In Re: SEC 2012-01 ANTRIM WIND ENERGY HEARING ON THE MERITS

DAY 4 - AFTERNOON SESSION ONLY November 1, 2012

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#### STATE OF NEW HAMPSHIRE

SITE EVALUATION COMMITTEE

November 1, 2012 - 1:35 p.m. DAY 4 Concord, New Hampshire AFTERNOON SESSION ONLY

> IN RE: SITE EVALUATION COMMITTEE: DOCKET NO. 2012-01: Application of Antrim Wind, LLC, for a Certificate of Site and Facility for a 30 MW Wind Powered Renewable Energy Facility to be Located in Antrim, Hillsborough County, New Hampshire. (Hearing on the merits)

PRESENT: SITE EVALUATION COMMITTEE:

Kate Bailey, Engineer (Presiding Officer)	Public Utilities Comm.
Amy L. Ignatius, Chrmn.	Public Utilities Comm.
Harry T. Stewart, Dir.	DES - Water Division
Johanna Lyons, Designee	Dept. of Resources &
	Econ. Dev.
Craig Green, Designee	Dept. of Transportation
Brad Simpkins, Dir.	DRED-Div. Forests & Land
Ed Robinson, Designee	Fish & Game Department
Richard Boisvert, Designee	Div. Historic Resources
Brook Dupee, Designee	Dept. Health & Human Svs.

COUNSEL FOR THE COMMITTEE: Michael Iacopino, Esq. COUNSEL FOR THE PUBLIC: Peter C. L. Roth, Esq. Sr. Asst. Atty. General N.H. Atty.Gen. Office

COURT REPORTER: Susan J. Robidas, N.H. LCR No. 44

 $\{\text{SEC 2010-12}\}$  [AFTERNOON SESSION ONLY]  $\{11-01-12\}$ 

1 2	APPEARANCES:	Reptg. Antrim Wind, LLC: Susan S. Geiger, Esq. (Orr & Reno) Douglas L. Patch, Esq. (Orr & Reno) Rachel Goldwasser, Esq. (Orr & Reno)
3		Dente Johnim Decad of Golestmen.
4		Galen Stearns, Town Administrator Michael Genest, Selectman
5		Town of Antrim
6		Reptg. Harris Center for Cons. Edu.: Stephen Froling, Esq.
7		Ponta Antrim Dianning Poard.
8		Martha Pinello, Member
9		Reptg. Audubon Society of N.H.: David M. Howe, Esq.
10		Amy Manzelli, Esq. (BCM Environment & Land Law)
11		
12		Reptg. Industrial Wind Action Group: Lisa Linowes
13		Reptg. North Branch Group of Intervenors:
14		Richard Block Loranne Carey Block
15		Lorumic curcy brock
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Ĺ	{SEC 2010-12}	[AFTERNOON SESSION ONLY] {11-01-12}

1 INDEX 2 PATRICK M. MARTIN WITNESS PANEL: 3 DANIEL T. BUTLER 4 PAGE Direct Examination by Mr. Patch 4 5 Cross-examination: 6 7 By Ms. Manzelli 8 By Mr. Block 34 By Mr. Roth 40 8 9 INTERROGATORIES BY SUBCOMMITTEE MEMBERS: 10 By Dir. Simpkins 49 By Dir. Stewart 50 11 By Mr. Robinson 54 By Mr. Green 56 12 58 By Chairman Ignatius By Mr. Iacopino 67 13 71 Redirect Examination by Mr. Patch 14 15 16 WITNESS: ROBERT D. O'NEAL 17 Direct Examination by Mr. Patch 75 18 Cross-examination: 19 86 20 By Ms. Longgood By Ms. Pinello 95 21 By Ms. Manzelli 99 By Mr. Block 138 22 By Ms. Linowes 178 By Mr. Roth 247 23 24

 $\{\text{SEC 2010-12}\}$  [AFTERNOON SESSION ONLY]  $\{11-01-12\}$ 

(Whereupon the hearing resumed after the 1 lunch break at 1:35 p.m.) 2 MS. BAILEY: Good afternoon. 3 We will continue the proceedings with the 4 5 panel of Mr. Butler and Mr. Martin. Is that correct? 6 7 MR. PATCH: Yes. 8 MS. BAILEY: All right. 9 Mr. Patch, you may proceed. 10 Thank you. MR. PATCH: 11 DIRECT EXAMINATION BY MR. PATCH: 12 Would you please, each of you, state your 13 Q. 14 name and address. 15 (Butler) Daniel T. Butler. My business Α. 16 address is 249 Western Avenue, Auburn --17 Augusta, Maine. (Martin) My name's Patrick Martin. I work at 18 Α. 19 400 Southborough Drive, South Portland, 20 Maine. 21 MS. BAILEY: Excuse me. Will 22 the reporter please swear the witnesses in. 23 (WHEREUPON, PATRICK M. MARTIN and DANIEL T. BUTLER were duly sworn and cautioned 24  $\{\text{SEC 2010-12}\}$  [AFTERNOON SESSION ONLY]  $\{11-01-12\}$ 

1		by the Court Reporter.)
2		PATRICK M. MARTIN, SWORN
3		DANIEL T. BUTLER, SWORN
4	BY M	IR. PATCH:
5	Q.	And by whom are you each employed and in what
6		capacity?
7	Α.	(Butler) I'm employed with TRC, and I am the
8		manager of the Civil and Transmission
9		Engineering Department.
10	Α.	(Martin) I also work for TRC. I'm a civil
11		engineer.
12	Q.	And could you give the Committee a brief
13		summary of your qualifications.
14	Α.	(Butler) I'm a civil engineer. I've been
15		registered in New Hampshire for about 20
16		21 years, and I've had I have
17		approximately 26 years experience.
18	A.	(Martin) I'm a registered civil engineer in
19		Maine. I have about 12 years of experience
20		in a wide variety of land development
21		projects.
22	Q.	And what is your role in the Antrim Wind
23		Project?
24	A.	(Butler) I am the engineer of record.
I	{SE	EC 2010-12} [AFTERNOON SESSION ONLY] {11-01-12}

1	A.	(Martin) I was the design engineer for the
2		project. I oversaw the design of the road
3		and the equipment pads.
4	Q.	And are you the same Daniel Butler and
5		Patrick Martin who submitted prefiled
6		testimony in this docket?
7	A.	(Butler) Yes.
8	A.	(Martin) Yes.
9	Q.	And that was dated January 31st of 2012. And
10		that's been marked as Exhibit AWE 1, and
11		that's in Volume 1, Tab 7?
12	A.	(Butler) Yes.
13	Q.	And did you also submit supplemental prefiled
14		testimony that was dated, I believe,
15		October 11th, 2012, which has been marked as
16		Exhibit AWE 9, and also Tab 7 in the fourth
17		supplement?
18	Α.	(Martin) Yes, that's correct.
19	Α.	(Butler) Yes.
20	Q.	And do you have any corrections or updates to
21		either the original prefiled or the
22		supplemental prefiled testimony?
23	Α.	(Butler) No.
24	Α.	(Martin) No, sir.
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{SEC 2010-12} [AFTERNOON SESSION ONLY]  ${11-01-12}$ 

1 Q. If you were asked the same questions in both 2 of those testimonies today under oath, would your answers be the same? 3 (Butler) Yes. 4 Α. 5 (Martin) Yes. А. MR. PATCH: The witnesses are 6 7 available for cross. 8 MS. BAILEY: Thank you. Mr. Frohling. 9 10 MR. FROHLING: No questions. 11 MS. BAILEY: Is Mr. Beblowski here? 12 13 MR. FROHLING: He's not. 14 MS. BAILEY: Is Mr. Jones here? 15 16 (No verbal response) MS. BAILEY: Ms. Sullivan? 17 (No verbal response) 18 19 MS. BAILEY: Ms. Longgood? MS. LONGGOOD: Nothing. 20 21 MS. BAILEY: Mr. Stearns or 22 Mr. Genest? 23 MR. STEARNS: No questions. 24 MS. BAILEY: Ms. Osler from {SEC 2010-12} [AFTERNOON SESSION ONLY] {11-01-12}

the Gregg Lake Association? 1 (No verbal response) 2 MS. BAILEY: No questions. 3 Mr. Levesque or Ms. Pinello? 4 5 MS. PINELLO: No questions. MS. BAILEY: Okay. It's your 6 7 Oh, no questions. turn. 8 MS. PINELLO: No questions. 9 MS. BAILEY: Thank you. 10 Ms. Manzelli? 11 MS. MANZELLI: Yes, thank you. CROSS-EXAMINATION 12 BY MS. MANZELLI: 13 Gentlemen, my name is Amy Manzelli. 14 Q. Ι 15 represent New Hampshire Audubon in this 16 matter. They're an intervenor. Good 17 afternoon. I want to start by directing your 18 19 attention to your prefiled direct testimony 20 from January 31st, 2012. 21 You discussed rock outcropping in your 22 testimony; right? 23 (Martin) Where is that reference, please? Α. Sure. Looking at Page 5. 24 Q.  $\{\text{SEC 2010-12}\}$  [AFTERNOON SESSION ONLY]  $\{11-01-12\}$ 

1	Α.	(Butler) Line 4?
2	Q.	Lines 4 and 5, yeah. I just want to make
3		make sure everyone was at the right page
4		first.
5	A.	(Martin) Yes.
6	Q.	Okay. Can you provide approximate
7		proportions of rock outcrop and rock outcrop
8		complex that will be disturbed during
9		construction?
10	A.	(Butler) I know I can't.
11	A.	(Martin) I don't think so. These
12		descriptions are actually soil descriptions
13		from the Soil Conservation Service Manual.
14		We haven't done an analysis of how much rock
15		will be required to be removed from the site
16		yet.
17	Q.	When will that be done?
18	A.	(Martin) We haven't been asked to do that.
19	Q.	Does it need to be done to construct this
20		facility?
21	A.	(Martin) Not in my opinion.
22	Q.	Of the 57.9 acres described on Line 7 that
23		will be disturbed, do I understand
24		correctly let me ask you this: Of the
l	{SE	C 2010-12} [AFTERNOON SESSION ONLY] {11-01-12}

1		57.9 acres that you reference as that will
2		be disturbed, is any of that rock outcrop or
3		rock outcrop complex?
4	A.	(Martin) Yes, I believe so.
5	Q.	Can you state what percentage of the
6		57.9 acres is rock outcrop or rock outcrop
7		complex?
8	Α.	(Martin) No. We haven't done that analysis.
9	Q.	Okay. And you can't quantify it in terms of
10		how many acres either?
11	Α.	(Martin) Not today.
12	Q.	Can you say whether it's more or less than
13		10 acres?
14	Α.	(Butler) I can't.
15	Α.	(Martin) No, I don't know. We haven't looked
16		at that. I don't know how to answer that
17		question otherwise.
18	Q.	Have you been to the site?
19	Α.	(Martin) Yes, I have.
20	Q.	Did rock outcrop and rock outcrop complex
21		dominate the 57.9 acres?
22	Α.	(Martin) No.
23	Q.	But it was there?
24	Α.	(Martin) Yes.

{SEC 2010-12} [AFTERNOON SESSION ONLY] {11-01-12}

1	Q.	Less than half of it?
2	A.	(Martin) Yes.
3	Q.	Same document, the January 31st, 2012,
4		prefiled testimony. Turning now to Page 7
5		let me just back up as I'm thinking over what
6		you testified about the rock outcrop.
7		Will any rock outcrop or rock outcrop
8		complex be blasted in the 57.9 acres?
9	А.	(Martin) Yes, there will be rock removal
10		required. How the contractor chooses to do
11		that is somewhat up to him. It may be
12		blasting; it may be another method.
13	А.	(Butler) It's his means and methods.
14	Q.	And what would the other methods be?
15	Α.	(Martin) There are chemical methods; there
16		are pressurized water methods.
17	Q.	What are the chemical methods?
18	Α.	(Martin) I don't know, off the top of my
19		head, specifically what that is. I'm aware
20		of their existence.
21	Q.	Who on the Antrim Wind Energy team would be
22		qualified to speak to that?
23	Α.	(Martin) I'm not aware that anybody would.
24		That's a very specialized method of rock
l	{SE	C 2010-12} [AFTERNOON SESSION ONLY] {11-01-12}

1		removal used in very particular locations.
2		It's something that the contractor would have
3		to evaluate if it was something that they
4		might want to use.
5	Q.	So it
6	A.	(Martin) It's not on anybody's radar right
7		now, though.
8	Q.	If the project were to be certificated and
9		get all the required approvals and go
10		forward, a contractor would be hired. We
11		don't know who that contractor is yet,
12		though?
13	Α.	(Martin) I don't.
14	Α.	(Butler) Don't know.
15	Q.	Okay. So a contractor would be hired. And
16		that contractor alone would determine the
17		method of removing the rock outcrop and rock
18		outcrop complex?
19	Α.	(Martin) I don't think that's exactly right.
20		I'm sure he would coordinate it with the
21		client. Any method he chooses would have to
22		be approved.
23	Q.	By who?
24	А.	(Martin) Would that be the Town or the DOT
l	{ SE	C 2010-12} [AFTERNOON SESSION ONLY] {11-01-12}

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		±
1		or
2	A.	(Butler) Is there a blasting plan?
3	A.	(Martin) There is. Is that DES?
4	A.	(Butler) DES. I believe DES has approvals
5		for blasting plans.
6	Q.	And those approvals have not yet been sought?
7	A.	(Butler) I don't think so.
8	A.	(Martin) No, that's farther down the road.
9		That's nobody would have done that yet.
10	Q.	And where exactly down the road would that be
11		done?
12	A.	(Martin) Once a contractor has been selected,
13		that would probably be one of the first
14		things they would need to do.
15	Q.	And when would a contractor be selected?
16	A.	(Martin) That's up to the client.
17	Q.	Can you state, based on your experience, when
18		it's likely that the contractor joins the
19		team?
20	A.	(Martin) After permits are issued.
21	Q.	So, getting back now to Page 7, Lines 17 and
22		18, you state there that the project will
23		result in a relatively small amount of new
24		impervious areas distributed between
	{s:	EC 2010-12} [AFTERNOON SESSION ONLY] {11-01-12}

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Reporter interjects.)		Court Reporter interjects.)
re that the project will	Q.	s there that the project will result
ly small amount of new		atively small amount of new
eas distributed between		ous areas distributed between four
rgely undeveloped waters		ve, largely undeveloped watersheds. I
rectly?		at correctly?
	A.	Yes.
watersheds the Willard	Q.	of the watersheds the Willard Pond
		ed?
	А.	Yes.
rovide the area of imper	Q.	you provide the area of impervious
will be located in the W		that will be located in the Willard
1?		ershed?
would be in the stormwa	Α.	That would be in the stormwater
		yes.
le that information to r	Q.	provide that information to me now?
n try to find it, sure.	A.	I can try to find it, sure.
tell me, does does t	Q.	ou can tell me, does does the
nagement report quantify		er management report quantify the
ne Willard Pond watershe		hin the Willard Pond watershed that
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<pre>ie that information to r n try to find it, sure. tell me, does does t nagement report quantify ne Willard Pond watershe ed with impervious surfa ed to verify that. you. s reviews document.)</pre>	Q. A. Q. A. Q.	<pre>yes. provide that information to me now? I can try to find it, sure. ou can tell me, does does the cer management report quantify the chin the Willard Pond watershed that covered with impervious surface? I need to verify that. Thank you. Witness reviews document.)</pre>

{SEC 2010-12} [AFTERNOON SESSION ONLY]  ${11-01-12}$ 

1	Q.	And if you or Antrim Wind counsel could
2		remind us which AWE exhibit is the Stormwater
3		Management Plan contained in?
4	A.	(Martin) It's in Volume 2. I don't know
5		which reference that is.
6		MR. PATCH: That would be
7		AWE 2.
8		MS. GEIGER: Not sure which
9		tab.
10		MR. PATCH: Is there an
11		appendix number for that?
12		WITNESS MARTIN: It's
13		Appendix 2B.
14	Q.	Thanks very much.
15		MR. PATCH: If I could
16		approach the witness and maybe try to help?
17	A.	(Martin) It's .037 acres.
18	Q.	What page are you reading from, please?
19	A.	(Martin) I don't think this has a number. It
20		is in the Appendix A of the stormwater
21		report.
22	Q.	Does Appendix A of the stormwater report have
23		a title other than Appendix A?
24	A.	(Martin) Yes, ma'am. It is the "Watershed
I	{SE	EC 2010-12} [AFTERNOON SESSION ONLY] {11-01-12}

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1		Analysis Calculations."	
2	Q.	Thank you.	
3		Moving along in your testimony, turning	
4		to Page 9, directing your attention to Lines	
5		4 through 6, could you read the sentence that	
6		begins with "Culverts"?	
7	А.	(Martin) "Culverts, level spreaders and	
8		additional retention areas that are needed	
9		based on the project's impacts will be	
10		maintained during operations in accordance	
11		with state requirements."	
12	Q.	Thank you.	
13		How does the decommissioning plan deal	
14		with those features you just read off?	
15	Α.	(Martin) I'm not familiar with the	
16		decommissioning plan. I'm a designer.	
17	Q.	So you're not familiar with what the fate of	
18		the culverts would be, for example?	
19	A.	(Martin) I can assume.	
20	Q.	What would your assumption be?	
21	A.	(Martin) I assume that they would be removed	
22		from the site and disposed of in a legal	
23		manner.	
24	Q.	Is that the standard practice?	
L	{SE	EC 2010-12} [AFTERNOON SESSION ONLY] {11-01-12}	

1	Α.	Sure. Yeah.	
2	Q.	And would you make that same assumption for	
3		the level spreaders and additional retention	
4		areas?	
5	Α.	(Martin) Yes. The level spreaders are just	
6		made of stone. They can be removed or	
7		possibly spread on the site. That's up to	
8		the decommissioning plan, whoever approves	
9		that. And the what was the third?	
10	Q.	The additional retention areas.	
11	Α.	(Martin) Yeah. Those can just be graded back	
12		to original grade.	
13	Q.	And just to confirm, your testimony is that	
14		that's not necessarily what the	
15		decommissioning plan calls for, because	
16		you're not familiar with it, but these things	
17		we just discussed would be standard practice?	
18	A.	(Martin) My testimony is, I don't know what	
19		the decommissioning plan says, but this is	
20		standard practice.	
21	Q.	Now sorry. Backing up just a bit to Page	
22		7, Lines 18 to 20. There's discussion of a	
23		permeable road base; is there not?	
24	Α.	(Martin) On 18 to 20. Yes, ma'am.	
L	{SEC 2010-12} [AFTERNOON SESSION ONLY] {11-01-12}		

1	Q.	And in the Stormwater Management Plan,
2		Section 4.3.2, there is discussion of the
3		permeable road base; right?
4	Α.	(Martin) I'll take your word for that.
5	Q.	Okay. And are you aware that under New
6		Hampshire law, gravel and crushed stone are
7		defined as being "impervious"?
8	Α.	(Martin) Gravel roads are.
9	Q.	And crushed stone?
10	Α.	(Martin) Crushed stone roads are.
11	Q.	Okay. So what will be the composition of
12		this road base that makes it permeable?
13	Α.	(Martin) It's a particular crushed stone. It
14		has very few fines in the mix. This method
15		is was actually requested by the DES to be
16		included in the project.
17	Q.	So is there some sort of process that you've
18		gone through with the DES to classify this
19		road as permeable?
20	A.	(Martin) We might not be talking about the
21		same thing here.
22	A.	(Butler) I think you're talking surface.
23		This permeable base is below the surface. It
24		allows water to flow underneath the roadway.
I	{SE	C 2010-12} [AFTERNOON SESSION ONLY] {11-01-12}

1		And I think what you're talking about is
2		surface gravel or gravel roadways.
3	Q.	So describe to me, then, the composition of
4		this road and how and to what extent it will
5		be permeable.
6	Α.	(Martin) The permeable base is made up of the
7		open, graded stone. On top of that is the
8		regular you know, the standard gravel
9		road, crushed stone and fine. So it compacts
10		really well.
11		It's permeable, as Mr. Butler said, in
12		that runoff flows through the base under the
13		road, but it's not permeable in the sense
14		that rainwater infiltrates into the road.
15	Α.	(Butler) We have the detail in the drawings.
16		I can't
17	Q.	Well, my question relates more to the nature
18		of the top of the road. Do I understand
19		correctly that the top of the road is not
20		permeable at all?
21	Α.	(Martin) That's correct.
22	Q.	And so while stormwater may infiltrate on the
23		sides of the road and then flow under it,
24		stormwater that falls onto the road will flow
I	{SE	C 2010-12} [AFTERNOON SESSION ONLY] {11-01-12}

1		on top of it and not infiltrate into it?
2	Α.	(Martin) That's correct.
3	Q.	And could you please state, either in linear
4		measurement or in percentage of the road,
5		what amount of the road will have this
6		permeable road base? I'm given to understand
7		from your testimony that it won't be in
8		the underneath the entire road; correct?
9	A.	(Martin) No, it won't. It's only proposed
10		under certain sections. And fairly flat
11		sections where you can expect water to flow
12		through the road, we designed it there. We
13		also included it in areas where we're forced
14		to cross wetlands.
15	Q.	If I can
16	A.	(Martin) I cannot quantify it.
17	Q.	Okay.
18	A.	(Martin) It's delineated on the plans. The
19		road is stationed, so you can what I would
20		do is just go through the plans, read off the
21		stations, calculate the length that way. I
22		haven't done that yet.
23	Q.	I'm not the expert here, so that's why I'm
24		asking you. How long would it take you to do
	{SE	C 2010-12} [AFTERNOON SESSION ONLY] {11-01-12}

1		that calculation?
2	А.	(Martin) Fifteen minutes, 20 minutes.
3	Q.	Okay. Is that calculations that you could
4		provide before the conclusion of the hearing
5		in this matter?
6	Α.	(Martin) Yes.
7	Q.	Thank you.
8		MR. PATCH: So is the request
9		that we provide that? Should we reserve an
10		exhibit?
11		MS. BAILEY: I haven't heard
12		such a request.
13	BY M	IS. MANZELLI:
14	Q.	Would you please quantify the area which will
15		have the permeable road base.
16	A.	(Martin) Yes, ma'am.
17	Q.	Thank you.
18		MR. IACOPINO: Mr. Patch, I
19		assume that will be the next numbered exhibit
20		when it comes in.
21		MR. PATCH: Okay.
22		MR. IACOPINO: It's really
23		treated as a record request.
24		MS. MANZELLI: Thank you.
	{SE	C 2010-12} [AFTERNOON SESSION ONLY] {11-01-12}

1 BY MS. MANZELLI:

2	Q.	Do you agree that continuing to look at
3		the Stormwater Management Plan on Page 5,
4		there's a statement that implies that all
5		volumes of the New Hampshire Stormwater
6		Management Plan excuse me. Let me make
7		sure I'm using the right title for the
8		document.
9		On Page 5 there's a statement that the
10		New Hampshire stormwater manual, Volumes 1, 2
11		and 3 that the project had been designed
12		to meet the standards set forth there. Am I
13		characterizing that statement accurately?
14	A.	(Martin) Yes, that's right.
15	Q.	Later in the application excuse me. Later
16		in the Stormwater Management Plan and in your
17		testimony, there's particular mention of
18		Chapters 2 and 4 of the New Hampshire
19		stormwater manual; correct?
20	A.	(Martin) I imagine so.
21	Q.	So, was every section of the New Hampshire
22		stormwater manual followed?
23	A.	(Martin) Yes, generally. There are some
24		specific requirements that apply more to a
L	{SE	C 2010-12} [AFTERNOON SESSION ONLY] {11-01-12}

1		subdivision type of plan that wouldn't apply
2		to a road like this. So we worked with our
3		DES reviewer to figure out how to address
4		that as best we could for this project.
5	Q.	So I don't want to put words in your
6		mouth, so you tell me if this is accurate.
7		Is every requirement set forth or excuse
8		me. Every standard in the New Hampshire
9		stormwater manual that's set forth there,
10		that's applicable to this project, was the
11		project designed to meet all of those?
12	A.	(Martin) Yes.
13	Q.	And just so I'm clear, I know you understand,
14		because it's in the plan and in your
15		testimony, that the stormwater manual has
16		three volumes, one, two, three?
17	A.	(Martin) Yes.
18	Q.	When you reference, in particular, Chapters 2
19		and 4, do you recall what volume that
20		referred to?
21	A.	(Martin) I believe it's Volume 2. I'm not a
22		hundred percent sure on that. That's where
23		most of the design standards are.
24	Q.	That is what I assumed. Thank you for
	{SE	C 2010-12} [AFTERNOON SESSION ONLY] {11-01-12}

1		confirming.		
2		Do you agree that invasive species are a		
3		public health issue?		
4	A.	(Martin) I guess that depends on the species.		
5	Q.	Some?		
6	Α.	(Martin) I assume so. I'm not a biologist or		
7		a botanist.		
8	Q.	Do you agree that invasive species are a		
9		water quality issue?		
10	Α.	(Martin) Yes.		
11	Q.	And on Page 9 of your testimony, in Lines 10		
12		through 11, there's a reference to native mix		
13		reseeding; right?		
14	A.	(Martin) Yes.		
15	Q.	Prior testimony in this matter, I understood,		
16		was that native mix reseeding would be used		
17		to the extent possible. That's not a quote.		
18		That's my summary of what I think I heard.		
19		Can you explain whether only native mix		
20		reseeding will be done or whether there's		
21		some option for something other than native		
22		mix reseeding to be used?		
23	Α.	(Martin) The only circumstance I can think of		
24		right now where we wouldn't use that would be		
	$\{\text{SEC } 2010-12\}$ [AFTERNOON SESSION ONLY] $\{11-01-12\}$			

1		if we needed to establish growth very
2		quickly, like in conditions now, winter or
3		fall. And again, I'm not a botanist, so I
4		haven't memorized a native species list. But
5		it's possible that, like our rye grass,
6		something that grows very quickly would be
7		used then. But that would be something that
8		we could negotiate with the DES.
9	Q.	And is that something that could be avoided
10		with through planning?
11	A.	(Martin) Yes.
12	Q.	And what aside from using a native mix
13		reseeding, what other efforts will be used to
14		prevent invasive species?
15	Α.	(Martin) Other than that, I would say that
16		the regular cleaning of the construction
17		vehicles to make sure they don't, you know,
18		bring seeds or species in from other sites.
19		That's the limit of my knowledge on that.
20		That's really more of an environmental
21		monitor's job.
22	Q.	Is the regular cleaning of vehicles that you
23		just mentioned documented somewhere in the
24		Antrim Wind Application? I don't need a
l	{SE	C 2010-12} [AFTERNOON SESSION ONLY] {11-01-12}

1		particular citation. I just would like your
2		confirmation whether it's in there or not, to
3		your knowledge.
4	A.	(Martin) Not to my knowledge. That would
5		come in a different section than the
6		engineering part.
7	Q.	So it's just to confirm what you're
8		saying, it might be in the Application, but
9		it's not in the part of the Application that
10		your testimony deals with?
11	A.	(Martin) Correct.
12	Q.	Now, turning to your supplemental prefiled
13		testimony from October 11th I can give you
14		the page and line if you'd like. But
15		generally, I'd like you to let us know where
16		the water in which watershed the
17		radar-activated lighting system will be
18		located excuse me the radar-activated
19		lighting system tower will be located.
20	Α.	(Martin) That tower is going to be in the
21		neighborhood of Structure 10. And I believe
22		that's going to fall in the Gregg Lake
23		watershed.
24	Q.	Is there something that you could do to be
I	{SE	C 2010-12} [AFTERNOON SESSION ONLY] {11-01-12}

1		sure that's where it will be located?
2	Α.	(Martin) Yes.
3		(Witness reviews document.)
4	Α.	(Martin) I was mistaken. That was the
5		Willard Pond watershed.
6	Q.	Thanks for verifying.
7		Now, moving along, in this matter, the
8		Wildlife Impact Assessment says, "Stormwater
9		runoff will be treated at this site through
10		utilizing undisturbed forested buffers." To
11		the best of your knowledge, is that statement
12		accurate?
13	Α.	(Martin) That's one of the methods that we
14		use.
15	Q.	Will this site retain existing grades and
16		elevations?
17	Α.	(Martin) Throughout the site?
18	Q.	Yup.
19	Α.	(Martin) No, there's going to be a road
20		there.
21	Q.	Okay. So will there be elevation differences
22		between the edge of the disturbed site and
23		the adjacent undisturbed forest?
24	Α.	(Martin) No. The edge of the disturbance is
	{SE	C 2010-12} [AFTERNOON SESSION ONLY] {11-01-12}

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1		where disturbance stops.		
2	Q.	And where disturbance stops, there's going to		
3		be no elevation change between		
4	А.	(Martin) No, beyond that is undisturbed land.		
5		That's exactly what's out there now.		
6	Q.	Right. But where it's disturbed say, for		
7		example, let's look at the five the		
8		outermost 5 feet of disturbance.		
9	Α.	(Martin) Okay.		
10	Q.	Is there going to be an elevation change		
11		along that 5 feet and the undisturbed forest?		
12	Α.	(Martin) I don't think I understand the		
13		question.		
14	Q.	So is there going to be a drop-off of any		
15		sort, either way, even if it's only even		
16		if it can only be measured in inches?		
17	Α.	(Martin) Okay. No. The roadbed well, the		
18		road slopes will be graded down to meet the		
19		existing ground, so there won't be any		
20		drop-off there.		
21	Q.	Okay. And to achieve the situation where		
22		there is no change in there's no drop-off		
23		either way, will the disturbed area need to		
24		be made bigger than what is proposed right		
	{SEC 2010-12} [AFTERNOON SESSION ONLY] {11-01-12}			

1		now?	
2	А.	(Martin) No.	
3	Q.	Now, also looking at the wildlife impact	
4		or referencing the Wildlife Impact	
5		Assessment, it mentions the bedrock outcrops	
6		in the very steep slopes, and that those are	
7		considered constraints to engineering design.	
8		Do you agree with that statement?	
9	A.	(Martin) Yeah, generally.	
10	Q.	Can you describe how these constraints will	
11		be addressed?	
12	A.	(Martin) Well, best option would be to avoid	
13		them.	
14	Q.	Are they avoidable?	
15	A.	(Martin) I believe so, yeah.	
16	Q.	Well, didn't you just testify earlier that	
17		some of the rock outcrop in the 57 some-odd	
18		acres would be impacted?	
19	Α.	(Martin) I think I need to hear the question	
20		again. I don't think I understood it.	
21	Q.	Sure. Are the rock, the existing bedrock	
22		outcrops, a constraint to this project?	
23	Α.	(Butler) I don't believe they're constrained.	
24	Α.	(Martin) No. They're a factor that you need	
	{SE	C 2010-12} [AFTERNOON SESSION ONLY] {11-01-12}	_

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1		to account for, but
2	A.	(Butler) Exactly.
3	A.	(Martin) it's just rock.
4	Q.	So how will they be accounted for?
5	A.	(Martin) We designed the road to avoid as
6		much of those areas as possible. When that's
7		not possible, then the rock will be removed.
8	Q.	How close will turbine pads be located to
9		bedrock outcrops that will remain
10		undisturbed?
11	A.	(Martin) I'm not sure how to answer that.
12		Some of them will be built on rock outcrops.
13	Q.	Okay. How does the Application address
14		climate change?
15	A.	(Martin) To my knowledge, it does not.
16	Q.	And do you agree that climate change is
17		already bringing increasingly frequent
18		extreme weather events to New Hampshire?
19	A.	(Martin) My personal opinion?
20	Q.	I'm asking if you are aware of this.
21	A.	(Martin) My personal opinion is yes. That
22		has nothing to do with my professional
23		opinion of this project.
24	Q.	Are you aware that climate change is expected
l	{se	EC 2010-12} [AFTERNOON SESSION ONLY] {11-01-12}

			51
1		to exacerbate water quality?	
2	A.	(Martin) Yes, I'm aware of that.	
3	Q.	Are you aware that climate change is expected	
4		to affect water availability?	
5	Α.	(Martin) I'm aware of that.	
6	Q.	Are you aware that climate change is expected	
7		to test our readiness to deal with droughts	
8		and flooding?	
9	Α.	(Martin) Yes, ma'am.	
10	Q.	Are you aware that climate change is expected	
11		to overwhelm the existing stormwater	
12		infrastructure in many places?	
13	Α.	(Martin) Yes.	
14	Q.	Are you aware that climate change is	
15		increasing is expected to have	
16		increasingly frequent storms with extreme	
17		precipitation?	
18	Α.	(Martin) Yes.	
19	Q.	Are you aware that EPA categorizes New	
20		Hampshire in the highest level of increases	
21		in the frequency of storms with extreme	
22		precipitation?	
23	Α.	(Martin) I was not aware of that.	
24	Q.	Do you agree that 50-year storms are coming	
	{SE	EC 2010-12} [AFTERNOON SESSION ONLY] {11-01-12}	

1		more frequently than 50 years recently?
2	A.	(Martin) I haven't seen any evidence on that.
3	Q.	But you are aware that climate change is
4		expected to cause increasingly frequent
5		storms with extreme precipitation?
6	A.	(Martin) I believe that's expected, yes.
7	Q.	Do you believe that's occurring already?
8	A.	(Martin) I haven't seen any evidence of that.
9	Q.	And you agree that the data used in the
10		Stormwater Management Plan regarding the
11		frequency of storm events is from 1986?
12	A.	(Martin) I don't know for certain, but that
13		sounds about right.
14	Q.	Is there something that you could do quickly
15		to be certain?
16	A.	(Martin) No. I would have to go to the
17		website where we get our precipitation data.
18	Q.	Do you know, just sitting here quickly, if it
19		wasn't from a 1986 source, what other source
20		it would be from?
21	A.	(Martin) I don't know the date of the source
22		I used.
23	A.	(Butler) It's from a source acceptable to the
24		State of New Hampshire, the DES.
	{SE	EC 2010-12} [AFTERNOON SESSION ONLY] {11-01-12}

1	Q.	Well, in fact, it's a DES publication, the
2		"Water Resources Primer," that states that
3		increasingly frequent storms with extreme
4		precipitation are expected, the statement you
5		agreed to.
6	A.	(Martin) To my knowledge, they've not changed
7		their design standards yet.
8	Q.	And based on your experience, do design
9		standards always keep up with scientific
10		knowledge?
11	A.	(Martin) No.
12	Q.	And are you familiar with the "New Hampshire
13		Water Resources Primer"?
14	A.	(Martin) No.
15	Q.	So that wasn't incorporated into your
16		analysis in this matter?
17	A.	(Martin) No.
18	Q.	Thank you, gentlemen. I have no further
19		questions for you.
20	A.	Thank you.
21		MS. BAILEY: Thank you.
22		Mr. Allen I mean
23		sorry Ms. Allen or Mr. Edwards?
24		(No verbal response)
ļ	{se	C 2010-12} [AFTERNOON SESSION ONLY] {11-01-12}

1		MS. BAILEY: Not here.
2		Mr. Block.
3		CROSS-EXAMINATION
4	BY M	IR. BLOCK:
5	Q.	Yes. Good afternoon, gentlemen.
6		Referencing your prefiled direct
7		testimony on Page 10 of the original of
8		the January 31st testimony, I'd like to read
9		line parts of Lines 10 through 14, which
10		says, "Any blasting that is necessary will be
11		done by an experienced, licensed contractor
12		who will operate in strict compliance with a
13		project blasting plan which will be provided
14		to the Town and reviewed and approved by the
15		New Hampshire Department of Safety. Blasting
16		plans typically include advance
17		notification."
18		Can you let us know how residents in the
19		area will be notified of blasting activities?
20	A.	(Martin) I would assume that they would
21		establish a radius around the blasting area
22		and notify all of the property owners in that
23		radius.
24	Q.	Do you know how that notification will occur?
l	{SE	C 2010-12} [AFTERNOON SESSION ONLY] {11-01-12}

1	A.	(Martin) I don't. This is typically
2		conducted by the contractor. It's not
3		something that we would ordinarily deal with
4		as engineers.
5	Q.	So you so you don't know if there will be
6		advance notice to residents or anything.
7	A.	(Martin) I understand that advance notice is
8		required.
9	Q.	Is advance notice to individuals living in
10		the area or just to the Town, because it does
11		say "provided to the Town."
12	A.	(Martin) I don't know the answer to that.
13	Q.	Okay. I was just wondering if do you know
14		whose responsibility it is, therefore, to let
15		residents know?
16	A.	(Martin) It will be the responsibility of
17		either the contractor or the client, and I
18		assume that they will be requirements of
19		whatever permit is issued for the blasting or
20		approval of the blasting plan process.
21	Q.	Do you know who approves the blasting plan
22		process?
23	A.	(Martin) The Department of Safety.
24	Q.	The state's Department of Safety. Okay.
	{se	C 2010-12} [AFTERNOON SESSION ONLY] {11-01-12}
Thank you. 1 Actually, I'd like you now to reference 2 Exhibit NB 4, the Susan Morse testimony. 3 MR. IACOPINO: Just a minute, 4 Mr. Block. 5 MR. BLOCK: Electronically 6 7 that's NB 4. BY MR. BLOCK: 8 And specifically in that testimony, I'd like 9 Q. 10 to look at her Exhibit SM 8, towards the back 11 of that, and the sixth and seventh page of that exhibit. Electronically, that's Pages 12 56 and 57. 13 14 (Martin) Could you please repeat where we Α. could find that? 15 16 Exhibit SM 8, towards the back. Q. 17 Α. (Martin) Those photographs? There's some photographs --18 Q. 19 Α. Photographs? Okay. 20 They're photographs. 0. 21 Α. Okay. Thank you. 22 And it's the sixth and seventh page. And the 0. 23 captions for all of them are, "Large boulders 24 along proposed road." There are six  $\{\text{SEC 2010-12}\}$  [AFTERNOON SESSION ONLY]  $\{11-01-12\}$ 

1		photographs there.
2	A.	(Butler) Yeah.
3	A.	(Martin) Yes, sir.
4	Q.	I'm just wondering, have you seen this type
5		of house-side boulders or glacial erratics on
6		other projects you've worked on?
7	Α.	(Martin) Yes, we have.
8	Q.	And in those instances, what was done? Were
9		they blasted away, or was the road or turbine
10		site moved in response to this kind of
11		terrain?
12	A.	(Martin) Depending on the project, either is
13		possible. Both have happened.
14	Q.	Okay. If you could take a look at the next
15		page after that, there's a the top picture
16		says, "Large boulder on summit of Willard
17		Mountain."
18	A.	(Martin) Yes.
19	Q.	Have you been up there and seen this? It's a
20		cabin-side glacial erratic on the summit,
21		right close to the proposed site of Wind
22		Turbine 10.
23	A.	(Martin) Yes, I've seen it.
24	Q.	And that's about 50 yards. Do you know what

1		the prognosis for that will be?
2	A.	(Martin) I don't know specifically. If I
3		recall correctly, the road has been adjusted
4		to avoid it. But I can't I'm not a
5		hundred percent sure on that.
6	Q.	Okay. I'm just wondering if that if
7		something like that would be in the way,
8		being only 50 yards from the stake there
9		if that would be in the way of the turbine or
10		if that could remain.
11	A.	Yeah, I see what you're saying. Yeah, in
12		that case, yeah, it would have to be removed.
13		Probably be reduced to stone and used in the
14		road construction.
15	Q.	Okay. Just one more question, going back to
16		your prefiled testimony, back to Page 10
17		again. And Line 15 and 16 says, "At the end
18		of construction, all areas that are not
19		developed into the final operational
20		components of the project will be restored to
21		their pre-construction condition." And I
22		guess my question is, how do you plan to
23		restore glacial erratics and boulder fields
24		on Willard Mountain?

1	A.	(Martin) Well, using the last one for an
2		example, that one is actually located where
3		the pretty close to where the tower was
4		going to be, so it would be removed. That
5		would be part of the final operational
6		component of the project.
7	Q.	Okay. And what about the ones along the way
8		if you have to skirt close to them?
9	A.	(Martin) If there's no way to avoid them with
10		the road, then they would be incorporated
11		into the road, and that would make them part
12		of the operational components of the project.
13	Q.	Do you have a preference for avoidance over
14		disruption of the rocks? Is there any level
15		of priority on that?
16	A.	(Martin) It would depend on the nature of the
17		rock. If it's just an erratic like that, if
18		there's no way to avoid it, then, like I
19		said, it would have to be removed, reduced to
20		stone and incorporated into the road. I
21		can't say if one is preferable to the other.
22	Q.	All right. Thank you. No more questions
23		from me.
24	A.	(Martin) Thank you, sir.

MS. BAILEY: Thank you. 1 Ms. Linowes? 2 MS. LINOWES: I have no 3 questions. Thank you. 4 5 MS. BAILEY: Mr. Roth. CROSS-EXAMINATION 6 7 BY MR. ROTH: 8 0. Thank you. Only a couple. You mentioned in your earlier 9 10 cross-examination an environmental monitor. 11 Can you talk about what an environmental monitor is and whether there's one provided 12 in this project? 13 14 (Martin) An environmental monitor is a Α. 15 specialist in erosion control. Frequently 16 they are required as part of one of the 17 conditions of the project to just stay on the site while construction is going on and make 18 sure that all the erosion and sediment 19 20 control methods are being built correctly and 21 are functioning properly. 22 Is there anything in the permits that Okay. 0. 23 have been taken thus far or the plans as you know them that requires an environmental 24

{SEC 2010-12} [AFTERNOON SESSION ONLY] {11-01-12}

1		monitor for this project?
2	A.	(Martin) I believe there is. I need to check
3		for sure, though.
4		MR. IACOPINO: That would be
5		Committee Exhibit 12, the DES exhibits.
6	A.	(Martin) Yes. Right here.
7		(Witness reviews document.)
8	A.	(Martin) Did you get that? It's in Section
9		12, second page under Project Specific
10		Conditions. Item No. 8 covers that.
11		"Requires an environmental monitor to be on
12		site."
13	Q.	Okay. And who hires the environmental
14		monitor?
15	Α.	(Martin) I believe the client or the
16		developer, yeah.
17	Q.	So is it someone independent from the
18		construction firm?
19	Α.	(Martin) Yes.
20	Q.	Okay. And someone independent from the
21		developer?
22	Α.	(Martin) If the developer is paying him, I
23		don't think he's very independent. It's not
24		someone who works for the developer, but
L	{SE	C 2010-12} [AFTERNOON SESSION ONLY] {11-01-12}

1	Q.	Okay. Thank you.
2		Now, are you familiar with the Kibbe
3		project?
4	A.	(Martin) Only vaguely.
5	Q.	I'm going I'd like you to look at AWE 15.
6		And there are a series of photographs. And
7		the first four photographs are of Kibbe
8		Mountain, so described. Can you look at
9		those briefly? And there's a moose kind of
10		wandering around in a strange state of
11		confusion.
12	A.	(Martin) I don't think I can speak to the
13		state of mind of the moose.
14	Q.	I don't think anybody can, actually.
15		Can you tell whether he's been
16		disturbed?
17	A.	(Martin) He looks happy to me.
18	Q.	The question I have for you is: Looking at
19		this site, can you tell whether this has been
20		revegetated?
21	A.	(Butler) There is some vegetation.
22	Q.	This first picture, for example, would you
23		expect Antrim Wind at a, quote, restored
24		state, you know, revegetated state, to look
ļ	{SE	EC 2010-12} [AFTERNOON SESSION ONLY] {11-01-12}

1		something like this?
2	A.	(Butler) It would look better.
3	Q.	You would hope; right?
4	A.	(Butler) This is at elevation 3,000. And
5		Antrim, I believe what are we dealing with
6		in elevations?
7	A.	(Martin) Nothing close to that.
8	A.	(Butler) This is the growing season. A lot
9		shorter and type of vegetation is different.
10	Q.	So is it fair to say that it's sometimes
11		difficult to get vegetation to take when you
12		try to revegetate?
13	Α.	(Butler) It's really dependent on where you
14		are. And again, Kibbe is a different this
15		is a different location, different
16	Q.	I understand. But what I'm suggesting
17		what I'm asking you is it sometimes difficult
18		to get the revegetation to take?
19	A.	(Butler) Yes.
20	Q.	Okay. Some places it's more successful than
21		others; correct?
22	A.	(Butler) Yeah.
23	A.	(Martin) And sometimes you just need to be
24		more persistent.
	{SI	EC 2010-12} [AFTERNOON SESSION ONLY] {11-01-12}

1	Q.	Okay. Now, look down further below those
2		first four. You'll come to a picture that
3		says "Stetson," and then you'll see one
4		that's Mars Hill. Are you familiar with
5		either of those sites?
6	A.	(Martin) I wasn't involved in any of those
7		projects.
8	Q.	Okay. Do you see the level of vegetation in
9		those pictures?
10	A.	(Martin) Yes.
11	Q.	Is that kind of an ideal, from your
12		perspective?
13	A.	(Martin) It looks like a good start. I don't
14		think that's been fully vegetated.
15	Q.	Okay. Thank you.
16		Have you ever heard the expression "best
17		laid plans of mice and men," and so on?
18	A.	(Martin) Yes, I have.
19	Q.	Okay. And in general, what does that
20		expression mean to you?
21	A.	(Martin) If at first you don't succeed, try,
22		try again.
23	Q.	Well, I suppose that's the corollary, isn't
24		it?
I	{SE	EC 2010-12} [AFTERNOON SESSION ONLY] {11-01-12}

1	Α.	(Martin) Can you repeat your question,
2		please?
3	Q.	What do you think the expression, "the best
4		laid plans of mice and men" I guess it's
5		something like "often go astray," if I'm
6		getting it right what does that mean to
7		you?
8	Α.	(Martin) That if your plan doesn't go as
9		expected, then you need to address why.
10	Q.	That's an interesting perspective. I always
11		took it as things don't always turn out as
12		you plan. Does that does that sound more
13		like it?
14	Α.	I'm a glass half full kind of guy.
15		[Laughter]
16	Q.	Okay. Is it fair to say I'm looking at
17		the your testimony of January 31st, Page 9
18		through 11. And you talk about the Applicant
19		will retain an experienced general
20		contractor, a qualified logging company, an
21		experienced licensed contractor for blasting,
22		et cetera.
23		Now, you guys do plans. But somebody
24		else is going to hire and supervise the
Į	{SE	C 2010-12} [AFTERNOON SESSION ONLY] {11-01-12}

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1		contractor; correct?	
2	A.	(Martin) Yes, that's correct.	
3	Q.	And so your opinions in here are with respect	
4		to the plan, but it is premised upon using	
5		qualified experienced people; correct?	
6	A.	(Martin) It's also a condition of the DES	
7		permit.	
8	Q.	Okay. And sometimes the contractors that are	
9		retained may appear to be qualified and	
10		experienced, but it doesn't work out so good;	
11		correct?	
12	Α.	(Martin) I agree that's sometimes the case.	
13	Q.	Okay. That's all.	
14		Now, this is kind of a shot in the dark	
15		here. Following up on questions by the	
16		previous questioner, how many 50-year storms	
17		have we had in New Hampshire since 2000?	
18	A.	(Martin) I don't know that.	
19	Q.	Do you know since 2005?	
20	A.	(Martin) I don't know that either.	
21	Q.	Or since 2010?	
22	Α.	(Martin) No, sir.	
23	Q.	Okay. Now, there was some testimony earlier	
24		about the 16-foot road and the 34-foot road.	
	{SE	C 2010-12} [AFTERNOON SESSION ONLY] {11-01-12}	

1		Are you familiar with those sections of the
2		road?
3	Α.	(Martin) Yes, I am, sir.
4	Q.	Okay. And it was there was discussed that
5		in some places there's going to be a 50- to a
6		100-foot clearing, sort of, I suppose, wide
7		with the road more or less, you know, in the
8		middle. Maybe not always in the middle,
9		but
10	Α.	(Martin) Generally true, yes.
11	Q.	Okay. So do you agree with that statement
12		that there's going to be a 50- to
13		100-foot-wide clearing?
14	Α.	(Martin) Yes.
15	Q.	Okay. And as part are part of those
16		clearings going to be cuts and fills?
17	A.	(Martin) Yes, that's how you build the road.
18	Q.	Right. And is this road in terms of the
19		technical specifications of it, this isn't an
20		ordinary road for Jeeps or Formula One cars
21		or anything like that, is it?
22	Α.	No, they're rarely seen on farm sites.
23	Q.	No, that's true. But what is this road being
24		built for?

1	Α.	(Martin) Officially for construction of the
2		projects, and beyond that, maintenance.
3	Q.	Okay. And isn't it true that, with respect
4		to a road for this type for this type of
5		project, you need to have very particularly
6		gentle grades?
7	А.	(Martin) I believe our grades are appropriate
8		for the site.
9	Q.	Okay. And if you were to have two points on
10		the road, the differential between those two
11		points and I'm trying to get you to
12		envision this. Whether there's a little hill
13		or a little dip, that has to be very tightly
14		controlled because of the size of the
15		machinery that's being brought up on this
16		road; isn't that correct?
17	A.	(Martin) Yes, that's correct.
18	Q.	And similarly with the curves, don't the
19		curves on the road need to have particularly
20		wide radii?
21	A.	(Martin) Yes, all of that was taken into
22		account during our design.
23	Q.	Okay. So this isn't just a usual, typical
24		road up a mountainside for automobile traffic
	{SE	C 2010-12} [AFTERNOON SESSION ONLY] {11-01-12}

1		or light truck traffic, is it?
2	A.	(Martin) I don't entirely agree with that,
3		no. The same design requirements are I
4		mean, they're the same for any road, no
5		matter its use.
6	Q.	Have you been up the Mount Washington Road?
7	Α.	(Martin) I have not.
8	Q.	That's all I have. Thank you.
9	Α.	(Martin) Thank you, sir.
10		MS. BAILEY: Thank you.
11		Questions from the Committee?
12		Mr. Simpkins.
13		DIR. SIMPKINS: Yes, I just
14		have a quick question.
15	INTE	RROGATORIES BY DIR. SIMPKINS:
16	Q.	This is for either one of you.
17		On Page 10 of 11 of your prefiled direct
18		testimony, Line 3, you mentioned a qualified
19		logging company will clear and remove trees
20		where necessary, and I was just curious if
21		you could describe what those qualifications
22		will be.
23	Α.	(Martin) I can't say for sure. I would
24		imagine that, if I were hiring a logging
	{SE	C 2010-12} [AFTERNOON SESSION ONLY] {11-01-12}

1		company, I would want to look for years of
2		experience, maybe check in with some previous
3		clients to see if they did a good job, check
4		to see if the State has any complaints
5		against them, that sort of thing.
6	Q.	Okay. And are you aware that in New
7		Hampshire there's no qualifications for
8		loggers, no certification or no licensing
9		other than voluntary?
10	Α.	(Martin) No, I was not aware of that.
11		DIR. SIMPKINS: Thank you. No
12		further.
13		MS. BAILEY: Mr. Stewart.
14	INTE	ERROGATORIES BY DIR. STEWART:
15	Q.	I'm in Commission 12, which is the Department
16		of Environmental Services' letter dated
17		August 31st, 2012, from Rene Pelletier.
18	Α.	(Martin) Is that the letter of approval?
19	Q.	Yes. And that was my first question. What
20		is this letter?
21	Α.	(Martin) Yeah. Okay. I have it here.
22	Q.	Okay. What does this letter recommend?
23	Α.	(Martin) "DES recommends approval of the
24		Application with the conditions that are
l	{SE	EC 2010-12} [AFTERNOON SESSION ONLY] {11-01-12}

1		enclosed with this letter. The following is
2		a list of the program permit numbers" oh,
3		I guess that's not applicable.
4	Q.	That's fine. Thank you.
5		There was a question earlier in No. 14
6		of the alteration of terrain comments or
7		conditions, really. It concerns best
8		management practices for blasting.
9		(Witness reviews document.)
10	A.	(Martin) Yes, sir.
11	Q.	Can you explain what that condition requires
12		and how you would comply with that condition?
13	A.	(Butler) Yeah. We don't think that's our
14		job, basically. I think
15	Q.	Well, whose job is it?
16	A.	(Butler) Well, I think one of the things that
17		we can do is we can assist the owner. But in
18		terms of selection of the logging firm, is to
19		ensure that they can provide this
20		information, and the fact that they can
21		include this information and do it.
22	Q.	Do you agree that the best management
23	A.	(Butler) I mean, it should be adhered to.
24	Q.	Would your company be the inspector on the
I	{ SE	C 2010-12} [AFTERNOON SESSION ONLY] {11-01-12}

1		job of the Applicant, or do you not know
2		that?
3	Α.	(Butler) No, don't know that.
4	Q.	Okay. Would the resident engineer on a
5		project oversee compliance with this
6		requirement?
7	Α.	(Butler) Well, I would suspect that one of
8		the if we were the owner's engineer, which
9		we're not we don't know if we are, in
10		fact, going to be the owner's engineer.
11		But one of the things that we would do
12		is work with the owner to get the logging
13		company to provide this as a submittal. Some
14		of these things best management
15		procedures, blasting procedures, I mean,
16		loading practices we would ask the
17		blasting company to provide that information
18		and work with the owners to, I guess, really,
19		just making sure that the information is
20		appropriate. I mean, is that what your
21		question is?
22	Q.	Well, pretty much. I mean, I'm trying to
23		understand how the Applicant is going to
24		comply with this blasting condition, and I
I	{SE	C 2010-12} [AFTERNOON SESSION ONLY] {11-01-12}

1		just assumed that the resident engineering
2		firm would be responsible for oversight of
3		that.
4	Α.	(Martin) This is not something I've been
5		asked to do before. But your assumptions
6		make sense to me. Again, the blasting plan
7		would have to be developed and approved by
8		the State. The resident engineer or the
9		owner's engineer would probably work with the
10		blasting company, as well as the developer,
11		to work out a plan and then make sure that
12		all these steps are followed. And I would
13		assume that the State would have a monitor
14		there as well.
15	Q.	All right. I wouldn't assume that.
16	А.	(Martin) Okay.
17	Q.	It would be on the Applicant, generally.
18		Similarly, Conditions 16 and 17
19		Condition 16 requires a construction BMP,
20		inspection and maintenance plan, and 17, with
21		regard to turbidity sampling plan to ensure
22		water quality standards again, I was
23		assuming the resident engineer or the company
24		overseeing the project, construction manager,
	{SE	C 2010-12} [AFTERNOON SESSION ONLY] {11-01-12}

1		would assist with this. Is that accurate?
2	A.	(Butler) And if that's us, yes. I mean, it
3		would be the engineering firm, the owner's
4		engineer. The owner's engineer would assist
5		with this.
6	Q.	Have you done that on other projects, those
7		functions?
8	А.	(Butler) We've had individuals provide this.
9		Me personally, no.
10	Q.	Okay. Thank you. I have no other questions.
11		MS. BAILEY: Mr. Robinson.
12		MR. ROBINSON: Just one
13		question.
14	INTE	RROGATORIES BY MR. ROBINSON:
15	Q.	Say the project's up and running. Year five,
16		one of the turbines has to be replaced. And
17		say it's the furthest turbine from Route 9.
18		How difficult or how much of the road would
19		have to be reopened up to bring a new turbine
20		in and replace it, and how long would how
21		difficult would that be?
22	Α.	(Martin) I don't believe the road would have
23		to be reopened at all. Excuse me. The
24		34-foot width would still be there. It's
	{SE	C 2010-12} [AFTERNOON SESSION ONLY] {11-01-12}

1		just that we'll be vegetating the outer
2		length of that to reduce it to gravel of
3		16 feet. So the road base is still
4		structurally present, and it would be able to
5		be used for a maintenance type of project
6		like that.
7	Q.	So the end travel way would not have to be
8		widened to bring equipment in to replace a
9		blade or whatnot?
10	Α.	(Martin) Can you repeat that, please?
11	Q.	The end travel way of 16 feet, 12 feet
12		16 feet?
13	Α.	(Martin) Yes, 16 feet.
14	Q.	Sixteen feet. That is wide enough to allow
15		the necessary equipment to bring in a new
16		turbine?
17	Α.	(Martin) No, sir. What I'm saying is that
18		we're building a 34-foot wide construction
19		road, and at the end of the construction, the
20		outer
21	Α.	(Butler) Nine feet.
22	Q.	9 feet, I think, of that will be
23		revegetated and restored. So the 34-foot
24		width will still be structurally there. If
I	{SE	C 2010-12} [AFTERNOON SESSION ONLY] {11-01-12}

it needs to be used temporarily for a 1 2 maintenance item like that, the trucks could drive on it. They would just be driving on 3 grass or -- or plants instead of gravel. 4 5 MR. ROBINSON: Okay. Thank 6 you. 7 MR. MARTIN: Yes, sir. 8 MS. BAILEY: Mr. Green. 9 MR. GREEN: Thank you. INTERROGATORIES BY MR. GREEN: 10 How much of the engineering have you folks 11 0. done so far on the site? 12 (Martin) I don't think I understand where 13 Α. you're going with that. 14 15 Well, what I was looking for is, have you Q. 16 determined, like, some of the grades that the 17 roadway will be at, if you're going to have ditching in there or not? 18 19 Α. (Butler) That's all in the permit drawings, 20 permit level --21 Q. Yeah, could you tell me what the steepest 22 grade is on that access road? 23 (Butler) Thirteen percent. Α. 24 Thirteen percent? And how about your plan to Q.

1		have ditches on either side, I assume?
2	А.	(Butler) Yes.
3	Q.	And how steep are those or the steepest
4		one I'd say?
5	Α.	(Martin) They generally follow the same slope
6		as the road.
7	Q.	Okay. And what I heard here is, it sounded
8		to me like you used the 50-year storm is
9		that correct or the calculations for the
10		storm runoff?
11	Α.	(Martin) Twenty-five or 50.
12		(Witness reviews document.)
13	Α.	(Martin) Are you referring to our culvert
14		sizing?
15	Q.	Yes.
16	Α.	(Martin) Here we go. We used the 25-year
17		storm for that, sir.
18	Q.	How about the ditches?
19	Α.	(Martin) Those require a 10-year design [sic]
20		storm.
21	Q.	And then the other question I had is: Are
22		you involved are you going to be involved
23		in putting up the blasting spec for the
24		contractor, developing the blasting spec?
L	{SE	C 2010-12} [AFTERNOON SESSION ONLY] {11-01-12}

1	Α.	(Martin) We have not been asked to do that.
2		Typically the blasting contractor would do
3		that, and the engineering the owner's
4		engineer would review it.
5	Q.	Okay. All right. And then the other
6		question I had here was, have you done any
7		coring of the ledge in the area?
8	Α.	(Martin) No, I don't believe any geotechnical
9		work's been done yet.
10	Q.	Okay. And I guess my last question is having
11		to do with the level spreaders that you
12		talked about.
13	A.	(Martin) Yeah.
14	Q.	Are those going to be revegetated afterwards?
15	Α.	(Martin) No, that's a permanent stormwater
16		management BMP.
17	Q.	So it's going to be stone?
18	A.	(Martin) Yes.
19	Q.	Okay. Thanks.
20		MS. BAILEY: Chairman
21		Ignatius.
22		CHAIRMAN IGNATIUS: Thank you.
23	INTE	RROGATORIES BY CHAIRMAN IGNATIUS:
24	Q.	Initially you had just said that the road
	{SE	C 2010-12} [AFTERNOON SESSION ONLY] {11-01-12}

1		specs permit application as shown, the
2		maximum slope was 13 percent. The testimony
3		says it will be a maximum slope of 12
4		percent. Do you know what the right number
5		is?
6	Α.	(Martin) I believe it says a maximum of 12
7		percent, with two short segments of 13
8		percent.
9	Q.	You're right. That's where the computer
10		stops at one page and you got to jump to the
11		next to get it. Right, it does say that.
12		Thank you.
13		I know that you're not doing a blasting
14		plan, but do you know any rough approximation
15		of how much blasting is going to be
16		necessary?
17	Α.	(Martin) I don't know that at this point, no.
18	Q.	In order to create the is it a 50-foot
19		corridor you need for putting in the crane
20		construction road initially? Does all of
21		that in this kind of terrain have to be
22		blasted?
23	Α.	(Martin) No, only I don't know how much,
24		but it's not the whole thing. A lot of that
	{SE	C 2010-12} [AFTERNOON SESSION ONLY] {11-01-12}

1		is built and filled. A lot of that is built
2		through cut slopes that are in the soil that
3		need to be excavated. So the blasting would
4		only be required where we hit, you know,
5		bedrock or ledge.
6	Q.	All right. And when would all of those plans
7		be finalized in a project like this?
8	A.	(Butler) Yeah, I would suspect after
9		permitting.
10	Q.	The testimony says that you would require for
11		blasting there would be a requirement of a
12		state plan and approval. It says that,
13		typically, advance notice is given for
14		blasting.
15		Do you know, is it the expectation that
16		it's not going to be required, a notice of
17		blasting, just that it typically is, but not
18		necessarily?
19	Α.	(Martin) I think I included "typically" in
20		there because I'm not I'm not overly
21		familiar with the requirements of New
22		Hampshire specifically. And the blasting
23		plan was not something that we've been asked
24		to address yet. So I was just speculating to
	{SE	C 2010-12} [AFTERNOON SESSION ONLY] {11-01-12}

1		give you a general idea of how things worked.
2	Q.	So if there were a requirement in a permit
3		that there be a mandate that advance notice
4		of blasting be given, would that be a
5		problem?
6	А.	(Martin) Not at all.
7	Q.	And on the width of the corridors, there's a
8		section of your testimony that, in the space
9		of one paragraph, refers to 30 feet, 40 feet
10		and 50 feet for different purposes. And I'm
11		not sure I followed each one. I think it's
12		on Page 10. If you could just describe
13		there is a reference to between Lines 8
14		and 10, I think, there's a discussion of
15		clearing typically done to establish an
16		approximately 30-foot corridor; then in some
17		cases with a collection system, you go to a
18		40-foot corridor, and for the crane roads,
19		50 feet.
20		Rather than me pick away at that, can
21		you just describe what's really expected for
22		this project, the width of the corridors to
23		be built?
24	А.	(Martin) Sure. And actually, they address
l	{SE	C 2010-12} [AFTERNOON SESSION ONLY] {11-01-12}

1		three different roadway configurations or
2		design criteria. Where we're building only
3		the 16-foot access road, that would typically
4		require about 30 feet to build that road.
5		In the areas where the collection system
6		is going to be overhead, there's more
7		clearing required so the wires can run from
8		pole to pole. And then finally, where the
9		crane roads are going to be constructed,
10		that's a 34-foot road width. So, typically
11		roughly 50 feet would be required for that.
12	Q.	So if we were to look at the large, long map
13		behind you, perhaps you can just show us what
14		you're referring to. Or maybe there's an
15		easier question first.
16		During the initial construction phase to
17		build the turbines, would the entire length
18		of the road be the 50-foot corridor?
19	Α.	(Martin) No. The initial I need to step
20		away from my mic.
21	Q.	Yeah, please.
22	A.	(Martin) The initial stretch of the road up
23		to the first structure pad is going to be the
24		16-foot width. So that would require roughly
I	{ SE	C 2010-12} [AFTERNOON SESSION ONLY] {11-01-12}

30 feet of clearing. 1 Beyond that, we'd be constructing the 2 34-foot crane access road, and that would be 3 the wider clearing. 4 So how does the crane get up to the first 5 Q. turbine pad without starting from the 6 beginning of the road? 7 8 Α. (Martin) It's brought up in pieces on a flatbed and assembled on site. 9 And the access road, Route 9, is where on 10 Q. 11 that? Is it the green road? (Martin) This is Route 9 right here. 12 Α. Okay. On the far left of your diagram? 13 0. (Martin) Yes. The green is the existing 14 Α. 15 utility corridor. 16 Okay. Thank you. Q. 17 All right. So that you can build from Route 9 up to the first turbine pad can 18 only -- only needs to be the 16-foot road, 19 and so the 30-foot clearance? 20 21 Α. (Martin) That's correct. Roughly 30 feet. 22 Then, from the first turbine on out, Yeah. 0. 23 tell us where the road gets wider or narrower 24 again.

 $\{\text{SEC 2010-12}\}$  [AFTERNOON SESSION ONLY]  $\{11-01-12\}$ 

1	Α.	(Martin) Beyond that, it's all 34 feet for
2		the crane. It will be driven from site to
3		site at that point.
4	Q.	All right. Then what ends up being at
5		locations for the what you call the
6		collection system? I assume that's overhead
7		wiring for the electricity?
8	Α.	(Martin) Yeah, it's a combination of overhead
9		and underground.
10	Q.	All right. So what area of that road is the
11		40-foot clearing?
12	Α.	(Martin) Well, it goes back and forth from
13		underground to above ground, and I don't have
14		the station locations on that. Might show up
15		better on this one.
16		(Witness reviews document.)
17	Α.	(Martin) Based on just a quick review of the
18		plans, it looks to me like it's going to be
19		underground from Structure 10 to Structure 1.
20		There might be one or two sections that are
21		above ground there. That's not something I'd
22		be able to pinpoint quickly at this point.
23	Q.	Well, I'm not trying to pin you down on a lot
24		of details. I'm just trying to really get a
l	-	

1		sense in my own mind of what it's going to
2		end up looking like during the construction
3		phase; how much is going to be how wide
4		things are going to be, and then, once the
5		revegetation and putting in gravel phase
6		begins, what things are going to end up
7		looking like.
8		And so for areas that you have
9		underground, do you not need the wider
10		corridor because there's no overhead
11		collection to be taking up space? So that
12		can be narrow, and then it widens out again
13		in places where you can't underground it?
14	Α.	(Martin) No, that's not quite correct.
15		Again, beyond the first turbine location it's
16		going to need to be 34 feet wide for crane
17		access. And that's more than enough to
18		account for any overhead electrical runs.
19		Beyond that, you know, toward the
20		beginning where it's going to be 16 feet,
21		there are sections most of that is going
22		to be overhead, I believe, and that will need
23		to be wider up to the substation to
24		accommodate the overhead wire.

1	Q.	Can you ballpark what the width of this room
2		is?
3	Α.	(Martin) I'd really rather pace it off.
4		Yeah, I was going to say like 25 or 30 feet
5		maybe.
6	Q.	From side to side, where you are to where
7		Mr. Stewart is, right, that direction?
8	A.	(Martin) Ballpark, yeah.
9	Q.	That helps. I'm not very visual about these
10		things.
11		So during the construction phase, it
12		would be did you say 25 or so you thought
13		this was? So, about double for the
14		construction phase. And then once you're
15		done, this plus maybe a third again as much
16		for the continuation post-construction? No.
17		I'm sorry. That's the clearance, not the
18		road itself. The final road would be
19		considerably less than this, the width of
20		this room?
21	Α.	(Martin) Yes, that's correct.
22	Q.	I don't think I made any of that clearer. I
23		apologize.
24		Okay. You also said in your testimony
	{SE	C 2010-12} [AFTERNOON SESSION ONLY] $\{11-01-12\}$

1		that the access road has two spur roads. Can
2		you show us on that diagram what you're
3		referring to?
4	A.	(Martin) Yes. I'm we're calling this a
5		spur road. This is the main road. The first
6		spur road approaches Structures 2 and 3. The
7		second one comes down here and provides
8		access to Structure 7.
9	Q.	All right. So the little loop that's at 7
10	A.	(Martin) Well, it's a it's not a loop.
11		It's a dead end. But essentially, yeah.
12	Q.	And the only access to public road is
13		Route 9?
14	A.	(Martin) That's correct.
15	Q.	Thank you. Nothing else.
16	A.	Thank you.
17		MS. BAILEY: Okay.
18		Mr. Iacopino.
19	INTE	RROGATORIES BY MR. IACOPINO:
20	Q.	How long ago were you employed to work on
21		this project?
22	A.	(Martin) I think the design phase was about a
23		year ago.
24	Q.	And in the process of your design process,
	{SE	C 2010-12} [AFTERNOON SESSION ONLY] {11-01-12}

1		were you asked to consider alternative ways
2		to run this to develop the project?
3	Α.	(Martin) No. The client did all the
4		background research, as far as I know. We
5		were provided with turbine locations,
6		obviously that's going to drive the
7		efficiency of the project. And we were hired
8		to build the road to provide access.
9	Q.	So the turbine locations were already set
10		when you came onboard.
11	Α.	(Martin) Yes.
12	Q.	Okay. The other set of questions I have are
13		as much out of curiosity as anything else.
14		You were asked a question about if they
15		had to reconstruct the road in order to get
16		up there to remove a turbine. Is this
17		area would it be accessible, and could a
18		turbine be removed and replaced by the use of
19		helicopters?
20	Α.	(Martin) Yeah, I suppose so.
21	Q.	I mean, I've been up there once. But you
22		guys, I take it, have been up there a lot
23		more. Is it the type of terrain that could
24		accommodate that?

1	A.	(Martin) It would have a hard time finding a
2		place to land. But if it was just if it
3		was just flying something in I mean, I'm
4		not an expert on helicopters or that kind of
5		construction, but I assume it's possible.
6	Q.	Have you ever worked on a site where lift
7		towers or wind turbines were, in fact,
8		installed through the use of helicopters?
9	A.	(Martin) I have not.
10	A.	(Butler) No.
11	Q.	Thank you.
12		MS. BAILEY: Redirect,
13		Mr. Patch? Actually, we're about at the
14		right time for a break. Would you rather do
15		that and do the redirect after?
16		MR. PATCH: That would be
17		good, and we might be able to condense it.
18		MS. BAILEY: Okay. All right.
19		We'll take a 10-minute break. And can we get
20		back here at 3:00? Thank you.
21		(Whereupon a brief recess was taken at
22		2:53 p.m., and the hearing resumed at
23		3:06 p.m.)
24		MS. BAILEY: We're back on the
I	{SE	EC 2010-12} [AFTERNOON SESSION ONLY] {11-01-12}

1 record. But before we proceed with the redirect, Chairman Ignatius has a very 2 important fact. 3 CHAIRMAN IGNATIUS: We got the 4 definitive measurement. 5 MS. BAILEY: Of the room. 6 7 CHAIRMAN IGNATIUS: It's 8 beyond me how somebody has one of those huge measurements [sic] in their briefcase, but... 9 10 MR. FROHLING: I forgot to put 11 it back where it belongs. CHAIRMAN IGNATIUS: And so the 12 exact width of this room is 30 feet 13 14 10 inches, you think? Is that right? So 15 whoever had that number in the bingo pool is 16 the winner. 17 [Laughter]. MR. ROTH: So that means the 18 19 construction road is going to be wider than this room? 20 21 MS. BAILEY: Yes. 22 Okay. Enough merriment. 23 Mr. Patch. 24 MR. PATCH: Thank you.  $\{\text{SEC 2010-12}\}$  [AFTERNOON SESSION ONLY]  $\{11-01-12\}$ 

1	REDIRECT EXAMINATION
2	BY MR. PATCH:
3	Q. This is for either of you who would like to
4	answer the question. But there was a
5	question to you about when you were retained
6	by AWE and basically what you did with regard
7	to the design of the roads. And I wonder if
8	you could just elaborate on what the process
9	was once you were retained and you were given
10	the number of turbines and the turbine
11	locations. Did you just come up with a road,
12	or were there iterations that you went
13	through?
14	A. (Martin) No, I think I actually
15	oversimplified that one. Thank you for
16	asking that. There was kind of an iterative
17	process. There were several components of
18	the project that needed to be considered, one
19	of which was avoiding the wetlands. You
20	know, once the wetlands were finally
21	delineated, we adjusted the road to make sure
22	we minimized our impacts on those. We
23	adjusted the location and the profile of the
24	road to account for cuts and fills because we
l	{SEC 2010-12} [AFTERNOON SESSION ONLY] {11-01-12}
#### [WITNESS PANEL: BUTLER|MARTIN]

1		wanted to achieve essentially a balanced
2		site, so you're not bringing material in or
3		out. Everything stays on site, ideally.
4		We also spent a bit of time trying to
5		find the best location for the substation,
6		because there's are lots of wetlands in that
7		area as well. So that was another thing that
8		we had to play around with. So it was
9		definitely an iterative process.
10	Q.	In response to a question, you provided some
11		testimony with regard to the assembling of
12		the crane. Do you have anything you'd like
13		to explain further with regard to that? I
14		mean, the location where you indicated that
15		the crane was going to be assembled, I
16		mean
17	A.	(Martin) Oh, was that in relation to the
18		possible maintenance of the Structure 10?
19	Q.	Yes.
20	A.	(Martin) Yeah. Just thinking off the top of
21		my head, I assumed that we would drive the
22		crane up from the same place where we would
23		be for the initial construction. And then
24		thinking about it a little bit more, there's
	{SE	C 2010-12} [AFTERNOON SESSION ONLY] {11-01-12}

1		no reason we couldn't keep the crane on the
2		flatbed, use the 16-foot road all the way to
3		the last structure and then assemble it to do
4		the maintenance. And that would, again,
5		minimize some of the impacts on the
6		vegetation that has been established there or
7		re-established.
8	Q.	You were asked some questions about the
9		portion of your testimony where you sort of
10		delineated transport roadway widths of 30, 40
11		and 50. And I think in response to questions
12		about that, you talked about the location of
13		undergrounding or above-grounding of the
14		lines down from the turbines. And I wonder
15		if you have anything you'd like to add on
16		that particular issue.
17	Α.	(Martin) Yeah, I was able to go over the
18		plans during the break, and I think I can
19		clarify that a bit more. Back me up on this
20		one.
21		But for the most of the projects, the
22		conduit will be underground under the road.
23		Actually, it comes above ground at the first
24		spur road where the met tower is. So this
l		

{SEC 2010-12} [AFTERNOON SESSION ONLY] {11-01-12}

1		would be the slightly wider section. And
2		then it goes underground when we reach the
3		PSNH right-of-way and comes into the
4		substation at that point. So the only area
5		where the road would be 16 feet without
6		above-ground conduit would be from the
7		beginning to the substation. And that would
8		be the narrowest clearing width.
9	Q.	And so the width from the substation up to
10		where the turbines begin, what would the
11		width of the road be?
12	A.	(Martin) The width of the road from the
13		substation to the first turbine, the road
14		width will be 16 feet. The clearing width
15		will be roughly 40 feet to account for the
16		overhead conduit. From the first structure
17		to the first spur road, we're still overhead,
18		but we'd be building a 34-foot road for crane
19		access. So that would be the wider, 50-foot
20		width. Beyond that is all crane access road,
21		so even though conduit is underground, we'd
22		still have the 50-foot width.
23	Q.	That's all our questions. Thank you.
24	A.	Thank you, sir.

{SEC 2010-12} [AFTERNOON SESSION ONLY] {11-01-12}

#### [WITNESS PANEL: BUTLER|MARTIN]

MS. BAILEY: Okay. Thank you. 1 2 The panel is dismissed. Thank you for your testimony. 3 Is the Applicant ready to put 4 5 on Mr. O'Neal? 6 MR. PATCH: Yes. 7 (WHEREUPON, ROBERT D. O'NEAL was duly 8 sworn and cautioned by the Court 9 Reporter.) ROBERT D. O'NEAL, SWORN 10 11 DIRECT EXAMINATION BY MR. PATCH: 12 Good afternoon, Mr. O'Neal. Would you please 13 Q. state your name and address. 14 15 I am Robert O'Neal, and my business address Α. 16 is Three Clock Tower Place, Maynard, 17 Massachusetts. And by whom are you employed and in what 18 Q. 19 capacity? 20 I'm a principal at Epsilon Associates. Α. 21 And could you give the Committee a brief Q. 22 summary of your qualifications. 23 I've been doing community noise work Α. Sure. and meteorology work for 26 years now, the 24  $\{\text{SEC 2010-12}\}$  [AFTERNOON SESSION ONLY]  $\{11-01-12\}$ 

1		last eight years specifically focusing on
2		wind energy projects.
3	Q.	And what is your role in the Antrim Wind
4		Project?
5	Α.	Epsilon Associates was retained to do a
6		sound-level study for the project.
7	Q.	Are you the same Robert D. O'Neal who
8		submitted prefiled testimony in this docket,
9		dated January 31st of 2012, which has been
10		marked as Exhibit AWE 1? Excuse me. It's
11		actually Volume 1, Tab 10.
12		MS. BAILEY: Mr. O'Neal, could
13		you pull the microphone closer to you?
14		THE WITNESS: Sure.
15		MS. BAILEY: Thank you.
16		THE WITNESS: I'll try not to
17		hit it with my
18		MS. BAILEY: Maybe it's not
19		on.
20		THE WITNESS: You're right.
21		MS. BAILEY: We were having
22		trouble with the sound.
23		THE WITNESS: Go figure. Is
24		that better?
	{SE	C 2010-12} [AFTERNOON SESSION ONLY] {11-01-12}

		,
1		MS. BAILEY: Yes.
2	А.	I'm sorry. What was the question?
3	BY	MR. PATCH:
4	Q.	Are you the same Robert D. O'Neal who
5		submitted prefiled testimony in this docket
6		which has been marked as part of Exhibit AWE
7		1, Tab 10?
8	А.	Yes, I am.
9	Q.	And did you also submit supplemental prefiled
10		testimony dated October 11th of 2012, which
11		has been marked as Exhibit AWE 9, again, Tab
12		10?
13	Α.	Yes, I did.
14	Q.	And do you have any corrections or updates to
15		either of those two testimonies?
16	Α.	I have one very minor update to my
17		supplemental prefiled testimony, the
18		October 11th testimony, on Page 5 of 16.
19	Q.	Okay. If you could go ahead and explain the
20		update.
21	А.	Sure. Towards the bottom of the page, Lines
22		16 through 22, there's a brief discussion
23		about some of the technical data that the
24		turbine manufacturer, Acciona, supplied with
	{s	EC 2010-12} [AFTERNOON SESSION ONLY] {11-01-12}

1		regard to the sound levels for this machine.
2		And they supplied two rounds of sound data,
3		and we've had some additional discussions
4		with them since I filed this supplemental
5		testimony. And the gist of it is that the
6		uncertainty in their sound levels is still
7		plus or minus two decibels, not the plus or
8		minus one which I incorrectly stated here in
9		the supplemental. The difference, now,
10		however, is that Acciona is guaranteeing
11		those levels. So in other words, their
12		expected level from the turbine sound power
13		level is 107.4 decibels, plus or minus 2 dBA.
14		But that's now guaranteed. So that's the one
15		correction I wanted to make.
16	Q.	And with that correction, if you were asked
17		the same questions contained in both of your
18		prefiled testimonies under oath, would your
19		answers be the same?
20	Α.	Yes, they would.
21	Q.	Now, I have a couple of questions to ask you
22		about testimony that was filed after or
23		actually at the same time that your
24		October 11th testimony was filed. Beginning
I	{SE	C 2010-12} [AFTERNOON SESSION ONLY] {11-01-12}

1	on Page 3 of his supplemental testimony,
2	dated October 11th in this docket, Mr. Tocci
3	provided testimony regarding background
4	sound-level measurements that he or his
5	company had taken from August 22nd through
6	the 29th at Gregg Lake and at Willard Pond,
7	which you have not had the opportunity to
8	address in your prefiled testimony.
9	Is there anything you would like to say
10	in response to Mr. Tocci's testimony with
11	regard to those background sound-level
12	measurements?
13	A. Yes. I'll just make a couple of brief
14	remarks.
15	In that first couple of pages of the
16	background testimony, you can see some of the
17	sound levels that his firm measured at both
18	Gregg Lake and Willard Pond during one week
19	in late August. And in general, the L90
20	sound levels and the L90 is basically the
21	residual sound level, so the quietest sound
22	level during a 10-minute period those L90
23	sound levels, in general, those two locations
24	as you can see from the graphs on Page 4 and

1	5 there, range from about 20 decibels to 55
2	decibels during the course of that week. And
3	certainly there's been some discussion, and
4	there is certainly some insect noise that
5	contributes to some of those levels.
6	So, with that said, Mr. Tocci recommends
7	a design goal of a baseline of 15 decibels
8	plus some delta, some increment above that
9	baseline. And I guess I do have a little
10	problem with that, in the sense for a
11	couple reasons. One, 15 decibels was never
12	measured. You never see that anywhere in
13	these data nor in the data that Epsilon
14	collected in the two and a half weeks we were
15	out there in 2011.
16	If you look at the high-level met tower
17	wind speeds that were shown by Mr. Tocci in
18	his testimony on Page 9, the wind speeds
19	during that night were very light in other
20	words, they were 1 to 4 meters per second up
21	at 57 meters above the ground. These
22	turbines won't run
23	MR. BOISVERT: Excuse me.
24	Could you translate meters per second and
	{SEC 2010-12} [AFTERNOON SESSION ONLY] {11-01-12}

1		miles per hour for us, please? I don't think
2		in those terms.
3		THE WITNESS: Absolutely.
4		Since the turbines generally started in
5		Europe, they always use meters per second.
6		So, 5 meters per second is roughly 10 miles
7		an hour. It's about a two-to-one conversion,
8		approximately. All set?
9	A.	Okay. So I guess the point is on these sound
10		levels, in particular and a lot of times
11		the turbine wouldn't have even been running.
12		And so the suggestion of a background level
13		of 15, which is extremely, extremely quiet,
14		something you might find in a very, very
15		remote wilderness area, plus a background
16		over that I have difficulty with.
17		In addition, Willard Pond is a
18		recreation area which, as I understand, is
19		certainly primarily for daytime use. And
20		these are nighttime sound levels we're
21		talking about here.
22	BY M	R. PATCH:
23	Q.	In that same testimony, Mr. Tocci's
24		testimony, at Page 18 he had said that the
l	{SE	C 2010-12} [AFTERNOON SESSION ONLY] {11-01-12}

1	E	psilon data, the data your company collected
2	i	n connection with this project, would
3	u	nderstate the project sound impact unless it
4	w	ere corrected.
5		MR. ROTH: I'm going to object
6	t	o the form of the question. He's leading
7	t	he witness.
8		MR. PATCH: I understood,
9	М	adam Chair, that I was supposed to
10	s	pecifically direct the witness to portions
11	0	of the testimony, so that's what I'm trying
12	t	o do.
13		MS. BAILEY: I'll allow you to
14	P	proceed.
15	BY MR.	PATCH:
16	Q. I	s there anything you would like to say in
17	r	esponse to that specific testimony that I
18	j	ust cited?
19	A. W	ell, I guess, again, the comment is that I
20	t	hink this certainly insects did and do
21	t	ypically influence sound levels. That's a
22	f	act. No one's going to argue with that.
23		I think what this does is, it points out
24	0	one of the difficulties of trying to suggest
	{SEC	2010-12} [AFTERNOON SESSION ONLY] {11-01-12}

1		a delta over background sound criteria versus
2		an absolute sound criteria. If you look at
3		the worst-case sound levels that were
4		predicted for this project, there were a few
5		of the nearest homes that are perhaps going
6		to be in the 40 to 41 decibel range.
7		Everybody else is going to be in the 20 and
8		30 decibels. And so I guess that is another
9		reason that I would suggest that an absolute
10		level is more appropriate for this project,
11		as has been done by the SEC in previous cases
12		before them, such as Lempster and Groton.
13	Q.	And then the final question that I have, on
14		Pages 19 through 21 of his supplemental
15		testimony, Mr. Tocci provided specific
16		criteria that he thought should be
17		established for this project. Is there
18		anything you would like to say in response to
19		that specific testimony?
20	Α.	Just a couple of quick comments. No. 1, on
21		Page 19, he talks about applying delta over
22		background criteria to residences that are
23		under 30 decibels. So in other words, where
24		the project impacts are in the 20s and
l	{SE	C 2010-12} [AFTERNOON SESSION ONLY] {11-01-12}

again I -- at those sound levels, the project 1 is going to be so low, that it would not be 2 appropriate. 3 On Page 20 there's a table with some 4 adjusted baseline sound levels with insect 5 sound removed, which again the comment is 6 similar to before. We have baseline levels 7 suggested of 15, 17, 19 decibels, which are 8 9 extremely, extremely rare, and very low. And so, again, not appropriate. 10 11 Finally, on Page 21 there's a remark about some of the New Hampshire Audubon 12 trails where the wind turbine noise may be 13 audible. And I guess the suggestion of 14 15 audibility as a criteria is not appropriate. 16 It should not be a criteria for sound. 17 Audibility is pretty much everywhere, in anything we do. You know, we could suggest 18 lots of instances where sounds are audible 19 20 around Willard Pond and Gregg Lake. Standing out there, I heard gunshots from a nearby 21 22 firing range, for example. 23 So again, I strongly disagree with the suggestion that audibility is something that 24  $\{\text{SEC 2010-12}\}$  [AFTERNOON SESSION ONLY]  $\{11-01-12\}$ 

1 should be taken into consideration for a criteria. 2 Okay. Thank you. 3 Q. MR. PATCH: The witness is 4 available for cross. 5 MS. BAILEY: Thank you. 6 7 Mr. Froling. 8 MR. FROLING: No questions. MS. BAILEY: Mr. Beblowski 9 here? 10 11 (No verbal response) MS. BAILEY: Mr. Jones? 12 (No verbal response) 13 14 MS. BAILEY: Ms. Osler? 15 (No verbal response) 16 MS. BAILEY: Ms. Sullivan? 17 (No verbal response) Ms. Longgood? MS. LONGGOOD: Yes, I have 18 19 some questions. I would like to, for the 20 Committee's sake, to go up to the map and show where I live and -- as close to the 21 22 turbines just so that you have a visual. 23 MS. BAILEY: Okay. 24 MS. LONGGOOD: I don't know if {SEC 2010-12} [AFTERNOON SESSION ONLY] {11-01-12}

that's the best map. I've seen some where 1 2 the sound leveling was done. But thank you. MR. IACOPINO: Ms. Longgood, 3 when you're up here, just keep your voice up, 4 because you'll be away from the microphone. 5 MS. LONGGOOD: I'll just show, 6 7 and then I'll go back and sit down. 8 This is the Location 3, and my home is down there, 800 feet in. And this 9 was just done above where my driveway begins, 10 11 and my driveway is an 800-foot driveway in. So I'm in fairly close proximity. 12 MR. IACOPINO: Could you tell 13 us what the number is on that? 14 MS. BAILEY: The exhibit 15 16 number. 17 MR. IACOPINO: Upper right-hand corner, there's an orange sticker. 18 19 MS. LONGGOOD: AWE 41. 20 MR. IACOPINO: Thank you. 21 MS. LONGGOOD: You're welcome. 22 CROSS-EXAMINATION BY MS. LONGGOOD: 23 Being a layperson, I don't have a tremendous 24 Q. {SEC 2010-12} [AFTERNOON SESSION ONLY] {11-01-12}

1		amount of knowledge regarding this. But in
2		reading some of the information, you stated
3		that L3 was located 4,200 feet from
4		Turbine 5; is that correct?
5	Α.	That is correct.
6	Q.	Okay. The information that I was given by
7		Mr. Kenworthy, the closest turbine to my home
8		is Turbine 5, which is 3,843 feet, which is
9		closer than your sound leveling.
10		And then you did state that there is
11		absolute sound, not over ambient. I don't
12		understand that. Could you explain that so
13		that I get a clearer understanding of what
14		the impact might be on my residence.
15	A.	Sure. All set?
16	Q.	Right. I'd like to know at night, too. It
17		is extremely quiet where I live, just I
18		don't even hear traffic down on the
19		driveway sits me way down, kind of in a
20		hollow by the beaver pond.
21	A.	Sure. Well, as depicted in the you have
22		to help me out in terms of what exhibit this
23		is. But the sound-level study, which was an
24		appendix in part of the Application,

{SEC 2010-12} [AFTERNOON SESSION ONLY] {11-01-12}

#### [WITNESS: O'NEAL]

appendix --1 2 MR. PATCH: Just stop for one minute so I can get you that number. Ι 3 believe that's part of AWE 1, and it would be 4 Appendix 13A. It's the sound-level 5 6 Assessment Report. 7 THE WITNESS: Correct. That's 8 what I'm referring to. MR. PATCH: 9 Okav. So, in Appendix 13A of the Application --10 Α. 11 MR. IACOPINO: Actually, that would be AWE 3. 12 MR. PATCH: 13 Okay. Sorry. 14 Yeah, that's actually an appendix that's contained in Volume 3. 15 16 So I guess one of the ways I can try to help Α. 17 answer that question is, as you pointed out, we collected some actual measurement data at 18 that L3 location, which is fairly close to 19 20 your house, for two and a half weeks. And if 21 you go to Appendix A in that Application, 22 there's a very detailed graph with a lot of 23 information there that shows how the sound level varied over the course of two and a 24  $\{\text{SEC 2010-12}\}$  [AFTERNOON SESSION ONLY]  $\{11-01-12\}$ 

1		half weeks. You can see the sound level
2		varied from anywhere from, say, mid-20s,
3		say about 24, 25 decibels, up to, you know,
4		over 65 decibels from different sources of
5		sound. So that's why it's difficult when
6		someone says, you know, "What will the sound
7		be at my house?" The answer is always, "To
8		some degree, it's going to vary," which we
9		all know.
10	BY M	S. LONGGOOD:
11	Q.	It's my understanding, during that period of
12		time you did the sound measurements, that a
13		logging operation was going on at the time
14		during the day. I don't know if that might
15		have impacted part of that, but I did note
16		that during the time that the collections
17		were there.
18	Α.	Okay. I don't recall a logging operation
19		anywhere near the meter. There may have been
20		one somewhere off in the distance.
21		So I guess to then try to answer your
22		question, the predicted sound levels if I
23		may get up to the map for one second?
24	Q.	Certainly.
	{SE	C 2010-12} [AFTERNOON SESSION ONLY] {11-01-12}

1	A.	I know Ms. Longgood knows where she lives.
2		But for the Committee, she pointed out
3		location L3, which is where the actual
4		sound-level meter was that we collected the
5		data. And all these blue squares that are on
6		the map here, they represent residences that
7		were provided by the Applicant in their GIS
8		data base.
9		So Ms. Longgood's house is this blue
10		square just a little bit northeast of
11		location L3. So, that location.
12		So each one of these blue squares we
13		calculated and expected a worst-case sound
14		level from operation of the all the
15		turbines. And at that location, the
16		worst-case sound level was 41 decibels. So
17		what that means to you
18	Q.	What is the increase?
19	A.	What does that mean to you as a layperson?
20		That means, you know, if you look at the
21		data, for example, in the appendix, sometimes
22		it's going to be 10 to 15 decibels above the
23		very quietest, middle-of-the-night sound
24		levels, and other times it's going to be
L	{SE	C 2010-12} [AFTERNOON SESSION ONLY] {11-01-12}

1		similar to what you hear today, and sometimes
2		it's going to be a little bit below it.
3	Q.	Is 10 to 15 decibels something that is an
4		acceptable increase? I don't know if there
5		are measurements out there. Again, I'm not
6		very knowledgeable about any of this. But to
7		me, part of the reason I live there is the
8		quietude as well as for the environment. And
9		this to me seems to would have a major
10		impact on my experience of being in my home.
11	A.	I guess one way to answer that is, will you
12		hear it at times? Yes, it will be audible at
13		times. Forty-one decibels, I mean, one way
14		to put that into some perspective is, you
15		know, if I stopped talking, we all stopped
16		talking for a second and just listened to the
17		background, the quiet HVAC system going
18		(pause) the sound level in this room is on
19		the order of 40 to 42 decibels. Something
20		like that, just for a rough perspective.
21	Q.	I can't hear the highway from my home. I
22		think out on Salmon Brook itself you can. So
23		I think it's certainly my experience might
24		vary from others.

{SEC 2010-12} [AFTERNOON SESSION ONLY]  $\{11-01-12\}$ 

1		Have you had experience with people
2		living in close proximity, such as I, to the
3		turbines? Have you heard any complaints in
4		terms of nuisance noise?
5	A.	You're almost you're on the order of
6		4,000 feet. The closest turbine
7	Q.	3,883 as I was quoted by Mr. Kenworthy.
8	A.	Okay. Call it almost 4,000 feet.
9	Q.	Give or take 200.
10	A.	Works for me.
11		Well, in general at that distance I
12		personally have not talked to people.
13		Certainly I've read the literature, and there
14		are people who complain about sound from wind
15		turbines, at closer distances and further
16		away distances.
17	Q.	I have heard and read that at least a mile or
18		a mile and a half, I certainly I have four
19		turbines closer than a mile, and I'm
20		wondering if you can give me any indication
21		of the impact of multiple turbines kind of
22		surrounding my property.
23	A.	Well, the number that I just quoted you takes
24		that into account. In other words, when you
	{SE	C 2010-12} [AFTERNOON SESSION ONLY] {11-01-12}

1	look at the layout here on the map, you see
2	the swing of turbines running generally in a
3	northeasterly to southwesterly alignment
4	along the ridgetop. The sound-level
5	calculations that went into the 41 decibels
6	at your house, and everyone else's house,
7	assumed by standard because we're required
8	to do the standard that the wind is
9	blowing from every turbine to every house at
10	the same time. In other words, you have a
11	southwest wind or a southeast wind, an
12	easterly wind and a northeast wind, which
13	you'd have to have to get the sound from all
14	those turbines at your house at the same
15	time. Now we know that's a physical
16	impossibility. It can't happen
17	simultaneously. The reality is you may
18	have you'll have one of those wind
19	directions. You'll be downwind of some of
20	those turbines, but not all of them. But
21	that's some of that conservatism that's built
22	into the analysis methodology. So the
23	impacts or the contribution from all ten
24	turbines are taken into account at your
	{SEC 2010-12} [AFTERNOON SESSION ONLY] {11-01-12}

# [WITNESS: O'NEAL]

	house.
Q.	And if I heard you correctly, you stated
	how were you able to measure what the
	Acciona, if I'm pronouncing it correctly
	these turbines who have not they have not
	been up and they have not been proven. How
	can you measure the sound of those?
A.	Well, that's the purpose of the mathematical
	computer modeling that's done at this stage
	of the permitting. The vendor, Acciona in
	this case, has provided guaranteed sound
	levels for this project. So that was what
	was used in the calculations here.
Q.	How will that guaranty affect me if it's
	louder than you state? Is it guaranteed to
	abutters?
A.	Well, I mean, I guess the way to think about
	that is, I would assume that if the Committee
	approves this project, they're going to put
	some sound conditions on, and those sound
	conditions will have to be verified and
	tested. And if they're not met, then the
	burden will come back to the operator to fix
	it.

{SEC 2010-12} [AFTERNOON SESSION ONLY] {11-01-12}

1	Q.	All right. I have been told that my home is
2		in an area that is sheltered, so there is no
3		wind on the ground, which would validate then
4		Mr. Tocci's 15 decibels. What is your
5		response to that?
6	А.	I guess my response would be, again, I'd look
7		at the data we collected at Location 3, which
8		is not that far from your house it's also
9		in a sheltered location down in the valley
10		over the course of two and a half weeks, and
11		we never measured a 15-decibel level.
12	Q.	It's uphill from me. It's in a very
13		different location. The topography is very
14		different in different locations on the road,
15		so thank you very much.
16	А.	You're welcome.
17		MS. BAILEY: Mr. Stearns?
18		MR. STEARNS: No questions.
19		MS. BAILEY: Antrim Planning
20		Board? Oh, Ms. Pinello.
21		CROSS-EXAMINATION
22	BY M	IS. PINELLO:
23	Q.	I have one question to ask you. And I've
24		looked at the map. I don't have it in front
l	{SE	C 2010-12} [AFTERNOON SESSION ONLY] {11-01-12}

			2
1		of me.	
2		Could you tell me why you chose not to	
3		measure at individual residences within	
4		say you got you're saying, oh, give or	
5		take	
6		(Court reporter interjects.)	
7	Q.	Excuse me. I'm sorry.	
8		You said give or take, 4,000 feet, give	
9		or take 200 feet. Given that range, can you	
10		explain your testing model in such a way that	
11		you did not you chose not to test at	
12		residences within that range?	
13	Α.	I'm not sure I understand what you mean by	
14		"in that range."	
15	Q.	If it's within a 400-foot range and you made	
16		your choices as to where to select, why	
17		didn't you choose to put a monitor at	
18		someone's home?	
19	Α.	I guess there's two answers to that: One is	
20		we didn't have permission to be there, for	
21		starters. But that's not really that	
22		important. What's more important is that,	
23		for purposes of collecting pre-construction	
24		data where the turbines aren't there yet, in	
	{SE	C 2010-12} [AFTERNOON SESSION ONLY] {11-01-12}	

# [WITNESS: O'NEAL]

1		general, unless you're near some very
2		specific sound source, the offset of a few
3		hundred feet in the woods is not going to
4		make a difference over long-term data
5		collection, you know, over the period of
6		several weeks.
7	Q.	I understand that. I guess my question is:
8		If you have a known, why didn't you collect
9		data at the known when you have the turbines
10		being the unknown?
11	Α.	I guess I'm sorry. I'm not following you
12		mean by the "known."
13	Q.	The "known" is the residence. The "unknown"
14		is where you're going to have your turbine
15		and the effects of the turbine. So you're
16		saying you're going to test in the area.
17		I still am not clear, when you and
18		Antrim Wind have heard concerns from
19		residents, why you chose not to test at those
20		residences as part of your testing strategy?
21	Α.	Well, I guess, certainly post-construction,
22		that if permission is granted by residents,
23		the owner and operator would typically test
24		at those locations.

{SEC 2010-12} [AFTERNOON SESSION ONLY] {11-01-12}

1	Q.	That's understood. But my question is
2		pre-construction.
3	Α.	Well, the testing locations really represent
4		different directions, north, south, east,
5		west of the site, different land uses, and
6		represent the general community sound levels
7		in the areas around those residences. You
8		don't have to be actually in someone's
9		backyard necessarily to understand what the
10		typical sound level is in the area.
11	Q.	Yeah. So am I understanding you correctly,
12		that you understood there were concerns from
13		residents about the sound measurements at
14		their what it would be at their homes, and
15		you chose in your pre-construction testing
16		strategy not to test at any residence, but
17		rather to test for other criteria than for
18		citizens who had expressed concerns about
19		sound within a certain distance, who live
20		within certain distance from turbines?
21	A.	Actually, a lot of that testing did occur at
22		residents' houses who were relatively close
23		to other residents.
24	Q.	I understand that. But I also understand you
	{SE	C 2010-12} [AFTERNOON SESSION ONLY] {11-01-12}

1		had been asked about Ms. Longgood's concerns
2		many the company had been, as well as you.
3		I'm just curious as to why her home was not
4		tested when it is that close, when you only
5		have 200 feet.
6	Α.	And I guess I'll answer it again the same
7		way. For pre-construction, it doesn't
8		matter. The answer
9	Q.	Thank you. You made that clear.
10	Α.	The answer would be the same.
11	Q.	Okay. Thank you. You've made that clear.
12		Thank you.
13		MS. BAILEY: Ms. Manzelli.
14		MS. MANZELLI: Yes. Thank
15		you.
16		CROSS-EXAMINATION
17	BY M	IS. MANZELLI:
18	Q.	For the record, my name is Amy Manzelli. I'm
19		here representing New Hampshire Audubon, an
20		intervenor in this matter.
21		Mr. O'Neal, what is the standard
22		regarding sound that this Committee is asked
23		to rule on in the certification of this
24		project?
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{SEC 2010-12} [AFTERNOON SESSION ONLY]  ${11-01-12}$ 

# [WITNESS: O'NEAL]

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1	A.	There's precedent that the Committee has
2		approved previous projects similar to this
3		one, and the standard of that has been 55
4		decibels during the day, 45 decibels at
5		night.
6	Q.	What's the legal requirement that needs to be
7		satisfied regarding sound?
8		MR. PATCH: I'm going to
9		object to that question. I think he's
10		asking she's asking for a legal conclusion
11		of the witness, and the witness isn't a
12		lawyer. So I'm not sure I even understand
13		the question.
14		MS. BAILEY: Ms. Manzelli?
15		MS. MANZELLI: Thank you.
16		Just give me a moment.
17		MS. BAILEY: Okay.
18	BY M	IS. MANZELLI:
19	Q.	What was the purpose of your direct
20		testimony, your original direct testimony?
21	A.	Give me a minute to go back and
22	Q.	Sure. I'm struggling to put my fingers on
23		the document also.
24	A.	see what I said.
	{SE	EC 2010-12} [AFTERNOON SESSION ONLY] {11-01-12}

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1		(Witness reviews document.)
2	А.	So the purpose of the testimony was to lay
3		out in very brief summary form the results of
4		the sound-level assessment that was done that
5		we just referred to as Appendix 13A, which is
6		the detailed Sound-Level Assessment Report.
7		But the prefiled testimony contains that in
8		summary fashion, where we tested what the
9		results were, what some standards could be
10		used to evaluate sound impacts.
11	Q.	Let me ask you directly. Do you understand
12		that this Committee will be evaluating
13		whether this project will have an
14		unreasonable adverse effect on aesthetics?
15	Α.	Yes.
16	Q.	And you agree that's the measure that this
17		Committee will be evaluating to decide
18		whether this project is a go or no-go, among
19		other measures?
20	Α.	I'm going to leave that to the Committee.
21		That's not my call.
22	Q.	Is it possible that the areas that were
23		tested for sound are quieter at other times
24		of the year than what was measured?
	{SE	C 2010-12} [AFTERNOON SESSION ONLY] {11-01-12}

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1	А.	Is it possible?	
2	Q.	Yeah.	
3	Α.	Yes, it's possible.	
4	Q.	Do you think it's likely?	
5	A.	Well, I think one of the things you may take	
6		away from looking at the graphs in the back	
7		of the study is how much sound levels can	
8		vary at any one location at any time. I	
9		mean, they vary by 20 to 30 to 40 decibels	
10		over the course of two and a half weeks. So	
11		I would expect that same to hold true other	
12		times of the year as well.	
13	Q.	So doesn't that mean if you measured 30	
14		decibels, then it would naturally go as low	
15		as 15 decibels?	
16	A.	I don't necessarily believe it will go to 15.	
17		But it could go lower, sure. And it could go	
18		higher.	
19	Q.	Well, didn't you just say that the	
20		measurements that you have could vary by as	
21		much as 20 to 30, or did you even say 40	
22		decibels?	
23	Α.	I did say that. And that's that was the	
24		variation from the low to the high in the	
	{SE	C 2010-12} [AFTERNOON SESSION ONLY] {11-01-12}	

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1		data that's presented.
2	Q.	So how low could it go if what you measured
3		was 30?
4	Α.	Well, the limits of instrumentation are
5		generally around 15 to 16 decibels. And, you
6		know, I can't say I personally observed 15
7		decibels anywhere.
8	Q.	Okay. But given the limits on your
9		instrumentation, if you were measuring 30,
10		it's possible that what actually existed was
11		15.
12	Α.	No, if we measured 30, then 30 is what
13		existed at that time.
14	Q.	Explain to me, then, what you mean by the
15		"limits" on your instrumentation?
16	A.	What I mean is that the hardware in any
17		sound-level meter has a physical limitation.
18		It can only measure there's a floor, they
19		call it. It can only measure so low.
20		Frankly, it's typically not an issue
21		because there are you just don't see
22		locations getting down to much below 20
23		decibels. Twenty decibels is very quiet.
24	Q.	What's the floor of your instrumentation?
	{SE	C 2010-12} [AFTERNOON SESSION ONLY] {11-01-12}

# [WITNESS: O'NEAL]

		Τ.
1	A.	It's around 15, 16 decibels.
2	Q.	And so how strike that.
3		Do you agree that is it your position
4		that you picked the quietest two and a half
5		weeks of the year to measure sound?
6	A.	I don't know the answer to that. You'd have
7		to measure for a lot longer to know if that
8		was the quietest two and a half weeks.
9	Q.	Have you ever measured sound in any site in
10		the northeast over a period of time that
11		expands the entire year, or close to an
12		entire year?
13	A.	No.
14	Q.	So you can't state an opinion as to whether
15		the summer or the first month of the year or
16		the September/October period is quieter or
17		louder?
18	A.	To some degree, it's going to depend on
19		location-specific. Certainly, certain times
20		of the year have insect activity which
21		contributes to higher sound levels.
22	Q.	And the corollary there being certain times
23		of the year don't have insect sounds, and
24		those would be quieter.

{SEC 2010-12} [AFTERNOON SESSION ONLY]  ${11-01-12}$ 

1	A.	The off to some degree, the offsetting
2		principle that other times of the year it's
3		also windier; there's other events perhaps
4		going on. But everything else being equal,
5		take away the insects, sure, it could be a
6		little quieter.
7	Q.	And do you agree that there are some periods
8		of the year where there are neither insects
9		nor wind?
10	A.	I'm sure you could find them. Sure.
11	Q.	Would they be hard to find, or does that
12		happen pretty much every year?
13	A.	I'm sure you'd find that every year.
14	Q.	Okay. So do you agree that at times Willard
15		Pond could be 15 decibels?
16	A.	If I if we put a meter out there for an
17		entire year, I suspect we could find a time
18		where it was 15 decibels, sure.
19	Q.	Can you
20	Α.	I'll agree with that.
21	Q.	I'm sorry. I didn't mean to interrupt you.
22	A.	I'm done.
23	Q.	Can you quantify how much of the year it
24		might be 15 decibels?

{SEC 2010-12} [AFTERNOON SESSION ONLY]  $\{11-01-12\}$ 

		-
1	A.	I have no way of quantifying that.
2	Q.	Because you didn't measure sound at Willard
3		Pond; right?
4	A.	We did not, no.
5	Q.	Why not?
6	A.	Well, there's obviously a physical limitation
7		to how many locations you can measure around
8		the site. And that site is further away than
9		a lot of other ones that we measured. And we
10		felt it was more appropriate to include some
11		of the the residences that were nearer to
12		the proposed wind turbines.
13	Q.	Why are there physical limitations to how
14		many sites you can measure?
15	A.	There are equipment and logistical
16		limitations to how much you can be running at
17		a time.
18	Q.	So does that mean your company isn't capable
19		of sampling six sites at once as opposed to
20		five?
21	A.	No, we could certainly do six.
22	Q.	And how far is the was there a sampling
23		site on Gregg Lake?
24	Α.	Yes, there was.
	{SE	C 2010-12} [AFTERNOON SESSION ONLY] {11-01-12}

# [WITNESS: O'NEAL]

1	Q.	And how from the site is that?
2	A.	Just give me a minute. I'll tell you exactly
3		how far it is.
4		(Witness reviews document.)
5	A.	That information is in the Appendix 13A of
6		the report. I'm looking at Page 5-2. So the
7		Gregg Lake sound-level meter was 8,700 feet
8		from the closest proposed wind turbine.
9	Q.	And could you point out Gregg Lake on the map
10		behind you, and could you also identify the
11		exhibit number of the map behind you?
12	A.	Sure. It's Exhibit AWE 41.
13		Here's Gregg Lake down here in the
14		southeast corner, and L5 is the measured
15		location that we had at Gregg Lake.
16	Q.	And could you point out Willard Pond on that
17		map also?
18	Α.	Willard Pond is over here, the southern edge.
19	Q.	And do you know how far Willard Pond is from
20		the site?
21	A.	I don't know exactly.
22	Q.	Can you guess from looking at that map
23		whether it's closer to the site than Gregg
24		Lake, the same distance to the site as Gregg
	{se	C 2010-12} [AFTERNOON SESSION ONLY] {11-01-12}
1		Lake, or farther from the site as Gregg Lake?
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2	A.	It looks like it might be a little closer to
3		Turbine 10 than the Gregg Lake site is.
4	Q.	And is it an assumption in your analysis that
5		the sound data collected for the five sites
6		applied to Willard Pond?
7	A.	I guess what I would say to that is, Site L3,
8		which was very, very far removed from Route
9		9, not near any other real man-made sources
10		of sound, would be a reasonable surrogate for
11		other sort of off-the-beaten-path type
12		locations such as Willard Pond.
13	Q.	And could you answer the question. Did you
14		have to make an assumption in your analysis
15		to apply sound data from the other sites to
16		Willard Pond?
17	A.	No, we didn't.
18	Q.	Then how would you characterize the
19		Application of sound data from the other
20		sites to Willard Pond?
21	A.	Well, what we did was use the predicted sound
22		levels from the project, which is what you
23		see here in AWE 41. Those are the sound
24		levels from the turbines, the proposed wind
	{ SE(	C 2010-12} [AFTERNOON SESSION ONLY] {11-01-12}

		10
1		turbines at every site, including Willard
2		Pond. That's what we used to estimate the
3		impacts.
4	Q.	So you no data characterizing the sound at
5		Willard Pond, without the turbine impact.
6	A.	In other words, existing background or
7		ambient?
8	Q.	Right.
9	A.	That's correct.
10	Q.	And are you aware that Gregg Gregg Lake or
11		Gregg Pond?
12		MS. BLOCK: Gregg Lake.
13		MS. MANZELLI: Thank you.
14	BY M	IS. MANZELLI:
15	Q.	You're aware that Gregg Lake allows
16		vehicles boats on the lake that are
17		powered by motorized engines?
18	A.	Yes.
19	Q.	And you're aware that Willard Pond does not?
20	A.	I thought my understanding was that
21		Willard Pond also allowed motorized.
22		MR. PATCH: No.
23	A.	My mistake.
24		
	{SE	EC 2010-12} [AFTERNOON SESSION ONLY] {11-01-12}

1	BY M	IS. MANZELLI:
2	Q.	And that's a pretty big difference; right?
3	Α.	I guess for the boaters it is. I'm not sure
4		what you mean by "big difference."
5	Q.	Well, would the sound on and around a lake
6		that allows motorized vehicles or let me
7		ask you this: How would the sound around a
8		lake that allows motorized vehicles be
9		different or the same as the sound around a
10		lake that does not?
11	A.	Well, certainly the sound from the motorized
12		vehicles or boats is going to be louder from
13		those sources at a place that allows them
14		than one that doesn't. There could be other
15		things. For example: At Willard Pond, there
16		are certainly planes flying overhead, which I
17		witnessed firsthand when I visited the site
18		during Mr. Tocci's testing.
19	Q.	And did you make any analysis of the
20		topography surrounding Willard Pond and how
21		that might affect the sounds that are there,
22		ambient sounds, without turbine sound?
23	Α.	Well, once again, the ambient at Willard Pond
24		was we did not measure it there. In terms
	{SE	C 2010-12} [AFTERNOON SESSION ONLY] {11-01-12}

1		of predicting the future sound levels for the
2		project, yes, we did. The topography is
3		taken into account and used in the
4		mathematical modeling.
5	Q.	Meaning the shape of the underlying ground,
6		or does that include the type of vegetative
7		cover?
8	Α.	The terrain contours, the topography, is
9		taken into account. We don't assume any
10		trees. We don't take any credit for trees.
11	Q.	Now, with respect to the HVAC system running
12		in this room that you mentioned earlier, you
13		characterized it as how did you
14		characterize that sound?
15	Α.	I said it was 40 to 42 decibels,
16		approximately.
17	Q.	Did you say it was not very loud?
18	Α.	I said if we were all very quiet, that's
19		the point of that was to give the Committee
20		and other folks in the room that maybe don't
21		have an acoustics appreciation or an
22		understanding that we look at sound-level
23		meters all the time, as a point of reference,
24		really.

1	Q.	Well, have you ever had the experience of
2		being in an office and having an HVAC system
3		going and then it shuts off and you realize,
4		in retrospect really how loud it was compared
5		to now how quiet it is?
6	Α.	I have been in the office when the HVAC shut
7		off. And you can tell the difference,
8		certainly.
9	Q.	And you may not realize how loud the HVAC
10		system was, but did you realize in retrospect
11		it was louder than you expected or louder
12		than you thought, something like that?
13	A.	Well, I guess we're getting into saying
14		what's loud and what's not. I'm not
15		necessarily going to agree with that. What I
16		will agree to is that there's a difference in
17		the sound levels, and you notice the
18		difference, yes.
19	Q.	Is the difference that when the HVAC turns
20		off, it's quieter?
21	Α.	Absolutely.
22	Q.	Do you know what the Willard Pond Sanctuary
23		is?
24	Α.	It's a property maintained by the New
	{SE	C 2010-12} [AFTERNOON SESSION ONLY] {11-01-12}

			11
1		Hampshire Audubon, I believe.	
2	Q.	What else do you know about it?	
3	A.	People go swimming there.	
4	Q.	Would you be surprised to learn that people	
5		go there to get away from industrial and	
6		heavily developed uses of the land?	
7	A.	Okay.	
8	Q.	Do you think that part of that is quiet?	
9	A.	I would expect so.	
10	Q.	And you testified earlier that the wind	
11		turbines will be heard at the Willard Pond	
12		Sanctuary; right?	
13	A.	I did not say that. I said Mr. Tocci said	
14		that.	
15	Q.	Well, looking at the map behind you, what's	
16		your opinion on whether the turbines will be	
17		audible at the Willard Pond Sanctuary?	
18	A.	So if we look at the predicted sound levels	
19		here on Exhibit AWE 41, the sound-level	
20		contours this is Willard Pond again. This	5
21		contour right here is the 30-decibel contour	
22		that goes towards the southern edge of	
23		Willard Pond. The one up here to the north	
24		of Willard Pond is a 35-decibel contour.	

1		So I guess I would characterize sound
2		levels around Willard Pond from the project
3		were going to be anywhere from the high 20s
4		to the 32, 33 level.
5		So if you look at the sound levels that
6		Mr. Tocci's company measured there today
7	Q.	What I'm asking is your opinion of whether
8		the turbines will be audible.
9	A.	And I'm going to give you that.
10		If you look at the data that was
11		collected out at Willard Pond to date, you
12		can see the sound levels range anywhere from
13		low 20s, again, up to 50 decibels. So the
14		point of that is that, at times, yes, I would
15		suspect that the sound from the turbines will
16		be audible, that you will hear something from
17		them, yes.
18	Q.	And would that interfere with the purpose
19		that people go to that place?
20	A.	I can't answer that question. I don't know
21		the answer to that question.
22	Q.	Well, didn't you agree earlier that one of
23		the reasons people go to that sanctuary is to
24		enjoy quiet?
	·	

1	A.	I'm assuming that is a reason. I don't know.
2		I don't go there.
3	Q.	So let's make it an assumption that people go
4		there to enjoy quiet. Would hearing the
5		turbines interfere with that?
6	A.	That's probably a personal observation
7		question. Some people may not even notice
8		it. For example: I saw plenty of families
9		swimming, splashing, yelling and screaming in
10		the water at Willard Pond. They're not going
11		to hear the turbines over that sound.
12		Somebody else who's up there taking a nap on
13		the far side, away from everybody else, with
14		no planes flying over at that time, they will
15		probably hear them. Are they bothered by it?
16		I can't say. I don't know.
17	Q.	And why do you think audibility shouldn't be
18		a consideration? Shouldn't the quiet be
19		preserved?
20	A.	I think audibility is a very slippery slope.
21		If we use audibility as a criteria for this
22		project or any project, how do you measure
23		it? How do you quantify that? How do you
24		tell if something is complying with that
	_	

1		criteria? Frankly, there's not going to be
2		much of anything that will comply with the
3		audibility criteria. You're going to hear
4		something sometimes anywhere.
5	Q.	Is 41 is the sound of 41 decibels coming
6		from a wind farm, the sound the same as the
7		41 decibels coming from the HVAC system? Are
8		all 41 decibels the same?
9	A.	No.
10	Q.	How are they different?
11	Α.	You could have different frequency content,
12		different octave bands that constitute that
13		41. That's an A-weighted number.
14	Q.	It's an average number; right?
15	Α.	It's not really an average number, per se.
16		What it is, it's a compendium, if you will,
17		of all the different octave bands at
18		different frequencies.
19	Q.	Just trying to sugar that down to something
20		simpler. Does that mean that sometimes if
21		you're talking about a 41-decibel level, that
22		sometimes it's louder than 41 and sometimes
23		it's quieter than 41?
24	Α.	Not under the explanation I was just giving
	{SE	C 2010-12} [AFTERNOON SESSION ONLY] {11-01-12}

I guess maybe I misunderstood 1 you, no. No. 2 your question. I'm sorry. You said what goes into it and that --3 an A-weighted number is a one-number 4 compendium, if you will, from the different 5 frequencies. 6 7 Let me ask you with respect to the map there. 0. 8 So pick a line and tell me what the value is for that line, and then answer me: Does that 9 mean that that will always be the sound level 10 11 Or does that -- could it mean that there? the sound level will be higher than that 12 sometimes or lower than that sometimes? 13 Okay. So, for example: Pick any of them. 14 Α. This blue one here is the 40-decibel line. 15 16 Now, in general, the sound level is going to 17 be lower than that. And the reason I say that is, what goes into these lines is the 18 assumption that all 10 turbines are running; 19 20 all 10 turbines are operating at their 21 maximum sound power. In other words, the 22 wind is blowing up at the hub; the cell is at 23 the maximum speed to generate the most sound. 24 So that's the assumption that we make when we  $\{\text{SEC 2010-12}\}$  [AFTERNOON SESSION ONLY]  $\{11-01-12\}$ 

1		do this model and we put this map together.
2		All 10 are operating. They're all the
3		maximum sound, and they're all as I said
4		before, every one of these points is downwind
5		of every turbine. So there's some
6		conservatism, a little over-estimation in
7		that assumption.
8		You know, is that condition going to be
9		true all the time, every day of the year?
10		No, certainly not. I'd say a lot of times
11		it's going to be somewhat lower than that.
12	Q.	Would it be higher sometimes?
13	A.	The manufacturer in this case, Acciona,
14		guarantees a sound level. Now, I have to
15		digress just for one second. There's sort of
16		two guaranties. There's what they call the
17		manufacturer's guaranty, which is a sound
18		power level. Excuse me if you've heard this
19		all before. But sound power is like the
20		rating of a lightbulb. So a lightbulb might
21		be rated a hundred watts.
22		So they do the same thing with wind
23		turbines. This one is rated at 107.4
24		decibels. It's a sound power level, plus or
ı	{SE	C 2010-12} [AFTERNOON SESSION ONLY] {11-01-12}

1		minus two. So you could be as high as 109.4
2		or as low as 105.4. That is the range that
3		they are guaranteeing as a manufacturer.
4		So we used the higher end of that, the
5		109.4. We took the plus-two margin that
6		they're guaranteeing. And these calculations
7		assume that every turbine is emitting that
8		109.4 decibel sound power. That then is
9		brought out to the community to generate
10		these sound pressure-level lines here, which
11		are the ones you see in the community. So
12		that 109.4 is guaranteed by the manufacturer,
13		and that's what went into generating these
14		lines.
15	Q.	So there's no guaranty, then, for anybody
16		that Willard Pond will never go above what
17		is it at the 30-decibel line?
18	A.	Yeah, Willard Pond has got the 30-decibel
19		line here to the south. The manufacturer
20		does not guarantee that's the
21		difference does not guarantee the sound
22		pressure levels in the community. That's the
23		purpose of the exercise of taking a
24		conservative assumption and making

1		calculations out in the community. Because
2		we expect and understand that any approval is
3		going to come with conditions to limit them.
4	Q.	Have you seen a copy of the written guaranty?
5	Α.	I have seen a copy of the noise specs which
6		guaranteed the sound level. I haven't seen a
7		copy of any contract or anything.
8	Q.	Well, what do you mean, then, when you say
9		there's a guaranty?
10	Α.	Just that. It's pretty standard in the wind
11		turbine business for as a developer who's
12		developing a project, when they're talking to
13		different manufacturers to say, you know,
14		what will you guarantee for me from a sound
15		perspective? And they have lots of other
16		criteria, but sound's just one of many.
17		And as I understand it from Acciona,
18		that's what they're guaranteeing to Antrim
19		Wind in this case.
20	Q.	Is that guaranty somewhere in the Application
21		package for Antrim Wind?
22	Α.	It would be contained in one of those two
23		sound-level sheets, which were provided. If
24		you give me a minute, I could find it.
I	{SE	C 2010-12} [AFTERNOON SESSION ONLY] {11-01-12}

1	Q.	Sure. I would appreciate that.
2		(Witness reviews document.)
3		MR. IACOPINO: I believe
4		you're speaking about a tech session request
5		and so the Committee would not have this in
6		their documents at this point.
7		THE WITNESS: Okay if I try to
8		go back on the record?
9		MS. BAILEY: Yes, go ahead.
10	A.	Okay. If you turn I don't know if you
11		have the tech session information.
12	BY N	AS. MANZELLI:
13	Q.	I do not, so I would appreciate it if you
14		would summarize it for me.
15	A.	Tech session Response 1-42 has a discussion
16		in there about the Acciona sound-level data.
17		And there is some verbiage in there that
18		talks about the 109.4. However, the
19		technical support documents were filed under
20		a protective, confidential order, I guess.
21		So they're not in the record.
22	Q.	Okay. When you say there's verbiage let
23		me just ask a clarifying question.
24		When you said 109.4, you're quoting the
I	{s:	EC 2010-12} [AFTERNOON SESSION ONLY] {11-01-12}

1		level the high end of the guaranty level;
2		right?
3	A.	Right. In other words
4	Q.	Yeah. Okay.
5	Α.	Right. Yes.
6	Q.	And when you say there's verbiage, could you
7		just quantify for me, in terms of a half a
8		page, a quarter of a page, five pages, how
9		much verbiage is there?
10	Α.	It's very short.
11	Q.	Could you just read it, please?
12	A.	Sure. The wind turbine data they used in the
13		sound modeling is contained in confidential
14		attachment TS1-42A. That's a document
15		number. This had the highest sound
16		power-level data, 107.4 dBA, plus or minus 2
17		dBA uncertainty. Therefore, the wind
18		turbines were modeled as emitting 109.4 dBA.
19	Q.	So did I miss the description of the guaranty
20		in there?
21	A.	It doesn't I didn't use the word
22		"guaranty" in my response. But that's what
23		Acciona has stated.
24	Q.	Okay. And is the and before you answer
ļ	{SE	C 2010-12} [AFTERNOON SESSION ONLY] {11-01-12}

1		the question, would you please consult with
2		the attorneys for Antrim Wind. Can you
3		disclose the name of the confidential
4		document?
5		MR. PATCH: Can you just read
6		what's on the data request?
7	Α.	It's in the reply in here. The name of the
8		document is in here.
9	BY M	IS. MANZELLI:
10	Q.	Could you read the name of the document?
11	Α.	Acciona Document D, as in David, G200266,
12		Revision A, dated 20/05/11.
13		And then there's a second Acciona
14		document which is also confidential, which is
15		in there, and I can read you that number if
16		you'd like as well.
17	Q.	Yes, please.
18	Α.	Acciona Document DG200266, Revision B, dated
19		28/05/12.
20	Q.	And again, please consult with counsel for
21		Antrim Wind before you answer. Can you
22		identify the parties to both of these
23		documents?
24		MR. PATCH: The witness
	{SE	C 2010-12} [AFTERNOON SESSION ONLY] {11-01-12}

1		doesn't really have an answer to that. I
2		think in the you know, in the interest of
3		trying to advance the proceeding, there
4		aren't any parties to that particular
5		document. It's just a standard document
6		advanced by the manufacturer.
7	BY M	S. MANZELLI:
8	Q.	So I don't understand then. A guaranty is
9		typically an agreement between two parties.
10		I'm trying to get at the basis, Mr. O'Neal,
11		of your knowledge that there's a guaranty.
12		Have you read an agreement or a document that
13		told you there was a guaranty?
14	Α.	Without those documents in front of me, I
15		can't remember if they used the word
16		"guaranty" in there or not. But I know from
17		clarification discussions with Acciona, that
18		is what I was told.
19	Q.	So your basis for saying that there's a
20		guaranty on the sound of the turbines is
21		because someone from Acciona told you there
22		was?
23	Α.	That is correct.
24	Q.	And do you know how you would go about

1		cashing in the guaranty and what would happen
2		if you did?
3	Α.	That's probably more a question for Antrim
4		Wind.
5	Q.	So you don't know?
6	Α.	I don't know.
7	Q.	Have you ever been involved in a project
8		where let me step back.
9		You've testified that it's standard that
10		a turbine manufacturer would guarantee its
11		product?
12	Α.	Correct.
13	Q.	Including the sound?
14	A.	Yes.
15	Q.	Have you ever been involved in a project
16		where that guaranty wasn't met excuse me.
17		Let me phrase where the sound was louder
18		than what was guaranteed?
19	A.	I guess the answer is, I don't know. And the
20		reason I say that, it's not an evasive
21		answer. It's just that, if there's a
22		guaranty, sometimes or oftentimes the
23		owner/developer will have another party come
24		in and do some testing to confirm that the
	{SE	C 2010-12} [AFTERNOON SESSION ONLY] {11-01-12}

1		supplier has met that sound-level guaranty.
2		And to date, we have not done that testing.
3		So that's been done by others.
4		So, whether a wind farm we worked on
5		passed or not, I would not necessarily know.
6	Q.	Is there an insurance product available to
7		insure that a sound guaranty is met?
8	A.	Again, I don't know the answer to that.
9	Q.	Are there any disclaimers regarding the
10		sound?
11	Α.	Please explain. I'm not sure what you mean
12		by "disclaimers"?
13	Q.	Sure. Well, is there any condition under
14		which the guaranty would not be effective if
15		the sound exceeded the limit that they're
16		telling you?
17	Α.	Not that I'm aware of.
18	Q.	But there could be?
19	Α.	I'm not privy to any contractual documents or
20		details between the supplier and the owner.
21	Q.	You're just relying on what Acciona tells
22		you?
23	Α.	That's right.
24	Q.	And do I understand correctly that the sound
I	{SE	C 2010-12} [AFTERNOON SESSION ONLY] {11-01-12}

1		levels we're talking about were predicted
2		using models rather than taking actual
3		measurements of the actual turbines that
4		would be used, and for the same model turbine
5		that would be used at Antrim Wind?
6	A.	That's correct.
7	Q.	So there is no actual measured data from the
8		same turbine anywhere?
9	A.	No. They're in the process of constructing
10		them right now. They have units with
11		different rotor diameters that they've gotten
12		some data to confirm that this is good
13		engineering information.
14	Q.	In the Sound-Level Assessment Report, there's
15		a statement that low-frequency sound,
16		approximately 10 hertz to 200 hertz, has been
17		reduced to low level in modern wind turbines,
18		and it's generally not an issue. Am I
19		characterizing that appropriately?
20	A.	Could you tell me what page you're reading
21		from?
22	Q.	Sure. It's on Page 4-1.
23	А.	Yes.
24	Q.	Okay. Can you please explain why this is the
	{SE	C 2010-12} [AFTERNOON SESSION ONLY] {11-01-12}

1 case? Under some of the older designs of downwind 2 Α. turbines, there was some low-frequency issue 3 with the sound passing over. Under the 4 modern wind design, that level of 5 low-frequency sound has been significantly 6 reduced. 7 8 It's important to understand, there's still infrasound and low-frequency sound 9 generated by the wind turbines, just as there 10 11 is from everything, the HVAC system in this room, et cetera. The point is, they're not 12 at levels that are sufficiently high to be a 13 14 problem. 15 It's our understanding that differences in Q. 16 wind speed within the rotator-swept area can 17 substantially increase the modulation of turbine noise and that the frequency of 18 19 occurrence for this phenomenon increases with 20 the hub height and blade length. Did your 21 modeling scenarios take this phenomenon into 22 account; and if they did, how? There are -- there is no way to model 23 Α. modulation -- amplitude modulation at this 24  $\{\text{SEC 2010-12}\}$  [AFTERNOON SESSION ONLY]  $\{11-01-12\}$ 

		1:
1		point.
2	Q.	No one in the world for any wind project has
3		been able to model this?
4	A.	Well, you can go out to a wind turbine that's
5		existing and you can measure the modulation.
6		You can't model it, though. There's no
7		there are no acoustical models that are
8		accepted for regulatory use that handle
9		amplitude modulation that have a standard.
10	Q.	And because this wind turbine is so new and
11		not in use in the industry, nobody's been
12		able to do that; right?
13	Α.	Well, nobody's been able to do what? To go
14		measure it?
15	Q.	Yes, make actual measurements related to this
16		particular model that's proposed here.
17	A.	That's correct. It's going to be up and
18		running fairly soon.
19	Q.	How soon?
20	Α.	There's two units being built in Iowa right
21		now that are under construction. They're
22		trying to have them up and running by the end
23		of the year.
24	Q.	And how long would it take to do this type of
ľ	{se	EC 2010-12} [AFTERNOON SESSION ONLY] {11-01-12}

			<u></u> .
1		measurement?	
2	A.	I can't say. I don't know.	
3	Q.	Have you ever done this type of measurement?	
4	Α.	What type of measurement are you talking	
5		about?	
6	Q.	The measuring the increase in the	
7		modulation of turbine noise and the frequency	-
8		of occurrence, increasing with the hub height	•
9		and blade length basically the modulation.	
10	Α.	We have measured amplitude modulation. The	
11		answer to that is, yes, from other turbines.	
12	Q.	For the model of turbine that's going to be	
13		used at Antrim Wind?	
14	Α.	Well, as I said, it doesn't exist in this	
15		country. So, no.	
16	Q.	Right. And so then, I thought you said two	
17		would be installed in the Midwest and	
18		operational by the end of next year.	
19	Α.	They're under construction right now. They	
20		should be up and running by the end of this	
21		year.	
22	Q.	Excuse me. By the end of this year. So my	
23		question was, then then let me start with	
24		the basic question.	

Γ

		13
1		Is it possible to measure this type of
2		modulation on those two turbines?
3	A.	Is it possible? Sure.
4	Q.	Okay. How long would that take?
5	Α.	I don't know.
6	Q.	Why don't you know?
7	Α.	Well
8	Q.	I don't know what's involved in making these
9		sort of measurements.
10	A.	The actual process of measuring them wouldn't
11		take that long.
12	Q.	Then what would the process be to convert
13		that, those measurements into meaningful
14		information?
15	A.	Obviously, you'd have to wait until the
16		turbines were fully commissioned, they're up
17		and running and so forth, and they're running
18		in the mode that they were designed to be in,
19		which is a normal shakedown.
20		I guess the answer is, I don't know when
21		they're ready to do that. They said they'd
22		be up and running by the end of the year.
23		That's the best information I have right now.
24	Q.	In complex topography, such as exists in the
	{SE	C 2010-12} [AFTERNOON SESSION ONLY] {11-01-12}

1		vicinity of the Antrim Wind Energy Project,
2		it's not uncommon for a valley to experience
3		calm conditions, while at the same time
4		strong winds occur on ridge tops and above
5		ridgetop level.
6		Did your sound-level scenarios take
7		atmospheric stability into account; and if
8		they did, how did they do so?
9	Α.	Let me start with the first part of that, in
10		that strong winds up at ridgetop are going to
11		be what produces the largest sound from the
12		wind turbines. In other words, that's going
13		to be what gets them up to that 109.4 sound
14		power level, the maximum sound power level.
15		So, yes, that was what was assumed in
16		doing the calculations that you see here on
17		Exhibit AWE 41.
18		The standard of downwind propagation
19		that is used in this country and the industry
20		is this ISO 9613-2 standard propagation,
21		which assumes a moderate ground-based
22		temperature inversion for propagation
23		purposes.
24		Now, to do the calculations down
l	{SE	C 2010-12} [AFTERNOON SESSION ONLY] {11-01-12}

1		going away from the project, it doesn't
2		matter what the actual wind speed is, per se.
3		It's did we use the worst-case sound levels
4		emanating from a source of sound the
5		turbine in this case and the answer is
6		yes.
7	Q.	In your prefiled direct testimony dated
8		January 31st, you referenced a guidance
9		document from 1974, right the U.S.
10		Environmental Protection Agency, Office of
11		Noise Abatement and Control, Washington,
12		D.C., identified with a series of numbers?
13		If you'd like me to read them, I can.
14	Α.	You're talking about the levels document, I
15		assume?
16	Q.	Yes. Information on levels of environmental
17		noise requisite to protect public health and
18		welfare, with an adequate margin of safety.
19	A.	Yes.
20	Q.	Now, do you agree that, in 1974, the modern
21		industrial wind energy sector did not exist
22		in the way that it exists today?
23	A.	It has certainly changed a lot since 1974.
24		I'd agree with that.

			±.
1	Q.	Did it even exist in 1974?	
2	A.	Nothing like it is today, no.	
3	Q.	Meaning that it's substantially a bigger	
4		business than today than it was then.	
5		Excuse me.	
6	A.	Right. Sure.	
7	Q.	And you agree that government standards and	
8		guidance documents, such as this EPA	
9		document, don't always keep up with	
10		scientific knowledge?	
11	A.	Well, I mean, that's a blanket statement. I	
12		guess in terms of impacts of interference	
13		with activities, that would I don't see	
14		why that would be any different today versus	
15		1974. The sources of sound are different in	
16		2012 than they were back in 1974, yes.	
17	Q.	Well, how can you prepare guidance based on	
18		sources of sound that didn't exist at that	
19		time?	
20	Α.	Well, the levels document was looking at	
21		things like activity interference, you know,	
22		communication between individuals, things	
23		like that. That was irregardless of the	
24		source of the sound.	

1	Q.	And with respect to wildlife, do you agree
2		that just because there aren't any in your
3		testimony, anyway let me back up.
4		You testified that there are no
5		applicable regulations or guidelines
6		regarding noise and wildlife; right?
7	Α.	There are none that I'm aware of. Correct.
8	Q.	So, do you agree that, if there are no
9		guidelines and there are no legal
10		requirements, that that doesn't necessarily
11		mean that a wind farm shouldn't consider
12		impacts to wildlife from sound?
13	Α.	Well, I guess I'd answer that by saying,
14		based on personal observation from what I've
15		seen around a lot of active wind turbines,
16		there's a lot of wildlife that exists around
17		them. It's anecdotal. It's personal
18		firsthand knowledge. I'm not a biologist.
19		So until animal folks who are smarter
20		than I am about animals come out with some
21		criteria guidelines, I think we're left with,
22		you know, what would we compare it to.
23	Q.	So are you saying that there's not enough
24		data to know how to manage the impacts from
	{SE	C 2010-12} [AFTERNOON SESSION ONLY] {11-01-12}

1		the sounds of a wind farm upon wildlife?
2	A.	I'm saying there's nothing out there today in
3		the scientific literature that says you must
4		do that because of these impacts. If you're
5		at this level, there will be impacts.
6	Q.	But my question isn't what the legal
7		requirements are. My question is: Is it
8		possible that there are impacts to wildlife
9		from the sound of wind farms, even though,
10		according to your testimony, there are no
11		legal requirements about that topic?
12	A.	I guess the preface to the question, isn't it
13		possible, the obvious answer is, yes,
14		anything is possible. I don't necessarily
15		agree with that premise. But the way you
16		phrase the question, I have to say anything
17		is possible. But again, absent some any
18		kind of peer-reviewed studies documenting
19		that, I guess I wouldn't necessarily go along
20		with that.
21	Q.	And are you aware that the U.S. Fish and
22		Wildlife Service Land-Based Wind Energy
23		Guidelines address impact to wildlife related
24		to sound?

1 Α. No. Thanks very much for your time this 2 Q. afternoon. I have no further questions for 3 4 you. 5 Α. Thank you. Mr. Edwards or 6 MS. BAILEY: 7 Ms. Allen. (No verbal response) 8 MS. BAILEY: Not here. 9 10 Okay. The next up is 11 Mr. Block. About how long do you think you'll be, because we're in the area of a 12 13 break --14 MR. BLOCK: Probably a break would make sense first. 15 16 MS. BAILEY: All right. Let's take a 10-minute break and be back at 25 of. 17 (Whereupon a brief recess was taken at 18 19 4:27 p.m., and the hearing resumed at 20 4:40 p.m.) Okay. Mr. Block, 21 MS. BAILEY: 22 you may proceed with your cross-examination. 23 MR. BLOCK: Thank you very 24 much.  $\{\text{SEC 2010-12}\}$  [AFTERNOON SESSION ONLY]  $\{11-01-12\}$ 

1		CROSS-EXAMINATION
2	BY M	R. BLOCK:
3	Q.	Good afternoon, Mr. O'Neal.
4	Α.	Good afternoon.
5	Q.	Can I prevail upon you to help educate me a
6		little here, because there's a bunch of stuff
7		here that I'm really just learning about
8		here.
9		So, early on, a little while ago, you
10		talked about levels of 55 decibels in day and
11		45 at night. Could you explain where that
12		comes from, what that's in reference to or
13		what the context is of that?
14	Α.	Sure. Those were some of the sound-level
15		limits that the New Hampshire Site Evaluation
16		Committee ascribed to some of the earlier
17		wind farm projects, the Lempster project and
18		the Groton project. Sound-level limits that
19		they placed upon those projects.
20	Q.	That's the limits. In other words, that's
21		the what they're expecting them to be
22		better than or something
23		(Court Reporter interjects.)
24	Q.	To be better or to be less than that; is that
	{SE	C 2010-12} [AFTERNOON SESSION ONLY] {11-01-12}

		±.
1		correct?
2	A.	They shall be equal to or less than those
3		numbers, yes.
4	Q.	Okay. I understand.
5		Are you aware of the EPA levels document
6		from 1974, which is actually illustrated in
7		Rick James' report to us, which is, I
8		believe, NB 1, and that's on Page 2. NB 1 in
9		the electronic version, and it's on Page 2 of
10		that. And it's a 1974 document that explains
11		that in that those I guess the 55 and
12		45 that you're referring to, if I understand
13		this correctly, are actually urban
14		measurements. And in an area which they
15		which the EPA classifies as "no prior
16		experience with intruding noise," the ambient
17		level would need to be have about 15
18		decibels subtracted, which would end up to be
19		about 40/day and 30/night in an area like
20		Antrim. Does that sound correct?
21	Α.	I'm not sure. I'm confused by your question.
22		It sounded like you were bringing in the
23		levels that were imposed as limits for
24		Lempster and Groton and somehow comparing
I	{SE	C 2010-12} [AFTERNOON SESSION ONLY] {11-01-12}

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		14
1		them to the EPA levels document.
2	Q.	No. I'm asking about these 55, 45 I was led
3		to believe are urban are based on EPA's
4		urban measurements.
5	A.	Well, the excuse me.
6		(Witness reviews document.)
7		MR. PATCH: I'm just showing
8		the witness the document you were referring
9		to, Mr. Block.
10		MR. BLOCK: Thank you.
11	Α.	Are you on Page 2 of Mr. James' report?
12	BY M	IR. BLOCK:
13	Q.	I am now, yes.
14	Α.	Okay.
15	Q.	The chart that shows corrections.
16	Α.	Yeah. I mean, this chart from the EPA levels
17		document is a discussion about the day/night
18		sound level, which is something called the
19		LDN, another type of sound-level statistic
20		that's in the industry, and a technique that
21		they the EPA put out to estimate what
22		people's reactions to be would be to sound
23		levels.
24		So it has nothing to do with the sound

1		levels you mentioned 45 and 55 before.
2		But that was those numbers that I gave
3		were in relation to the permit limits that
4		were imposed on other wind projects. But
5		that's not what you're talking about. Am I
6		right?
7	Q.	I understand that. That's what you were
8		talking about with Ms. Manzelli; correct?
9	Α.	That's correct.
10	Q.	Now, I just want to know, did those numbers
11		relate to or come from any of the EPA
12		excuse me the EPA levels that are referred
13		to here?
14	Α.	I don't believe so, for two reasons: One,
15		the 55 limit in the Lempster in the Groton
16		projects is an LEQ. This EPA levels document
17		is an LDN. So it's a different animal
18		altogether.
19		And then the 45 dBA, at least in the
20		Groton case since I was a participant in
21		that case, I can speak to that that came
22		more from the WHO guidelines for community
23		noise documents. That's where that number
24		came from.

1	Q.	Okay. I guess what I'm trying to understand
2		here is if are you implying that those
3		similar numbers might be appropriate for
4		Antrim, I guess is the first part of my
5		question?
6	A.	The 45 and 55?
7	Q.	Correct.
8	A.	Mr. Kenworthy's not here. My understanding
9		is that there's an agreement already with the
10		Town of Antrim, which I am not real familiar
11		with. And there may be some additional
12		information that talks about sound levels
13		that the Applicant has agreed to with the
14		Town. So I guess I'd like to see that, if
15		that's possible.
16	Q.	What would your recommendation be I guess
17		maybe non-binding at this point. Would 45,
18		55 be appropriate for the Town of Antrim?
19	A.	Well, I think certainly the 45 is the key
20		number, because since the turbines can run
21		day or night, they have to comply with the
22		nighttime limit, the 45 in this case.
23	Q.	I understand.
24	Α.	And so that would be and keep in mind that

1		these numbers are exterior numbers. These
2		are outside the home, as all these numbers
3		are here up on the chart that you've seen.
4		These are all outside. They're obviously
5		going to be 10 to 15 decibels lower inside,
6		whether the windows are open or closed.
7		So I guess to answer your question, yes,
8		I think 45 would be an appropriate number for
9		a nighttime limit.
10	Q.	So I guess the follow-up to this, and this is
11		what I don't understand, I was led to believe
12		that a number like this is more of an urban
13		number as compared to the chart here,
14		compared to what I see in terms of the EPA
15		classification of an area that has little or
16		no prior experience with noise, intruding
17		noise.
18	Α.	Well, I guess, is there a specific question
19		in there? You want me to look at Mr. James'
20		testimony?
21	Q.	No, I guess I'd like to know, do you
22		consider I'll word it differently.
23		Do you consider Antrim an urban area?
24	Α.	No.
	{SE	C 2010-12} [AFTERNOON SESSION ONLY] {11-01-12}
1	Q.	Okay. Would you consider noise levels that
----	-----	---
2		are acceptable, I guess, in an urban area to
3		be similar to noise levels that would be
4		acceptable in a very rural area?
5	A.	You could certainly have different limits.
6		Like I say, I don't agree with the premise
7		that 45 is an urban area limit. Okay? I
8		don't know where that came from. I'm not
9		sure where you're getting that from.
10	Q.	Okay. Well, earlier I heard you compare this
11		room. You said this room is about 40
12		decibels if people are not talking.
13	A.	Correct.
14	Q.	Do you agree?
15	A.	Correct.
16	Q.	Okay. Would it surprise you to know that
17		people who are accustomed to a very quiet
18		environmental situation would find or do
19		find the sound level in this room, even when
20		people aren't talking, to be quite
21		irritating?
22	A.	Okay.
23	Q.	All right. Isn't it true that rooms like
24		this are actually designed to seem quiet?
	{SE	EC 2010-12} [AFTERNOON SESSION ONLY] {11-01-12}

			1
1	A.	I don't know.	
2	Q.	Are you aware of background noise here when	
3		it's in between when people are speaking?	
4	A.	I'm not aware of it, no.	
5	Q.	Okay. Do you live in a quiet, rural	
6		environment?	
7	Α.	It's got its ups and downs. Sometimes it's	
8		quiet. Sometimes it's got, you know, plenty	
9		of human noise.	
10	Q.	Okay. Is your house heated with a furnace?	
11		Are there refrigerators humming? Are there	
12		air conditioners, things like that, that are	
13		generally going?	
14	Α.	I do have those things, yes.	
15	Q.	Okay. Is it possible that people who don't	
16		live with those kind of things would be very	
17		aware when those sounds are in existence	
18		around them?	
19	A.	If they don't have a refrigerator or a	
20		furnace?	
21	Q.	Or maybe just a quiet refrigerator, no	
22		furnace, no air conditioner.	
23	A.	I haven't been in a house yet that doesn't	
24		have a refrigerator these days. But if you	
ļ	{SE	C 2010-12} [AFTERNOON SESSION ONLY] {11-01-12}	ł

1		have none of those appliances, it's probably
2		going to be pretty quiet in your house. No
3		TV, no nothing.
4	Q.	Let me go to your testing in Antrim, which is
5		listed in your original Antrim noise report,
6		the one you submitted to Antrim Wind. I
7		don't remember the Appendix 19, is it, if
8		I have that correct?
9	A.	I believe it's 13A.
10	Q.	That sounds correct.
11		You tested at five locations in Antrim;
12		is that correct?
13	Α.	That's correct.
14	Q.	I'm interested in all of them. But I live on
15		Loveren Mill Road, so that's the one I know
16		the best.
17		Could you describe more specifically
18		Location L2, exactly where you placed your
19		testing equipment, so I can visualize this?
20	Α.	Sure. I mean, all the the discussions of
21		all those, the meters and where they were
22		placed, are in the report. They're on Page
23		5-3.
24		But to briefly summarize, the meter was
	{SE	C 2010-12} [AFTERNOON SESSION ONLY] {11-01-12}

1		placed about 50 feet back from the road in
2		the woods, just to the north side of the
3		driveway.
4	Q.	Can you be more specific about what was in
5		the immediate surroundings? Was it in a
6		little clearing? Was it in the middle of the
7		trees or what? I know that area, so I'm just
8		curious exactly where, if I went down there,
9		I would have found that, which I didn't. But
10		I'm just curious.
11	A.	It's on the north side of the driveway.
12		There are some trees. It's a lightly wooded
13		area, I guess, so there's some trees around
14		it.
15	Q.	Just above that driveway there's a some,
16		little kind of access road. Was it in that
17		access road, or was it between the driveway
18		and the access road? Do you know?
19	A.	It was between the driveway. I'm not sure
20		where the access road is. So it was
21	Q.	It's just a little road that used to be for
22		logging, and it sort of dead-ends a little
23		ways in there.
24	A.	Like I said, it's about 20 feet north of the

	driveway. So I'm thinking there's probably
	no access road in between there and the
	driveway.
Q.	Okay. On the next couple pages you describe
	kind of the results, and you describe things,
	like that the different testing units were
	monitored, and you list various sounds that
	were picked up. L1 says steady fan or water
	noise, leaf rustle, insect noise, bird calls.
	L2, traffic noise along Route 9, aircraft,
	birds chirping, insect noise, rustling
	vegetation, et cetera, et cetera. Gregg Lake
	Road says traffic, insects, distant dogs
	barking, mechanical noise from across the
	lake to the east.
	Can you explain to me how you know what
	these sounds were? Are they actual
	recordings that you listened to and analyzed,
	or is there some other way to tell what sound
	is what? What is a rustling stream and what
	is a car, for instance?
A.	Those are based on personal observations from
	multiple visits that we made during the time
	that the meters were running.
	Q. A.

		14
1	Q.	Okay.
2	А.	So those are based on my visits and other
3		technicians' visits and our observations,
4		firsthand observations.
5	Q.	Okay. So it seems to me, when I read at
6		some point, I thought I read that field
7		personnel also checked on the integrity of
8		the equipment during the first day and third
9		night of monitoring and during an interim
10		field visit on September 3rd. Is that
11		correct?
12	A.	Correct. And also the final day of
13	Q.	And the final day. So those are the only
14		times when people were actually there?
15	A.	Right. Four times.
16	Q.	Okay. So in times between that, is there any
17		way for your equipment to know the difference
18		of whether it's hearing crackling branches or
19		rustling, or flowing water from a nearby
20		brook or what?
21	Α.	We did not have recorders on them, so we
22		could not go back and replay them and say,
23		oh, that was a dog barking or something. No.
24		It's just a decibel level.

1	Q.	I was curious on that, because I'm just
2		wondering if you were aware that the Loveren
3		Mill Road site, L2, was located about
4		500 feet from probably about 30 sled dogs;
5		therefore, at least once a day during feeding
6		time, there was quite a ruckus that gets put
7		up at that point. I would think that that
8		would be noticeable.
9	Α.	Well, if that's something that goes on there
10		every day, then and if it was something
11		that was of sufficient loudness to be
12		captured by the instruments, then it was
13		picked up as part of the measurements.
14	Q.	For about a half-hour to an hour it is every
15		day. But there's no way for your equipment
16		to know the difference between that and, say,
17		a car driving by?
18	A.	That's correct.
19	Q.	Okay. All right. I just want to ask you to
20		comment on this. Our house right above that
21		testing area, at one point we measured with a
22		decibel meter and this was indoors, in our
23		living room at night a level of 18
24		decibels. Does this surprise you at all?
	{SE	C 2010-12} [AFTERNOON SESSION ONLY] {11-01-12}

1	А.	Not necessarily, no. I assume nothing was
2		running at that point.
3	Q.	Well, nothing no, nothing was running,
4		except our refrigerator basically was the
5		only appliance that runs all the time in
6		there, so
7		So it's possible that people who live in
8		a quiet area experience a quiet environment
9		all the time.
10	Α.	That actually just kind of reinforces what I
11		said earlier, in these levels are outside
12		levels. And they're going to be lower inside
13		the house by at least 10, if not 15 decibels,
14		just because of the attenuation of the house.
15		
16	Q.	So do you think that the night when I
17		measured 18 decibels in the house, it might
18		have been 40 or 45 decibels if I had measured
19		it outdoors?
20	Α.	It's possible. It could have been 35, 40
21		decibels outdoors. I mean, a reduction of 17
22		decibels would not be unusual.
23	Q.	And is that effect, is that different in the
24		summer when windows might be open than it
l	{SE	C 2010-12} [AFTERNOON SESSION ONLY] {11-01-12}

			152
1		would be in the winter?	
2	A.	Well, as I said, a sort of minimum	
3		outside-to-inside reduction with the windows	
4		open is typically about 10 decibels. That's	
5		a conservative estimate.	
6	Q.	Here's another technical question. You said	
7		you understand or I understand you're	
8		saying you're using a model of 109.4	
9		decibels at the turbines as your basis to	
10		start with; is that correct?	
11	Α.	That's correct.	
12	Q.	Okay. Then I'm seeing charts you have	
13		projecting what the ambient what the sound	
14		plus the turbines will be at various	
15		locations. Is that true?	
16	Α.	Right. That's what this figure is right	
17		here.	
18	Q.	Right. How is this done? Is this a computer	
19		program that projects that?	
20	Α.	The short answer is yes, it is.	
21	Q.	Okay. Is topography accounted for in that?	
22	Α.	Yes, it is.	
23	Q.	In what way?	
24	Α.	The State of New Hampshire has a digital	
L	{SE	C 2010-12} [AFTERNOON SESSION ONLY] {11-01-12}	

1		elevation database, and that topography is
2		brought into the software package to account
3		for differences in terrain between sources at
4		locations that it's propagating to.
5	Q.	Does that include vegetation?
6	Α.	You have the ability to include vegetation in
7		the model. We did not take any credit for
8		vegetation.
9	Q.	Okay.
10	Α.	So in other words, no, zero for vegetation.
11	Q.	There is a paper that we submitted as Exhibit
12		NB 10 electronically. Let me see if I can
13		find it here. And it's a paper presented at
14		Noise Con 2011, called "Dynamic Measurements
15		of Wind Turbine Acoustic Signals Employing
16		Sound Quality Engineering Methods Considering
17		the Time and Frequency Sensitivities of Human
18		Perception." Are you aware of this paper?
19	Α.	I have it here. I was this paper was
20		submitted as part of a lot of the
21		documentation that came with Mr. James'
22		testimony.
23	Q.	Correct.
24	Α.	I have seen it, yes.

1	Q.	You have seen it. Okay. So you received a
2		copy of that. Have you reviewed it?
3	Α.	I scanned it quickly. There were an awful
4		lot of papers submitted by Mr. James.
5	Q.	Okay. I understand it was presented at Noise
6		Con 2011, which I guess is a conference that
7		was held in Portland, Oregon. Were you
8		present at the presentation of this paper?
9	A.	I did not go to that conference, no.
10	Q.	I was led to believe that you were actually
11		one of the session moderators for this. Is
12		that not true?
13	A.	That is not true.
14	Q.	Okay. Are you aware that this presentation
15		and this paper demonstrates that wind
16		turbines are found to produce infrasound
17		pulses lasting less than 100 milliseconds, or
18		one tenth of a second in their frequency
19		range of zero to 200 hertz?
20	A.	I guess I will take your word for it. Like I
21		said, I didn't read every sentence in here.
22		If you're telling me that's part of the
23		paper, then I'll take your word for it.
24	Q.	Are you aware that in this paper it also says
ļ	{SE	C 2010-12} [AFTERNOON SESSION ONLY] {11-01-12}

pulses reach sound pressure levels as high as 1 the mid-90 decibel range and sometimes over a 2 100 decibels? 3 MR. PATCH: Maybe, Mr. Block, 4 5 if you actually have a citation where it says that in the paper, that would be helpful to 6 7 the witness, so he could actually see the 8 words you're --9 MR. BLOCK: Okay. It might take me a second to find it. 10 11 (Pause in proceedings) BY MR. BLOCK: 12 Do you have the paper in front of you? 13 0. Yes, I do. 14 Α. 15 Okay. Excuse me one second. Q. 16 MR. IACOPINO: Mr. Block, on 17 the electronic copy, there are no page numbers, so I think you should use the 18 19 section number when you make reference. 20 MR. BLOCK: Okay. I will do 21 that, yes. 22 MR. BOISVERT: Which exhibit 23 is it? MR. BLOCK: NB 10, Section 6, 24  $\{\text{SEC 2010-12}\}$  [AFTERNOON SESSION ONLY]  $\{11-01-12\}$ 

1		which is labeled "Wind Turbine Results." And
2		there's a figure right after that which shows
3		the red line on there. I guess it's the
4		first chart immediately following the
5		introductory paragraph on Section 6 shown in
6		figure
7	Α.	Okay. I'm on that page.
8	BY M	R. BLOCK:
9	Q.	Okay. Oh, I just lost it. There we go.
10		So the red level on there is mine is
11		kind of reduced here, but it's showing peek
12		levels there. Do you see that?
13	A.	Yes.
14	Q.	Okay. And are you aware that pulses at that
15		peak level exceed thresholds of audibility
16		set for steady pure tones?
17	Α.	Right. And I think we talked about this in
18		my supplemental testimony. So if we're going
19		to get into this, I'm going to go back to my
20		supplemental testimony.
21	Q.	I do have your supplemental testimony open
22		here, too, if you want to identify what page
23		you discussed that.
24		(Witness reviews document.)
	{SE	C 2010-12} [AFTERNOON SESSION ONLY] {11-01-12}

1	Α.	I guess the question came up about infra
2		this is about infrasound and low frequency.
3		That's a subject of interest and conversation
4		among acoustical scientists for wind turbines
5		and other sources these days. And starting
6		on Page 11 of my supplemental prefiled and
7		going through Page 14, there's a discussion
8		about that. And I guess on Page 14 we get
9		into a little bit more of the nitty-gritty of
10		this paper
11		MR. IACOPINO: Mr. O'Neal,
12		just for the Committee's reference, that's
13		AWE 9, and it's Document 34 within that
14		electronic document.
15	BY M	R. BLOCK:
16	Q.	And you're talking about Page 14. Are there
17		specific lines on there you'd like to refer
18		to?
19	A.	Right. I guess Lines 8, 9 and 8 through
20		14. I'm paraphrasing here. But the Bray and
21		the James paper, which is what this is, this
22		NB 10 that we're talking about. And I'm just
23		reading here. It doesn't demonstrate that
24		infrasound can exceed the threshold of

1		perception. They talk about it may affect
2		the likelihood of audibility or other
3		response, and they encourage others to engage
4		in further research.
5		So this is something they've looked
6		into, they've had some interesting thoughts
7		and ideas on it, but certainly not conclusive
8		that infrasound and low-frequency sound from
9		the turbines is completely audible at these
10		low, low frequencies. I think that's been
11		confirmed in some of the other research by
12		Møller and Pedersen as well.
13	Q.	Since we have one of the authors of that
14		paper here, perhaps it might be more
15		appropriate for that to be addressed later
16		when he's speaking to get into more detail on
17		that. So, thank you.
18		Filter response time from one-third
19		octave band analyzers require sounds that are
20		being measured to be present and stay for at
21		least a quarter of a second for a 20-hertz
22		signal sound and over a second for sounds
23		below 5 hertz. Is that something you're
24		aware of and agree with?

1	A.	What are you reading from?
2	Q.	I'm reading from some notes I made here
3	Α.	Okay.
4	Q.	that in trying to educate myself, I found
5		that as you as sound levels become lower
6		in frequency for a one-third band analyzer to
7		be able to respond and measure the sound, the
8		sound itself needs to be longer.
9	Α.	Okay.
10	Q.	Okay? So I guess the question I have on that
11		is and my knowledge on this is based from
12		years ago, being involved in with sound
13		companies that do music support for concerts
14		and things like that. I worked with some
15		acousticians that did that. But I understand
16		from them that very low-level sounds take
17		longer to be registered, essentially, on
18		analyzers and microphones and testing
19		equipment. And I remember they had
20		situations with this with musical
21		instruments.
22		So if you've got sounds that are very
23		short in duration, is there a problem with
24		recording them or testing them or analyzing
l	{SE	C 2010-12} [AFTERNOON SESSION ONLY] {11-01-12}

1		them?
2	Α.	Well, obviously you would have to have the
3		appropriate settings on your equipment to do
4		that. I'm not sure where you're going in
5		terms of the acoustical study that we did for
6		characterizing the existing background, which
7		I thought was what we were talking about.
8	Q.	Well, I guess the question to that is
9		actually, let me go this was mentioned
10		earlier, I think, when you were being
11		questioned by Ms. Manzelli on your own
12		your report to Antrim Wind at Page 4-1, where
13		you stated infrasound sound at frequencies
14		below 20 hertz can be neglected in the
15		assessment of modern upwind turbines.
16		Low-frequency sound has been reduced to low
17		levels in modern wind turbines and is
18		generally not an issue. You do state that in
19		there.
20	A.	Yes.
21	Q.	Is that position of yours based on
22		measurements using one-third octave band
23		analyzers that your firm or others have used
24		in order to test this?

1	A.	It's based on a combination of several
2		things. That is one aspect of it. It's also
3		based on some of the other literature that's
4		out there by Leventhal and Møller and
5		Pedersen that confirm it again.
6		It's important to note that there is
7		infrasound low-frequency energy out. There's
8		no disagreement about that. I think the key
9		question and point is, is that a sufficiently
10		high level that it's injurious to people?
11		And that's where the statement that we make
12		in the report comes from.
13		When I say "low," low levels may not
14		have been a good choice of words. Low may
15		imply that there's nothing. There is some
16		there, but it's not at such a high level that
17		it's an issue.
18	Q.	Is it your contention that low-level sounds
19		need to be audible to be injurious?
20	А.	Well, there's certainly there's different
21		criteria. You can use audibility as one.
22		You've got to be again, the levels have to
23		be very high at lower and lower frequencies
24		to be audible.
	1	

1		You can also consider perhaps vibration
2		or rattle for low frequency. Again, if they
3		are at a sufficient level, they could cause
4		your windows to rattle and so forth. Again,
5		the research that's out there has
6		demonstrated that, at the setbacks we're
7		talking about here, the levels are not high
8		enough to cause those phenomenon.
9	Q.	Are you aware of any complaints around the
10		country or so that low-frequency sound is
11		annoying or harmful to people; and if so, how
12		would you explain those?
13	A.	Well, there's certainly a great deal of
14		information out on the Internet and the
15		literature that talks about complaints from
16		certain wind turbines, certain conditions.
17		However I'm sorry, could you read the
18		question back?
19	Q.	I guess are you aware of complaints about
20		low-frequency sounds
21	A.	Thank you.
22	Q.	and how would you explain those
23		complaints?
24	A.	The complaints are certainly out there.
	{SE	C 2010-12} [AFTERNOON SESSION ONLY] {11-01-12}

1		Whether they are truly due to low frequencies
2		I don't think has been demonstrated. In
3		other words, people have been complaining
4		about sound from wind turbines. And a lot of
5		the research, certainly from, again,
6		Pedersen, has shown that the visibility of
7		turbines contributes to that. People become
8		annoyed when they can see them. Whether the
9		complaints are due just to low-frequency
10		noise I don't think has been proven or
11		demonstrated.
12	Q.	For a minute, if we go afield from that a
13		little, do you know of other situations where
14		low-frequency sounds I'm eliminating wind
15		turbines right now from the picture. Do you
16		know of any other situation where
17		low-frequency sounds cause complaints and/or
18		problems in people? Can you describe some,
19		if so?
20	A.	I'm trying to think of any. And I know there
21		was a research paper years ago where workers
22		were working on jet engines. But this was a
23		long time ago, and these are workers who
24		actually worked on the jet engines, who are
	{SE	C 2010-12} [AFTERNOON SESSION ONLY] {11-01-12}

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1		very close to and exposed to much, much
2		different levels of sound than we're talking
3		about here with wind turbines. These are jet
4		aircraft engines. And there were some
5		high/low frequency from that.
6		But in terms of community noise impacts
7		from, say, other sound sources, I'm not aware
8		of any, no.
9	Q.	Have you ever heard of a term called "sick
10		building syndrome"?
11	Α.	I've heard of it.
12	Q.	And what do you know about that?
13	Α.	My understanding is that's more of an
14		air-quality issue.
15	Q.	So in other words, inhaled it's something
16		having to do with the inhaled air, something
17		in the atmosphere itself?
18	Α.	Yeah. Has something to do with the quality
19		of the air within a building, a confined
20		space, not being fresh enough. That's my
21		understanding of it. I'm no expert in that
22		area.
23	Q.	So maybe so you think it maybe has
24		something to do with oxygen levels or
	{SE	C 2010-12} [AFTERNOON SESSION ONLY] {11-01-12}

1	something like that or contaminants in the
2	air? Is that what you believe it has
3	something to do?
4	MR. PATCH: Madam Chair, I
5	just don't see the relevance of questions
6	about sick building syndrome to noise levels.
7	MS. BAILEY: Can you tell me
8	why this is relevant?
9	MR. BLOCK: One second,
10	please.
11	(Pause in proceedings)
12	MR. BLOCK: I have information
13	that sick building syndrome and what's being
14	called "wind turbine syndrome" are actually
15	the same thing. And researchers who have
16	been working on it are discovering that
17	MS. BAILEY: Okay. Wait a
18	minute
19	MR. BLOCK: they are
20	related, and they're both based on
21	low-frequency sounds.
22	MS. BAILEY: Okay. But that
23	could be in your testimony; right? So
24	MR. BLOCK: It can.
	$\{$ SEC 2010-12 $\}$ [AFTERNOON SESSION ONLY] $\{$ 11-01-12 $\}$

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		16
1		MS. BAILEY: So let's keep
2		going.
3	BY M	IR. BLOCK:
4	Q.	Okay. I just wanted to know if you were
5		aware of, if that was something that you as
6		an acoustician all right.
7		I know parts of this were already
8		brought up. But we heard on Tuesday, I
9		believe it was, from Sean McCabe, that the
10		tech specs, and therefore the sound data for
11		the Acciona AW16 [sic], will be available
12		somewheres around the second quarter of 2013.
13		Are you aware of that?
14	A.	No. I just know it's coming. I don't know.
15		So whatever he said is what I know.
16	Q.	So you know they're working on that right
17		now.
18	A.	I know they're working on it, yes.
19	Q.	In light of that, how can you assure us, at
20		this point, of your predicted sound levels
21		for the turbines in Antrim if we still don't
22		have the final data?
23	Α.	I guess a couple of answers to that. No. 1,
24		Acciona has done enough testing on similar
	{SE	C 2010-12} [AFTERNOON SESSION ONLY] {11-01-12}

units, that they're willing to guarantee it. 1 Now, that's a -- that's a big risk for 2 But I got to believe that they're not 3 them. going to take that risk unless they feel 4 confident. That's a big business risk for 5 So, you know, I don't think they would 6 them. do that otherwise. 7 And No. 2, again, if you look back at 8 9 the Møller and Pedersen paper that Mr. James submitted as part of some of his exhibits, 10 11 there's a very nice graph in there that shows 12 you a wide range of turbines that they tested for different sizes, going up to 3 megawatts, 13 14 and even -- well, they tested them up to 15 3 megawatts. There's a graph in there that 16 shows the sound power levels. It's in Figure 17 1 of that paper. And it shows that 109 is on the very, very high end of their conclusions 18 to sound power levels, which I think, again, 19 20 reinforces the fact that the sound levels 21 that Acciona is putting forth are eminently 22 reasonable. Now, I actually have that paper open in front 23 Q. of me. If people want to look it up, it's 24

 $\{\text{SEC 2010-12}\}$  [AFTERNOON SESSION ONLY]  $\{11-01-12\}$ 

1		NB24. And it's called, "Low-Frequency Noise
2		from Large Wind Turbines," by Møller and
3		Pedersen. Is this the paper you're talking
4		about?
5	A.	Yes, it is.
6	Q.	I just wanted to point out in the abstract,
7		in the beginning, it's that the premise of
8		this paper is that the relative amount of
9		low-frequency noise is higher for larger
10		turbines than for smaller turbines. So would
11		that be fit in with the characteristic
12		with the kind of turbines being proposed
13		here?
14	A.	Yes. And their findings were that they are 1
15		to 3 decibels higher in some of those lower
16		bands, which is appropriate and
17		understandable. That's not a problem.
18	Q.	Okay. And according to Mr. James, the Møller
19		paper also says the dBA is not a useful way
20		to limit wind turbine noise.
21		Essentially when I read here and see
22		if you agree with me simplifying this down
23		to my level, larger wind turbines make more
24		noise, have more low-frequency sound. Is
	{SE	C 2010-12} [AFTERNOON SESSION ONLY] {11-01-12}

1		that true?
2	A.	That is generally true.
3	Q.	Okay. Going back for a minute to the
4		guaranty from them, I know Ms. Manzelli
5		talked about on a legal basis. I'm talking
6		about that somebody potentially living across
7		from this, if there's a guaranty, what is my
8		option if I bring in for instance, that
9		decibel meter I used before. Wind turbines
10		are up and I measure it, and it's higher than
11		what the Town has said or what your guaranty
12		says. How do I address that guaranty?
13	A.	Well, I'm not sure I'm the right person to
14		answer that question. That's more of a legal
15		and a procedural question.
16	Q.	But you're telling me that you personally are
17		willing to stand by this guaranty because you
18		believe what Acciona is telling you.
19	A.	I believe what Acciona is putting forth. I
20		don't think I have no reason to believe
21		that it's, you know, bad information. I
22		believe it's good information. And it's
23		consistent with what we see from other wind
24		turbines in the industry. This is what we
	{SE	C 2010-12} [AFTERNOON SESSION ONLY] {11-01-12}

1		modeled here, 109.4, is the highest level
2		we've ever modeled for any wind turbine, if
3		that gives you any comfort.
4	Q.	No, none whatsoever. But I guess I'm kind of
5		asking if you're are you willing to take
6		some responsibility for recommending this, to
7		say that this is an appropriate wind turbine?
8		Are you willing to take some responsibility
9		for this guaranty so that, you know, I have
10		some insurance?
11		MR. PATCH: I'm going to
12		object to the question. I don't quite
13		understand. He's asking this consultant if
14		he will take responsibility for the guaranty
15		from Acciona? I just don't understand the
16		question.
17		MS. BAILEY: Mr. Block
18		MR. BLOCK: Can I rephrase it?
19		MS. BAILEY: You can try.
20	BY M	R. BLOCK:
21	Q.	Okay. I think you just told me that you
22		believe Acciona and you're willing to
23		stand by what they're saying. I guess
24		another way to say this is, if an engineer
	{SE	C 2010-12} [AFTERNOON SESSION ONLY] {11-01-12}

1	came in and told in a permitting process
2	said, I am telling you that this project will
3	meet these standards, and those standards
4	were violated once the project is completed,
5	I believe that engineer might be subject to
6	some kind of possibly losing a license or
7	so, because an engineer is supposed to know
8	and be able to predict this, and the people
9	who are building a project need to count on
10	that advice before they can take it to
11	completion.
12	I'm asking you as in effect, taking
13	the role of an engineer here of predicting
14	what the sound will be, would you
15	MS. BAILEY: Mr. Block, how is
16	an engineer losing his license going to help
17	you? It's not.
18	MR. BLOCK: It may not.
19	But well, I think the way it would help me
20	is that, if an engineer had the threat or the
21	possibility of losing his license over a
22	recommendation, he or she would not make that
23	recommendation. They would want to make
24	recommendations that they could stand by.
ļ	{SEC 2010-12} [AFTERNOON SESSION ONLY] {11-01-12}

And what I'm looking for here 1 2 is a guaranty that the recommendation that's being made by the advisors and experts to 3 Antrim Wind are things that they feel are 4 realistic and can really be achieved. 5 MS. BAILEY: Well, he's giving 6 his testimony under oath. 7 8 MR. ROTH: If I may address this momentarily? 9 I think it's a fair question 10 11 to ask whether if an engineer puts his stamp 12 on a particular engineered design, is he willing to stand by that, whatever it is, 13 whether it's personal liability or some sort 14 15 of consequence at the licensing board. 16 If Mr. O'Neal is putting his 17 stamp on this figure based on the guaranty from Acciona, I think it's a fair question. 18 What does that mean to him? 19 MR. PATCH: I think it's an 20 21 unfair question, you know, to put this 22 particular witness, when he's on the stand, you know, under this kind of scrutiny, and 23 ask him to answer a question about personal 24  $\{\text{SEC 2010-12}\}$  [AFTERNOON SESSION ONLY]  $\{11-01-12\}$ 

liability or personal responsibility. 1 I just think it's taking us very far afield. 2 MS. BAILEY: Can we just --3 how about if I try it? 4 In general, if a professional, 5 such as yourself testifies that this is what 6 it is, and you end up to be wrong, and --7 8 what would be the consequence to your reputation or your -- do you have any 9 licenses that could be affected? 10 11 THE WITNESS: Well, certainly 12 if I'm proven to be disastrously wrong -- and I'll say "disastrously," meaning that -- for 13 example: Up near the Blocks' residence --14 15 just since Mr. Block is asking me the 16 questions, let's use his as example -- we're 17 calculating a level of around 35 decibels, I'm looking up at the Location L2, 18 okay. which we measured, his next door neighbor. 19 20 So, actually, his house is a little beyond 21 that. So maybe it's 34 decibels. So if we 22 get out there and this thing gets built and 23 we do post-construction testing and we find out -- we measure a sound level of, you know, 24

42 decibels from the turbines now -- not just 1 2 42 decibels just because it was a windy day that day and the dogs were barking, but 42 3 from the turbines -- I'd say I did a bad job. 4 That's really a bad job. 5 If we get out there and it's 6 35, that's pretty good. If you're off by a 7 decibel or two, that's pretty close. 8 So I guess that's how I would answer that. 9 MS. BAILEY: What happens if 10 11 you did a really bad job? That's what I think he wants to know. 12 THE WITNESS: Well, my 13 14 reputation sort of goes in the toilet. Ι 15 probably won't get hired again, for starters. 16 Number two is, these machines 17 do have the capability to go into -- and the developer doesn't want to hear this, but they 18 19 do have a noise-reduction option, which costs 20 them power production and, therefore, money. 21 But that would lower the sound levels. If 22 we're egregiously wrong and things are way 23 wrong and Acciona -- you know, so I'll leave 24 it at that --

{SEC 2010-12} [AFTERNOON SESSION ONLY] {11-01-12}

1 MS. BAILEY: Okay. 2 THE WITNESS: -- okay? So there is a recourse. 3 MS. BAILEY: Is that 4 5 satisfactory? MR. BLOCK: Yeah. 6 The 7 reputation part is, I guess, where I was 8 thinking this was going to. BY MR. BLOCK: 9 Just sort of a corollary question on this is: 10 0. 11 Can you be as sure about your assurances on this based on the fact that what you're 12 working with is essentially experimental 13 14 model data as you would be if you were 15 working on actual tested data? 16 Again, since Acciona is guaranteeing this, Α. 17 yes, I do. And, again, that's based on a combination of seeing other turbines in the 18 industry as well as doing a lot of 19 20 post-construction testing. 21 Q. So does that mean that if it turns out to be 22 wrong, that you can pass on the 23 responsibility to them --24 Well --Α.

 $\{\text{SEC 2010-12}\}$  [AFTERNOON SESSION ONLY]  $\{11-01-12\}$ 

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1	Q.	reputation-wise?
2	A.	For example: If things don't come out, for
3		whatever reason, as we all expect they will,
4		and the owner comes out and hires a third
5		party to test the turbine and says, Oh, my
6		gosh, it was really 115.4, we were all wrong.
7		Then Acciona obviously has a major issue, and
8		then I'll look bad for believing them.
9		But okay?
10	Q.	And this is probably you're not the one to
11		ask. But will Acciona then buy my house?
12	A.	I can't answer that for you.
13	Q.	Okay.
14	A.	But I have no reason to believe that's going
15		to be the case.
16	Q.	Has you or your firm actually ever handled
17		complaints or worked as experts in response
18		to a lawsuit or complaint having to do with
19		wind turbines?
20	A.	We have worked on several litigation matters.
21		Do you mean which side we worked on or
22		I'm what's the question?
23	Q.	If you can tell me and in what capacity
24		did you serve in those instances, if that's
	{SE	EC 2010-12} [AFTERNOON SESSION ONLY] {11-01-12}

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1		something you can reveal?
2	A.	Well, certainly the lawsuit in Texas is well
3		known. That's public knowledge. We worked
4		on the Horse Hollow Wind case where a group
5		of individuals sued the developer, the owner
6		of the wind farm. We worked on that case.
7	Q.	I wasn't knowledgeable. If you could, in one
8		or two sentences, describe that, I would
9		appreciate it.
10	A.	Describe what happened?
11	Q.	What the case was about, yes.
12	Α.	The case was a group of 18 plaintiffs that
13		sued the owner and operator of a wind farm in
14		Texas, that noise was a nuisance. And they
15		lost the case.
16		We did a lot of studies of the wind
17		turbine sounds, presented the results in a
18		court of law before a jury trial, and the
19		jury found that the owner and operator was
20		reasonable in the construction and operation
21		of the wind farm and that noise was not a
22		nuisance. And that was the end of the case.
23	Q.	In that instance in Texas, do you know how
24		far homes were from those turbines?

Yes, I do. 1 Α. Can you -- and I guess the litigants, I 2 Q. guess, would be the critical ones. Can you 3 tell me what the distances were? 4 5 Α. They ranged. The closest plaintiff was 1,700 feet away. There was a second -- the 6 7 second closest plaintiff was 2,000 feet away. And there were numerous other ones at 8 distances out to a few miles. 9 Who were involved in the case? 10 0. 11 Α. Yes. 12 Okay. Can you excuse me one second? Q. (Pause in proceedings) 13 That's all my questions for now. Thank you. 14 Q. 15 Thank you. Α. 16 MS. BAILEY: Thank you. 17 Ms. Linowes. MS. LINOWES: Thank you, Madam 18 Chair. 19 20 CROSS-EXAMINATION 21 BY MS. LINOWES: 22 I wanted to start -- let me tell you Okay. 0. 23 the items that I'm going to be referencing 24 during my cross-examination. It will be your  $\{\text{SEC 2010-12}\}$  [AFTERNOON SESSION ONLY]  $\{11-01-12\}$ 

1		January prefiled direct testimony; your
2		report that was included as part of that
3		submittal, which I don't recall the exhibit
4		number on that; also, IWAG-N1, IWAG-N3, N5
5		and N7. I'll also be referring to NB
6		Exhibit NB 10 and also NB 1, which is
7		Mr. James' report.
8		Before I get started with my questions,
9		I wanted to ask a couple of questions in
10		reference to what was said so far.
11		That guaranty that you're talking about
12		with regard to the Acciona turbine, you said
13		that Acciona has guaranteed the turbine. Is
14		that guaranty that you're saying that the
15		turbine will produce a sound level of 109.4
16		decibels sound emission, I should say?
17	A.	What that's saying is that, under the maximum
18		sound power level, the maximum wind
19		condition, that's the highest sound level it
20		will be rated at. So in other words, at
21		different wind speeds there will be some
22		lower sound levels.
23	Q.	Right. So that the sound but that is the
24		guaranty. All it states is that it
{SEC 2010-12} [AFTERNOON SESSION ONLY] {11-01-12}		
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1		guarantees there's a maximum sound emission;
2		is that correct?
3	A.	That's correct.
4	Q.	Okay. And can you just tell me what if
5		what occurs in nature somewhere near Tuttle
6		Hill or the surrounding property, the project
7		area, that is at 109 decibels? Is there
8		anything?
9	Α.	Well, no.
10	Q.	Can you tell me something that exists in the
11		world that's 109 decibels?
12	Α.	See, as I explained a little bit earlier in
13		the proceedings, you got to be very careful.
14		The 109 is sound power
15	Q.	I understand that.
16	Α.	it's a rating.
17	Q.	I understand that. And I'm asking you to
18		you're an acoustician. Can you liken that
19		I understand there has to be some kind of
20		mapping. Can you liken that sound power to
21		something that exists in the world, other
22		than a turbine?
23		MS. BAILEY: Ms. Linowes,
24		remember to let him answer the question for
	{SE	C 2010-12} [AFTERNOON SESSION ONLY] {11-01-12}

the reporter, please. 1 There are lots of mechanical 2 Α. Sure. equipment, for example, that have sound 3 power-level ratings of around 110 4 decibels and --5 6 Q. Mr. -- I'm sorry. 7 MS. LINOWES: I apologize, The reason I'm a little anxious 8 Madam Chair. is that he tends to go on with his -- and he 9 10 takes a long time to answer questions that 11 are relatively short answers. So --MR. PATCH: I'm going to 12 object to that and ask that that be struck 13 from the record. I don't think that's fair 14 15 at all. And she's just not letting the 16 witness answer the question, and she should 17 allow him to answer the question. MS. LINOWES: Well, then, if I 18 19 can rephrase the question. MS. BAILEY: Wait a minute. 20 21 Let's strike that from the record. I don't 22 think that was fair, because I've never heard 23 this witness before. You have to let him 24 answer the question. That's fair.

1		MS. LINOWES: Okay. Well, I
2		will rephrase the question then.
3	BY M	IS. LINOWES:
4	Q.	Can you name a mechanical structure a
5		mechanical device that produces that sound
6		power that many of the people in the room
7		will be able to understand or recognize?
8	A.	There are many. So let me search for one.
9		How's that?
10	Q.	That would be great.
11	A.	Cooling towers that often go on top of an
12		office building, for example. They come in
13		all different sizes and shapes and
14		capacities. But there are many of them that
15		are around 110 decibel 109, 110-decibel
16		sound power-level rating.
17	Q.	So you wouldn't find a cooling tower like
18		that on a building in Antrim; is that
19		correct?
20	A.	You might find it on top of a library or a
21		school or something like that, sure.
22	Q.	How about a lawnmower?
23	A.	I am not entirely sure what the sound power
24		level is of a lawnmower. Sound pressure
	{se	C 2010-12} [AFTERNOON SESSION ONLY] {11-01-12}

1		level, yes, but not the sound power level. I
2		don't know.
3	Q.	Okay. All right. So now I want to go to
4		Page 1 of your January testimony. And on
5		Line 8 you state that you earned a master's
6		in atmospheric science and that you're a
7		certified meteorologist; is that correct?
8	Α.	Correct.
9	Q.	How did you get into noise?
10	A.	Through a series of work experience,
11		continuing education, training.
12	Q.	And is there a commonality between modeling
13		meteorological events and noise events? Is
14		that part of what the crossover was?
15	A.	There is some commonality there, yes.
16		Certainly the atmosphere is an area of
17		commonality.
18	Q.	So did you at one time do you work as a
19		meteorologist today?
20	A.	Some of the projects I work on for
21		example: Some of the wind projects have a
22		meteorological aspect to them. So that type
23		of training and education is very useful.
24	Q.	So are you predominantly working as an
l	{SE	C 2010-12} [AFTERNOON SESSION ONLY] {11-01-12}

			184
1		acoustician now?	
2	А.	More of my time is spent doing community	
3		noise, yes, than actual meteorology.	
4	Q.	Okay. And now it says on the next Page 2,	
5		Line 4, that you are a member of the	
6		Institute of Noise Control Engineers,	
7		Acoustic Society of America, the American	
8		Meteorological Society, et cetera; is that	
9		correct?	
10	A.	That's correct.	
11	Q.	As a professional acoustician is it	
12		appropriate to call you that?	
13	A.	That's fine.	
14	Q.	Okay and a member of INCE, et cetera, is	
15		there a certain professional ethic that you	
16		commit to?	
17	Α.	Yes, there is.	
18	Q.	Are you licensed?	
19	A.	I do not have the board-certification	
20		license.	
21	Q.	Is that something that one can get?	
22	A.	Yes, you can.	
23	Q.	Is it a separate step, a testing that you go	
24		through?	
	{SE	C 2010-12} [AFTERNOON SESSION ONLY] {11-01-12}	•

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1	A.	Yes, it is.	
2	Q.	Do many acousticians that you know, are they	
3		board-certified?	
4	A.	Very few.	
5	Q.	And what is the difference between a	
6		board-certified acoustician and one that is	
7		not?	
8	A.	That means that if you've taken and passed	
9		the board-certified exam, that's just what	
10		that means. You've taken a you have the	
11		experience, the credentials, the	
12		qualifications, and you've taken the one-day	
13		licensing test and passed it.	
14	Q.	Does it commit you to a higher level of	
15		ethics?	
16	Α.	Beyond being a member of the INCE?	
17	Q.	That's correct.	
18	Α.	I don't recall. I don't know.	
19	Q.	Okay. Now, as an acoustician who is a member	•
20		of INCE and all of these other organizations,	
21		and one who is committed to a set of ethics,	
22		at what you have mentioned several times	
23		that it's important that projects meet	
24		compliance, permitting compliance. Is that	
	{SE	EC 2010-12} [AFTERNOON SESSION ONLY] {11-01-12}	

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1		about right, what you said? You agree?	
2	Α.	Well, of course, if a project has a permit,	
3		they must comply with it.	
4	Q.	And you have you seem to be very	
5		comfortable with the limits or sound	
6		limits that were imposed on the Lempster	
7		project, as well as, I believe, the Groton	
8		project. You raised both of those. Is	
9		that you're comfortable with those?	
10	Α.	Yes.	
11	Q.	Okay. And as a professional acoustician, is	
12		your obligation to any situation where there	
13		is a noise concern, where a complaint has	
14		been raised, where someone has stated there	
15		is a problem with noise, is your first	
16		commitment as a professional acoustician to	
17		assure that the project for or the source	
18		of the noise is in compliance with the	
19		permit? Or is your first concern trying to	
20		make some understanding as to why the	
21		complaint is there and help the person who	
22		has the problem with noise? What is your	
23		first priority?	
24	Α.	I'm not sure I understand your question.	

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1	Under what situation am I working in here?
2	Q. Well, we'll use an example of a noise
3	problem. You were involved, I believe
4	there was a data request let me just find
5	that. This would have been my IWAG6. I
6	didn't intend to bring it up, but let me just
7	pull it out just so we have it. And that
8	would have been 1-18. I believe it was
9	IWAG 6
10	MS. LINOWES: Mike, correct me
11	if I'm wrong.
12	MR. IACOPINO: Is it 6 or N6?
13	MS. LINOWES: This would have
14	been where all my data requests were, so
15	MR. IACOPINO: That is
16	Exhibit 6.
17	MS. LINOWES: The request
18	number was IWAG 1-18?
19	MR. IACOPINO: I think that's
20	electronic Page 19.
21	BY MS. LINOWES:
22	Q. And you state that you were
23	MR. IACOPINO: Wrong one. One
24	dash what?
Į	{SEC 2010-12} [AFTERNOON SESSION ONLY] {11-01-12}

1 MS. LINOWES: Eighteen. 2 THE WITNESS: No. That's a P90 capacity factor question. 3 4 MR. IACOPINO: Yeah, that's a 5 tech session request. So we're looking for --6 7 MS. LINOWES: Oh, maybe it's 8 IWAG 5. My apologies. I think I separated 9 them. MR. IACOPINO: Actually, I 10 11 think it's four. Michigan Thumb? 12 MS. LINOWES: Yes, that's 13 correct. Thank you. 14 MR. IACOPINO: Yes, that's 15 IWAG 4, and it's Page 18 on the electric 16 [sic] version. 17 THE WITNESS: Okay. I found it. 18 19 BY MS. LINOWES: 20 Now, there is -- I believe the circumstance 0. 21 was that there was a complaint at the 22 Michigan Thumb 1 wind farm; is that correct? 23 There were complaints out there, yes. Α. 24 So, more than one. Q.

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1	A.	Yes.	
2	Q.	Okay. And you went out there. And your	
3		obligation, I believe, in reading your	
4		response here it sounds like your	
5		obligation was to determine whether or not	
6		the project was in compliance with the	
7		permit.	
8	A.	The project had a permit limit. And, right,	
9		the purpose of what we were hired for was to	
10		go out and determine whether the project at	
11		all these different locations was in	
12		compliance with their permit.	
13	Q.	And who was who paid you to go out there?	
14	A.	John Deere Wind Energy.	
15	Q.	So, John Deere owned the project?	
16	A.	That's correct.	
17	Q.	As a professional acoustician who is	
18		obligated to a set of ethics, if you	
19		understood that there was a problem with the	
20		noise, you found there was a problem that	
21		I don't remember what the decibel limit of	
22		50, 55 at any point, would you say, or	
23		would it even occur to you to say, there's a	
24		problem with the noise here? Or was it only	
l	{SI	EC 2010-12} [AFTERNOON SESSION ONLY] {11-01-12}	

			190
1		enough that you said, I represent my client,	
2		and I'm telling you today that it's in	
3		compliance with the permit?	
4	Α.	In the case of the Michigan Wind 1 they're	
5		talking about, we had no involvement at all	
6		in the project until after it was up and	
7		operating and built. So	
8	Q.	I understand.	
9	Α.	we were retained to measure at the	
10		complainant's house, a non-complainant's	
11		house alike. As you see there, we found some	2
12		locations that were not in compliance.	
13	Q.	But you stopped there, though; is that	
14		correct? It was not material to you, as an	
15		acoustician, outside of your obligation to	
16		your client, if you thought that there was a	
17		problem with noise?	
18	Α.	One of the items of discussion we had with	
19		the client was, you know, what other	
20		sound-level limits are there in other	
21		projects that you've seen. And we indicated	
22		that 45 was becoming a more common limit than	L
23		50. We do see limits of 50 in places, but 45	;
24		is more common.	

1		But we were not retained after that.
2		They sold the project and moved on, and we
3		were not brought back.
4	Q.	Okay. And Mr. O'Neal, if I could ask you:
5		Was this the first wind project that you had
6		ever been involved with?
7	A.	No.
8	Q.	All right. So now I want to go through my
9		questions.
10		There was testimony earlier this week
11		and I think you might have heard it also
12		today. You're aware that the Acciona AW116,
13		3-megawatt turbine, is not commercially
14		operating anywhere in the United States, or
15		actually in the world. It might be in Spain
16		or in the process of going online. But is
17		that your understanding?
18	A.	Yes.
19	Q.	So it's accurate to state that your
20		predictive sound modeling was based on the
21		power curve, I think you had stated that
22		earlier?
23	Α.	Well, a power curve relates electrical output
24		to wind speed. So we use the maximum sound
	{se	C 2010-12} [AFTERNOON SESSION ONLY] {11-01-12}

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1		level in our modeling.
2	Q.	Hmm-hmm. And there is no way for you to
3		validate your model against a working AW116
4		turbine; is that correct?
5	Α.	There's currently two under construction
6		right now in Iowa. And as you said, there is
7		one that's now finished in Spain, and there
8		will be some data available, I'm sure, soon.
9	Q.	After these proceedings?
10	Α.	I can't say when they'll be available.
11	Q.	Okay. And the turbine blades with the
12		rotator diameter of 116 meters, is that the
13		longest the largest rotor diameter that
14		you have encountered?
15	Α.	It's the largest one I've worked on so far,
16		yes.
17	Q.	Now, there are basically two areas that I
18		want to talk to you about. And I just want
19		to check the clock. We might only get to the
20		first half. But I
21		MS. LINOWES: You're looking
22		concerned.
23		MR. IACOPINO: Are you telling
24		us you're going to be keep examining him
	{SE	C 2010-12} [AFTERNOON SESSION ONLY] {11-01-12}

1 until 7:00, when it's quarter of six? MS. LINOWES: I don't know. 2 Ι hope not. I just want to characterize I have 3 two sets of -- I only just started. Did I 4 say an hour or an hour and a half? 5 MR. IACOPINO: I'm checking. 6 7 MS. LINOWES: Okay. 8 MR. IACOPINO: You told us 10 to 20 minutes. 9 10 MS. LINOWES: No, not 11 possible. No, 90 minutes 12 MR. IACOPINO: is what you said. 13 14 [Laughter] 15 MS. LINOWES: That was not 16 fair. 17 MR. ROTH: Does the record reflect that laughter? 18 MS. LINOWES: I am sensitive 19 20 to burning everyone out, so I --21 MS. BAILEY: Well, you 22 predicted -- if you predicted 90 minutes and 23 you started at 5:30, you should be finished 24 with all your cross by the time we end  $\{\text{SEC 2010-12}\}$  [AFTERNOON SESSION ONLY]  $\{11-01-12\}$ 

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		19
1		tonight.
2		MS. LINOWES: And you're okay
3		with that?
4		MS. BAILEY: If you can
5		shorten it and don't be repetitive, that
6		would be appreciated. But if you can't, then
7		we'll go till 7:00 and we'll have to continue
8		tomorrow with Mr. Roth.
9	BY M	IS. LINOWES:
10	Q.	Okay. I wanted to talk about two areas
11		that there are two components to this
12		process; correct? There is a
13		pre-construction sound survey study; is that
14		correct? That's one component?
15	A.	Yes.
16	Q.	The second component is the predictive
17		modeling of the sound.
18	Α.	Yes.
19	Q.	And I'd like to understand exactly the
20		purpose of the pre-construction noise survey.
21		It's you went out you set up five
22		receptors. You collected noise for a period
23		of 16 days. Somewhere in the around I
24		don't remember the number of hours. How many
	{SE	C 2010-12} [AFTERNOON SESSION ONLY] {11-01-12}

1		hours is that?
2	Α.	It was about 400 hours in each location.
3	Q.	Okay. And you were attempting to understand
4		the background noise level; is that correct?
5	A.	Correct.
6	Q.	Okay. Is it and the purpose of
7		understanding the background noise level is
8		why? Why were you trying to do that?
9	Α.	Well, the reason is to try to put it in some
10		context. What is the sound level out there
11		today in different points in the community?
12	Q.	Okay. And now the expectation is, once
13		you've done that post pre-construction
14		survey, there is going to be some
15		construction, and then there will be an
16		introduction of a new source into the
17		environment; correct?
18	A.	Yes.
19	Q.	Is it fair to say that adverse impacts could
20		occur if the new noise from the project
21		significantly exceeds the background level at
22		the receptors? Is that a fair statement,
23		without defining the word "significantly"?
24	Α.	No, it's not a fair statement.

1	Q.	Okay. What would you expect it to be?
2	A.	For instance
3	Q.	What would your expectation be?
4	A.	For example: You said 10 decibels over the
5		background. What if the background is 16
6		decibels and the new project is 26 at the
7		location? I wouldn't characterize that as an
8		adverse impact.
9	Q.	I believe you said it was very diff
10		unlikely to be 16. But okay. I understand.
11		So if it were at 30, and it ended up being
12		introduction of a noise source that was 40,
13		would that be problematic?
14	Α.	What's going to happen there is that it will
15		be audible at times. Is it a problem? I
16		don't think so.
17	Q.	Now I'm asking you as the point as someone
18		who has examined community noise, which I
19		believe you said that you do. In the event
20		that a noise is introduced into an
21		environment that is 10 decibels above the
22		background noise, can you anticipate an
23		adverse reaction?
24	A.	People have adverse reactions for a number of
	{se	C 2010-12} [AFTERNOON SESSION ONLY] {11-01-12}

1		reasons. Sound may be one. The visual, the
2		view. They may not like the view of it.
3		There are a lot of reasons.
4	Q.	I know. But we're talking about sound. I
5		said, if you have a noise source that is
6		introduced into an environment that increases
7		the background noise level by 10 decibels,
8		can you anticipate, as an acoustician who
9		works with community noise, can you
10		anticipate an adverse effect?
11	A.	Some people will probably react adversely to
12		that. Some people won't notice it.
13	Q.	Thank you.
14		I have a technical question for you.
15		When you collected the noise at these five
16		receptors, what was the spectra of the noise
17		you collected in your survey, in hertz?
18	A.	Out of the five locations we collected, two
19		of them had one-third octave band data
20		collected. The other three did not. So I
21		can't tell you what the other three were at
22		all. The two that did have the third octave
23		band data, they're not presented in the
24		report. We turned that all over to Mr. Roth
	{SE	C 2010-12} [AFTERNOON SESSION ONLY] {11-01-12}

1		and his consultant. They have that data. I
2		mean, it's I'm not sure how I can answer
3		that. There's a lot of different frequency
4		information in there.
5	Q.	I'm not asking you to deliver that
6		information to me. I'm just trying to
7		understand what the spectra was.
8		So you did two receptors. You did
9		collect the full range of frequency sounds?
10	A.	That's correct. Yes.
11	Q.	But at the other three you did not?
12	Α.	Correct.
13	Q.	And why did you do that? Why did you make a
14		distinction between those?
15	Α.	We didn't feel that we needed to get
16		one-third octave band sound levels
17		everywhere. Again, particularly since the
18		background is being used more for
19		informational purposes, the A-weighted values
20		that we were collecting at all five locations
21		would be adequate to characterize what's out
22		there today.
23	Q.	Okay. Then, if I could if we can look at
24		your report, I would like to know which
	{SE	C 2010-12} [AFTERNOON SESSION ONLY] {11-01-12}

1		locations you did not I'm sorry. My
2		apologies.
3		If we look at your report, I believe it
4		is on Page one of the pages. It will be
5		Table 6-2. This would be Page 6-3. You have
6		the five locations.
7	Α.	Yes.
8	Q.	And which ones did not have the full spectra?
9		MR. IACOPINO: Just for the
10		Committee, we're looking at AWE 3, and it's
11		Document 25 in the electronic version of that
12		exhibit.
13	Α.	I'll actually direct your attention a few
14		pages back in that same report to Page 5-3
15		and 5-4, where the five locations are
16		discussed. And in those descriptions, it
17		tells you which ones had the third octave
18		band.
19	BY M	S. LINOWES:
20	Q.	Okay. Without reading it, do you happen to
21		know?
22	Α.	Location 1 had the one-third and Location 4.
23	Q.	So, Location 1 and Location 4. Okay.
24		All right. Now I would like to direct
	{SE	C 2010-12} [AFTERNOON SESSION ONLY] {11-01-12}

1		your attention to the Exhibit IWAG-N5. This
2		is a letter written by the Massachusetts
3		Department of Environmental Protection. It
4		was in response to noise complaints at an
5		operating wind turbine in Falmouth,
6		Massachusetts.
7	A.	Can you repeat the exhibit number, please?
8	Q.	Yes, I can. IWAG-N, as in Nancy or noise, 5.
9		Before I go down my line of questioning
10	Α.	I don't have it yet.
11	Q.	Oh, you don't. I'm sorry. Well, while
12		you're getting it, if I could ask this
13		question for verification: If you conducted
14		the 16 days of noise the noise survey
15		unmanned is that correct? So those
16		monitors were put out, and no one was at the
17		site or where the monitors were 24/7? You
18		may have gone out to check them, but no one
19		was manning them; is that correct?
20	Α.	Right. You don't staff them 24 hours a day
21		for 16 days.
22	Q.	Okay.
23	Α.	N5. Okay. I got it.
24	Q.	Now, this letter, just to set it up, as I
	{SE	C 2010-12} [AFTERNOON SESSION ONLY] {11-01-12}

1		said, it's an operating wind turbine. There
2		were complaints that the turbine Mass. DEP
3		wanted to go out and take noise measurements
4		at the site, okay.
5		It's different from attempting to get
6		background sound levels, okay. But I do want
7		to direct you to the second paragraph on the
8		second page and the second sentence which
9		starts, "It is important" Do you see
10		that? Second page, second paragraph, second
11		sentence.
12	А.	Yes, I see it.
13	Q.	It says, "It is important to note that in
14		most cases, Mass. DEP relies on attended
15		sound observation studies so that sound
16		observations, slash, decibel readings can be
17		attributed to particular sound sources." See
18		that?
19	А.	Yes.
20	Q.	Okay. And then it goes on into the second
21		paragraph second excuse me. The
22		sentence after that, it writes, "The
23		limitation of attendant studies is that they
24		are short-term and provide only small amounts
l	{SE	C 2010-12} [AFTERNOON SESSION ONLY] {11-01-12}

1		of data for impact evaluation and compliance
2		decision-making," but then explains that
3		long-term unattendant studies, like the one
4		performed by HMMH, another company, can
5		provide substantially more data so impact
6		evaluations can include different sound
7		source operating conditions and more times a
8		day, but can leave questions unanswered
9		regarding L max data observations and data
10		captured related to specific sound source in
11		question.
12		Now, the difference in this sentence and
13		with the pre-construction sound survey, I
14		believe, is they're looking for L max and
15		you're looking for L90; is that correct?
16	Α.	The short answer is yes.
17	Q.	Okay. They are recommending that the
18		noise that those be attendant studies.
19		And can you explain a little bit more what
20		their concern is about unattendant studies?
21	A.	Well, I think you said this. But just so
22		everybody was clear, what she's reading is
23		for a post-construction compliance test,
24		which is not what we're talking about here.

1	Q.	I understand. But I think you agree that the
2		difference between the post-construction and
3		pre-construction would be, instead of looking
4		for L max, you'd be looking at L90? You just
5		agreed to that?
6	A.	So in Massachusetts, the L90 is the required
7		background level, yes.
8	Q.	Oh, so you don't okay. Well, that's
9		but in any event I do want to come back on
10		that.
11		But in any event, the point being, the
12		difference between the unmanned and manned
13		study, the concern is what?
14	A.	The DEP is interested in making sure that
15		when someone is taking compliance sound-level
16		measurements of a source, that they're there;
17		they know what's going on; they know what
18		sound levels are happening; is it the wind
19		turbine or is it something else.
20	Q.	So the worry is that it might be
21		contaminating the noise the noise
22		collection. The noise collection may be
23		contaminated with other noise sources; is
24		that correct?

			20
1	A.	Correct.	
2	Q.	Okay. All right. Now, I want to direct you	
3		to excuse me one second.	
4		Okay. Now, I want to direct you now to	
5		IWAG-N7 dash N7.	
6		Do you know who George Hessler is?	
7	A.	I'm at IWAG-N7 and there's nothing in here.	
8	Q.	Oh, I can give you a copy if you don't have	
9		it.	
10	A.	Oh, I'm sorry. If you turn a few more tabs,	
11		there's a Schomer & Associates	
12	Q.	Yes, that's it.	
13	A.	report. Is that what I'm looking for?	
14	Q.	That's what you're looking for.	
15	A.	Yes. And to answer your question about	
16		Mr. Hessler, I have heard of him. I know who	)
17		he is.	
18	Q.	And he's a acoustician?	
19	A.	Yes, he is.	
20	Q.	And knowing about him, would you characterize	9
21		him as someone who has done work with regard	
22		to turbine noise pre-construction and	
23		post-construction?	
24	A.	I have seen reports from him on certainly	
L	{SI	EC 2010-12} [AFTERNOON SESSION ONLY] {11-01-12}	•

1		pre-construction. I'm not sure how much
2		post-construction he's done.
3	Q.	Okay. Now I would like to direct you to
4		page it's called Page 34. I don't know if
5		you have the whole report, but Page 34 of
6		that report.
7	A.	Okay.
8	Q.	And at the bottom of the page, this report
9		has a the last paragraph of a paper
10		written by George Hessler. The paper is
11		called, "Baseline Environmental Sound Levels
12		for Wind Turbine Projects." I can show you
13		the full paper on the iPad, but this is the
14		paragraph that's in that report.
15		And I want to read this. Now, this is
16		George Hessler's words. It starts, "To
17		exclude" excuse me.
18		"To exclude certain contaminating noise
19		and to correct measured sound levels for
20		self" you know what? I'm going to read
21		you from the original paper so that you
22		can 'cause I'm let's just go to that.
23		Bear with me for one second.
24		Yeah, it is exactly that. I just wanted
	{SE	C 2010-12} [AFTERNOON SESSION ONLY] {11-01-12}

1		to make sure I had that. My apologies.
2		Okay. The concluding paragraph of this
3		paper that George Hessler wrote reads, "To
4		conclude certain" "To exclude certain
5		contaminating noise and to correct measured
6		sound levels for self-induced wind noise, it
7		is necessary to record not only the
8		A-weighted sound level, but also the octave
9		band frequency content of the background
10		sound level."
11		And then he goes on to explain that this
12		approach allows the mathematical subtraction
13		of high-frequency insect noise from
14		summertime survey results, yielding a
15		modified A-weighted sound level that can be
16		used as a year-round design basis.
17		Do you understand what he's talking
18		about there?
19	Α.	Yes.
20	Q.	Okay. So you did not measure the full octave
21		band frequency for all five locations, did
22		you?
23	Α.	That's correct.
24	Q.	You did it for just two locations?

1	А.	Correct.
2	Q.	So in those other three locations, it is not
3		possible you have not collected data that
4		will make it possible for you to subtract out
5		insect noise; is that correct?
6	A.	Correct.
7	Q.	Was it your intent to not subtract out insect
8		noise?
9	Α.	Well, by collecting it at other locations, if
10		we felt that insects were present, it would
11		be possible to make an approximate correction
12		at other locations, if that were appropriate.
13		But no, we did not make any corrections for
14		insect noise in the data.
15	Q.	Okay. And then let me read the last
16		paragraph of the last sentence of this
17		paragraph.
18		"Without this adjustment, one might
19		easily over-estimate the long-term background
20		level, particularly the nighttime level that
21		is present at the site." Do you agree with
22		that?
23	A.	You certainly might over-estimate the
24		background level measured when you were out
	{SE	C 2010-12} [AFTERNOON SESSION ONLY] {11-01-12}

1		there, yes.
2	Q.	And then he goes on in the very last
3		sentence, he explains what the long-term
4		background level is. "It is the lowest sound
5		level that is consistently present and
6		available to mask project noise that is
7		sought in every baseline ambient sound
8		survey."
9		Is that your do you agree with his
10		definition of the long-term background level?
11	A.	I think the challenge that everybody has in
12		this is, and he says it in that last
13		sentence, is the lowest sound level that's
14		consistently present. How do you know what's
15		consistently present unless you measure for a
16		long, long time?
17	Q.	Mr. O'Neal, it is apparent in Mr. Hessler's
18		testimony or his statement that he doesn't
19		think insects are part of the long-term
20		background level. Do you disagree with that?
21	A.	No, that's a fair characterization. The
22		insects are not there all year long.
23	Q.	Okay. And I'll bring this up again when I
24		have an opportunity to cross-examine Mr.
l	{SE	C 2010-12} [AFTERNOON SESSION ONLY] {11-01-12}

1 Tocci and Mr. James. Okay. I would now -- I would now like 2 to have you look at Page 6.3 [sic] of your 3 report. And this would be Table 6.2. 4 This is what we looked at a little while -- a few 5 6 moments ago. 7 MR. IACOPINO: Which exhibit, 8 please? BY MS. LINOWES: 9 10 I'm sorry. It is your report. IW -- I don't 0. 11 know what it is. 12 It's Appendix 13A --Α. 13A? 13 Q. 14 -- of the Application. А. 15 MR. IACOPINO: AWE 1. I'm 16 sorry. What page are we looking at? 17 MS. LINOWES: 6.3. MR. IACOPINO: Three. 18 19 MS. LINOWES: Yeah, 6.3 -- 6-3. 20 21 MR. IACOPINO: I'm sorry. 22 It's AWE 3, folks. 23 BY MS. LINOWES: Q. Now, do these -- these figures, these are 24  $\{\text{SEC 2010-12}\}$  [AFTERNOON SESSION ONLY]  $\{11-01-12\}$ 

1		the what you referred to as the minimum
2		L90, the maximum L90, the median L90, and the
3		average L90 that you picked up at those five
4		locations; is that correct?
5	A.	Correct.
6	Q.	So it appears, in looking at this, that the
7		minimum L90 ranges between 27 and 31?
8	Α.	Actually, 24 and 31.
9	Q.	Oh, I'm sorry, 24 and 31. And that's with
10		insect noise included, or at least not
11		subtracted out?
12	Α.	Yeah, we did not make an attempt to determine
13		in each of these if there was insect noise
14		present or not in every 10-minute period. So
15		there may or may not be insect noise present.
16	Q.	And in addition, any other transient noise,
17		such as Ms. Longgood had suggested, that
18		there might have been some timbering going on
19		nearby, a car driving by, dogs barking if
20		they're being fed, those transient noises are
21		also included in these numbers?
22	Α.	Generally, no. That's one of the purposes of
23		this L90 is that generally it does not
24		include those transient noises.

1	Q.	Mr. O'Neal, if you did not make any
2		adjustments to the corrections, particularly
3		in those three source monitors where you
4		had did not have one-third octave band
5		collected, how did you make any adjustments
6		to get rid of those noises?
7	A.	Well, as I said already, these numbers have
8		not been adjusted to eliminate insect noise.
9		The L90, by itself, eliminates brief
10		transient events just by the nature of its
11		statistical the way it calculates things.
12	Q.	Okay. And then at the average, the L90
13		average what does it mean to have L90
14		average? Did you just average L90 minimum
15		and L90 maximum? Is that what that 44 is?
16	Α.	No. We have to actually go back a page or
17		two, but I'll try to summarize in the
18		interest of time.
19	Q.	That would be good.
20	A.	These two tables, Tables 6-1 and 6-2, the
21		purpose of them was to present a snapshot, or
22		really an idea of how the sound levels vary
23		out there today over time, during a time
24		period when the turbines would be expected to
	{se	C 2010-12} [AFTERNOON SESSION ONLY] {11-01-12}

be blowing at a strong wind speed up on the 1 2 ridgetop. In other words, we looked at the met tower that acts -- I'm sorry -- that 3 Antrim Wind runs up there on top of the ridge 4 and looked at wind speeds that would have 5 corresponded at times where that high sound 6 level could be expected, and looked at every 7 time that wind was blowing hard, what were 8 the sound levels like down at the five 9 locations in the valley. And so from that, 10 11 we picked out these sound levels that were going on down in the valley when the winds 12 were blowing strong up on the ridge. 13 So this is not -- this is not a summary 14

of the entire 16 days' worth of sound levels. Because you have to remember, during some of that time the wind turbines would never operate because the winds were too light.

So the attempt here was really to say, okay, during a time when we think the wind turbines would be operating and at their worst-case sound level, their highest sound level, what do we think the sound levels were down at those five locations around the

1		project site?
2		And so we came up with I forget the
3		exact number. It's in the report but 50
4		to a hundred different periods and took all
5		those sound levels and sorted them from high
6		to low and came up with a minimum, the
7		maximum, the average, and the median out of
8		all those sound levels.
9		So this is really a subset of the entire
10		16-day period. Make that clear for people to
11		understand that.
12	Q.	And you were taking noise levels at that
13		point based on wind data that you you were
14		measuring also wind data, and you were based
15		on that was you were treating that as
16		your loudest noise condition? Is that what
17		that is about; right?
18	A.	Correct. Based on the wind data from the
19		ridge.
20	Q.	And we're talking now about pre-construction,
21		though. So we're not talking about modeling
22		the turbine sounds. I'm talking about
23		pre-construction.
24	A.	These sound levels that we're looking at on
I	{SE	C 2010-12} [AFTERNOON SESSION ONLY] {11-01-12}

1		Table 6-2 are actually measured. That's
2		what's out there today.
3	Q.	Right. Right. But I guess I'm not clear.
4		Why was why were you waiting for winds on
5		the ridgeline? I don't quite understand
6		that. If you when you were deciding
7		which which sound levels would be
8		incorporated into the average, what
9		exactly what did you do? I don't quite
10		understand what you did.
11	A.	Sure. It's a little bit complicated. But
12		essentially what we did was, over 16 days,
13		the sound-level meters ran 24 hours a day.
14		And the typical policy for wind products now
15		is to collect data in 10-minute intervals.
16		So that's just what's become the convention
17		and the norm, 10-minute slices, if you will.
18		So, over 16 days, times 24 hours,
19		times
20		MR. DUPEE: Six.
21	A.	six thank you I don't know what the
22		number is, but it's a very large number, a
23		couple thousand 10-minute data points.
24		If we looked at all those data points
l	{SE	C 2010-12} [AFTERNOON SESSION ONLY] {11-01-12}

1		and said, out of those times, when was the
2		wind blowing at such a wind speed and I
3		believe it's 9.3 meters per second. I talk
4		about that in the report at a
5		9-meter-per-second or thereabouts wind speed
6		or greater so anything above that, when
7		was that happening during those 16 days, and
8		then what were the corresponding sound levels
9		during that same time period.
10		So that was what we extracted to come up
11		with this table. Does that make sense?
12	Q.	Okay. Yes, it does. So you don't know how
13		many hours went into that were factored
14		into the
15	Α.	Well, I told you it's in the report. But I'm
16		trying to save time. You can go look it up
17		in the report or we can do it now.
18	Q.	Now, I want to direct your attention to
19		another data request. This was IWAG-6, and
20		it was numbered TS 1-44. Do you have that?
21	A.	Well, I guess I'm confused on the
22		nomenclature. These tabs say IWAG-N6.
23	Q.	Right. Oh, no, no. It's six. It should be
24		six.
1 Just six. Α. 2 MR. PATCH: But it's also Data Request 1-44. 3 MS. LINOWES: Yes. 4 5 MR. PATCH: So that might make it easier. 6 7 BY MS. LINOWES: I think it's TS 1-44. 8 0. Okay. Yes, I found it. 9 Α. Okay. 10 0. Great. 11 And I had asked in that data request if you -- I was looking at location L-3, which 12 was showing at L90 of 24 decibels, I believe. 13 And I had asked you if you can provide for me 14 15 the amount of time that that location, L-3 16 location, had experienced a 24-decibel sound 17 level in a pre-construction condition. And you had responded that out of 2,583 10-minute 18 periods, that 24-decibel sound level occurred 19 20 twice; is that right? 21 Α. That's correct. 22 Now, if I had phrased that to be 24 decibels 0. 23 plus or minus 5, I would have gotten a 24 different answer; correct?

{SEC 2010-12} [AFTERNOON SESSION ONLY] {11-01-12}

		:	21
1	А.	Yes.	
2	Q.	Were you looking specifically at 24 decibels?	
3		Is that why when you looked up that data	
4		for me, did you look specifically for 24	
5		decibels?	
6	Α.	That's how I read the request. So, yes.	
7	Q.	Okay. I would like to direct your attention	
8		to your report again, which is Appendix 13A,	
9		AWE 1, I think.	
10		MR. IACOPINO: AWE 3,	
11		electronic Document 25, Appendix 13A.	
12	BY M	AS. LINOWES:	
13	Q.	And I want to have you look at go to the	
14		appendix, which I believe is Page it's	
15		showing 34. But Appendix Figure A-2. So	
16		this is Appendix A.	
17	A.	Okay.	
18	Q.	Okay. We can look at the others. But A-2	
19		and then A-3 also. These are the A-2 is	
20		that location.	
21		Anyway, I want you to I'm looking at	
22		the magenta-colored lines. Do you see that?	
23		The magenta color I believe in your legend is	
24		the L90?	

1	A.	Yes.
2	Q.	And so along the bottom of the scale, or the
3		X axis, we see time. That's and for the
4		16 days. And along the Y axis we have the
5		A-weighted sound pressure.
6		So I'm looking at the magenta line on
7		the down side, where it's down where it
8		goes down. And you could see when it's
9		going down, that is at nighttime, according
10		to your scale?
11	Α.	Yes.
12	Q.	There are a fair number of it appears that
13		there are a fair number of periods when that
14		sound is down around 24 decibels. Would you
15		agree? I'm looking at the beginning part of
16		this scale.
17	Α.	There's a few occasions there. Absolutely.
18	Q.	Now, we can't know for sure because this
19		is you squeezed 2,583 10-minute periods
20		into this one scale. But if we were to look
21		at those individual nights, we would have a
22		fair number of events where the sound level
23		was down at 24 or plus or minus two or three;
24		would you agree?

1	A.	Well, you would have some number of events.
2		I can't tell you how many. You'd have some.
3	Q.	More than two?
4	A.	Yes, more than two.
5	Q.	Okay. And now I also want to talk to you
6		about the collection process.
7		MS. BAILEY: Ms. Linowes, it
8		sounds like you're taking a shift, a turn. I
9		just want to check with the court reporter
10		and make sure she's all right.
11		MS. LINOWES: Oh, sure, sure,
12		sure.
13		THE COURT REPORTER: Go ahead.
14		Keep going.
15		MS. BAILEY: Can you keep
16		going till seven?
17		THE COURT REPORTER: Yeah.
18		MS. BAILEY: Okay. All right.
19		Thank you. I'm sorry for interrupting.
20		THE COURT REPORTER: Thank
21		you.
22		MS. LINOWES: Please feel free
23		to and I know this is
24		MS. BAILEY: I just want her
I	{SI	C 2010-12} [AFTERNOON SESSION ONLY] {11-01-12}

			2
1		to get it all down.	
2		MS. LINOWES: Okay. Thanks.	
3	BY M	IS. LINOWES:	
4	Q.	So when you're out there collecting this	
5		noise, you have the five monitors. And in	
6		addition, you have you're collecting wind	
7		data as well, from what you've told me;	
8		correct?	
9	A.	Correct.	
10	Q.	And did you have well, let me go to	
11		Appendix 2 of that report. I'm sorry, B.	
12		Appendix B. And on the cover of Appendix B	
13		it says "NWS Meteorological Data, Jaffrey	
14		Muni Airport [sic] Silver Ranch." Is that	
15		the location where you collected the wind	
16		information?	
17	Α.	No.	
18	Q.	What is that?	
19	A.	That is the location that we used to	
20		understand when there were events of	
21		precipitation that occurred.	
22	Q.	Okay. Do you have any of the wind data in	
23		this report?	
24	Α.	Yes.	

1	Q.	Okay. Where would that be?
2	A.	In Appendix A. If you look at the bottom of
3		every one of those five figures, there are
4		two additional lines in the graphs. One is
5		for the ridgetop met tower wind speed, and
6		the second one is the 2-meter wind tower that
7		we erected during the course of the study.
8	Q.	Okay. And that 2-meter wind tower, how
9		many you had one?
10	A.	Correct.
11	Q.	Okay. So if I were to look at this graph, if
12		I look at every one of these figures, A1, 2,
13		3, 4 and 5, would the orange line referencing
14		the wind blowing at 2 meters be identical on
15		every page?
16	A.	Yes.
17	Q.	Okay.
18	A.	Yeah.
19	Q.	Would you say the same for the green?
20	A.	Yes. There's one ridgetop met station. So
21		that wind speed is the same for every
22		location.
23	Q.	And how far away was that 2-meter wind was
24		that an anemometer?
L	{si	EC 2010-12} [AFTERNOON SESSION ONLY] {11-01-12}

			22
1	A.	Yes, it was.	
2	Q.	How far away was that from the five	
3		collection monitors?	
4	A.	It was co-located with Location 5, Gregg	
5		Lake. There's a picture of it in the report.	
6	Q.	Okay. So it was with one of the five	
7		monitors?	
8	A.	Correct.	
9	Q.	Was it right at it?	
10	A.	It was 50 feet away. It was in the park	
11		there.	
12	Q.	Okay. And did you have a wind screen on your	
13		monitors?	
14	Α.	Yes, we did.	
15	Q.	And what size was it?	
16	A.	I mean, this was all discussed in record	
17		requests.	
18	Q.	I understand. But if we could get it on the	
19		record	
20	A.	I'm going to go find it so I give you the	
21		exact right answer.	
22	Q.	Well, I understand it's either a 3-inch or a	
23		7-inch. Do you know what you typically use?	
24		(Witness reviews document.)	
	-		-

1	А.	Yeah. For these we used the
2		manufacturer's the Larson Davis
3		manufacturer, long-term environmental wind
4		screen, which is 3 to 4 inches.
5	Q.	Three to 4 inches. Great.
6		Now, Mr. O'Neal, do you know what
7		self-generated self-induced wind noise is?
8	Α.	Yes.
9	Q.	What is it?
10	Α.	It's the sound of the wind blowing over the
11		microphone.
12	Q.	This kind of thing?
13		(Ms. Linowes makes sound in mic.)
14	Q.	That kind of thing?
15	Α.	More or less, yes.
16	Q.	Your wind so your wind anemometer was
17		located away from the monitors. How can
18		you how can you address or deal with
19		wind-induced noise?
20	Α.	I'm not sure I understand the question. Do
21		you mean is the wind speed that we measured
22		at the 2-meter wind tower representative of
23		what the other sound-level measurement
24		locations?

1	Q.	Yes. If you have a 2-meter anemometer over
2		here measuring wind and some distance away
3		you have a monitor, there's no certainty that
4		the wind blowing over here equals the wind
5		blowing over in this location.
6	Α.	For the purposes of this exercise, we
7		absolutely do, and it's fine. If it's off by
8		a few hundredths of a mile per hour or meter
9		per second, that really doesn't matter.
10	Q.	I'm sorry. What do you mean, you do and it's
11		fine? What does that mean?
12	Α.	Meaning that, as I said, the 2-meter
13		meteorological tower that we use to measure
14		the wind speeds down near the ground at the
15		height of the microphones was more or less
16		co-located with the sound-level meter at
17		location L5, Gregg Lake.
18		So the wind speed that we measured down
19		there at this relatively open fetch area by
20		the park is absolutely the same as was
21		experienced at the sound-level meter that was
22		also located at Location 5.
23	Q.	Right. But I'm talking about one, two, three
24		and four.
	L	

1	Α.	Right. Those locations were generally more
2		sheltered, being in the woods. Therefore,
3		the sound I'm sorry. The ground-level
4		wind speeds are going to be equal to or lower
5		than what we measured down at the more open
6		and exposed location.
7	Q.	Mr. O'Neal, you're a scientist. Are you just
8		making an assumption here, or did you measure
9		the wind-induced sound?
10	Α.	Well, that's the purpose of having the wind
11		screens over the microphones.
12	Q.	Thank you. Okay. So you have those screens
13		on. And those screens, you have a 3- to
14		4-inch, you said?
15	Α.	Yes.
16	Q.	Okay. And then I would like to talk just
17		bear with me for a second.
18		Okay. Do you know what the wind screen
19		is capable of, what wind conditions it can
20		operate in?
21	Α.	I don't know, offhand.
22	Q.	Is it your understanding that the wind
23		that the wind screens will a 3 to 4-inch
24		wind screen diameter would block any noise
	{SE	C 2010-12} [AFTERNOON SESSION ONLY] {11-01-12}

		-
1		blowing any wind blowing on it?
2	A.	There are charts and graphs for each of the
3		manufacturer's microphones that get into
4		that.
5	Q.	So you don't know.
6	Α.	I can't sit here and tell you exactly what it
7		is for every frequency. But what I can tell
8		you is that, for what we did here,
9		wind-induced noise is not an issue.
10	Q.	You haven't proven that to me. I don't
11		understand how you can say that. You have no
12		idea what the winds were at the location of
13		four of those monitors. You're saying they
14		were somewhere in a covered area, so it's
15		obviously you're thinking the wind won't blow
16		on it. But what are you saying? Do you know
17		if wind was blowing on these monitors or not?
18	Α.	If you look at the data that's in the report,
19		it shows you what the wind speeds were at the
20		location that was most exposed.
21	Q.	Location 5? Is that
22	Α.	Right.
23	Q.	I'm asking you about Locations 1, 2, 3 and 4.
24		Do you know can you say today, since this
	{SE	C 2010-12} [AFTERNOON SESSION ONLY] {11-01-12}

1		was your study, whether or not noise
2		inside in that data represents wind
3		blowing on the monitor that would inflate the
4		sound? Yes or no?
5	A.	Well, the wind speeds were of such a low
6		level, which is the whole point of collecting
7		that data, that the answer is no.
8	Q.	Okay. Low level is 2-1/2 meters per second
9		or 5 miles an hour. Is that a low level?
10	A.	Yes.
11	Q.	And would 5 meters per second, or 11 miles an
12		hour, be low?
13	A.	Like I said, I don't know the exact numbers,
14		off the top of my head. We can research that
15		if it's really important.
16	Q.	No, it's okay. Let's stick with 5 miles an
17		hour. You're saying that that's a low level?
18	Α.	That's a low level.
19	Q.	Okay. Are you familiar
20		MS. LINOWES: Now, Madam
21		Chairman, I am referencing a document here
22		that I thought was part of North Branch's
23		exhibits. In fact, I learned today that it
24		was not. And I would like to point to
	{se	EC 2010-12} [AFTERNOON SESSION ONLY] $\{11-01-12\}$

1		something in an article written by George
2		Hessler who I mentioned earlier, and I'm
3		wondering if I could bring the report
4		tomorrow. If you would indulge me by
5		allowing me to show Mr. O'Neal on my iPad? I
6		want to show him one chart.
7		MR. IACOPINO: Why don't you
8		ask him if he's familiar with the report
9		first.
10	BY M	S. LINOWES:
11	Q.	Okay. Are you familiar with the report by
12		George Hessler from February 2008? It's
13		entitled, "Experimental Study to Determine
14		Wind-Induced Noise and Wind Screen
15		Attenuation Effects on Microphone Response
16		for Environmental Wind Turbine and Other
17		Applications." Are you familiar with that
18		report?
19	Α.	I'm familiar with the report that he did
20		about studying different wind screens.
21		Whether that's the same one, I can't say.
22	Q.	If I were to show you on the iPad, would you
23		recognize it?
24	Α.	I would have to take the time to look through
	{SE	C 2010-12} [AFTERNOON SESSION ONLY] {11-01-12}

1 it to make sure it was the same one that I'm thinking of. 2 MS. BAILEY: 3 Okay. If you can show him the report and you can verify that 4 5 you recognize it. You need to bring copies 6 tomorrow. 7 MS. LINOWES: I will 8 definitely do that. Thank you. (Ms. Linowes shows iPad to witness.) 9 MR. IACOPINO: Ms. Linowes, 10 11 please show it to counsel as well. (Ms. Linowes complies.) 12 MS. LINOWES: Thank you, Madam 13 Chair. Appreciate that. 14 BY MS. LINOWES: 15 16 Okay. So what I specifically want to ask you Q. about -- and I will bring the report 17 tomorrow, and I will make sure everyone has a 18 19 copy. There is a set of charts that he uses. 20 21 What he did -- and if you're familiar with 22 the report, he took a series of monitors, 23 such as you used, put various-sized wind screens on them, put these monitors into a 24  $\{\text{SEC 2010-12}\}$  [AFTERNOON SESSION ONLY]  $\{11-01-12\}$ 

1		wind tunnel and blew wind over them. And he
2		attempted he was testing to see the extent
3		to which wind noise would be blocked by the
4		wind screen and whether or not how
5		effective the wind screen was in stopping the
6		wind.
7		And what I wanted to point out is, in
8		his charts, he looked at 2-1/2 meters per
9		second or 5-mile an hour, 11-mile an hour,
10		22-mile an hour, various levels of wind
11		speed. And what he found at 5 miles an hour
12		was that on a 3-inch filter, it introduced a
13		28-decibel increase in sound. Do you
14		understand what I'm if you are you
15		aware of that?
16	A.	Again, I want to have the report in front of
17		me if you're going to ask me specific
18		questions about it.
19	Q.	Okay. And on a 7-inch filter, it increased
20		the noise that was collected at that monitor
21		by 18 decibels.
22		MS. BAILEY: Ms. Linowes, he
23		doesn't have the report in front of him, so
24		you're kind of testifying here.
	с	

MS. LINOWES: I'm sorry. 1 2 MS. BAILEY: So if you want to ask him the question, give him the iPad. 3 MS. LINOWES: Oh, can I... all 4 5 right. Well, I will bring the report 6 tomorrow. 7 BY MS. LINOWES: But if you're familiar with it, his finding 8 0. 9 was that, in fact, even at very low wind speeds, it introduced noise. Are you aware 10 11 of that? It's not that simple. 12 Α. I understand. I'm not asking you to evaluate 13 Q. 14 whether it happens or not. I'm asking you if 15 you're aware of Mr. Hessler's conclusions. 16 What you just said -- and if I'm the Α. 17 Committee listening to this, it sounds like, with that certain wind screen, the sound 18 levels are off by 28 decibels, and that's not 19 20 true. I appreciate that. But it is also -- is it 21 Q. 22 also possible that when you're saying you 23 don't know whether the noise -- whether wind around the monitor was introducing 24

1		contamination, or was it contaminating the
2		noise that you were collecting, there is
3		apparently at least one report out there that
4		says wind screens aren't always a hundred
5		percent.
6	A.	You absolutely have to have the
7		manufacturer's wind screen when you do these
8		outdoor measurements.
9	Q.	Okay. Then if I could just understand then
10		and just clarify. You do not know if there
11		is noise from the wind on the monitor
12		collected in your at your five four
13		locations; is that correct?
14	Α.	I can't tell you to what extent, if any, the
15		wind made a contribution to those levels. I
16		don't believe that it's significant at all.
17	Q.	Okay. Thank you.
18		MS. LINOWES: Okay. Then I
19		will finish at seven. I'm changing topics.
20	BY M	S. LINOWES:
21	Q.	Okay. I want to know now that we've
22		talked about pre-construction, I would like
23		to talk about post-construction modeling.
24		And I would like to draw your attention
1	{SE	C 2010-12} [AFTERNOON SESSION ONLY] {11-01-12}

			23
1		I'm going to be referencing two exhibits.	
2		These will be IWAG-N1 and IWAG-N3.	
3		Now, on IWAG-N1, this is a table that I	
4		showed you at a technical session back in	
5		June. Do you recognize that table or that	
6		page, rather?	
7	Α.	Yes.	
8	Q.	Okay. And can you tell us what that is?	
9	Α.	It's an excerpt from the Propagation Standard	
10		ISO 9613-2.	
11	Q.	Thank you. And that's standard that is a	
12		standard the ISO 9613-2 is a standard for	
13		doing what?	
14	Α.	It's a standard that software developers will	
15		take and incorporate the equations of this in	
16		propagation modeling to do calculations of	
17		sound level.	
18	Q.	Great. Okay. So that and now, in that	
19		table by the way, when you say "software	
20		development," there is one software product	
21		that is most commonly used; is that right?	
22	A.	Well, there's I think there's two that I'm	
23		aware of that are commonly used in this	
24		country: CADNA and Sound Plan.	

		23.
1	Q.	Which one did you use?
2	A.	We used the CADNA.
3	Q.	And that's what you did to model what the
4		turbine would sound like once it was
5		operational; correct?
6	A.	Correct.
7	Q.	Now, there's a table on this page, and it
8		shows it is attempting to understand the
9		estimated accuracy for the results of the
10		modeling. And it has two components.
11		There's the source of the noise the
12		height the source, at what height. Do you
13		see that's you have noise source. It's
14		emanating it's putting out noise, and it's
15		at a height either from 0 to 5 meters or from
16		5 meters to 30 meters. Do you see that?
17	Α.	Yes.
18	Q.	Okay. And then it also has the receptor at
19		locations some distance away. And that is
20		either from less than 100 meters or between
21		100 and 1,000 meters; is that correct?
22	Α.	Correct.
23	Q.	And so, if we were to plug in a wind turbine
24		into this, we would have a height of what?
	{SE	C 2010-12} [AFTERNOON SESSION ONLY] {11-01-12}

1		Ninety what is the height of this turbine?
2	А.	The hub height is 92 meters for these
3		turbines.
4	Q.	Ninety-two meters. And what is the distance
5		that you used for your receptors in meters?
6		Do you know?
7	Α.	Well, the distances were set up as a grid.
8		So they range from zero, if you will, or very
9		close to turbines, out into the community
10		several kilometers.
11	Q.	But if I could ask you where your receptors
12		were, though, at least so that just so we
13		know at least those.
14	Α.	Well, there's really two groups of receptors.
15		There are the five monitoring points which we
16		talked about earlier where the data was
17		measured, the L1 through L5. But we also set
18		up what's called a grid. So every 20 meters
19		we put in a point, a grid. So we set up a
20		grid point to cover this area. And then from
21		that the contours were calculated.
22	Q.	Great. Thank you.
23		So if I have if I'm attempting to
24		model predict the noise of my turbine,
	{SE	C 2010-12} [AFTERNOON SESSION ONLY] {11-01-12}

1		which is standing 92 the hub height is
2		92 feet 92 meters above ground, and I'm
3		trying to understand where how to predict
4		the noise level some 2,000 meters away,
5		what how does that fit into this table?
6	Α.	What that says is, according to the standard,
7		that the accuracy is unknown. In other
8		words, it doesn't mean you can't do it, but
9		it means the accuracy is not as specified in
10		this table.
11	Q.	If you had okay. So you're a scientist;
12		right? So you work with models. Everyone
13		works with models. Do you accept that models
14		have constraints
15	Α.	Yes, they do.
16	Q.	in what you input into them and how they
17		operate?
18		If you look at the ISO model, the ISO
19		standard, it would appear that these are the
20		constraints: That the object that's
21		producing the noise cannot be more than
22		30 meters above the ground, and the object
23		that's going to be hearing the noise cannot
24		be more than a hundred meters away, and then
ļ	{SE	C 2010-12} [AFTERNOON SESSION ONLY] {11-01-12}

1		we can come up with some conclusion of the
2		plus or minus some decibels that we can
3		predict. We'll get within plus or minus 3
4		decibels.
5		What are we talking about when you're
6		talking a kilometer away?
7	A.	Well, as I said, the software is still okay
8		to use. In other words but when you're
9		beyond that height and that distance, the ISO
10		standard does not give you a plus or minus
11		estimated accuracy for it.
12	Q.	Mr. O'Neal, can you be off by a hundred
13		percent?
14	A.	Well, I guess the way I would answer that is
15		we've done a lot of measurements and found
16		that, even at turbines that are more than
17		30 meters tall, which is the only turbines
18		we've marked they're all over 30 meters
19		today, and at distances that have been in
20		excess of 1,000 meters, that they the
21		measured are still within plus or minus 3
22		decibels.
23	Q.	Plus or minus 3 decibels. So you've done
24		predictive modeling, and then you've gone
I	{SE	C 2010-12} [AFTERNOON SESSION ONLY] {11-01-12}

1		back you conducted the predictive
2		modeling, you went back and conducted
3		post-construction noise surveys on an
4		existing operating turbine, and you found
5		that you were within plus or minus 3
6		decibels?
7	A.	The one I'm thinking of is, we did not do the
8		pre-construction but we did the
9		post-construction. I guess where I'm going
10		with this is that I mean, yes, the ISO
11		standard has that plus or minus accuracy for
12		a height of a source and a receptor distance.
13		However, I think in reality and practice,
14		with sufficient conservatism, which I believe
15		we've included in this for reasons I've
16		outlined before between downwind distances,
17		no vegetation, using the worst sound power,
18		et cetera, we're still managing to come in
19		reasonably close to the predicted levels.
20	Q.	Mr. O'Neal, in addition to the height and
21		distance, it also has a condition around the
22		weather conditions, the meteorological
23		conditions, when the modeling is done. Is
24		that not correct?

		23
1	A.	What are you looking at?
2	Q.	At the is this what your paper looks like?
3	A.	(No verbal response)
4	Q.	Yes. You see on the first column there it
5		says the bottom, it says throughout this
6		part of the ISO 9613, the meteorological
7		conditions under consideration are limited to
8		only two cases do you see that?
9	A.	Yes, I do.
10	Q.	Moderate downwind conditions of propagation
11		or their equivalent as defined and a variety
12		of meteorological conditions as they exist
13		over months or years. What did you model
14		with?
15	A.	We modeled with the downwind conditions of
16		propagation.
17	Q.	So, moderate downward conditions okay.
18	A.	That's what's included in the standard, yes.
19	Q.	And so you're up on a ridgeline. The winds
20		are whipping around. You have the turbine
21		going. Is that what you call "moderate
22		downwind conditions"?
23	A.	Well, between the propagation line, the key
24		is how loud is it? In other words, what's
	{s:	EC 2010-12} [AFTERNOON SESSION ONLY] {11-01-12}

1		the sound level coming from the source? Did
2		we use the highest sound level from the
3		source? The answer is yes.
4	Q.	No, I didn't ask you that question. I'm
5		asking you well, the what is the
6		definition of "moderate downward"
7		"downwind conditions," what is that?
8	A.	If you go back to Clause 5, they talk about
9		it here in this section. It talks about a
10		1-to-5-meter-per-second wind speed and a
11		moderate ground-base temperature version.
12	Q.	So would that be 1 to 5 meters per second at
13		hub height?
14	A.	No. It's at a 3- to 10-meter height. I
15		believe it's specified in the standard.
16	Q.	Okay. So if it's particularly so 1 meter
17		or 5 meters per second, we said that that was
18		quite calm; correct?
19	A.	Five meters per second is around 10, 11 miles
20		an hour.
21	Q.	And what is 1 meter per second?
22	Α.	About two miles an hour.
23	Q.	So that's pretty calm.
24	Α.	I wouldn't say it's calm, but it is what it
1	{SE	C 2010-12} [AFTERNOON SESSION ONLY] {11-01-12}

			24
1		is. I mean, it's 2 to 10 miles per hour.	
2	Q.	Would a turbine operate at 1 meter per	
3		second?	
4	A.	Well, again, what you're forgetting is that	
5		those aren't the hub-height wind speeds that	
6		they're assuming.	
7	Q.	I understand. And what I'm trying to	
8		understand from you is that the model is	
9		designed to work designed to predict sound	L
10		levels when these winds are between 1 and	
11		5 meters per second, when the noise source is	•
12		90 meters 30 meters or lower, and when the	:
13		receptor is no more than 1,000 meters away.	
14		You're working you're modeling something	
15		that is completely outside the range of the	
16		standard, and you're telling me that it	
17		works.	
18	A.	I guess what I would suggest is that this has	)
19		been used by hundreds of other applicants in	
20		other projects around the country.	
21	Q.	Okay. Well, again, we have our acousticians.	
22		I'll talk to them about that.	
23		But I now want to refer to IWAG-N3.	
24		MS. LINOWES: And this is my	
I	{SE	C 2010-12} [AFTERNOON SESSION ONLY] {11-01-12}	

	242
1	last set of questions, Madam Chair.
2	MS. BAILEY: Thank you.
3	BY MS. LINOWES:
4	Q. This is an e-mail that I can authenticate
5	because I was on it when it was sent. It was
6	a communication between a colleague of mine
7	in New York state and the CADNA company, the
8	company that manufacturers CADNA.
9	Do you recognize the name DataKustik,
10	GmbH?
11	A. They're the developers of the CADNA software.
12	Q. We had inquired of them about the conditions
13	that the the standard. And they responded
14	back, if I may read this.
15	Long range the question raised to
16	them was what happens when you are when
17	you have a source that is a receptor
18	outside the range, particularly a source
19	that's at hub height, at 90 meters?
20	MR. PATCH: Madam Chair, I'd
21	just like to object to this. If you look at
22	this exhibit, there doesn't seem to be much
23	there to verify that it is what she says it
24	is. I mean, there's no date, there's
l	{SEC 2010-12} [AFTERNOON SESSION ONLY] {11-01-12}

I can bring the 1 MS. LINOWES: whole e-mail in. 2 I was -- it was a long stream. But I can bring the whole email in 3 tomorrow. I was one of the recipients on it, 4 5 and I can -- if you would trust me, I'm authenticating it. 6 7 MR. ROTH: Madam Chair, I've 8 moved to the back of the room just to get some more fresh air. 9 This seems to me to be the 10 11 same kind of problem we had with the 12 photographs earlier today. And if Ms. Linowes is willing to say on the record, as 13 did the witnesses regarding the photographs, 14 15 that, yes, she received this e-mail, and yes, she received it on a particular date, 16 17 certainly was good enough for the pictures, it ought to be good enough for her e-mail. 18 MR. PATCH: Well, she doesn't 19 20 happen to be a witness at this point in time. 21 She's asking the questions. We had witnesses 22 to verify the photographs. So I think there's a big difference. 23 24 MS. BAILEY: Ms. Linowes, I  $\{\text{SEC 2010-12}\}$  [AFTERNOON SESSION ONLY]  $\{11-01-12\}$ 

1	think it might be better for you to bring
2	this exhibit in when you testify and make
3	your point that way, because the witness
4	can't verify that this is an e-mail, and we
5	don't even have the first sentence is not
6	a complete sentence.
7	MS. LINOWES: Actually, it is
8	a sentence. It just doesn't have a cap
9	letter on it.
10	MS. BAILEY: Okay. Can you do
11	it in your testimony?
12	MS. LINOWES: I don't know if
13	I I don't know if I went into noise in my
14	own testimony. There's
15	MS. BAILEY: Can you share
16	with us what you're trying to get out of
17	this?
18	MS. LINOWES: Yes. Yes,
19	absolutely.
20	The makers of the CADNA A
21	software sorry. The makers of the CADNA A
22	software, which have taken the standard and
23	made it a modeling software, explained why
24	they are unable to model their software is
	{SEC 2010-12} [AFTERNOON SESSION ONLY] {11-01-12}

unable to manage anything outside the ISO 1 2 standard. MS. BAILEY: And what's your 3 question to the witness? 4 MS. LINOWES: I wanted to read 5 one sentence from it and then get his 6 7 reaction. MR. PATCH: We don't know who 8 "H" is. We have no verification that this is 9 actually somebody at CADNA. So it just seems 10 11 like it's really very speculative. MS. BAILEY: Well, how about 12 if we give it the weight it deserves? Why 13 14 don't you read the sentence, and then you 15 answer it to the best that you can, and we 16 will give it the weight that it deserves. 17 BY MS. LINOWES: 18 The sentence is: "Long-range propagation, Q. 19 including atmospheric refraction, is not part of the standards used for normal standard 20 21 noise calculations." Are you --22 What's the question? Α. 23 Do you understand that sentence? 0. 24 Yes. Α.

 $\{\text{SEC 2010-12}\}$  [AFTERNOON SESSION ONLY]  $\{11-01-12\}$ 

1	Q.	So if you're using the modeling software that
2		is you're using a modeling software based
3		on the standard where the modeling the
4		makers of the modeling software are saying
5		that the standard does not
6		MR. IACOPINO: Ms. Linowes,
7		isn't the question, Do you agree with that
8		MS. LINOWES: Yes.
9		MR. IACOPINO: rather than
10		you telling us what you want him to say. Why
11		don't you ask that question.
12	BY N	AS. LINOWES:
13	Q.	Do you agree with that?
14	A.	No.
15	Q.	Do you agree with that sentence?
16	A.	No.
17	Q.	You don't agree with this sentence?
18	A.	The reason I say that is I've attended
19		training classes that CADNA software, put on
20		by I'm not sure it was Mr. Metson, but
21		some of his colleagues where they go
22		through some exercises of showing how to
23		model wind turbines. And they routinely put
24		wind turbines into their software package and
L	{s:	EC 2010-12} [AFTERNOON SESSION ONLY] {11-01-12}

use them as examples of one of many sources 1 that can be modeled using the techniques. 2 So I would not agree with that 3 characterization. 4 5 MS. LINOWES: Thank you, Madam Chair. I'm all set. 6 7 MS. BAILEY: Okay. Thank you. 8 Mr. Roth, how long do you have? 9 MR. ROTH: Hours and hours. 10 11 MS. BAILEY: Come on, tell the truth, because we're going to be here hours 12 and hours. 13 14 MR. ROTH: Let me just take 15 stock. I could probably do it before seven. 16 MS. BAILEY: That would be so 17 appreciated. Thank you. MR. ROTH: I don't know how 18 much more there is to be said about it at 19 20 this point, but I'll give it a try. 21 CROSS-EXAMINATION 22 BY MR. ROTH: Now, Mr. O'Neal, looking at the map behind 23 0. you and remembering the discussion you had 24  $\{\text{SEC 2010-12}\}$  [AFTERNOON SESSION ONLY]  $\{11-01-12\}$ 

1		some hours ago about audibility at Willard
2		Pond do you remember that?
3	A.	Yes.
4	Q.	Okay. If you were to remove from that
5		picture Turbines 8, 9 and 10, which I assume
6		are at the southwestern end of the string
7	Α.	Yes.
8	Q.	and that would pull all those circles up
9		closer to the nucleus of the amoeba there on
10		the picture; right?
11	Α.	Yes, it would.
12	Q.	Okay. Could you hypothesize that, at that
13		point, wind turbine noise would not be
14		audible at Willard Pond?
15	A.	I'm not sure I could hypothesize that. I
16		mean, we're talking about levels today of,
17		say, 29 to 33 or so at Willard Pond. So if
18		we pull the contours further north by
19		removing those three turbines, hypothetically
20		speaking, it's now going to be below 33.
21		That's for sure. How much below that, I'm
22		not sure.
23		And to say I guess the part that
24		makes me uncomfortable is to say it will
	{SE	C 2010-12} [AFTERNOON SESSION ONLY] {11-01-12}

1		never be audible. That's a very difficult
2		thing to say. I mean, you know, sometimes
3		under the right atmospheric conditions you
4		can hear something very faintly, very far
5		away, even though it may be very low levels.
6	Q.	Because what I thought I heard you say
7		earlier was that you said it will always be
8		audible. And I'm trying to figure out how
9		many of these, if we pulled them off, would
10		it no longer be audible. And I thought,
11		well, maybe we'll start there.
12		Now, which you know, how many
13		decibels would it have to be before it was
14		not audible with background and just plain
15		faintness?
16	A.	Again, that's a very difficult question to
17		surmise, only because, again, the background
18		level is going to vary. I mean, we've seen
19		that from the various measurements that were
20		done around there. The frequency
21		characteristic could be different with the
22		turbines versus the background; therefore,
23		you could get an A-weighted number that's
24		very low, yet still be faintly audible.

Q.	So even if there was just one turbine at the
	very top of the string, do you think it could
	be faintly audible that far away?
A.	Probably not.
Q.	Okay. Well, I guess I'm not going to take
	the time to go through that. But you would
	agree with me, at some point, if those
	turbines were far enough away from Willard
	Pond, it wouldn't be audible; correct?
A.	At some point, any source of noise, if you
	were far enough away, it will be inaudible.
	Yes.
Q.	Okay. There was some discussion about
	guaranty. And as I understood it, the
	guaranty is based upon the modeling; correct?
A.	The guaranty is based upon information that
	the turbine manufacturer, Acciona in this
	case, has done internally with some type of
	engineering and blade-foil type of modeling.
Q.	Okay. Yeah. And I think in your testimony
	you described it as "an empirical engineering
	model" of some sort.
A.	I was repeating the language that Acciona had
	provided, yes.
	Q. A. Q. A. A.

1	Q.	If the turbine manufacturer begins to conduct
2		what I think were called "typed tests," if
3		I'm right if I'm not mistaken, the actual
4		operational testing and measurement, and they
5		come up with different results than the model
6		predicted, will the guaranty that is offered
7		reflect the as-run number or the model number
8		for people who purchase the turbines after
9		those tests are done?
10		So let's say they do the they run the
11		model they run the turbine. They find
12		out, oh, no, it's running at 115. Are they
13		going to sell those turbines to Acciona next
14		July and guarantee it at 109, or are they
15		going to guarantee it at 115?
16	A.	Do you mean sell them to Antrim Wind?
17	Q.	I'm sorry. Yeah, Antrim Wind. It is late.
18	Α.	I mean, I'm afraid I'm not the qualified
19		witness to answer. That's really a
20		contractual question between Acciona and
21		them. I don't know how that would be
22		handled.
23	Q.	So you don't know whether it would be
24		guaranteed at 115 at the time they purchased
L	{SE	C 2010-12} [AFTERNOON SESSION ONLY] {11-01-12}
1		it, based on the actuals, or at 109, based on
----	-----	--
2		the experimental models, the black box?
3	Α.	Right. I mean, if there's a permit in hand
4		for the project that has a sound-level limit,
5		they'll have to live with that and make that
6		work. That I feel fairly comfortable saying,
7		if the Committee approves the project and
8		puts permit conditions out in the community.
9		But in terms of what the contract limit would
10		be, I can't say.
11	Q.	How would they make the sound level work if,
12		in fact, the turbine is running at 115 and
13		they can't achieve that here, but they
14		haven't bought the turbines yet? Wouldn't
15		that mean they just wouldn't sell the
16		turbines in this particular project? They'd
17		say, oh, can't work?
18	Α.	Under the scenario you just described for
19		example: If Acciona says, oh, we made a huge
20		mistake, it's really 115 not 109, but the
21		project hadn't purchase them yet?
22	Q.	Correct.
23	Α.	Now I'm surmising here, understand, but my
24		expectation is that the project would have to
l	{SE	C 2010-12} [AFTERNOON SESSION ONLY] {11-01-12}

252

# [WITNESS: O'NEAL]

Γ

		25
1		look at a different vendor
2	Q.	Okay.
3	Α.	and find some turbine they can live with
4		in that number they're already committed to.
5	Q.	Okay. Thank you.
6		Now, in Mr. Tocci's supplemental
7		testimony, you probably observed that he did
8		some working of your numbers to model without
9		insect noise.
10	Α.	Yes.
11	Q.	Do you agree with the way he did that? Are
12		you comfortable with that? Because I notice
13		that you didn't critique it in your earlier
14		comments when you were first introduced, your
15		rebuttals.
16	Α.	I reviewed the literature that Mr. Tocci
17		cites in there, the Schomer, Schloss, Hessler
18		paper that gives the procedure for doing that
19		correction. And it certainly appears that
20		he's applied that correction appropriately.
21		I think where we disagree is then taking
22		that corrected number and saying that's what
23		it should be for everything going forward.
24	Q.	Okay. I understand. You disagree on sort of
ļ	{SE	C 2010-12} [AFTERNOON SESSION ONLY] {11-01-12}

253

1		whether it ought to be an absolute number or
2		his relative system.
3	Α.	Correct.
4		MR. ROTH: Okay. That's all
5		the questions I have. Thank you.
6		MS. BAILEY: Thank you.
7		Can I just get a show of hands
8		on the Committee of who has questions?
9		(Committee Members comply.)
10		MS. BAILEY: All right. So I
11		think we're going to finish with the
12		testimony for today. Thank you.
13		I'm sorry you have to come
14		back tomorrow.
15		THE WITNESS: That's no
16		problem.
17		MS. BAILEY: Now, what are we
18		going to do tomorrow? We need to start at
19		9:00, and we're planning to go till 6:00.
20		And I think we can oh, right. And we're
21		also going to take public comments first
22		thing in the morning at 9:00, like we did
23		today.
24		So I guess that would conclude
L	{SE	C 2010-12} [AFTERNOON SESSION ONLY] {11-01-12}

the record for today. Thank you. (Whereupon the hearing was adjourned at 7:00 p.m.) {SEC 2010-12} [AFTERNOON SESSION ONLY] {11-01-12}

CERTIFICATE 1 2 I, Susan J. Robidas, a Licensed Shorthand Court Reporter and Notary Public 3 of the State of New Hampshire, do hereby 4 5 certify that the foregoing is a true and accurate transcript of my stenographic 6 7 of these proceedings taken at the notes 8 place and on the date hereinbefore set forth, to the best of my skill and 9 ability under the conditions present at 10 11 the time. I further certify that I am neither 12 attorney or counsel for, nor related to or 13 14 employed by any of the parties to the 15 action; and further, that I am not a 16 relative or employee of any attorney or 17 counsel employed in this case, nor am I 18 financially interested in this action. 19 20 Susan J. Robidas, LCR/RPR 21 Licensed Shorthand Court Reporter Registered Professional Reporter 22 N.H. LCR No. 44 (RSA 310-A:173) 23 24

 $\{\text{SEC 2010-12}\}$  [AFTERNOON SESSION ONLY]  $\{11-01-12\}$ 

	68.17	activities (2)	advanced (1)	246.7 12 15 17.
	$\frac{100:17}{100:000}$	$\frac{1}{24\cdot 10\cdot 124\cdot 12}$		240:/,13,13,17;
l	Acciona (54)	34.19,134.15	124:0	24/:5;250:/;255:11
	10.118.12.120.17	104.20.124.21	101.14.105.10.	agreed (3)
[Laughter] (3)	10,116,13,120,17, 121,16,122,22,	104:20;154:21	101:14;195:19;	55:5;142:15;205:5
45:15;70:17;	121.10;122.23; 122.11,12,18,124,17	212.2	190.8,25,24,197.10	124:0 12:142:0
193:14	125.11,15,16,124.17, 21.126.21.166.11	212.3	107.11	124.9,12,142.9
[sic] (6)	21,120,21,100,11, 24,167,21,160,18	$\begin{array}{c} \text{actual (12)} \\ \text{99.19.00.2.127.2} \end{array}$	19/.11 advice (1)	77.10.121.0.
57:19;70:9;166:11;	24,107.21,109.18,	88:18;90:5;127:2, 2 7:120:15:121:10:	171:10	77:19;121:9;
188:16;209:3;220:14	19,170,13,22,	3,7,129,13,131,10, 122,2,149,17,	1/1.10	219.15
	172.10,174.23, 175.16.176.7.11.	133.2,140.17, 175.15.184.3.251.2	172.2	145.1222.164.16
A	170.12 12.101.12	1/3.13,184.3,231.3	1/2.3	145.12,22,104.10, 10.165.2.242.0
	179.12,13,191.12, 250.1722.251.1220.	0.12.18.15.26.2.	$101 \cdot 14$	19,105.2,245.9
A1 (1)	250.17,25,251.15,20,	30.2.42.14.61.24	101.14	1/8·10·16/·/
221:12	accommodate (2)	69.13.71.14.73.23	31.4.94.14.110.21	Airport (1)
A-2 (3)	65·24·68·24	76.11.78.23.88.11	158.1	220.14
217:15,18,19	accordance (1)	14.98.8 21.103.10	affected (1)	air-quality (1)
A-3 (1)	16·10	139.6 13.144.24	173.10	164.14
217:19	according (4)	149.14.151.10	afield (2)	alignment (1)
Abatement (1)	136.10.168.18.	154.10.155.5 7	163.12.173.2	93·3
133:11	218.9.236.6	160.9.163.24	afraid (1)	alike (1)
ability (1)	account (12)	165:14:167:23:	251.18	190.11
153:6	30.1.48.22.65.18	173.20.176.16	afternoon (7)	Allen (3)
able (11)	71.24.74.15.92.24	188.10.191.15	4.3.8.17.34.5.	33.22 23.137.7
55:4;64:22;69:17;	93.24.111.3.9.	199.13.210.8.	75.13.137.3.138.3.4	allow (3)
73:17;94:3;129:3,12,	128.22.132.7.153.2	211.16.214.1.244.7	afterwards (1)	55.14.82.13.
13;159:7;171:8;	accounted (2)	245.10	58.14	181.17
182:7	30.4.152.21	actuals (1)	again (45)	allowed (1)
above (15)	accuracy (5)	252:1	25.3.29.20.38.17	109.21
64:13,21;/3:23;	234.9.236.7.9	add (1)	43.14.44.22.53.6.22	allowing (1)
80:8,21;86:10;90:22;	237:11:238:11	73:15	63:24:65:12.15:	228:5
119:10;132:4;	accurate (4)	addition (4)	66:15:73:4:77:11:	allows (6)
147:15;150:20;	23:6:27:12:54:1:	81:17:210:16:	82:19:84:1.6.10.23:	18:24:109:15:
196:21;215:6;236:2,	191:19	220:6:238:20	91:5:95:6:99:6:	110:6.8.13:206:12
22 above ground (1)	accurately (1)	additional (6)	110:23:113:20:	almost (2)
	22:13	16:8;17:3,10;78:3;	114:13;123:20;	92:5.8
74.0 above grounding (1)	accustomed (1)	142:11:221:4	126:8;136:17;161:5,	alone (1)
72.12	144:17	address (14)	22;162:2,4;163:5;	12:16
/3.13 absent (1)	achieve (3)	4:14,16;23:3;	167:8,19;174:15;	along (10)
136.17	28:21;72:1;252:13	30:13;45:9;60:24;	175:16,17;198:17;	16:3;27:7;28:11;
absolute (1)	achieved (1)	61:24;75:14,15;79:8;	208:23;217:8;	36:24;39:7;93:4;
83.2 9.87.11.25/1.1	172:5	136:23;169:12;	230:16;241:4,21;	136:19;148:10;
A beolutely (7)	Acoustic (2)	172:8;223:18	249:16,17	218:2,4
81.3.112.21.	153:15;184:7	addressed (2)	against (2)	alteration (1)
218.17.224.7 20.	acoustical (3)	29:11;158:15	50:5;192:3	51:6
232.6.244.19	129:7;157:4;160:5	adequate (2)	Agency (1)	alternative (1)
abstract (1)	acoustician (12)	133:18;198:21	133:10	68:1
168.6	166:6;180:18;	adhered (1)	ago (8)	altogether (1)
abutters (1)	184:1,11;185:6,19;	51:23	67:20,23;138:9;	141:18
94.16	186:11,16;189:17;	adjacent (1)	159:12;163:21,23;	always (10)
accept (1)	190:15;197:8;204:18	27:23	209:6;248:1	33:9;45:10,11;
236:13	acousticians (3)	adjourned (1)	agree (42)	47:8;81:5;89:7;
acceptable (4)	159:15;185:2;	255:2	22:2;24:2,8;29:8;	117:10;134:9;232:4;
32:23:91:4:144:2.4	241:21	adjusted (5)	30:16;31:24;32:9;	249:7
accepted (1)	acoustics (1)	38:3;71:21,23;	46:12;47:11;49:2;	ambient (7)
129:8	111:21	84:5;211:8	51:22;101:16;104:3;	87:11;109:7;
access (16)	acres (9)	adjustment (1)	105:7,14,20;112:15,	110:22,23;139:16;
56:22;62:3;63:3,	9:22;10:1,6,10,13,	207:18	16;114:22;133:20,	152:13;208:7
10;65:17;67:1,8,12;	21;11:8;15:17;29:18	adjustments (2)	24;134:7;135:1,8;	America (1)
68:8;74:19,20;	across (2)	211:2,5	136:15;144:6,14;	184:7
147:16,17,18,20;	148:14;169:6	advance (7)	158:24;168:22;	American (1)
148:2	active (1)	34:16;35:6,7,9;	186:1;203:1;207:21;	184:7
accessible (1)	135:15	60:13;61:3;124:3	208:9;218:15,24;	amoeba (1)

accessible (1)

248:9 among (2) 101:18:157:4 amount (6) 13:23:14:3:20:5; 87:1;168:8;216:15 amounts (1) 201:24 amplitude (3) 128:24;129:9; 130:10 Amy (2) 8:14;99:18 analysis (8) 9:14;10:8;16:1; 33:16;93:22;108:4, 14;110:19 analyzed (1) 148:18 analyzer (1) 159:6 analyzers (3) 158:19;159:18; 160:23 analyzing (1) 159:24 and/or (1) 163:17 anecdotal (1) 135:17 anemometer (3) 221:24:223:16: 224:1 animal (2) 135:19;141:17 animals (1) 135:20 annoved (1) 163:8 annoving (1) 162:11 anticipate (3) 196:22;197:8,10 Antrim (33) 5:22;11:21;15:1; 25:24;42:23;43:5; 76:3;95:19;97:18; 120:18,21;123:2,21; 125:3;127:5;130:13; 132:1;139:20;142:4, 10,18;143:23;146:4, 5,6,11;160:12; 166:21;172:4; 182:18;212:4; 251:16,17 anxious (1) 181:8 apologies (3) 188:8;199:2;206:1 apologize (2) 66:23;181:7 apparent (1) 208:17

apparently (1) 232:3 appear (2)46:9:236:19 appears (3) 210:6;218:12; 253:19 appendix (25) 15:11,13,20,22,23; 87:24:88:1,5,10,14, 21;90:21;101:5; 107:5;146:7;209:12; 217:8,11,14,15,16; 220:11,12,12;221:2 appliance (1) 151:5 appliances (1) 146:1 applicable (3) 23:10;51:3;135:5 **Applicant** (7) 45:18;52:1,23; 53:17;75:4;90:7; 142:13 applicants (1) 241:19 application (13) 22:15;25:24;26:8, 9;30:13;50:24;59:1; 87:24;88:10,21; 108:19:120:20; 209:14 Applications (1) 228:17 applied (2) 108:6;253:20 apply (3) 22:24;23:1;108:15 applying (1) 83:21 appreciate (5) 121:1,13:177:9; 229:14;231:21 appreciated (2) 194:6;247:17 appreciation (1) 111:21 approach (2) 15:16;206:12 approaches (1) 67:6 appropriate (16) 48:7;52:20;83:10; 84:3,10,15;106:10; 142:3,18;143:8; 158:15;160:3; 168:16;170:7; 184:12;207:12 appropriately (2) 127:19;253:20 approval (5) 35:20;50:18,23; 60:12:120:2

approvals (3) 12:9:13:4.6 approved (4) 12:22;34:14;53:7; 100:2approves (4) 17:8;35:21;94:19: 252:7 approximate (2) 9:6:207:11 approximately (5) 5:17:61:16:81:8; 111:16;127:16 approximation (1) 59:14 area (36) 14:11,20;21:14; 28:23;34:19,21; 35:10;58:7;64:10; 68:17;72:7;74:4; 81:15,18;95:2;97:16; 98:10:128:16: 137:12;139:14,19; 143:15,23;144:2,4,7; 147:7,13;150:21; 151:8;164:22;180:7; 183:16;224:19; 226:14:235:20 areas (14) 13:24:14:4:16:8; 17:4,10:20:13:30:6; 38:18:62:5:65:8: 98:7;101:22;192:17; 194:10 argue (1) 82:22 around (30) 34:21;42:10;72:8; 84:20;98:7;103:5; 104:1;106:7;110:5,7, 9:114:2:135:15.16: 145:18:147:13; 162:9;166:12; 173:17;181:4; 182:15;194:23; 212:24;218:14; 231:24;238:21; 239:20;240:19; 241:20;249:20 article (1) 228:1 ascribed (1) 138:16 aside (1) 25:12 aspect (2) 161:2;183:22 as-run (1) 251:7 assemble (1) 73:3 assembled (2) 63:9;72:15

assembling (1) 72:11 Assessment (7) 27:8:29:5:88:6: 101:4,6;127:14; 160:15 assist (3) 51:17:54:1,4 Associates (3) 75:20;76:5;204:11 Association (1) 8:1 assume (17) 16:19,21:21:19; 24:6:34:20:35:18: 53:13,15;57:1;64:6; 69:5;94:18;111:9; 119:7;133:15;151:1; 248:5 assumed (5) 23:24;53:1;72:21; 93:7:132:15 assumes (1) 132:21 assuming (3) 53:23;115:1;241:6 assumption (10) 16:20:17:2:108:4, 14;115:3;117:19,24; 118:7;119:24;225:8 assumptions (1) 53:5 assurances (1) 175:11 assure (2) 166:19;186:17 astray (1) 45:5 atmosphere (2) 164:17:183:16 atmospheric (4) 132:7:183:6; 245:19;249:3 attachment (1) 122:14 attempt (2) 210:12;212:19 attempted (1) 230:2 attempting (4) 195:3:201:5:234:8; 235:23 attendant (2) 201:23;202:18 attended (2) 201:14;246:18 attention (7) 8:19;16:4;199:13; 200:1;215:18;217:7; 232:24 attenuation (2) 151:14:228:15 attorneys (1)

123:2 attributed (1) 201:17 Auburn (1) 4:16 audibility (11) 84:15,17,24; 115:17,20,21;116:3; 156:15;158:2; 161:21:248:1 audible (18) 84:14,19;91:12; 113:17;114:8,16; 158:9;161:19,24; 196:15;248:14; 249:1,8,10,14,24; 250:3,9 Audubon (4) 8:15;84:12;99:19; 113:1 August (3) 50:17;79:5,19 Augusta (1) 4:17 authenticate (1) 242:4 authenticating (1) 243:6 authors (1) 158:13 automobile (1) 48:24 availability (1) 31:4 available (7) 7:7;85:5;126:6; 166:11;192:8,10; 208:6 Avenue (1) 4:16 average (9) 116:14,15;210:3; 211:12,13,14,14; 213:7;214:8 avoid (5) 29:12;30:5;38:4; 39:9,18 avoidable (1) 29:14 avoidance (1) 39:13 avoided (1) 25:9 avoiding (1) 71:19 AW116 (2) 191:12;192:3 AW16 (1) 166:11 aware (42) 11:19,23;18:5; 30:20,24;31:2,3,5,6, 10,14,19,23;32:3;

	17.01	120.24	149.0	hasta (2)
50:6,10;109:10,15,	17:21	130:24	148:9	Doats (2)
19;126:17;135:7;	backyard (1)	basically (6)	birds (1)	109:16;110:12
136:21;139:5;145:2,	98:9	51:14;71:6;79:20;	148:11	BOISVERT (2)
4,17;150:2;153:18;	bad (5)	130:9;151:4;192:17	bit (10)	80:23;155:22
154:14,24;156:14;	169:21;174:4,5,11;	basis (5)	17:21;72:4,24;	botanist (2)
158:24;162:9,19;	176:8	124:10,19;152:9;	73:19;90:10;91:2;	24:7;25:3
164:7;166:5,13;	BAILEY (89)	169:5;206:16	157:9;180:12;	both (7)
191:12;230:15;	4:3,8,21;7:8,11,14,	Bear (2)	202:19;214:11	7:1;37:13;78:17;
231:10.15:233:23	17.19.21.24:8:3.6.9:	205:23:225:17	black (1)	79:17:123:22:
away (27)	21:11:33:21:34:1:	beaver (1)	252:2	165:20:186:8
37:9:61:20:62:20:	40:1.5:49:10:50:13:	87:20	blade (3)	bothered (1)
86.5.92.16.102.6	54.11.56.8.58.20	Beblowski (2)	55.9.128.20.130.9	115.15
105.5.106.8.113.5	67.17.69.12 18 24	7.11.85.9	blade-foil (1)	bottom (5)
115.13.133.1.178.6	70:6 21:75:1:76:12	become (3)	250.10	77.21.205.8.218.2
7.221.23.222.2	15 18 21.77.1.82.13	150.5.163.7.	blades (1)	221.2.230.5
7,221.23,222.2,10,	85.6012141623	214.16	102.11	221.2,237.3
223.17, 224.2,	85.0,9,12,14,10,25,	214.10	192.11 blombot (1)	252.14
254:19;250:4,24;	80:15;95:17,19;	becoming (1)	Dianket (1)	252:14
237:0;241:13;249:5;	99:13;100:14,17;	190:22	134:11	boulder (2)
250:3,8,11	121:9;137:6,9,16,21;	bedrock (4)	blasted (3)	37:16;38:23
AWE (22)	165:7,17,22;166:1;	29:5,21;30:9;60:5	11:8;37:9;59:22	boulders (2)
6:10,16;15:2,7;	170:17,19;171:15;	begin (1)	blasting (29)	36:23;37:5
42:5;71:6;76:10;	172:6;173:3;174:10;	74:10	11:12;13:2,5;	box (1)
77:6,11;86:19;88:4,	175:1,4;178:16;	beginning (6)	34:10,13,15,19,21;	252:2
12;107:12;108:23;	180:23;181:20;	63:7;65:20;74:7;	35:19,20,21;45:21;	branches (1)
113:19;132:17;	193:21;194:4;219:7,	78:24;168:7;218:15	51:8;52:15,17,24;	149:18
157:13:199:10:	15.18.24:229:3:	begins (4)	53:6.10:57:23.24:	Branch's (1)
209:15.22:217:9.10	230:22:231:2:242:2:	16:6:65:6:86:10:	58:2:59:13.15:60:3.	227:22
A-weighted (7)	$243\cdot24\cdot244\cdot10$ 15:	251.1	11 14 17 22.61.4	$\mathbf{Brav}(1)$
116.13.117.4	245.3 12.247.7 11	behind (5)	blew (1)	157.20
198.19.206.8 15	16:254:6 10 17	62.13.107.1011.	230.1	break (7)
218.5.240.23	helenced $(1)$	$113 \cdot 15 \cdot 247 \cdot 23$	230.1 Block (36)	1.2.60.14 10.
210.3, 249.23	72.1	113.13,247.23	34.2 4.36.5 6 8.	4.2,09.14,19, 73.18.137.13,14,17
awiui (1)	12.1	Deneving (1)	54.2,4,50.5,0,6,	/5.10,15/.15,14,1/
154.2	hollnorly (2)	176.9	100.12.127.11 14 21	brief (8)
154:3	ballpark (2)	176:8	109:12;137:11,14,21,	brief (8)
154:3 axis (2)	ballpark (2) 66:1,8	176:8 belongs (1)	109:12;137:11,14,21, 23;138:2;140:9,10, 12,155:4,0,12,16,20	<b>brief (8)</b> 5:12;69:21;75:21;
154:3 axis (2) 218:3,4	ballpark (2) 66:1,8 band (10)	176:8 belongs (1) 70:11	109:12;137:11,14,21, 23;138:2;140:9,10, 12;155:4,9,12,16,20,	<b>brief (8)</b> 5:12;69:21;75:21; 77:22;79:13;101:3;
154:3 axis (2) 218:3,4	ballpark (2) 66:1,8 band (10) 158:19;159:6;	176:8 belongs (1) 70:11 below (8)	109:12;137:11,14,21, 23;138:2;140:9,10, 12;155:4,9,12,16,20, 24;156:8;157:15;	brief (8) 5:12;69:21;75:21; 77:22;79:13;101:3; 137:18;211:9
154:3 axis (2) 218:3,4 B	ballpark (2) 66:1,8 band (10) 158:19;159:6; 160:22;197:19,23;	176:8 belongs (1) 70:11 below (8) 18:23;44:1;91:2;	109:12;137:11,14,21, 23;138:2;140:9,10, 12;155:4,9,12,16,20, 24;156:8;157:15; 165:9,12,19,24;	brief (8) 5:12;69:21;75:21; 77:22;79:13;101:3; 137:18;211:9 briefcase (1)
154:3 axis (2) 218:3,4 B	ballpark (2) 66:1,8 band (10) 158:19;159:6; 160:22;197:19,23; 198:16;199:18;	176:8 belongs (1) 70:11 below (8) 18:23;44:1;91:2; 103:22;158:23;	109:12;137:11,14,21, 23;138:2;140:9,10, 12;155:4,9,12,16,20, 24;156:8;157:15; 165:9,12,19,24; 166:3;170:17,18,20;	brief (8) 5:12;69:21;75:21; 77:22;79:13;101:3; 137:18;211:9 briefcase (1) 70:9
154:3 axis (2) 218:3,4 B back (38)	ballpark (2) 66:1,8 band (10) 158:19;159:6; 160:22;197:19,23; 198:16;199:18; 206:9,21;211:4	176:8 belongs (1) 70:11 below (8) 18:23;44:1;91:2; 103:22;158:23; 160:14;248:20,21	109:12;137:11,14,21, 23;138:2;140:9,10, 12;155:4,9,12,16,20, 24;156:8;157:15; 165:9,12,19,24; 166:3;170:17,18,20; 171:15,18;173:15;	brief (8) 5:12;69:21;75:21; 77:22;79:13;101:3; 137:18;211:9 briefcase (1) 70:9 briefly (2)
154:3 axis (2) 218:3,4 B back (38) 11:5;13:21;17:11;	ballpark (2) 66:1,8 band (10) 158:19;159:6; 160:22;197:19,23; 198:16;199:18; 206:9,21;211:4 bands (3)	176:8 belongs (1) 70:11 below (8) 18:23;44:1;91:2; 103:22;158:23; 160:14;248:20,21 best (13)	109:12;137:11,14,21, 23;138:2;140:9,10, 12;155:4,9,12,16,20, 24;156:8;157:15; 165:9,12,19,24; 166:3;170:17,18,20; 171:15,18;173:15; 175:6,9;225:24	brief (8) 5:12;69:21;75:21; 77:22;79:13;101:3; 137:18;211:9 briefcase (1) 70:9 briefly (2) 42:9;146:24
154:3 axis (2) 218:3,4 B back (38) 11:5;13:21;17:11; 36:10,16;38:15,16;	ballpark (2) 66:1,8 band (10) 158:19;159:6; 160:22;197:19,23; 198:16;199:18; 206:9,21;211:4 bands (3) 116:12,17;168:16	176:8 belongs (1) 70:11 below (8) 18:23;44:1;91:2; 103:22;158:23; 160:14;248:20,21 best (13) 23:4;27:11;29:12;	109:12;137:11,14,21, 23;138:2;140:9,10, 12;155:4,9,12,16,20, 24;156:8;157:15; 165:9,12,19,24; 166:3;170:17,18,20; 171:15,18;173:15; 175:6,9;225:24 <b>blocked (1)</b>	brief (8) 5:12;69:21;75:21; 77:22;79:13;101:3; 137:18;211:9 briefcase (1) 70:9 briefly (2) 42:9;146:24 bring (14)
154:3 axis (2) 218:3,4 B back (38) 11:5;13:21;17:11; 36:10,16;38:15,16; 64:12;69:20,24;	ballpark (2) 66:1,8 band (10) 158:19;159:6; 160:22;197:19,23; 198:16;199:18; 206:9,21;211:4 bands (3) 116:12,17;168:16 barking (4)	176:8 belongs (1) 70:11 below (8) 18:23;44:1;91:2; 103:22;158:23; 160:14;248:20,21 best (13) 23:4;27:11;29:12; 44:16;45:3;51:7,22;	109:12;137:11,14,21, 23;138:2;140:9,10, 12;155:4,9,12,16,20, 24;156:8;157:15; 165:9,12,19,24; 166:3;170:17,18,20; 171:15,18;173:15; 175:6,9;225:24 <b>blocked (1)</b> 230:3	brief (8) 5:12;69:21;75:21; 77:22;79:13;101:3; 137:18;211:9 briefcase (1) 70:9 briefly (2) 42:9;146:24 bring (14) 25:18;54:19;55:8,
154:3 <b>axis (2)</b> 218:3,4 <b>B</b> <b>back (38)</b> 11:5;13:21;17:11; 36:10,16;38:15,16; 64:12;69:20,24; 70:11;73:19;86:7;	ballpark (2) 66:1,8 band (10) 158:19;159:6; 160:22;197:19,23; 198:16;199:18; 206:9,21;211:4 bands (3) 116:12,17;168:16 barking (4) 148:14;149:23;	176:8 belongs (1) 70:11 below (8) 18:23;44:1;91:2; 103:22;158:23; 160:14;248:20,21 best (13) 23:4;27:11;29:12; 44:16;45:3;51:7,22; 52:14;72:5;86:1;	109:12;137:11,14,21, 23;138:2;140:9,10, 12;155:4,9,12,16,20, 24;156:8;157:15; 165:9,12,19,24; 166:3;170:17,18,20; 171:15,18;173:15; 175:6,9;225:24 <b>blocked (1)</b> 230:3 <b>Blocks' (1)</b>	brief (8) 5:12;69:21;75:21; 77:22;79:13;101:3; 137:18;211:9 briefcase (1) 70:9 briefly (2) 42:9;146:24 bring (14) 25:18;54:19;55:8, 15;169:8;187:6;
154:3 <b>axis (2)</b> 218:3,4 <b>B</b> <b>back (38)</b> 11:5;13:21;17:11; 36:10,16;38:15,16; 64:12;69:20,24; 70:11;73:19;86:7; 94:23;100:21;102:6;	ballpark (2) 66:1,8 band (10) 158:19;159:6; 160:22;197:19,23; 198:16;199:18; 206:9,21;211:4 bands (3) 116:12,17;168:16 barking (4) 148:14;149:23; 174:3;210:19	176:8 belongs (1) 70:11 below (8) 18:23;44:1;91:2; 103:22;158:23; 160:14;248:20,21 best (13) 23:4;27:11;29:12; 44:16;45:3;51:7,22; 52:14;72:5;86:1; 131:23;146:16;	109:12;137:11,14,21, 23;138:2;140:9,10, 12;155:4,9,12,16,20, 24;156:8;157:15; 165:9,12,19,24; 166:3;170:17,18,20; 171:15,18;173:15; 175:6,9;225:24 <b>blocked (1)</b> 230:3 <b>Blocks' (1)</b> 173:14	brief (8) 5:12;69:21;75:21; 77:22;79:13;101:3; 137:18;211:9 briefcase (1) 70:9 briefly (2) 42:9;146:24 bring (14) 25:18;54:19;55:8, 15;169:8;187:6; 208:23;228:3;229:5,
154:3 <b>axis (2)</b> 218:3,4 <b>B</b> <b>back (38)</b> 11:5;13:21;17:11; 36:10,16;38:15,16; 64:12;69:20,24; 70:11;73:19;86:7; 94:23;100:21;102:6; 121:8;125:8;134:16;	ballpark (2) 66:1,8 band (10) 158:19;159:6; 160:22;197:19,23; 198:16;199:18; 206:9,21;211:4 bands (3) 116:12,17;168:16 barking (4) 148:14;149:23; 174:3;210:19 base (10)	176:8 belongs (1) 70:11 below (8) 18:23;44:1;91:2; 103:22;158:23; 160:14;248:20,21 best (13) 23:4;27:11;29:12; 44:16;45:3;51:7,22; 52:14;72:5;86:1; 131:23;146:16; 245:15	109:12;137:11,14,21, 23;138:2;140:9,10, 12;155:4,9,12,16,20, 24;156:8;157:15; 165:9,12,19,24; 166:3;170:17,18,20; 171:15,18;173:15; 175:6,9;225:24 <b>blocked (1)</b> 230:3 <b>Blocks' (1)</b> 173:14 <b>blow (1)</b>	brief (8) 5:12;69:21;75:21; 77:22;79:13;101:3; 137:18;211:9 briefcase (1) 70:9 briefly (2) 42:9;146:24 bring (14) 25:18;54:19;55:8, 15;169:8;187:6; 208:23;228:3;229:5, 17;231:5;243:1,3;
154:3 <b>axis (2)</b> 218:3,4 <b>B</b> <b>back (38)</b> 11:5;13:21;17:11; 36:10,16;38:15,16; 64:12;69:20,24; 70:11;73:19;86:7; 94:23;100:21;102:6; 121:8;125:8;134:16; 135:3;137:17;147:1;	ballpark (2) 66:1,8 band (10) 158:19;159:6; 160:22;197:19,23; 198:16;199:18; 206:9,21;211:4 bands (3) 116:12,17;168:16 barking (4) 148:14;149:23; 174:3;210:19 base (10) 17:23;18:3,12,23;	176:8 belongs (1) 70:11 below (8) 18:23;44:1;91:2; 103:22;158:23; 160:14;248:20,21 best (13) 23:4;27:11;29:12; 44:16;45:3;51:7,22; 52:14;72:5;86:1; 131:23;146:16; 245:15 better (6)	109:12;137:11,14,21, 23;138:2;140:9,10, 12;155:4,9,12,16,20, 24;156:8;157:15; 165:9,12,19,24; 166:3;170:17,18,20; 171:15,18;173:15; 175:6,9;225:24 <b>blocked (1)</b> 230:3 <b>Blocks' (1)</b> 173:14 <b>blow (1)</b> 226:15	brief (8) 5:12;69:21;75:21; 77:22;79:13;101:3; 137:18;211:9 briefcase (1) 70:9 briefly (2) 42:9;146:24 bring (14) 25:18;54:19;55:8, 15;169:8;187:6; 208:23;228:3;229:5, 17;231:5;243:1,3; 244:1
154:3 <b>axis (2)</b> 218:3,4 <b>B</b> <b>back (38)</b> 11:5;13:21;17:11; 36:10,16;38:15,16; 64:12;69:20,24; 70:11;73:19;86:7; 94:23;100:21;102:6; 121:8;125:8;134:16; 135:3;137:17;147:1; 149:22;156:19;	ballpark (2) 66:1,8 band (10) 158:19;159:6; 160:22;197:19,23; 198:16;199:18; 206:9,21;211:4 bands (3) 116:12,17;168:16 barking (4) 148:14;149:23; 174:3;210:19 base (10) 17:23;18:3,12,23; 19:6,12:20:6;21:15;	176:8 belongs (1) 70:11 below (8) 18:23;44:1;91:2; 103:22;158:23; 160:14;248:20,21 best (13) 23:4;27:11;29:12; 44:16;45:3;51:7,22; 52:14;72:5;86:1; 131:23;146:16; 245:15 better (6) 43:2;64:15;76:24;	109:12;137:11,14,21, 23;138:2;140:9,10, 12;155:4,9,12,16,20, 24;156:8;157:15; 165:9,12,19,24; 166:3;170:17,18,20; 171:15,18;173:15; 175:6,9;225:24 <b>blocked (1)</b> 230:3 <b>Blocks' (1)</b> 173:14 <b>blow (1)</b> 226:15 <b>blowing (14)</b>	brief (8) 5:12;69:21;75:21; 77:22;79:13;101:3; 137:18;211:9 briefcase (1) 70:9 briefly (2) 42:9;146:24 bring (14) 25:18;54:19;55:8, 15;169:8;187:6; 208:23;228:3;229:5, 17;231:5;243:1,3; 244:1 bringing (3)
154:3 <b>axis (2)</b> 218:3,4 <b>B</b> <b>back (38)</b> 11:5;13:21;17:11; 36:10,16;38:15,16; 64:12;69:20,24; 70:11;73:19;86:7; 94:23;100:21;102:6; 121:8;125:8;134:16; 135:3;137:17;147:1; 149:22;156:19; 162:18:167:8:169:3:	ballpark (2) 66:1,8 band (10) 158:19;159:6; 160:22;197:19,23; 198:16;199:18; 206:9,21;211:4 bands (3) 116:12,17;168:16 barking (4) 148:14;149:23; 174:3;210:19 base (10) 17:23;18:3,12,23; 19:6,12;20:6;21:15; 55:3;90:8	176:8 belongs (1) 70:11 below (8) 18:23;44:1;91:2; 103:22;158:23; 160:14;248:20,21 best (13) 23:4;27:11;29:12; 44:16;45:3;51:7,22; 52:14;72:5;86:1; 131:23;146:16; 245:15 better (6) 43:2;64:15;76:24; 138:22,24:244:1	109:12;137:11,14,21, 23;138:2;140:9,10, 12;155:4,9,12,16,20, 24;156:8;157:15; 165:9,12,19,24; 166:3;170:17,18,20; 171:15,18;173:15; 175:6,9;225:24 <b>blocked (1)</b> 230:3 <b>Blocks' (1)</b> 173:14 <b>blow (1)</b> 226:15 <b>blowing (14)</b> 93:9;117:22;212:1,	brief (8) 5:12;69:21;75:21; 77:22;79:13;101:3; 137:18;211:9 briefcase (1) 70:9 briefly (2) 42:9;146:24 bring (14) 25:18;54:19;55:8, 15;169:8;187:6; 208:23;228:3;229:5, 17;231:5;243:1,3; 244:1 bringing (3) 30:17;72:2:139:22
154:3 <b>axis (2)</b> 218:3,4 <b>B</b> <b>back (38)</b> 11:5;13:21;17:11; 36:10,16;38:15,16; 64:12;69:20,24; 70:11;73:19;86:7; 94:23;100:21;102:6; 121:8;125:8;134:16; 135:3;137:17;147:1; 149:22;156:19; 162:18;167:8;169:3; 191:3;199:14:203:9:	ballpark (2) 66:1,8 band (10) 158:19;159:6; 160:22;197:19,23; 198:16;199:18; 206:9,21;211:4 bands (3) 116:12,17;168:16 barking (4) 148:14;149:23; 174:3;210:19 base (10) 17:23;18:3,12,23; 19:6,12;20:6;21:15; 55:3;90:8 based (26)	176:8 belongs (1) 70:11 below (8) 18:23;44:1;91:2; 103:22;158:23; 160:14;248:20,21 best (13) 23:4;27:11;29:12; 44:16;45:3;51:7,22; 52:14;72:5;86:1; 131:23;146:16; 245:15 better (6) 43:2;64:15;76:24; 138:22,24;244:1 bevond (11)	109:12;137:11,14,21, 23;138:2;140:9,10, 12;155:4,9,12,16,20, 24;156:8;157:15; 165:9,12,19,24; 166:3;170:17,18,20; 171:15,18;173:15; 175:6,9;225:24 <b>blocked (1)</b> 230:3 <b>Blocks' (1)</b> 173:14 <b>blow (1)</b> 226:15 <b>blowing (14)</b> 93:9;117:22;212:1, 8,13:215:2;221:14;	brief (8) 5:12;69:21;75:21; 77:22;79:13;101:3; 137:18;211:9 briefcase (1) 70:9 briefly (2) 42:9;146:24 bring (14) 25:18;54:19;55:8, 15;169:8;187:6; 208:23;228:3;229:5, 17;231:5;243:1,3; 244:1 bringing (3) 30:17;72:2;139:22 Brook (2)
154:3 <b>axis (2)</b> 218:3,4 <b>B</b> <b>back (38)</b> 11:5;13:21;17:11; 36:10,16;38:15,16; 64:12;69:20,24; 70:11;73:19;86:7; 94:23;100:21;102:6; 121:8;125:8;134:16; 135:3;137:17;147:1; 149:22;156:19; 162:18;167:8;169:3; 191:3;199:14;203:9; 211:16:233:4:238:1	ballpark (2) 66:1,8 band (10) 158:19;159:6; 160:22;197:19,23; 198:16;199:18; 206:9,21;211:4 bands (3) 116:12,17;168:16 barking (4) 148:14;149:23; 174:3;210:19 base (10) 17:23;18:3,12,23; 19:6,12;20:6;21:15; 55:3;90:8 based (26) 13:17:16:9:33:8;	176:8 belongs (1) 70:11 below (8) 18:23;44:1;91:2; 103:22;158:23; 160:14;248:20,21 best (13) 23:4;27:11;29:12; 44:16;45:3;51:7,22; 52:14;72:5;86:1; 131:23;146:16; 245:15 better (6) 43:2;64:15;76:24; 138:22,24;244:1 beyond (11) 28:4:48:2:63:2;	109:12;137:11,14,21, 23;138:2;140:9,10, 12;155:4,9,12,16,20, 24;156:8;157:15; 165:9,12,19,24; 166:3;170:17,18,20; 171:15,18;173:15; 175:6,9;225:24 <b>blocked (1)</b> 230:3 <b>Blocks' (1)</b> 173:14 <b>blow (1)</b> 226:15 <b>blowing (14)</b> 93:9;117:22;212:1, 8,13;215:2;221:14; 223:10:224:4,5;	brief (8) 5:12;69:21;75:21; 77:22;79:13;101:3; 137:18;211:9 briefcase (1) 70:9 briefly (2) 42:9;146:24 bring (14) 25:18;54:19;55:8, 15;169:8;187:6; 208:23;228:3;229:5, 17;231:5;243:1,3; 244:1 bringing (3) 30:17;72:2;139:22 Brook (2) 91:22:149:20
154:3 <b>axis (2)</b> 218:3,4 <b>B</b> <b>back (38)</b> 11:5;13:21;17:11; 36:10,16;38:15,16; 64:12;69:20,24; 70:11;73:19;86:7; 94:23;100:21;102:6; 121:8;125:8;134:16; 135:3;137:17;147:1; 149:22;156:19; 162:18;167:8;169:3; 191:3;199:14;203:9; 211:16;233:4;238:1, 2:240:8:242:14:	ballpark (2) 66:1,8 band (10) 158:19;159:6; 160:22;197:19,23; 198:16;199:18; 206:9,21;211:4 bands (3) 116:12,17;168:16 barking (4) 148:14;149:23; 174:3;210:19 base (10) 17:23;18:3,12,23; 19:6,12;20:6;21:15; 55:3;90:8 based (26) 13:17;16:9;33:8; 64:17:134:17	176:8 belongs (1) 70:11 below (8) 18:23;44:1;91:2; 103:22;158:23; 160:14;248:20,21 best (13) 23:4;27:11;29:12; 44:16;45:3;51:7,22; 52:14;72:5;86:1; 131:23;146:16; 245:15 better (6) 43:2;64:15;76:24; 138:22,24;244:1 beyond (11) 28:4;48:2;63:2; 64:1:65:15,19:70:8:	109:12;137:11,14,21, 23;138:2;140:9,10, 12;155:4,9,12,16,20, 24;156:8;157:15; 165:9,12,19,24; 166:3;170:17,18,20; 171:15,18;173:15; 175:6,9;225:24 <b>blocked (1)</b> 230:3 <b>Blocks' (1)</b> 173:14 <b>blow (1)</b> 226:15 <b>blowing (14)</b> 93:9;117:22;212:1, 8,13;215:2;221:14; 223:10;224:4,5; 226:1 1 17:227:3	brief (8) 5:12;69:21;75:21; 77:22;79:13;101:3; 137:18;211:9 briefcase (1) 70:9 briefly (2) 42:9;146:24 bring (14) 25:18;54:19;55:8, 15;169:8;187:6; 208:23;228:3;229:5, 17;231:5;243:1,3; 244:1 bringing (3) 30:17;72:2;139:22 Brook (2) 91:22;149:20 brought (6)
154:3 <b>axis (2)</b> 218:3,4 <b>B</b> <b>back (38)</b> 11:5;13:21;17:11; 36:10,16;38:15,16; 64:12;69:20,24; 70:11;73:19;86:7; 94:23;100:21;102:6; 121:8;125:8;134:16; 135:3;137:17;147:1; 149:22;156:19; 162:18;167:8;169:3; 191:3;199:14;203:9; 211:16;233:4;238:1, 2;240:8;242:14; 243:8:254:14	ballpark (2) 66:1,8 band (10) 158:19;159:6; 160:22;197:19,23; 198:16;199:18; 206:9,21;211:4 bands (3) 116:12,17;168:16 barking (4) 148:14;149:23; 174:3;210:19 base (10) 17:23;18:3,12,23; 19:6,12;20:6;21:15; 55:3;90:8 based (26) 13:17;16:9;33:8; 64:17;134:17; 135:14:140.3:	176:8 belongs (1) 70:11 below (8) 18:23;44:1;91:2; 103:22;158:23; 160:14;248:20,21 best (13) 23:4;27:11;29:12; 44:16;45:3;51:7,22; 52:14;72:5;86:1; 131:23;146:16; 245:15 better (6) 43:2;64:15;76:24; 138:22,24;244:1 beyond (11) 28:4;48:2;63:2; 64:1;65:15,19;70:8; 74:20:173:20;	109:12;137:11,14,21, 23;138:2;140:9,10, 12;155:4,9,12,16,20, 24;156:8;157:15; 165:9,12,19,24; 166:3;170:17,18,20; 171:15,18;173:15; 175:6,9;225:24 <b>blocked (1)</b> 230:3 <b>Blocks' (1)</b> 173:14 <b>blow (1)</b> 226:15 <b>blowing (14)</b> 93:9;117:22;212:1, 8,13;215:2;221:14; 223:10;224:4,5; 226:1,1,17;227:3 <b>blue (4)</b>	brief (8) 5:12;69:21;75:21; 77:22;79:13;101:3; 137:18;211:9 briefcase (1) 70:9 briefly (2) 42:9;146:24 bring (14) 25:18;54:19;55:8, 15;169:8;187:6; 208:23;228:3;229:5, 17;231:5;243:1,3; 244:1 bringing (3) 30:17;72:2;139:22 Brook (2) 91:22;149:20 brought (6) 48:15:63:8:119:9:
154:3 <b>axis (2)</b> 218:3,4 <b>B</b> <b>back (38)</b> 11:5;13:21;17:11; 36:10,16;38:15,16; 64:12;69:20,24; 70:11;73:19;86:7; 94:23;100:21;102:6; 121:8;125:8;134:16; 135:3;137:17;147:1; 149:22;156:19; 162:18;167:8;169:3; 191:3;199:14;203:9; 211:16;233:4;238:1, 2;240:8;242:14; 243:8;254:14 <b>back ground (31)</b>	ballpark (2) 66:1,8 band (10) 158:19;159:6; 160:22;197:19,23; 198:16;199:18; 206:9,21;211:4 bands (3) 116:12,17;168:16 barking (4) 148:14;149:23; 174:3;210:19 base (10) 17:23;18:3,12,23; 19:6,12;20:6;21:15; 55:3;90:8 based (26) 13:17;16:9;33:8; 64:17;134:17; 135:14;140:3; 148:22:149:2:	176:8 belongs (1) 70:11 below (8) 18:23;44:1;91:2; 103:22;158:23; 160:14;248:20,21 best (13) 23:4;27:11;29:12; 44:16;45:3;51:7,22; 52:14;72:5;86:1; 131:23;146:16; 245:15 better (6) 43:2;64:15;76:24; 138:22,24;244:1 beyond (11) 28:4;48:2;63:2; 64:1;65:15,19;70:8; 74:20;173:20; 185:16:237:9	109:12;137:11,14,21, 23;138:2;140:9,10, 12;155:4,9,12,16,20, 24;156:8;157:15; 165:9,12,19,24; 166:3;170:17,18,20; 171:15,18;173:15; 175:6,9;225:24 <b>blocked (1)</b> 230:3 <b>Blocks' (1)</b> 173:14 <b>blow (1)</b> 226:15 <b>blowing (14)</b> 93:9;117:22;212:1, 8,13;215:2;221:14; 223:10;224:4,5; 226:1,1,17;227:3 <b>blue (4)</b> 90:5 9,12:117:15	brief (8) 5:12;69:21;75:21; 77:22;79:13;101:3; 137:18;211:9 briefcase (1) 70:9 briefly (2) 42:9;146:24 bring (14) 25:18;54:19;55:8, 15;169:8;187:6; 208:23;228:3;229:5, 17;231:5;243:1,3; 244:1 bringing (3) 30:17;72:2;139:22 Brook (2) 91:22;149:20 brought (6) 48:15;63:8;119:9; 153:2:166:8:191:3
154:3 <b>axis (2)</b> 218:3,4 <b>B</b> <b>back (38)</b> 11:5;13:21;17:11; 36:10,16;38:15,16; 64:12;69:20,24; 70:11;73:19;86:7; 94:23;100:21;102:6; 121:8;125:8;134:16; 135:3;137:17;147:1; 149:22;156:19; 162:18;167:8;169:3; 191:3;199:14;203:9; 211:16;233:4;238:1, 2;240:8;242:14; 243:8;254:14 <b>background (31)</b> 68:4:79:3:11:16;	ballpark (2) 66:1,8 band (10) 158:19;159:6; 160:22;197:19,23; 198:16;199:18; 206:9,21;211:4 bands (3) 116:12,17;168:16 barking (4) 148:14;149:23; 174:3;210:19 base (10) 17:23;18:3,12,23; 19:6,12;20:6;21:15; 55:3;90:8 based (26) 13:17;16:9;33:8; 64:17;134:17; 135:14;140:3; 148:22;149:2; 159:11:160:21:	176:8 belongs (1) 70:11 below (8) 18:23;44:1;91:2; 103:22;158:23; 160:14;248:20,21 best (13) 23:4;27:11;29:12; 44:16;45:3;51:7,22; 52:14;72:5;86:1; 131:23;146:16; 245:15 better (6) 43:2;64:15;76:24; 138:22,24;244:1 beyond (11) 28:4;48:2;63:2; 64:1;65:15,19;70:8; 74:20;173:20; 185:16;237:9 big (5)	109:12;137:11,14,21, 23;138:2;140:9,10, 12;155:4,9,12,16,20, 24;156:8;157:15; 165:9,12,19,24; 166:3;170:17,18,20; 171:15,18;173:15; 175:6,9;225:24 <b>blocked (1)</b> 230:3 <b>Blocks' (1)</b> 173:14 <b>blow (1)</b> 226:15 <b>blowing (14)</b> 93:9;117:22;212:1, 8,13;215:2;221:14; 223:10;224:4,5; 226:1,1,17;227:3 <b>blue (4)</b> 90:5,9,12;117:15 <b>BMP (2)</b>	brief (8) 5:12;69:21;75:21; 77:22;79:13;101:3; 137:18;211:9 briefcase (1) 70:9 briefly (2) 42:9;146:24 bring (14) 25:18;54:19;55:8, 15;169:8;187:6; 208:23;228:3;229:5, 17;231:5;243:1,3; 244:1 bringing (3) 30:17;72:2;139:22 Brook (2) 91:22;149:20 brought (6) 48:15;63:8;119:9; 153:2;166:8;191:3 buffers (1)
154:3 <b>axis (2)</b> 218:3,4 <b>B</b> <b>back (38)</b> 11:5;13:21;17:11; 36:10,16;38:15,16; 64:12;69:20,24; 70:11;73:19;86:7; 94:23;100:21;102:6; 121:8;125:8;134:16; 135:3;137:17;147:1; 149:22;156:19; 162:18;167:8;169:3; 191:3;199:14;203:9; 211:16;233:4;238:1, 2;240:8;242:14; 243:8;254:14 <b>background (31)</b> 68:4;79:3,11,16; 81:12,15:83:1,22;	ballpark (2) 66:1,8 band (10) 158:19;159:6; 160:22;197:19,23; 198:16;199:18; 206:9,21;211:4 bands (3) 116:12,17;168:16 barking (4) 148:14;149:23; 174:3;210:19 base (10) 17:23;18:3,12,23; 19:6,12;20:6;21:15; 55:3;90:8 based (26) 13:17;16:9;33:8; 64:17;134:17; 135:14;140:3; 148:22;149:2; 159:11;160:21; 161:13:165:20;	176:8 belongs (1) 70:11 below (8) 18:23;44:1;91:2; 103:22;158:23; 160:14;248:20,21 best (13) 23:4;27:11;29:12; 44:16;45:3;51:7,22; 52:14;72:5;86:1; 131:23;146:16; 245:15 better (6) 43:2;64:15;76:24; 138:22,24;244:1 beyond (11) 28:4;48:2;63:2; 64:1;65:15,19;70:8; 74:20;173:20; 185:16;237:9 big (5) 110:2,4:167:2,5;	109:12;137:11,14,21, 23;138:2;140:9,10, 12;155:4,9,12,16,20, 24;156:8;157:15; 165:9,12,19,24; 166:3;170:17,18,20; 171:15,18;173:15; 175:6,9;225:24 <b>blocked (1)</b> 230:3 <b>Blocks' (1)</b> 173:14 <b>blow (1)</b> 226:15 <b>blowing (14)</b> 93:9;117:22;212:1, 8,13;215:2;221:14; 223:10;224:4,5; 226:1,1,17;227:3 <b>blue (4)</b> 90:5,9,12;117:15 <b>BMP (2)</b> 53:10:58:16	brief (8) 5:12;69:21;75:21; 77:22;79:13;101:3; 137:18;211:9 briefcase (1) 70:9 briefly (2) 42:9;146:24 bring (14) 25:18;54:19;55:8, 15;169:8;187:6; 208:23;228:3;229:5, 17;231:5;243:1,3; 244:1 bringing (3) 30:17;72:2;139:22 Brook (2) 91:22;149:20 brought (6) 48:15;63:8;119:9; 153:2;166:8;191:3 buffers (1) 27:10
154:3 <b>axis (2)</b> 218:3,4 <b>B</b> <b>back (38)</b> 11:5;13:21;17:11; 36:10,16;38:15,16; 64:12;69:20,24; 70:11;73:19;86:7; 94:23;100:21;102:6; 121:8;125:8;134:16; 135:3;137:17;147:1; 149:22;156:19; 162:18;167:8;169:3; 191:3;199:14;203:9; 211:16;233:4;238:1, 2;240:8;242:14; 243:8;254:14 <b>background (31)</b> 68:4;79:3,11,16; 81:12,15;83:1,22; 91:17:109:6:145:2;	ballpark (2) 66:1,8 band (10) 158:19;159:6; 160:22;197:19,23; 198:16;199:18; 206:9,21;211:4 bands (3) 116:12,17;168:16 barking (4) 148:14;149:23; 174:3;210:19 base (10) 17:23;18:3,12,23; 19:6,12;20:6;21:15; 55:3;90:8 based (26) 13:17;16:9;33:8; 64:17;134:17; 135:14;140:3; 148:22;149:2; 159:11;160:21; 161:1,3;165:20; 172:17:175:12,17;	176:8 belongs (1) 70:11 below (8) 18:23;44:1;91:2; 103:22;158:23; 160:14;248:20,21 best (13) 23:4;27:11;29:12; 44:16;45:3;51:7,22; 52:14;72:5;86:1; 131:23;146:16; 245:15 better (6) 43:2;64:15;76:24; 138:22,24;244:1 beyond (11) 28:4;48:2;63:2; 64:1;65:15,19;70:8; 74:20;173:20; 185:16;237:9 big (5) 110:2,4;167:2,5; 243:23	109:12;137:11,14,21, 23;138:2;140:9,10, 12;155:4,9,12,16,20, 24;156:8;157:15; 165:9,12,19,24; 166:3;170:17,18,20; 171:15,18;173:15; 175:6,9;225:24 <b>blocked (1)</b> 230:3 <b>Blocks' (1)</b> 173:14 <b>blow (1)</b> 226:15 <b>blowing (14)</b> 93:9;117:22;212:1, 8,13;215:2;221:14; 223:10;224:4,5; 226:1,1,17;227:3 <b>blue (4)</b> 90:5,9,12;117:15 <b>BMP (2)</b> 53:19;58:16 <b>Board (2)</b>	brief (8) 5:12;69:21;75:21; 77:22;79:13;101:3; 137:18;211:9 briefcase (1) 70:9 briefly (2) 42:9;146:24 bring (14) 25:18;54:19;55:8, 15;169:8;187:6; 208:23;228:3;229:5, 17;231:5;243:1,3; 244:1 bringing (3) 30:17;72:2;139:22 Brook (2) 91:22;149:20 brought (6) 48:15;63:8;119:9; 153:2;166:8;191:3 buffers (1) 27:10 brid(5)
154:3 <b>axis (2)</b> 218:3,4 <b>B</b> <b>back (38)</b> 11:5;13:21;17:11; 36:10,16;38:15,16; 64:12;69:20,24; 70:11;73:19;86:7; 94:23;100:21;102:6; 121:8;125:8;134:16; 135:3;137:17;147:1; 149:22;156:19; 162:18;167:8;169:3; 191:3;199:14;203:9; 211:16;233:4;238:1, 2;240:8;242:14; 243:8;254:14 <b>background (31)</b> 68:4;79:3,11,16; 81:12,15;83:1,22; 91:17;109:6;145:2; 160:6:105:47:21;	ballpark (2) 66:1,8 band (10) 158:19;159:6; 160:22;197:19,23; 198:16;199:18; 206:9,21;211:4 bands (3) 116:12,17;168:16 barking (4) 148:14;149:23; 174:3;210:19 base (10) 17:23;18:3,12,23; 19:6,12;20:6;21:15; 55:3;90:8 based (26) 13:17;16:9;33:8; 64:17;134:17; 135:14;140:3; 148:22;149:2; 159:11;160:21; 161:1,3;165:20; 172:17;175:12,17; 101:20:212:14:149:	176:8 belongs (1) 70:11 below (8) 18:23;44:1;91:2; 103:22;158:23; 160:14;248:20,21 best (13) 23:4;27:11;29:12; 44:16;45:3;51:7,22; 52:14;72:5;86:1; 131:23;146:16; 245:15 better (6) 43:2;64:15;76:24; 138:22,24;244:1 beyond (11) 28:4;48:2;63:2; 64:1;65:15,19;70:8; 74:20;173:20; 185:16;237:9 big (5) 110:2,4;167:2,5; 243:23 biggor (2)	109:12;137:11,14,21, 23;138:2;140:9,10, 12;155:4,9,12,16,20, 24;156:8;157:15; 165:9,12,19,24; 166:3;170:17,18,20; 171:15,18;173:15; 175:6,9;225:24 <b>blocked (1)</b> 230:3 <b>Blocks' (1)</b> 173:14 <b>blow (1)</b> 226:15 <b>blowing (14)</b> 93:9;117:22;212:1, 8,13;215:2;221:14; 223:10;224:4,5; 226:1,1,17;227:3 <b>blue (4)</b> 90:5,9,12;117:15 <b>BMP (2)</b> 53:19;58:16 <b>Board (2)</b> 95:20:172:15	brief (8) 5:12;69:21;75:21; 77:22;79:13;101:3; 137:18;211:9 briefcase (1) 70:9 briefly (2) 42:9;146:24 bring (14) 25:18;54:19;55:8, 15;169:8;187:6; 208:23;228:3;229:5, 17;231:5;243:1,3; 244:1 bringing (3) 30:17;72:2;139:22 Brook (2) 91:22;149:20 brought (6) 48:15;63:8;119:9; 153:2;166:8;191:3 buffers (1) 27:10 build (5) 47:17:62:4.17;
154:3 <b>axis (2)</b> 218:3,4 <b>B</b> <b>back (38)</b> 11:5;13:21;17:11; 36:10,16;38:15,16; 64:12;69:20,24; 70:11;73:19;86:7; 94:23;100:21;102:6; 121:8;125:8;134:16; 135:3;137:17;147:1; 149:22;156:19; 162:18;167:8;169:3; 191:3;199:14;203:9; 211:16;233:4;238:1, 2;240:8;242:14; 243:8;254:14 <b>background (31)</b> 68:4;79:3,11,16; 81:12,15;83:1,22; 91:17;109:6;145:2; 160:6;195:4,7,21; 106:5 5 20:107.7	ballpark (2) 66:1,8 band (10) 158:19;159:6; 160:22;197:19,23; 198:16;199:18; 206:9,21;211:4 bands (3) 116:12,17;168:16 barking (4) 148:14;149:23; 174:3;210:19 base (10) 17:23;18:3,12,23; 19:6,12;20:6;21:15; 55:3;90:8 based (26) 13:17;16:9;33:8; 64:17;134:17; 135:14;140:3; 148:22;149:2; 159:11;160:21; 161:1,3;165:20; 172:17;175:12,17; 191:20;213:13,14,18; 246:2:250:15 16	176:8 belongs (1) 70:11 below (8) 18:23;44:1;91:2; 103:22;158:23; 160:14;248:20,21 best (13) 23:4;27:11;29:12; 44:16;45:3;51:7,22; 52:14;72:5;86:1; 131:23;146:16; 245:15 better (6) 43:2;64:15;76:24; 138:22,24;244:1 beyond (11) 28:4;48:2;63:2; 64:1;65:15,19;70:8; 74:20;173:20; 185:16;237:9 big (5) 110:2,4;167:2,5; 243:23 bigger (2) 28:24:124:2	109:12;137:11,14,21, 23;138:2;140:9,10, 12;155:4,9,12,16,20, 24;156:8;157:15; 165:9,12,19,24; 166:3;170:17,18,20; 171:15,18;173:15; 175:6,9;225:24 <b>blocked (1)</b> 230:3 <b>Blocks' (1)</b> 173:14 <b>blow (1)</b> 226:15 <b>blowing (14)</b> 93:9;117:22;212:1, 8,13;215:2;221:14; 223:10;224:4,5; 226:1,1,17;227:3 <b>blue (4)</b> 90:5,9,12;117:15 <b>BMP (2)</b> 53:19;58:16 <b>Board (2)</b> 95:20;172:15	brief (8) 5:12;69:21;75:21; 77:22;79:13;101:3; 137:18;211:9 briefcase (1) 70:9 briefly (2) 42:9;146:24 bring (14) 25:18;54:19;55:8, 15;169:8;187:6; 208:23;228:3;229:5, 17;231:5;243:1,3; 244:1 bringing (3) 30:17;72:2;139:22 Brook (2) 91:22;149:20 brought (6) 48:15;63:8;119:9; 153:2;166:8;191:3 buffers (1) 27:10 build (5) 47:17;62:4,17; 63:17:69:8
154:3 <b>axis (2)</b> 218:3,4 <b>B</b> <b>back (38)</b> 11:5;13:21;17:11; 36:10,16;38:15,16; 64:12;69:20,24; 70:11;73:19;86:7; 94:23;100:21;102:6; 121:8;125:8;134:16; 135:3;137:17;147:1; 149:22;156:19; 162:18;167:8;169:3; 191:3;199:14;203:9; 211:16;233:4;238:1, 2;240:8;242:14; 243:8;254:14 <b>background (31)</b> 68:4;79:3,11,16; 81:12,15;83:1,22; 91:17;109:6;145:2; 160:6;195:4,7,21; 196:5,5,22;197:7; 198:19:202:7	ballpark (2) 66:1,8 band (10) 158:19;159:6; 160:22;197:19,23; 198:16;199:18; 206:9,21;211:4 bands (3) 116:12,17;168:16 barking (4) 148:14;149:23; 174:3;210:19 base (10) 17:23;18:3,12,23; 19:6,12;20:6;21:15; 55:3;90:8 based (26) 13:17;16:9;33:8; 64:17;134:17; 135:14;140:3; 148:22;149:2; 159:11;160:21; 161:1,3;165:20; 172:17;175:12,17; 191:20;213:13,14,18; 246:2;250:15,16; 252:11	176:8 belongs (1) 70:11 below (8) 18:23;44:1;91:2; 103:22;158:23; 160:14;248:20,21 best (13) 23:4;27:11;29:12; 44:16;45:3;51:7,22; 52:14;72:5;86:1; 131:23;146:16; 245:15 better (6) 43:2;64:15;76:24; 138:22,24;244:1 beyond (11) 28:4;48:2;63:2; 64:1;65:15,19;70:8; 74:20;173:20; 185:16;237:9 big (5) 110:2,4;167:2,5; 243:23 bigger (2) 28:24;134:3 bigger (1)	109:12;137:11,14,21, 23;138:2;140:9,10, 12;155:4,9,12,16,20, 24;156:8;157:15; 165:9,12,19,24; 166:3;170:17,18,20; 171:15,18;173:15; 175:6,9;225:24 <b>blocked (1)</b> 230:3 <b>Blocks' (1)</b> 173:14 <b>blow (1)</b> 226:15 <b>blowing (14)</b> 93:9;117:22;212:1, 8,13;215:2;221:14; 223:10;224:4,5; 226:1,1,17;227:3 <b>blue (4)</b> 90:5,9,12;117:15 <b>BMP (2)</b> 53:19;58:16 <b>Board (2)</b> 95:20;172:15 <b>board-certification (1)</b> 184:10	brief (8) 5:12;69:21;75:21; 77:22;79:13;101:3; 137:18;211:9 briefcase (1) 70:9 briefly (2) 42:9;146:24 bring (14) 25:18;54:19;55:8, 15;169:8;187:6; 208:23;228:3;229:5, 17;231:5;243:1,3; 244:1 bringing (3) 30:17;72:2;139:22 Brook (2) 91:22;149:20 brought (6) 48:15;63:8;119:9; 153:2;166:8;191:3 buffers (1) 27:10 build (5) 47:17;62:4,17; 63:17;68:8
154:3 <b>axis (2)</b> 218:3,4 <b>B</b> <b>back (38)</b> 11:5;13:21;17:11; 36:10,16;38:15,16; 64:12;69:20,24; 70:11;73:19;86:7; 94:23;100:21;102:6; 121:8;125:8;134:16; 135:3;137:17;147:1; 149:22;156:19; 162:18;167:8;169:3; 191:3;199:14;203:9; 211:16;233:4;238:1, 2;240:8;242:14; 243:8;254:14 <b>background (31)</b> 68:4;79:3,11,16; 81:12,15;83:1,22; 91:17;109:6;145:2; 160:6;195:4,7,21; 196:5,5,22;197:7; 198:18;201:6;203:7; 205:40,207:10,21; 105:5,203:7; 205:40,207:10,21; 105:40,207:10,21;	ballpark (2) 66:1,8 band (10) 158:19;159:6; 160:22;197:19,23; 198:16;199:18; 206:9,21;211:4 bands (3) 116:12,17;168:16 barking (4) 148:14;149:23; 174:3;210:19 base (10) 17:23;18:3,12,23; 19:6,12;20:6;21:15; 55:3;90:8 based (26) 13:17;16:9;33:8; 64:17;134:17; 135:14;140:3; 148:22;149:2; 159:11;160:21; 161:1,3;165:20; 172:17;175:12,17; 191:20;213:13,14,18; 246:2;250:15,16; 252:1,1 basel (2)	176:8 belongs (1) 70:11 below (8) 18:23;44:1;91:2; 103:22;158:23; 160:14;248:20,21 best (13) 23:4;27:11;29:12; 44:16;45:3;51:7,22; 52:14;72:5;86:1; 131:23;146:16; 245:15 better (6) 43:2;64:15;76:24; 138:22,24;244:1 beyond (11) 28:4;48:2;63:2; 64:1;65:15,19;70:8; 74:20;173:20; 185:16;237:9 big (5) 110:2,4;167:2,5; 243:23 bigger (2) 28:24;134:3 bingo (1) 70:15	109:12;137:11,14,21, 23;138:2;140:9,10, 12;155:4,9,12,16,20, 24;156:8;157:15; 165:9,12,19,24; 166:3;170:17,18,20; 171:15,18;173:15; 175:6,9;225:24 <b>blocked (1)</b> 230:3 <b>Blocks' (1)</b> 173:14 <b>blow (1)</b> 226:15 <b>blowing (14)</b> 93:9;117:22;212:1, 8,13;215:2;221:14; 223:10;224:4,5; 226:1,1,17;227:3 <b>blue (4)</b> 90:5,9,12;117:15 <b>BMP (2)</b> 53:19;58:16 <b>Board (2)</b> 95:20;172:15 <b>board-certification (1)</b> 184:19	brief (8) 5:12;69:21;75:21; 77:22;79:13;101:3; 137:18;211:9 briefcase (1) 70:9 briefly (2) 42:9;146:24 bring (14) 25:18;54:19;55:8, 15;169:8;187:6; 208:23;228:3;229:5, 17;231:5;243:1,3; 244:1 bringing (3) 30:17;72:2;139:22 Brook (2) 91:22;149:20 brought (6) 48:15;63:8;119:9; 153:2;166:8;191:3 buffers (1) 27:10 build (5) 47:17;62:4,17; 63:17;68:8 building (10) 55:12;69:22:74:18
154:3 <b>axis (2)</b> 218:3,4 <b>B</b> <b>back (38)</b> 11:5;13:21;17:11; 36:10,16;38:15,16; 64:12;69:20,24; 70:11;73:19;86:7; 94:23;100:21;102:6; 121:8;125:8;134:16; 135:3;137:17;147:1; 149:22;156:19; 162:18;167:8;169:3; 191:3;199:14;203:9; 211:16;233:4;238:1, 2;240:8;242:14; 243:8;254:14 <b>background (31)</b> 68:4;79:3,11,16; 81:12,15;83:1,22; 91:17;109:6;145:2; 160:6;195:4,7,21; 196:5,5,22;197:7; 198:18;201:6;203:7; 206:9;207:19,24; 206:9:207:19,24; 206:9:207:19,24;	ballpark (2) 66:1,8 band (10) 158:19;159:6; 160:22;197:19,23; 198:16;199:18; 206:9,21;211:4 bands (3) 116:12,17;168:16 barking (4) 148:14;149:23; 174:3;210:19 base (10) 17:23;18:3,12,23; 19:6,12;20:6;21:15; 55:3;90:8 based (26) 13:17;16:9;33:8; 64:17;134:17; 135:14;140:3; 148:22;149:2; 159:11;160:21; 161:1,3;165:20; 172:17;175:12,17; 191:20;213:13,14,18; 246:2;250:15,16; 252:1,1 baseline (6) 90.7 c. 24:5.7	176:8 belongs (1) 70:11 below (8) 18:23;44:1;91:2; 103:22;158:23; 160:14;248:20,21 best (13) 23:4;27:11;29:12; 44:16;45:3;51:7,22; 52:14;72:5;86:1; 131:23;146:16; 245:15 better (6) 43:2;64:15;76:24; 138:22,24;244:1 beyond (11) 28:4;48:2;63:2; 64:1;65:15,19;70:8; 74:20;173:20; 185:16;237:9 big (5) 110:2,4;167:2,5; 243:23 bigger (2) 28:24;134:3 bingo (1) 70:15	109:12;137:11,14,21, 23;138:2;140:9,10, 12;155:4,9,12,16,20, 24;156:8;157:15; 165:9,12,19,24; 166:3;170:17,18,20; 171:15,18;173:15; 175:6,9;225:24 <b>blocked (1)</b> 230:3 <b>Blocks' (1)</b> 173:14 <b>blow (1)</b> 226:15 <b>blowing (14)</b> 93:9;117:22;212:1, 8,13;215:2;221:14; 223:10;224:4,5; 226:1,1,17;227:3 <b>blue (4)</b> 90:5,9,12;117:15 <b>BMP (2)</b> 53:19;58:16 <b>Board (2)</b> 95:20;172:15 <b>board-certification (1)</b> 184:19 <b>board-certified (3)</b>	brief (8) 5:12;69:21;75:21; 77:22;79:13;101:3; 137:18;211:9 briefcase (1) 70:9 briefly (2) 42:9;146:24 bring (14) 25:18;54:19;55:8, 15;169:8;187:6; 208:23;228:3;229:5, 17;231:5;243:1,3; 244:1 bringing (3) 30:17;72:2;139:22 Brook (2) 91:22;149:20 brought (6) 48:15;63:8;119:9; 153:2;166:8;191:3 buffers (1) 27:10 build (5) 47:17;62:4,17; 63:17;68:8 building (10) 55:18;62:2;74:18; 164:10:10
154:3 <b>axis (2)</b> 218:3,4 <b>B</b> <b>back (38)</b> 11:5;13:21;17:11; 36:10,16;38:15,16; 64:12;69:20,24; 70:11;73:19;86:7; 94:23;100:21;102:6; 121:8;125:8;134:16; 135:3;137:17;147:1; 149:22;156:19; 162:18;167:8;169:3; 191:3;199:14;203:9; 211:16;233:4;238:1, 2;240:8;242:14; 243:8;254:14 <b>background (31)</b> 68:4;79:3,11,16; 81:12,15;83:1,22; 91:17;109:6;145:2; 160:6;195:4,7,21; 196:5,5,22;197:7; 198:18;201:6;203:7; 206:9;207:19,24; 208:4,10,20;249:14, 172	ballpark (2) 66:1,8 band (10) 158:19;159:6; 160:22;197:19,23; 198:16;199:18; 206:9,21;211:4 bands (3) 116:12,17;168:16 barking (4) 148:14;149:23; 174:3;210:19 base (10) 17:23;18:3,12,23; 19:6,12;20:6;21:15; 55:3;90:8 based (26) 13:17;16:9;33:8; 64:17;134:17; 135:14;140:3; 148:22;149:2; 159:11;160:21; 161:1,3;165:20; 172:17;175:12,17; 191:20;213:13,14,18; 246:2;250:15,16; 252:1,1 baseline (6) 80:7,9;84:5,7; 205:7	176:8 belongs (1) 70:11 below (8) 18:23;44:1;91:2; 103:22;158:23; 160:14;248:20,21 best (13) 23:4;27:11;29:12; 44:16;45:3;51:7,22; 52:14;72:5;86:1; 131:23;146:16; 245:15 better (6) 43:2;64:15;76:24; 138:22,24;244:1 beyond (11) 28:4;48:2;63:2; 64:1;65:15,19;70:8; 74:20;173:20; 185:16;237:9 big (5) 110:2,4;167:2,5; 243:23 bigger (2) 28:24;134:3 bingo (1) 70:15 biologist (2)	109:12;137:11,14,21, 23;138:2;140:9,10, 12;155:4,9,12,16,20, 24;156:8;157:15; 165:9,12,19,24; 166:3;170:17,18,20; 171:15,18;173:15; 175:6,9;225:24 <b>blocked (1)</b> 230:3 <b>Blocks' (1)</b> 173:14 <b>blow (1)</b> 226:15 <b>blowing (14)</b> 93:9;117:22;212:1, 8,13;215:2;221:14; 223:10;224:4,5; 226:1,1,17;227:3 <b>blue (4)</b> 90:5,9,12;117:15 <b>BMP (2)</b> 53:19;58:16 <b>Board (2)</b> 95:20;172:15 <b>board-certification (1)</b> 184:19 <b>board-certified (3)</b> 185:3,6,9	brief (8) 5:12;69:21;75:21; 77:22;79:13;101:3; 137:18;211:9 briefcase (1) 70:9 briefly (2) 42:9;146:24 bring (14) 25:18;54:19;55:8, 15;169:8;187:6; 208:23;228:3;229:5, 17;231:5;243:1,3; 244:1 bringing (3) 30:17;72:2;139:22 Brook (2) 91:22;149:20 brought (6) 48:15;63:8;119:9; 153:2;166:8;191:3 buffers (1) 27:10 build (5) 47:17;62:4,17; 63:17;68:8 building (10) 55:18;62:2;74:18; 164:10,19;165:6,13;
154:3 <b>axis (2)</b> 218:3,4 <b>B</b> <b>back (38)</b> 11:5;13:21;17:11; 36:10,16;38:15,16; 64:12;69:20,24; 70:11;73:19;86:7; 94:23;100:21;102:6; 121:8;125:8;134:16; 135:3;137:17;147:1; 149:22;156:19; 162:18;167:8;169:3; 191:3;199:14;203:9; 211:16;233:4;238:1, 2;240:8;242:14; 243:8;254:14 <b>background (31)</b> 68:4;79:3,11,16; 81:12,15;83:1,22; 91:17;109:6;145:2; 160:6;195:4,7,21; 196:5,5,22;197:7; 198:18;201:6;203:7; 206:9;207:19,24; 208:4,10,20;249:14, 17,22	ballpark (2) 66:1,8 band (10) 158:19;159:6; 160:22;197:19,23; 198:16;199:18; 206:9,21;211:4 bands (3) 116:12,17;168:16 barking (4) 148:14;149:23; 174:3;210:19 base (10) 17:23;18:3,12,23; 19:6,12;20:6;21:15; 55:3;90:8 based (26) 13:17;16:9;33:8; 64:17;134:17; 135:14;140:3; 148:22;149:2; 159:11;160:21; 161:1,3;165:20; 172:17;175:12,17; 191:20;213:13,14,18; 246:2;250:15,16; 252:1,1 baseline (6) 80:7,9;84:5,7; 205:11;208:7	176:8 belongs (1) 70:11 below (8) 18:23;44:1;91:2; 103:22;158:23; 160:14;248:20,21 best (13) 23:4;27:11;29:12; 44:16;45:3;51:7,22; 52:14;72:5;86:1; 131:23;146:16; 245:15 better (6) 43:2;64:15;76:24; 138:22,24;244:1 beyond (11) 28:4;48:2;63:2; 64:1;65:15,19;70:8; 74:20;173:20; 185:16;237:9 big (5) 110:2,4;167:2,5; 243:23 bigger (2) 28:24;134:3 bingo (1) 70:15 biologist (2) 24:6;135:18	109:12;137:11,14,21, 23;138:2;140:9,10, 12;155:4,9,12,16,20, 24;156:8;157:15; 165:9,12,19,24; 166:3;170:17,18,20; 171:15,18;173:15; 175:6,9;225:24 <b>blocked (1)</b> 230:3 <b>Blocks' (1)</b> 173:14 <b>blow (1)</b> 226:15 <b>blowing (14)</b> 93:9;117:22;212:1, 8,13;215:2;221:14; 223:10;224:4,5; 226:1,1,17;227:3 <b>blue (4)</b> 90:5,9,12;117:15 <b>BMP (2)</b> 53:19;58:16 <b>Board (2)</b> 95:20;172:15 <b>board-certification (1)</b> 184:19 <b>board-certified (3)</b> 185:3,6,9 <b>boaters (1)</b>	brief (8) 5:12;69:21;75:21; 77:22;79:13;101:3; 137:18;211:9 briefcase (1) 70:9 briefly (2) 42:9;146:24 bring (14) 25:18;54:19;55:8, 15;169:8;187:6; 208:23;228:3;229:5, 17;231:5;243:1,3; 244:1 bringing (3) 30:17;72:2;139:22 Brook (2) 91:22;149:20 brought (6) 48:15;63:8;119:9; 153:2;166:8;191:3 buffers (1) 27:10 build (5) 47:17;62:4,17; 63:17;68:8 building (10) 55:18;62:2;74:18; 164:10,19;165:6,13; 171:9;182:12,18

30:12;40:20;47:24;	calm (4)	5:6;75:19;176:23;	148:12,12;184:8,14;	248:8
60:1,1;61:23;93:21;	132:3;240:18,23,	188:3	238:18	circumsta
129:20;173:22;190:7	24	captions (1)	Chair (9)	24:23;1
bunch (1)	came (9)	36:23	82:9;165:4;178:19;	citation (2
138:6	68:10;141:21,24;	captured (2)	181:8;229:14;242:1,	26:1;15
burden (1)	144:8;153:21;157:1;	150:12;202:10	20;243:7;247:6	cited (1)
94:23	171:1;213:2,6	car (3)	Chairman (8)	82:18
burning (1)	Can (157)	148:21;150:17;	58:20,22,23;70:2,4,	cites (1)
193:20	9:6;10:5,12;13:17;	210:19	7,12;227:21	253:17
business (5)	14:11,16,17,18;	careful (1)	challenge (1)	citizens (1
4:15;75:15;120:11;	16:19;17:6,11;20:11,	180:13	208:11	98:18
134:4;167:5	15,19;24:19,23;	cars (1)	change (11)	Civil (4)
Butler (49)	26:13;28:16;29:10;	47:20	28:3,10,22;30:14,	5:8,10,1
4:5,15,15,24;5:3,7,	34:18;40:11;42:8,12,	case (20)	16,24;31:3,6,10,14;	clarificati
14,24;6:4,7,12,19,23;	14,15,19;45:1;51:11,	38:12;46:12;94:11;	32:3	124:17
7:4;9:1,10;10:14;	17,17,19,20;55:10;	118:13;120:19;	changed (2)	clarify (2)
11:13;12:14;13:2,4,	61:20;62:7,13;63:17,	128:1;133:5;141:20,	33:6;133:23	73:19;2
7;18:22;19:11,15;	18;65:12;66:1;67:1;	21;142:22;176:15;	changing (1)	clarifying
29:23;30:2;32:23;	69:19;73:18;79:16,	177:4,6,11,12,15,22;	232:19	121:23
37:2;42:21;43:2,4,8,	24;88:3,16;89:1;	178:10;190:4;250:18	Chapters (2)	classes (1)
13,19,22;51:13,16,	91:22;92:20;94:7;	cases (4)	22:18;23:18	246:19
23;52:3,7;54:2,8;	96:9;102:7;103:18,	61:17;83:11;	characteristic (2)	classificat
55:21;56:19,23;57:2;	19;105:19,23;106:7,	201:14;239:8	168:11;249:21	143:15
60:8;69:10	14,16;107:22;112:7;	casning(1)	characterization $(2)$	classifies (
DUY (1)	114:12;125:2,5,15, 21:127:24:128:16;	125:1	208:21;247:4	139:15
1/0:11	21;12/:24;128:10; 120:45:122:12:	categorizes (1)	<b>Characterize</b> (7)	<b>classily</b> (1
С	129.4, 3, 155.15, 124.17, 129.5,	51.19 course ( <b>5</b> )	100.10,111.14, 114.1.102.2.106.7.	10.10
C	134.17,130.3, 141.21.142.20.	22.4.162.3 8.	108.21.204.20	240.8
cabin_side (1)	141.21, 142.20, 146.10.147.4.	163.17.205.22	198.21,204.20 characterized (1)	240.0
37.20	148.16.153.12	cautioned (2)	111.13	25.16 2
CADNA (9)	157.24.160.14	4·24·75·8	characterizing (4)	clear (8)
233.24.234.2	161.21.162.1.163.8	cell (1)	22.13.109.4	23.13.4
233.24,234.2,	18.165.7 24.166.19	117.22	127.19.160.6	99.9 11
21.245.10.246.19	170.18 19.171.10	certain (14)	chart (6)	213.10
calculate (1)	172:5:173:3:175:11	20:10:32:12.15:	140:15.16:143:3.	clearance
20:21	22:176:23:177:1:	98:19.20:104:19.22:	13:156:4:228:6	63:20:6
calculated (2)	178:2,3,12;180:4,10,	162:16,16;184:15;	charts (4)	clearer (2
90:13;235:21	18,20;181:19;182:4;	205:18;206:4,4;	152:12;226:2;	66:22;8
calculates (1)	184:21,22;194:4;	231:18	229:20;230:8	clearing (
211:11	196:22;197:8,9;	certainly (30)	check (6)	47:6,13
calculating (1)	198:2,23;200:7,8;	80:3,4;81:19;	41:2;50:2,3;	62:7;63
173:17	201:16;202:4,6,8,19;	82:20;89:24;91:23;	192:19;200:18;219:9	74:8,14
calculation (1)	204:8;205:12,22;	92:13,18;97:21;	checked (1)	clearings
21:1	206:15;215:16,17;	104:19;106:21;	149:7	47:16
Calculations (11)	216:14;217:18;	110:11,16;112:8;	checking (1)	client (8)
16:1;21:3;57:9;	219:15;223:17,18;	118:10;133:23;	193:6	12:21;12
93:5;94:13;119:6;	225:19;226:7,11,24;	142:19;144:5;158:7;	chemical (2)	41:15;68
120:1;132:16,24;	227:14;229:3,4;	161:20;162:13,24;	11:15,17	19
233:16;245:21	231:4;233:8;237:1,2,	163:5;173:11;177:2;	chirping (1)	clients (1)
call (7)	12;242:4;243:1,3,5;	183:16;204:24;	148:11	50:3
64:5;92:8;101:21;	244:10,15;245:15;	207:23;243:17;	choice (1)	climate (8
103:19;118:16;	247:2;249:4;253:3;	253:19	161:14	30:14,10
184:12;239:21	254:7,20	certainty (1)	choices (1)	10,14;3
called (9)	cap (1)	224:3	96:16	Clock (2)
140:18;153:14;	244:8	certificated (1)	cnoose (1)	/5:16;1
164:9;165:14;168:1;	$\frac{\text{capability}(\mathbf{I})}{174.17}$	12:8	90:17	close (16)
205:4,11;255:18;	1/4.1/	50.8.00.22	11,10,12,21	30:8;3/
231:2 colling (1)	(2)	JU:0;99:23	11:10;12:21	43:/;83
cannig (1) 67:4	100.18;223:19	183.7	06.2 11.07.10.	00.19;9
$\frac{07.4}{2}$	182.14	103.7 cotors (7)	90.2,11,97.19	171.2.0
17.15.148.0	102.14 conocity (1)	45.77.178.17.	70.1J	1/4:0;2
17.13,140.9	capacity (+)	+J.22,120.12,		cioscu (1)

248:8 circumstance (2) 24:23;188:20 citation (2) 26:1;155:5 cited (1) 82:18 cites (1) 253:17 citizens (1) 98:18 Civil (4) 5:8,10,14,18 clarification (1) 124:17 clarify (2) 73:19;232:10 clarifying (1) 121:23 classes (1) 246:19 classification (1) 143:15 classifies (1) 139:15 classify (1) 18:18 Clause (1) 240:8 cleaning (2) 25:16,22 clear (8) 23:13;49:19;97:17; 99:9,11;202:22; 213:10;214:3 clearance (2) 63:20;66:17 clearer (2) 66:22;87:13 clearing (10) 47:6,13;61:15; 62:7;63:1,4;64:11; 74:8,14;147:6 clearings (1) 47:16 client (8) 12:21;13:16;35:17; 41:15;68:3;190:1,16, 19 clients (1) 50:3 climate (8) 30:14,16,24;31:3,6, 10,14;32:3 Clock (2) 75:16;192:19 close (16) 30:8;37:21;39:3,8; 43:7;85:21;86:12; 88:19;92:2;98:22; 99:4;104:11;164:1; 174:8;235:9;238:19

143:6 closer (7) 76:13:87:9:92:15, 19:107:23:108:2: 248:9 closest (5) 87:7;92:6;107:8; 178:5.7 colleague (1) 242:6 colleagues (1) 246:21 collect (3) 97:8;198:9;214:15 collected (17) 80:14;82:1;88:18: 90:4;95:7;108:5; 114:11;194:22; 197:15,17,18,20; 207:3;211:5;220:15; 230:20:232:12 collecting (7) 96:23;198:20; 207:9;220:4,6;227:6; 232:2 collection (9) 61:17;62:5;64:6; 65:11:97:5:203:22, 22;219:6;222:3 collections (1) 89:16 co-located (2) 222:4:224:16 color (1) 217:23 column (1) 239:4 combination (3) 64:8:161:1:175:18 comfort (1) 170:3 comfortable (4) 186:5,9;252:6; 253:12 coming (5) 31:24;116:5,7; 166:14;240:1 comment (3) 82:19;84:6;150:20 comments (4) 51:6;83:20;253:14; 254:21 commercially (1) 191:13 **Commission** (1) 50:15commissioned (1) 131:16 commit (2) 184:16;185:14 commitment (1) 186:16 committed (2)

185:21;253:4 Committee (19) 5:12;41:5;49:11; 75:21:90:2:94:18: 99:22;100:1;101:12, 17,20;111:19;121:5; 138:16;199:10; 231:17:252:7:254:8, 9 Committee's (2) 85:20;157:12 common (2) 190:22.24 commonality (3) 183:12,15,17 commonly (2) 233:21,23 communication (2) 134:22;242:6 community (14) 75:23;98:6;119:9, 11.22:120:1:141:22: 164:6;184:2;195:11; 196:18;197:9;235:9; 252:8 compacts (1) 19:9 companies (1) 159:13 company (16) 45:20;49:19;50:1; 51:24:52:13.17: 53:10,23;79:5;82:1; 99:2:106:18:114:6: 202:4;242:7,8 compare (2) 135:22;144:10 compared (3) 112:4;143:13,14 comparing (1) 139:24 compendium (2) 116:16:117:5 complain (1) 92:14 complainant's (1) 190:10 complaining (1) 163:3 complaint (4) 176:18;186:13,21; 188:21 complaints (13) 50:4;92:3;162:9, 15,19,23,24;163:9, 17;176:17;188:23; 200:4;201:2 complete (1) 244:6 completed (1) 171:4 completely (2) 158:9;241:15

completion (1) 171:11 complex (7) 9:8:10:3.7.20:11:8: 12:18;131:24 compliance (12) 34:12;52:5;185:24, 24;186:18;189:6,12; 190:3,12;202:1,23; 203:15 complicated (1) 214:11 complies (1) 229:12 comply (6) 51:12;52:24;116:2; 142:21;186:3;254:9 complying (1) 115:24 component (3) 39:6;194:14,16 components (5) 38:20;39:12;71:17; 194:11;234:10 composition (2) 18:11;19:3 computer (3) 59:9;94:9;152:18 **Con** (2) 153:14:154:6 concern (4) 186:13.19:202:20: 203:13 concerned (1) 192:22 concerns (5) 51:7:97:18:98:12, 18:99:1 concerts (1) 159:13 conclude (2) 206:4;254:24 concluding (1) 206:2 conclusion (3) 21:4;100:10;237:1 conclusions (2) 167:18;231:15 conclusive (1) 158:7 condense (1) 69:17 condition (12) 38:21;46:6;51:11, 12;52:24;53:19; 118:8;126:13; 179:19;213:16; 216:17;238:21 conditioner (1) 145:22 conditioners (1) 145:12 conditions (25)

25:2;40:17;41:10; 50:24:51:7:53:18: 94:20.21:120:3: 132:3:162:16:202:7: 225:19:238:22,23; 239:7,10,12,15,17, 22;240:7;242:12; 249:3;252:8 conduct (1) 251:1 conducted (4) 35:2;200:13;238:1, 2 conduit (4) 73:22;74:6,16,21 conference (2) 154:6,9 confident (1) 167:5 confidential (4) 121:20;122:13; 123:3.14 configurations (1) 62:1 confined (1) 164:19 confirm (5) 17:13;26:7;125:24; 127:12:161:5 confirmation (1) 26:2confirmed (1) 158:11 confirming (1) 24:1confused (2) 139:21:215:21 confusion (1) 42:11 connection (1) 82:2 consequence (2) 172:15;173:8 **Conservation** (1) 9:13 conservatism (3) 93:21;118:6; 238:14 conservative (2) 119:24;152:5 consider (6) 68:1:135:11: 143:22,23;144:1; 162:1 considerably (1) 66:19 consideration (3) 85:1;115:18;239:7 considered (2) 29:7;71:18 Considering (1) 153:16 consistent (1)

169:23 consistently (3) 208:5.14.15 constitute (1) 116:12 constrained (1) 29:23 constraint (1) 29:22 constraints (4) 29:7,10;236:14,20 construct (1) 9:19 constructed (1) 62:9 constructing (2) 63:2;127:9 construction (24) 9:9:25:16:38:14, 18;40:18;41:18;48:1; 53:19,24;55:18,19; 59:20:62:16:65:2: 66:11,14;69:5;70:19; 72:23;129:21; 130:19;177:20; 192:5;195:15 consult (2) 123:1,20 consultant (2) 170:13:198:1 contained (5) 15:3:78:17:88:15: 120:22:122:13 contains (1) 101:7 contaminants (1) 165:1 contaminated (1) 203:23 contaminating (4) 203:21;205:18; 206:5:232:1 contamination (1) 232:1 content (2) 116:11;206:9 contention (1) 161:18 context (2) 138:13;195:10 continuation (1) 66:16 continue (2) 4:4;194:7 continuing (2) 22:2;183:11 contour (3) 113:21,21,24 contours (4) 111:8;113:20; 235:21:248:18 contract (2) 120:7;252:9

contractor (17) 11:10:12:2.10.11. 15,16;13:12,15,18; 34:11;35:2,17;45:20, 21:46:1:57:24:58:2 contractors (1) 46:8 contractual (2) 126:19;251:20 contributes (3) 80:5;104:21;163:7 contribution (2) 93:23;232:15 control (4) 40:15,20;133:11; 184:6 controlled (1) 48:14 convention (1) 214:16 conversation (1) 157:3 conversion (1) 81:7 convert (1) 131:12 Cooling (2) 182:11,17 coordinate (1) 12:20 copies (1) 229:5 copv(7)120:4,5,7;154:2; 155:17;204:8;229:19 coring (1) 58:7 corner (2) 86:18:107:14 corollary (3) 44:23;104:22; 175:10 corrected (2) 82:4;253:22 correction (5) 78:15,16;207:11; 253:19,20 corrections (5) 6:20;77:14;140:15; 207:13;211:2 correctly (10) 9:24;14:6;19:19; 38:3;40:20;94:2,4; 98:11;126:24;139:13 corresponded (1) 212:6 corresponding (1) 215:8 corridor (6) 59:19:61:16.18; 62:18;63:15;65:10 corridors (2) 61:7,22

costs (1) 174:19 counsel (3) 15:1:123:20: 229:11 count (1) 171:9 country (5) 130:15;132:19; 162:10:233:24; 241:20 couple (10) 40:8;78:21;79:13, 15;80:11;83:20; 148:4;166:23;179:9; 214:23 course (6) 80:2;88:24;95:10; 102:10;186:2;221:7 **Court (10)** 5:1;14:1;75:8; 96:6;138:23;177:18; 219:9,13,17,20 cover (3) 111:7;220:12; 235:20 covered (2) 14:21;226:14 covers (1) 41:10 crackling (1) 149:18 crane (13) 59:19:61:18:62:9: 63:3,5;64:2;65:16; 72:12,15,22;73:1; 74:18,20 create (1) 59:18 credentials (1) 185:11 credit (2) 111:10;153:7 criteria (15) 62:2;83:1,2,16,22; 84:15,16;85:2;98:17; 115:21;116:1,3; 120:16;135:21; 161:21 critical (1) 178:3 critique (1) 253:13 cross (4) 7:7;20:14;85:5; 193:24 **CROSS-EXAMINATION (12)** 8:12;34:3;40:6,10; 86:22;95:21;99:16; 137:22;138:1; 178:20,24;247:21 cross-examine (1) 208:24

crossover (1) 183:14 crushed (5) 18:6,9,10,13;19:9 culvert (1) 57:13 Culverts (3) 16:6,7,18 curiosity (1) 68:13 curious (5) 49:20;99:3;147:8, 10:150:1 currently (1) 192:5 curve (2) 191:21,23 curves (2) 48:18,19 cut (1) 60:2 cuts (2) 47:16:71:24 D Daniel (4) 4:15,23;5:3;6:4 dark (1) 46:14 dash (2) 187:24:204:5 data (62) 32:9,17;77:23; 78:2;80:13,13;82:1, 1;88:18;90:5,8,21; 95:7:96:24:97:4.9; 103:1;108:5,15,19; 109:4;114:10; 121:16:122:12.16: 123:6:127:7.12; 135:24:166:10.22: 175:14,15;187:4,14; 192:8;197:19,23; 198:1;202:1,5,9,9; 207:3,14;213:13,14, 18;214:15,23,24; 215:19;216:3,11; 217:3;220:7,13,22; 226:18:227:2.7; 235:16 database (1) 153:1 DataKustik (1) 242:9 date (5) 32:21;114:11; 126:2;242:24;243:16 dated (9) 6:9,14;50:16;76:9; 77:10;79:2;123:12, 18:133:7 David (1)

123:11 Davis (1) 223:2 dav (16) 89:14;100:4;118:9; 138:10:142:21: 149:8,12,13;150:5, 10,15:174:2,3; 200:20;202:8;214:13 day/night (1) 140:17 days (9) 145:24;157:5; 194:23;200:14,21; 214:12,18;215:7; 218:4 days' (1) 212:15 daytime (1) 81:19 dBA (6) 78:13;122:16,17, 18;141:19;168:19 DC (1) 133:12 dead (1) 67:11 dead-ends (1) 147:22 deal (5) 16:13:31:7:35:3; 162:13:223:18 dealing (1) 43:5 deals (1) 26:10 decibel (10) 83:6;119:8;149:24; 150:22;155:2;169:9; 174:8:182:15: 189:21;201:16 decibels (77) 78:7,13;80:1,2,7, 11;83:8,23;84:8; 89:3,4;90:16,22;91:3, 13,19;93:5;95:4; 100:4,4;102:9,14,15, 22;103:5,7,23,23; 104:1;105:15,18,24; 111:15;114:13; 116:5,7,8;118:24; 138:10:139:18: 143:5;144:12; 150:24;151:13,17,18, 21,22;152:4,9;155:3; 168:15;173:17,21; 174:1,2;179:16; 180:7,11;181:5; 196:4,6,21;197:7; 216:13,22;217:2,5; 218:14;230:21; 231:19:237:2,4,22, 23;238:6;249:13

decide (1) 101:17 deciding (1) 214:6 decision-making (1) 202:2 decommissioning (5) 16:13,16;17:8,15, 19 Deere (2) 189:14,15 defined (2) 18:7;239:11 defining (1) 195:23 definitely (2) 72:9;229:8 definition (2) 208:10:240:6 definitive (1) 70:5 degree (3) 89:8;104:18;105:1 delineated (3) 20:18;71:21;73:10 deliver (1) 198:5 delta (3) 80:8;83:1,21 demonstrate (1) 157:23 demonstrated (3) 162:6:163:2.11 demonstrates (1) 154:15 **DEP** (3) 201:2,14;203:14 **Department (6)** 5:9;34:15;35:23, 24;50:15;200:3 depend (2) 39:16:104:18 dependent (1) 43:13 Depending (1) 37:12 depends (1) 24:4depicted (1) 87:21 **DES (12)** 13:3,4,4;18:15,18; 23:3;25:8;32:24; 33:1;41:5;46:6;50:23 describe (11) 19:3;29:10;49:21; 61:12,21;146:17; 148:4,5;163:18; 177:8,10 described (4) 9:22;42:8;250:21; 252:18 description (1)

122:19 descriptions (3) 9:12,12;199:16 deserves (2) 245:13,16 design (17) 6:1,2;23:23;29:7; 33:7.8:48:22:49:3: 57:19;62:2;67:22,24; 71:7:80:7:128:5: 172:12;206:16 designed (8) 20:12:22:11:23:11: 30:5;131:18;144:24; 241:9,9 designer (1) 16:16 designs (1) 128:2 detail (2) 19:15:158:16 detailed (2) 88:22;101:6 details (2) 64:24;126:20 determine (5) 12:16;189:5,10; 210:12;228:13 determined (1) 56:16 develop (1) 68:2 developed (3) 38:19;53:7;113:6 developer (8) 41:16,21,22,24; 53:10:120:11; 174:18:177:5 developers (2) 233:14:242:11 developing (2) 57:24;120:12 development (2) 5:20;233:20 device (1) 182:5 DG200266 (1) 123:18 diagram (2) 63:13;67:2 diameter (3) 192:12.13:225:24 diameters (1) 127:11 diff (1) 196:9 difference (16) 78:9;97:4;110:2,4; 112:7,16,18,19; 119:21:149:17; 150:16:185:5: 202:12;203:2,12; 243:23

differences (3) 27:21:128:15: 153:3 different (44) 26:5:43:9,14,15, 15;61:10;62:1;89:4; 95:13,14,14;98:4,5; 110:9;116:10,11,12, 17,18;117:5;120:13; 127:11:134:14,15; 141:17;144:5;148:6; 151:23;161:20; 164:2;167:13; 179:21;182:13; 189:11;195:11; 198:3;201:5;202:6; 213:4;216:24; 228:20;249:21; 251:5;253:1 differential (1) 48:10 differently (1) 143:22 difficult (7) 43:11,17;54:18,21; 89:5;249:1,16 difficulties (1) 82:24 difficulty (1) 81:16 digital (1) 152:24 digress (1) 118:15 dip (1) 48:13 **DIR (4)** 49:13,15;50:11,14 **DIRECT** (18) 4:11;8:19;34:6; 49:17;75:11;82:10; 100:19,20:133:7; 179:1;199:13,24; 201:7;204:2,4;205:3; 215:18;217:7 directing (2) 8:18;16:4 direction (1) 66:7 directions (2) 93:19:98:4 directly (1) 101:11 disagree (4) 84:23;208:20; 253:21,24 disagreement (1) 161:8 disastrously (2) 173:12,13 disclaimers (2) 126:9,12 disclose (1)

123:3 discovering (1) 165:16 discussed (6) 8:21;17:17;47:4; 156:23;199:16; 222:16 discussion (11) 17:22;18:2;61:14; 77:22:80:3:121:15; 140:17;157:7; 190:18:247:24; 250:13 discussions (3) 78:3;124:17; 146:20 dismissed (1) 75:2 disposed (1) 16:22 disruption (1) 39:14 distance (11) 89:20;92:11;98:19, 20;107:24;224:2; 234:19;235:4;237:9; 238:12,21 distances (7) 92:15,16;178:4,9; 235:7;237:19;238:16 distant (1) 148:13 distinction (1) 198:14 distributed (2) 13:24;14:4 disturbance (4) 27:24:28:1.2.8 disturbed (7) 9:8,23;10:2;27:22; 28:6,23;42:16 ditches (2) 57:1,18 ditching (1) 56:18 docket (4) 6:6;76:8;77:5;79:2 document (40) 11:3;14:24;22:8; 27:3;41:7;51:9; 57:12;64:16;100:23; 101:1;107:4;121:2; 122:14;123:4,8,10, 11,14,18;124:5,5,12; 133:9,14;134:9,20; 139:5,10;140:1,6,8, 17;141:16;156:24; 157:13,14;199:11; 217:11;222:24; 227:21 documentation (1) 153:21

25:23 documenting (1) 136:18 documents (7) 121:6,19;123:23; 124:14;126:19; 134:8;141:23 dog (1) 149:23 dogs (4) 148:13;150:4; 174:3:210:19 dominate (1) 10:21 done (36) 9:14,17,19;10:8; 13:9,11;20:22;24:20; 34:11;37:8;54:6; 56:12;58:6,9;61:15; 66:15;83:11;86:2,10; 94:9;101:4;105:22; 126:2.3:130:3: 152:18;166:24; 195:13;204:21; 205:2;237:15,23; 238:23;249:20; 250:18;251:9 door (1) 173:19 **DOT** (1) 12:24 double (1) 66:13 down (32) 13:8,10:28:18; 44:1;64:23;67:7; 73:14:86:7,9:87:18, 19;95:9;103:22; 107:13;116:19; 132:24;147:8; 168:22;200:9;212:9, 12,24;218:7,7,8,9,14, 23;220:1;224:14,18; 225:5 downs (1) 145:7 downward (2) 239:17;240:6 downwind (9) 93:19;118:4;128:2; 132:18:238:16; 239:10,15,22;240:7 draw (1) 232:24 drawings (2) 19:15;56:19 Drive (4) 4:19;56:3;68:6; 72:21 driven (1) 64:2 driveway (11) 86:10,11,11;87:19;

147:3,11,15,17,19; 148:1.3 driving (3) 56:3;150:17; 210:19 drop-off (3) 28:14,20,22 droughts (1) 31:7 due (2) 163:1,9 duly (2) 4:24:75:7 DUPEE (1) 214:20 duration (1) 159:23 during (27) 9:8;16:10;48:22; 62:16;65:2;66:11; 73:18;79:18,22;80:2, 19:89:11.14.16: 100:4;110:18; 148:23:149:8.9: 150:5;178:24; 211:23;212:16,20; 215:7,9;221:7 Dynamic (1) 153:14 E earlier (19) 29:16:40:9:46:23; 51:5;111:12;113:10; 114:22;138:16; 144:10:151:11: 160:10;180:12; 191:10,22;228:2; 235:16:243:12: 249:7;253:13 early (1) 138:9 earned (1) 183:5 easier (2) 62:15;216:6 easily (1) 207:19 east (2)98:4:148:15 easterly (1) 93:12 edge (4) 27:22,24;107:18; 113:22 educate (2) 138:5;159:4 education (2) 183:11.23 Edwards (2) 33:23:137:6 effect (4)

documented (1)

101:14:151:23; 171:12:197:10 effective (2) 126:14:230:5 effects (2) 97:15:228:15 efficiency (1) 68:7 efforts (1) 25:13 egregiously (1) 174:22 eight (1) 76:1 Eighteen (1) 188:1 either (16) 6:21;10:10;20:3; 28:15,23;35:17; 37:12;44:5;46:20; 49:16;57:1;71:3; 77:15;222:22; 234:15.20 elaborate (1) 71:8 electric (1) 188:15 electrical (2) 65:18;191:23 electricity (1) 64:7 electronic (6) 139:9:155:17: 157:14:187:20: 199:11:217:11 **Electronically (3)** 36:6,12:153:12 elevation (5) 27:21;28:3,10; 43:4:153:1 elevations (2) 27:16:43:6 eliminate (1) 211:8 eliminates (1) 211:9 eliminating (1) 163:14 else (9) 45:24;67:15;68:13; 83:7:105:4:113:2; 115:12,13;203:19 else's (1) 93:6 email (1) 243:3 e-mail (5) 242:4;243:2,15,18; 244:4 emanating (2) 133:4;234:14 eminently (1) 167:21

emission (2) 179:16:180:1 emitting (2) 119:7:122:18 empirical (1) 250:21 employed (4) 5:5,7:67:20:75:18 **Employing** (1) 153:15 enclosed (1) 51:1 encountered (1) 192:14 encourage (1) 158:3 end (20) 38:17;55:7,11,19; 65:2,6;67:11;119:4; 122:1;129:22; 130:18,20,22;131:22; 139:18:167:18: 173:7;177:22; 193:24;248:6 ended (1) 196:11 ends (1) 64:4 Energy (7) 11:21:76:2:132:1; 133:21:136:22; 161:7:189:14 engage (1) 158:3 engineer (21) 5:11,14,18,24;6:1; 52:4,8,10:53:8,9,23; 54:4,4;58:4;170:24; 171:5,7,13,16,20; 172:11 engineered (1) 172:12 Engineering (11) 5:9;26:6;29:7; 53:1;54:3;56:11; 58:3;127:13;153:16; 250:19,21 engineers (2) 35:4;184:6 engines (4) 109:17:163:22,24; 164:4 enjoy (2) 114:24;115:4 enough (12) 55:14;65:17;70:22; 135:23;162:8; 164:20;166:24; 190:1;243:17,18; 250:8,11 ensure (2) 51:19:53:21 entire (7)

20:8;62:17;104:11, 12:105:17:212:15: 213:9 entirely (2) 49:2:182:23 entitled (1) 228:13 environment (6) 91:8;145:6;151:8; 195:17;196:21;197:6 environmental (15) 25:20;40:10,11,14, 24;41:11,13;50:16; 133:10,16:144:18; 200:3;205:11;223:3; 228:16 envision (1) 48:12 **EPA** (11) 31:19;134:8;139:5, 15:140:1,16,21; 141:11.12.16:143:14 **EPA's** (1) 140:3 **Epsilon** (4) 75:20;76:5;80:13; 82:1 equal (3) 105:4;139:2;225:4 equals (1) 224:4 equations (1) 233:15 equipment (11) 6:3:55:8.15; 106:15;146:19; 149:8,17:150:15; 159:19;160:3;181:3 equivalent (1) 239:11 erected (1) 221:7 erosion (2) 40:15,19 erratic (2) 37:20;39:17 erratics (2) 37:5;38:23 essentially (6) 67:11;72:1;159:17; 168:21:175:13; 214:12 establish (3) 25:1;34:21;61:15 established (2) 73:6;83:17 estimate (3) 109:2;140:21; 152:5 estimated (2) 234:9:237:11 et (7) 45:22;128:12;

148:12,12;184:8,14; 238:18 ethic (1) 184:15 ethics (3) 185:15,21;189:18 Europe (1) 81:5 evaluate (3) 12:3:101:10; 231:13 evaluating (2) 101:12.17 Evaluation (2) 138:15:202:1 evaluations (1) 202:6 evasive (1) 125:20 even (18) 28:15,15;74:21; 81:11;87:18;100:12; 102:21;115:7;134:1; 136:9:144:19: 167:14;189:23; 231:9;237:16;244:5; 249:5;250:1 event (3) 196:19;203:9,11 events (9) 30:18:32:11:105:3; 183:13.13:211:10: 218:22;219:1;220:20 Everybody (4) 83:7;115:13; 202:22;208:11 everyone (5) 9:3;93:6;193:20; 229:18:236:12 everywhere (2) 84:17;198:17 evidence (2) 32:2,8 exacerbate (1) 31:1 exact (4) 70:13;213:3; 222:21;227:13 exactly (12) 12:19;13:10;28:5; 30:2;107:2,21; 146:18:147:8: 194:19:205:24; 214:9;226:6 exam (1) 185:9 **EXAMINATION (3)** 4:11;71:1;75:11 examined (1) 196:18 examining (1) 192:24 example (18)

16:18:28:7:39:2: 42:22:84:22:90:21: 110:15:115:8; 117:14;173:14,16; 176:2;181:3;182:12; 183:21;187:2;196:4; 252:19 examples (1) 247:1 excavated (1) 60:3 exceed (2) 156:15;157:24 exceeded (1) 126:15 exceeds (1) 195:21 except (1) 151:4 excerpt (1) 233:9 excess (1) 237:20 exclude (3) 205:17,18;206:4 Excuse (20) 4:21;22:6,15;23:7; 26:18;54:23;76:10; 80:23;96:7;118:18; 125:16:130:22; 134:5;140:5;141:12; 155:15:178:12: 201:21;204:3;205:17 exercise (2) 119:23:224:6 exercises (1) 246:22 Exhibit (30) 6:10.16:15:2: 21:10,19:36:3,10,12, 16:41:5:76:10:77:6. 11:86:15:87:22: 107:11,12;113:19; 132:17;153:11; 155:22;179:3,6; 187:16;199:12; 200:1,7;209:7; 242:22;244:2 exhibits (4) 41:5;167:10; 227:23;233:1 exist (5) 130:14:133:21; 134:1,18;239:12 existed (2) 103:10,13 existence (2) 11:20:145:17 existing (9) 27:15:28:19:29:21; 31:11;63:14;109:6; 129:5;160:6;238:4 exists (5)

131:24;133:22; 135:16:180:10.21 expands (1) 104:11 expansive (1) 14:5 expect (7) 20:11:42:23; 102:11;113:9;120:2; 176:3:196:1 expectation (4) 60:15;195:12; 196:3;252:24 expected (15) 30:24;31:3,6,10, 15;32:4,6;33:4;45:9; 61:21;78:12;90:13; 112:11;211:24;212:7 expecting (1) 138:21 experience (15) 5:17,19;13:17; 33:8;50:2;91:10,23; 92:1;112:1;132:2; 139:16;143:16; 151:8;183:10;185:11 experienced (7) 34:11;45:19,21; 46:5,10;216:16; 224:21 experimental (3) 175:13:228:13: 252:2 expert (3) 20:23;69:4;164:21 experts (2) 172:3;176:17 explain (15) 24:19;51:11;72:13; 77:19:87:12:96:10: 103:14:126:11: 127:24:138:11; 148:16;162:12,22; 202:19;206:11 explained (2) 180:12;244:23 explains (3) 139:10;202:2; 208:3 explanation (1) 116:24 exposed (3) 164:1;225:6; 226:20 expressed (1) 98:18 expression (3) 44:16,20;45:3 extent (4) 19:4;24:17;230:2; 232:14 exterior (1) 143:1

extracted (1)	138:17:177:6.13.21:
215.10	100.00
213.10	100.22
extreme (5)	farms (1)
30.18.31.16.21.	136.9
22.5.22.2	forthor (2)
32:5;55:5	larther (2)
extremely (5)	13:8;108:1
81.13 13.84.9 9.	fashion (1)
01.15,15,04.7,7,	
8/:1/	101:8
	fate (1)
F	16.17
L'	10.17
	features (1)
facility (1)	16.14
	<b>F</b> -h-max (1)
9:20	February (1)
fact (11)	228:12
33.1.51.20.52.10.	fed (1)
55.1,51.20,52.10,	
69:7;70:3;82:22;	210:20
167:20:175:12:	feeding (1)
227.22.221.0.252.12	150.5
227:25;251:9;252:12	150.5
factor (2)	feel (5)
29.24.188.3	167.4.172.4.
for a formed (1)	109.15.210.22.252.6
lactored (1)	198:15;219:22;252:6
215:13	feet (43)
faintly (3)	28.8 11.55.3 11 11
240.4.24.250.2	10 10 14 01 00 61 0
249:4,24;250:3	12,13,14,21,22;61:9,
faintness (1)	9,10,19;62:4,11;63:1,
240:15	21.64.1.65.16 20.
249.13	21,04.1,05.10,20,
fair (15)	66:4;70:13;74:5,14,
43:10:45:16:	15:86:9:87:3.8:92:6.
172.10 18.181.14 22	8.06.8 0.07.3.00.5.
1/2.10,18,181.14,22,	8,90.8,9,97.3,99.3,
24;193:16;195:19,22,	10/:/;14/:1,24;
24:208:21:218:12.13.	150:4:178:6.7:
21,200.21,210.12,10,	222.10.236.2
	222.10,230.2
fairly (5)	telt (2)
20:10:86:12:88:19:	106:10:207:10
120.18.252.6	fotob (1)
129.10,232.0	
fall (2)	224:19
25:3:26:22	few (10)
folls (1)	18.14.83.4.07.2.
	10.14,03.4,97.2,
19:24	178:9;185:4;199:13;
Falmouth (1)	204:10:209:5:
200.5	218.17.224.8
200.3	210.17,224.0
familiar (16)	field (2)
16:15.17:17:16:	149:6.10
22.12.42.2.44.4.	fields (1)
33.12,42.2,44.4,	fields (1)
47:1;60:21;142:10;	38:23
227:19:228:8.11.17	Fifteen (1)
10.220.21.221.9	21.2
19,229.21,251.8	21:2
families (1)	figure (9)
115:8	23:3:76:23:152:16:
fon (1)	156.2 6.167.16
lan (1)	130.2,0,107.10;
148:8	172:17;217:15;249:8
far (20)	figures (3)
40.02.56.10.62.12.	200.24.221.2.12
40:23;56:12;63:13;	209:24;221:3,12
68:4;95:8;106:22;	filed (4)
107:3.19.108.8	78:4.22.24.121.19
115.12.172.2	filled (1)
113:13;1/3:2;	meu (1)
177:24;179:10;	60:1
192.15.221.23.	fills (2)
172.13,221.23,	47.16.71.04
222:2;249:4;250:3,8,	4/:10;/1:24
11	Filter (3)
farm (10)	158.18.230.12 19
47.00.116.6.106.4	<b>P</b> 1 (7)
4/:22;116:6;126:4;	nnal (7)
135:11;136:1;	38:19;39:5;66:18;

83:13:149:12.13; 166:22 finalized (1) 60:7 finally (3) 62:8;71:20;84:11 find (20) 14:17:36:15:72:5; 81:14;105:10,11,13, 17;120:24;144:18, 19;153:13;155:10; 173:23;182:17,20; 187:4;222:20; 251:11;253:3 finding (2) 69:1;231:8 findings (1) 168:14 fine (5) 19:9;51:4;184:13; 224:7,11 fines (1) 18:14 fingers (1) 100:22 finish (2) 232:19;254:11 finished (2) 192:7;193:23 firing (1) 84:22 firm(7)41:18;51:18;53:2; 54:3;79:17;160:23; 176:16 **first (35)** 9:4:13:13:42:7.22; 44:2,21;50:19;62:15, 23;63:5,18,22;65:15; 67:5;73:23;74:13,16, 17;79:15;104:15; 132:9;137:15;142:4; 149:8;156:4;186:15, 19,23;191:5;192:20; 228:9;239:4;244:5; 253:14;254:21 firsthand (3) 110:17;135:18; 149:4 Fish (1) 136:21 fit (2) 168:11;236:5 five (23) 28:7;54:15;106:20; 108:5;122:8;146:11; 194:21;197:15,18; 198:20;199:6,15; 206:21;210:3;212:9, 24;220:5;221:3; 222:2,6;232:12; 235:15;240:19 fix (1)

94:23 flat (1) 20:10 flatbed (2) 63:9:73:2 flooding (1) 31:8 floor (2) 103:18,24 flow (4) 18:24;19:23,24; 20:11 flowing (1) 149:19 flows (1) 19:12 flying (3) 69:3;110:16; 115:14 focusing (1) 76:1 folks (4) 56:11;111:20; 135:19;209:22 follow (1) 57:5 followed (3) 22:22;53:12;61:11 Following (4) 46:15;51:1;97:11; 156:4 follow-up (1) 143:10 forced (1) 20:13 forest (2) 27:23;28:11 forested (1) 27:10 forget (1) 213:2 forgetting (1) 241:4 forgot (1) 70:10 form (2) 82:6;101:3 Formula (1) 47:20 forth (8) 22:12:23:7.9; 64:12;131:17;162:4; 167:21;169:19 Forty-one (1) 91:13 forward (2) 12:10;253:23 found (11) 147:9;154:16; 159:4;177:19; 188:17;189:20; 190:11:216:9; 230:11;237:15;238:4

four (9)	
14:4;42:7;44:2;	G
92:18;149:15;	
188:11;224:24; 226:13:232:12	g
fourth (1)	
6:16	_
<b>Frankly</b> (2) 103·20·116·1	g
free (1)	
219:22	
<b>Irequencies (6)</b> 116:18:117:6:	
158:10;160:13;	
161:23;163:1	g
<b>frequency</b> (17) 31:21:32:11:	σ
116:11;128:18;	5
130:7;153:17;	g
154:18;157:2;159:6; 162:2:164:5:198:3.9:	G
206:9,21;226:7;	U
249:20	g
<b>frequent (4)</b> 30:17:31:16:32:4:	G
33:3	
frequently (2)	G
32:1;40:15 fresh (2)	
164:20;243:9	g
Frohling (4)	
7:9,10,13;70:10 Froling (2)	g
85:7,8	
front (6)	G
95:24;124:14; 155:13:167:23:	o
230:16,23	9
full (5)	g
45:14;198:9;199:8; 205:13:206:20	
fully (2)	gi
44:14;131:16	_
40:21	g
functions (1)	g
54:7	~
145:10.20.22	g
further (9)	G
33:18;44:1;50:12;	~
137:3:158:4:248:18	g
furthest (1)	g
54:17 future (1)	
111:1	
C	6
<u> </u>	U
G200266 (1) 123:11	
gave (1)	

141:2	
EIGER (1)	2
15:8	gos
eneral (10)	1
44:19;45:19;61:1;	gov
79:19,23;92:11;97:1;	1
98:6;117:16;173:5	gra
enerally (16)	1
22:23;26:15;29:9;	gra
47:10;53:17;57:5;	1
81:4;93:2;103:5;	gra
127:18;145:13;	4
160:18;169:2;	gra
210:22,23;225:1	9
enerate (2)	gra
117:23;119:9	8
enerated (1)	2
128:10	gra
enerating (1)	
119:13	2
enest (1)	gra
7:22	2
entle (1)	gra
48:6	1
Gentlemen (3)	-
8:14;33:18;34:5	gre
eorge (6)	1
204:6;205:10,16;	4
206:3;228:1,12	2
eotechnical (1)	gre
58:8	4
ets (4)	Gr
63:23;132:13;	-
150:6;173:22	1
GIS (1)	Gr
90:7	8
ist (1)	8
78:5	9
iven (7)	
20:6;60:13;61:4;	1
71:9;87:6;96:9;103:8	2
ives (2)	gri
170:3;253:18	2
iving (2)	Gr
116:24;172:6	8
lacial (3)	
37:5,20;38:23	1
lass (1)	gro
45:14	2
Hand Hand Hand Hand Hand Hand Hand Hand	
242:10	1
oal (1)	4
80:7	gro
oes (11)	4
64:12;74:2;113:22;	gro
117:3,18;150:9;	-
174:14;201:20;	gro
206:11;208:2;218:8	4
Good (17)	gro
4:3;8:16;34:5;	
44:13;46:10;50:3;	gro
69:17;75:13;127:12;	2
138:3.4:161:14:	gra

109.22,174.7,
211:19;243:17,18
gosh (1)
1/0:0 government (1)
134·7
grade (2)
17:12;56:22
graded (3)
17:11;19:7;28:18
grades (4)
27:15;48:6,7;56:16
granted $(1)$
97.22 granh (4)
88:22:167:11.15:
221:11
graphs (4)
79:24;102:6;221:4;
226:2
grass (2)
25:5;56:4
gravel (8)
18:0,8;19:2,2,8;
oreat (6)
162:13:182:10:
216:10;223:5;
233:18;235:22
greater (1)
215:6
Green (6)
56:8,9,10;63:11, 14:221:10
14,221.19 Gregg (22)
8.1.26.22.79.6.18
84:20;106:23;107:7,
9,13,15,23,24;108:1,
3;109:10,10,11,12,
15;148:12;222:4;
224:17
224:17 grid (4)
224:17 grid (4) 235:7,18,19,20 Groton (6)
224:17 grid (4) 235:7,18,19,20 Groton (6) 83:12:138:18:
224:17 grid (4) 235:7,18,19,20 Groton (6) 83:12;138:18; 139:24:141:15.20:
224:17 grid (4) 235:7,18,19,20 Groton (6) 83:12;138:18; 139:24;141:15,20; 186:7
224:17 grid (4) 235:7,18,19,20 Groton (6) 83:12;138:18; 139:24;141:15,20; 186:7 ground (10)
224:17 grid (4) 235:7,18,19,20 Groton (6) 83:12;138:18; 139:24;141:15,20; 186:7 ground (10) 28:19;64:13,21;
224:17 grid (4) 235:7,18,19,20 Groton (6) 83:12;138:18; 139:24;141:15,20; 186:7 ground (10) 28:19;64:13,21; 73:23;80:21;95:3;
224:17 grid (4) 235:7,18,19,20 Groton (6) 83:12;138:18; 139:24;141:15,20; 186:7 ground (10) 28:19;64:13,21; 73:23;80:21;95:3; 111:5;224:14;236:2, 222:14;236:2,
224:17 grid (4) 235:7,18,19,20 Groton (6) 83:12;138:18; 139:24;141:15,20; 186:7 ground (10) 28:19;64:13,21; 73:23;80:21;95:3; 111:5;224:14;236:2, 22 ground heat (1)
224:17 grid (4) 235:7,18,19,20 Groton (6) 83:12;138:18; 139:24;141:15,20; 186:7 ground (10) 28:19;64:13,21; 73:23;80:21;95:3; 111:5;224:14;236:2, 22 ground-base (1) 240:11
224:17 grid (4) 235:7,18,19,20 Groton (6) 83:12;138:18; 139:24;141:15,20; 186:7 ground (10) 28:19;64:13,21; 73:23;80:21;95:3; 111:5;224:14;236:2, 22 ground-base (1) 240:11 ground-based (1)
224:17 grid (4) 235:7,18,19,20 Groton (6) 83:12;138:18; 139:24;141:15,20; 186:7 ground (10) 28:19;64:13,21; 73:23;80:21;95:3; 111:5;224:14;236:2, 22 ground-base (1) 240:11 ground-based (1) 132:21
224:17 grid (4) 235:7,18,19,20 Groton (6) 83:12;138:18; 139:24;141:15,20; 186:7 ground (10) 28:19;64:13,21; 73:23;80:21;95:3; 111:5;224:14;236:2, 22 ground-base (1) 240:11 ground-based (1) 132:21 ground-level (1)
224:17 grid (4) 235:7,18,19,20 Groton (6) 83:12;138:18; 139:24;141:15,20; 186:7 ground (10) 28:19;64:13,21; 73:23;80:21;95:3; 111:5;224:14;236:2, 22 ground-base (1) 240:11 ground-based (1) 132:21 ground-level (1) 225:3
224:17 grid (4) 235:7,18,19,20 Groton (6) 83:12;138:18; 139:24;141:15,20; 186:7 ground (10) 28:19;64:13,21; 73:23;80:21;95:3; 111:5;224:14;236:2, 22 ground-base (1) 240:11 ground-based (1) 132:21 ground-level (1) 225:3 group (2)
224:17 grid (4) 235:7,18,19,20 Groton (6) 83:12;138:18; 139:24;141:15,20; 186:7 ground (10) 28:19;64:13,21; 73:23;80:21;95:3; 111:5;224:14;236:2, 22 ground-base (1) 240:11 ground-based (1) 132:21 ground-level (1) 225:3 group (2) 177:4,12 magnet (1)
224:17 grid (4) 235:7,18,19,20 Groton (6) 83:12;138:18; 139:24;141:15,20; 186:7 ground (10) 28:19;64:13,21; 73:23;80:21;95:3; 111:5;224:14;236:2, 22 ground-base (1) 240:11 ground-based (1) 132:21 ground-level (1) 225:3 group (2) 177:4,12 groups (1) 235:14
224:17 grid (4) 235:7,18,19,20 Groton (6) 83:12;138:18; 139:24;141:15,20; 186:7 ground (10) 28:19;64:13,21; 73:23;80:21;95:3; 111:5;224:14;236:2, 22 ground-base (1) 240:11 ground-based (1) 132:21 ground-level (1) 225:3 group (2) 177:4,12 groups (1) 235:14 growing (1)

43:8 grows (1) 25:6 growth (1) 25:1guarantee (7) 119:20,21;120:14; 125:10:167:1; 251:14,15 guaranteed (8) 78:14;94:11,15; 119:12;120:6; 125:18;179:13; 251:24 guaranteeing (5) 78:10;119:3,6; 120:18;175:16 guarantees (2) 118:14;180:1 guaranties (1) 118:16 guaranty (36) 94:14;118:17; 119:15;120:4,9,20; 122:1,19,22;124:8, 11,13,16,20;125:1, 16,22;126:1,7,14; 169:4,7,11,12,17; 170:9,14;172:2,17; 179:11,14,24;250:14, 15,16;251:6 guess (69) 24:4;38:22;45:4; 51:3;52:18;58:10; 80:9;81:9;82:19; 83:8;84:14;88:16; 89:21:91:11:94:17; 95:6;96:19;97:7,11, 21;99:6;107:22; 108:7:110:3:112:13; 114:1;117:1;121:20; 125:19:131:20; 134:12;135:13; 136:12,19;139:11; 142:1,4,14,16;143:7, 10,18,21;144:2; 147:13;154:6,20; 156:3;157:1,8,19; 159:10;160:8; 162:19;166:23; 170:4,23:174:9; 175:7;178:2,3;214:3; 215:21;237:14; 238:9;241:18; 248:23;250:5;254:24 guidance (3) 133:8;134:8,17 guidelines (5) 135:5,9,21;136:23; 141:22 gunshots (1) 84:21 guy (1)

45:14 guys (2) 45:23:68:22 Η half (13) 11:1;45:14;80:14; 88:20;89:1;92:18; 95:10:102:10:104:4. 8;122:7;192:20; 193:5 half-hour (1) 150:14 Hampshire (21) 5:15;8:15;18:6; 22:5,10,18,21;23:8; 30:18;31:20;32:24; 33:12;34:15;46:17; 50:7;60:22;84:12; 99:19;113:1;138:15; 152:24 hand (1) 252:3 handle (1) 129:8 handled (2) 176:16;251:22 hands (1) 254:7 happen (6) 93:16:105:12; 125:1;196:14; 199:20;243:20 happened (2) 37:13;177:10 happening (2) 203:18;215:7 happens (3) 174:10;231:14; 242:16 happy (1) 42:17 hard (3) 69:1;105:11;212:8 hardware (1) 103:16 harmful (1) 162:11 head (3) 11:19;72:21; 227:14 health (2) 24:3;133:17 hear (11) 29:19;87:18;91:1, 12,21;114:16;115:11, 15;116:3;174:18; 249:4 heard (19) 21:11;24:18;44:16; 57:7;84:21;92:3,17; 94:2;97:18;113:11;

118:18:144:10; 164:9.11:166:8: 181:22;191:11; 204:16:249:6 hearing (8) 4:1;21:4;69:22; 115:4;137:19; 149:18:236:23:255:2 heated (1) 145:10 heavily (1) 113:6 height (16) 128:20;130:8; 224:15;234:12,12,15, 24;235:1,2;236:1; 237:9;238:12,20; 240:13,14;242:19 held (1) 154:7 helicopters (3) 68:19:69:4.8 help (7) 15:16;87:22;88:16; 138:5;171:16,19; 186:21 helpful (1) 155:6 helps (1) 66:9 Here's (2) 107:13:152:6 hertz (6) 127:16,16;154:19; 158:23:160:14; 197:17 Hessler (7) 204:6.16:205:10: 206:3;228:2,12; 253:17 Hessler's (3) 205:16:208:17; 231:15 high (13) 102:24;114:3; 119:1;122:1;128:13; 155:1;161:10,16,23; 162:7;167:18;212:6; 213:5 high/low (1) 164:5 higher (9) 102:18:104:21; 117:12;118:12; 119:4;168:9,15; 169:10;185:14 highest (6) 31:20;122:15; 170:1;179:19; 212:22;240:2 high-frequency (1) 206:13 high-level (1)

80:16 highway (1) 91:21 Hill (3) 44:4;48:12;180:6 hire (1) 45:24 hired (5) 12:10,15;68:7; 174:15:189:9 hires (2) 41:13:176:4 hiring (1) 49:24 hit (2) 60:4;76:17 **HMMH** (1) 202:4 Hmm-hmm (1) 192:2 hold (1) 102:11 hollow (2) 87:20;177:4 home (8) 86:9;87:7;91:10, 21;95:1;96:18;99:3; 143:2 homes (3) 83:5:98:14:177:24 hope (2)43:3:193:3 Horse (1) 177:4 hour (16) 81:1,7;150:14; 193:5,5;224:8;227:9, 12,17;230:9,9,10,11; 240:20,22;241:1 hours (12)194:24;195:1,2; 200:20;214:13,18; 215:13;247:10,10,12, 13;248:1 house (20) 88:20;89:7;90:9; 93:6,6,9,14;94:1; 95:8;145:10,23; 146:2;150:20; 151:13,14,17;173:20; 176:11:190:10,11 houses (1) 98:22 house-side (1) 37:5 How's (1) 182:9 hub (7) 117:22;128:20; 130:8:235:2:236:1; 240:13:242:19 hub-height (1) 241:5

huge (2) 70:8:252:19 human (2) 145:9:153:17 humming (1) 145:11 hundred (8) 23:22:38:5:97:3; 118:21;213:4;232:4; 236:24:237:12 hundreds (1) 241:19 hundredths (1) 224:8 HVAC (8) 91:17;111:11; 112:2,6,9,19;116:7; 128:11 hypothesize (2) 248:12,15 hypothetically (1) 248:19 Τ **IACOPINO (35)** 21:18,22;36:4; 41:4;67:18,19;86:3, 13,17,20;88:11; 121:3;155:16; 157:11:187:12.15.19. 23;188:4,10,14; 192:23;193:6,8,12; 199:9:209:7,15,18, 21;217:10;228:7; 229:10;246:6,9 idea (3) 61:1;211:22; 226:12 ideal (1) 44:11 ideally (1) 72:3 ideas (1) 158:7 identical (1) 221:14 identified (1) 133:12 identify (3) 107:10;123:22; 156:22 Ignatius (7) 58:21,22,23;70:2,4, 7,12 illustrated (1) 139:6 imagine (2) 22:20;49:24 immediate (1) 147:5 immediately (1) 156:4

Impact (12) 27:8:29:3.4:82:3: 87:14:91:10:92:21; 109:5:136:23:196:8: 202:1.5 impacted (2) 29:18;89:15 impacts (15) 16:9;71:22;73:5; 83:24;93:23;101:10; 109:3;134:12; 135:12,24:136:4,5,8: 164:6;195:19 impervious (5) 13:24;14:4,11,21; 18:7 implies (1) 22:4 imply (1) 161:15 implying (1) 142:2 important (9) 70:3;96:22,22; 128:8:161:6:185:23: 201:9,13;227:15 imposed (3) 139:23;141:4; 186:6 impossibility (1) 93:16 inaudible (1) 250:11 INCE (3) 184:14;185:16,20 inches (4) 28:16;70:14;223:4, 5 include (8) 34:16:51:21; 106:10:111:6:153:5. 6:202:6:210:24 included (8) 18:16;20:13;60:19; 179:2;210:10,21; 238:15;239:18 including (3) 109:1;125:13; 245:19 incorporate (1) 233:15 incorporated (4) 33:15;39:10,20; 214:8 incorrectly (1) 78:8 increase (5) 90:18;91:4;128:17; 130:6;230:13 increased (1) 230:19 increases (3) 31:20;128:19;

197:6 increasing (2) 31:15:130:8 increasingly (4) 30:17;31:16;32:4; 33:3 increment (1) 80:8 independent (3) 41:17,20,23 indicated (2) 72:14:190:21 indication (1) 92:20 individual (2) 96:3;218:21 individuals (4) 35:9;54:8;134:22; 177:5 indoors (1) 150:22 indulge (1) 228:4 industrial (2) 113:5;133:21 industry (5) 129:11;132:19; 140:20;169:24; 175:19 infiltrate (2) 19:22;20:1 infiltrates (1) 19:14 inflate (1) 227:3 influence (1) 82:21 information (23) 14:16;51:20,21; 52:17,19:87:2,6; 88:23;107:5;121:11; 127:13:131:14,23; 133:16;142:12; 162:14;165:12; 169:21,22;198:4,6; 220:16;250:16 informational (1) 198:19 infra (1) 157:1 infrasound (7) 128:9;154:16; 157:2,24;158:8; 160:13;161:7 infrastructure (1) 31:12 inhaled (2) 164:15,16 initial (4) 62:16,19,22;72:23 Initially (2) 58:24:59:20 injurious (2)

161:10,19 input (1) 236:16 inquired (1) 242:12 insect (15) 80:4;84:5;104:20, 23:148:9,11:206:13; 207:5,7,14;210:10, 13,15;211:8;253:9 insects (7) 82:20;105:5,8; 148:13;207:10; 208:19,22 inside (3) 143:5;151:12; 227:2 inspection (1) 53:20 inspector (1) 51:24 installed (2) 69:8;130:17 instance (4) 148:21;169:8; 177:23;196:2 instances (3) 37:8;84:19;176:24 instead (2) 56:4:203:3 Institute (1) 184:6 instrumentation (4) 103:4.9.15.24 instruments (2) 150:12;159:21 insurance (2) 126:6;170:10 insure (1) 126:7 integrity (1) 149:7 intend (1) 187:6 intent (1) 207:7 interest (3) 124:2;157:3; 211:18 interested (2) 146:14;203:14 interesting (2) 45:10:158:6 interfere (2) 114:18;115:5 interference (2) 134:12,21 interim (1) 149:9 interjects (3) 14:1;96:6;138:23 internally (1) 250:18

Internet (1) 162:14 **INTERROGATORIES (6)** 49:15;50:14;54:14; 56:10;58:23;67:19 interrupt (1) 105:21 interrupting (1) 219:19 intervals (1) 214:15 intervenor (2) 8:16;99:20 into (46) 19:14;20:1;33:15; 38:19;39:11,20; 48:21;74:3;85:1; 91:14;92:24;93:5,22, 24;111:3,9;112:13; 117:3,18;119:13; 128:21;131:13; 132:7;153:2;156:19; 157:9;158:6,16; 174:17:183:9: 195:16;196:20; 197:6;201:20;214:8; 215:13,14;218:20; 226:3;229:24; 234:24:235:9:236:5. 16:244:13:246:24 introduced (5) 196:20:197:6: 230:12:231:10: 253:14 introducing (1) 231:24 introduction (2) 195:16;196:12 introductory (1) 156:5 intruding (2) 139:16:143:16 invasive (3) 24:2,8;25:14 inversion (1) 132:22 involved (10) 44:6;57:22,22; 125:7,15;131:8; 159:12;178:10; 187:3:191:6 involvement (1) 190:5 Iowa (2) 129:20;192:6 iPad (5) 205:13;228:5,22; 229:9:231:3 irregardless (1) 134:23 irritating (1) 144:21 ISO (9)

132:20:233:10,12; 236:18.18:237:9: 238:10;239:6;245:1 issue (11) 24:3,9:73:16; 103:20;127:18; 128:3;160:18; 161:17:164:14; 176:7;226:9 issued (2) 13:20;35:19 Item (2) 41:10:56:2 items (2) 178:23:190:18 iterations (1) 71:12 iterative (2) 71:16;72:9 IW (1) 209:10 IWAG (4) 187:9,18;188:8,15 **IWAG6 (1)** 187:5 **IWAG-6**(1) 215:19 IWAG-N(1) 200:8 **IWAG-N1 (3)** 179:4;233:2,3 **IWAG-N3 (3)** 179:4:233:2; 241:23 **IWAG-N5** (1) 200:1 IWAG-N6(1) 215:22 **IWAG-N7**(2) 204:5,7 J Jaffrey (1) 220:13 James (5) 154:4;157:21; 167:9;168:18;209:1 James' (5) 139:7;140:11; 143:19;153:21;179:7 January (9) 6:9;8:20;11:3; 34:8;45:17;76:9; 133:8;179:1;183:4 Jeeps (1) 47:20 jet (3) 163:22,24;164:3 job (8) 25:21:50:3:51:14. 15:52:1:174:4,5,11 John (2)

189:14,15 ioins (1) 13:18 Jones (2) 7:14;85:12 July (1) 251:14 jump (1) 59:10 June (1) 233:5 jury (2) 177:18,19 K keep (9) 33:9;73:1;86:4; 134:9;142:24;166:1; 192:24;219:14,15 Kenworthy (2) 87:7;92:7 Kenworthy's (1) 142:8 key (3) 142:19;161:8; 239:23 Kibbe (3) 42:2,7;43:14 kilometer (1) 237:6 kilometers (1) 235:10 kind (25) 37:10;42:9;44:11; 45:14;46:14;59:21; 69:4;71:16;87:19; 92:21:136:18: 145:16:147:16; 148:5:151:10: 156:11:168:12; 170:4;171:6;172:23; 180:19;223:12,14; 230:24;243:11 knowing (1) 204:20 knowledge (13) 25:19;26:3,4; 27:11;30:15;33:6,10; 87:1;124:11;134:10; 135:18:159:11:177:3 knowledgeable (2) 91:6:177:7 known (5) 97:8,9,12,13;177:3 knows (1) 90:1 L L1(2)148:8;235:17 L2(4)

146:18:148:10; 150:3:173:18 L3 (5) 87:3;88:19;90:3, 11:108:7 L-3(2) 216:12.15 L5 (3) 107:14;224:17; 235:17 L90 (19) 79:19,20,22; 202:15;203:4,6; 210:2,2,2,3,7,23; 211:9,12,13,14,15; 216:13;217:24 labeled (1) 156:1 laid (2) 44:17;45:4 Lake (25) 8:1;26:22;79:6,18; 84:20;106:23;107:7, 9,13,15,24;108:1,1,3; 109:10,12,15,16; 110:5,8,10;148:12, 15;222:5;224:17 land (5) 5:20;28:4;69:2; 98:5:113:6 Land-Based (1) 136:22 language (1) 250:23 Large (5) 36:23;37:16;62:12; 168:2;214:22 largely (1) 14:5 larger (2) 168:9.23 largest (3) 132:11;192:13,15 Larson (1) 223:2 last (10) 39:1;58:10;73:3; 76:1;205:9;207:15, 16;208:2,12;242:1 lasting (1) 154:17 late (2) 79:19;251:17 Later (3) 22:15,15;158:15 laughter (1) 193:18 law (2) 18:6;177:18 lawnmower (2) 182:22.24 lawsuit (2) 176:18;177:2

1 (1)	70.01.00.01.10		<b>a</b> 1 100 <b>a</b> 2 101 <b>z</b> 10	170 10 105 0 106 7
lawyer (1)	79:21,22;81:12;	license (4)	21;180:23;181:7,18;	1/3:18;195:2;196:7;
100:12	83:10;88:24;89:1;	171:6,16,21;	182:1,3;187:10,13,	199:22,22,23,23;
lay (1)	90:14,16;91:18;	184:20	17,21;188:1,7,12,19;	216:12,15,16;217:20;
101:2	95:11:98:10:114:4:	licensed (3)	192:21:193:2.7.10.	220:15.19:221:22:
levout (1)	116.21.117.10.12.16	34.11.45.21.	15 10.104.2 0.	222.4.224.5 17 22.
02.1	110.21,117.10,12,10,	104.10	10,10,200,0 17 10	222.4, 224.3, 17, 22,
93:1	118:14,18,24;120:0;	184:18	199:19;209:9,17,19,	225:0;220:12,20,21
layperson (2)	122:1,1;127:17;	licenses (1)	23;216:4,7;217:12;	locations (36)
86:24;90:19	128:5;132:5,14,14;	173:10	219:7,11,22;220:2,3;	12:1;64:5,14;68:5,
LDN (2)	136:5;139:17;	licensing (3)	223:13;227:20;	9;71:11;79:23;95:14;
140.19.141.17	140.18.144.19	50.8.172.15.	228.10.229.7910	97.24.98.3.103.22.
loading (1)	140.24.150.23	185.13	12 13 15:230:22:	106.7.108.12
	149.24,150.25,	103.13	12,13,13,230.22,	100.7,108.12,
82:6	156:10,15;161:10,16;	IIIT (1)	231:1,4,7;232:18,20;	146:11;152:15;
leaf (1)	162:3;168:23;170:1;	69:6	241:24;242:3;243:1,	153:4;189:11;
148:9	173:17,24;179:15,18,	light (4)	13,24;244:7,12,18;	190:12;197:18;
learn (1)	19;182:24;183:1,1;	49:1;80:19;166:19;	245:5,17;246:6,8,12;	198:20;199:1,6,15;
113:4	185:14:192:1:195:4	212:18	247:5	206:21.24:207:2.9
learned (1)	7 10 21:197:7:203:7:	lighthulb (2)	list (3)	12:210:4:212:10 24:
227.22	206.9 10 15:207.20	118.20.20	25.4.51.2.149.7	12,210.4,212.10,24,
227:25	206.8,10,13,207.20,	118:20,20	25:4;51:2;146:7	225:24;225:1;
learning (1)	20,24;208:4,5,10,13,	lighting (2)	listed (1)	226:23;232:13;
138:7	20;212:7,22,23;	26:17,19	146:5	234:19
least (9)	216:17,19;218:22;	lightly (1)	listened (2)	location-specific (1)
92:17:141:19:	227:6.8.9.17.18:	147:12	91:16:148:18	104:19
150.5.151.13.	233.17.236.4.240.1	likelihood (1)	listening (1)	loggers (1)
150.3,131.13,	2.33.17,230.4,240.1,	159.2	221.17	50.9
138:21;210:10;	2,249:18,232:11	138:2	251:17	30.8
232:3;235:12,13	leveling (2)	likely (2)	literature (5)	logging (8)
leave (3)	86:2;87:9	13:18;102:4	92:13;136:3;161:3;	45:20;49:19,24;
101:20;174:23;	levels (89)	liken (2)	162:15;253:16	51:18;52:12;89:13,
202:8	78:1,6,11:79:17,20,	180:18,20	litigants (1)	18;147:22
led (3)	23.80.5.81.10.20	limit (13)	178.2	logistical (1)
140.2.143.11	82.21.83.3.84.1 5 7	25:10:120:3:	litigation (1)	106.15
140.2, 145.11, 154.10	80.22.00.24.04.12	25.19,120.5, 126.15.141.15.	176.20	100.13
134:10	89:22;90:24;94:12;	120:13;141:13;	1/0.20	long (10)
ledge (2)	98:6;102:7;104:21;	142:22;143:9;144:7;	little (25)	20:24;54:20;62:12;
58:7;60:5	108:22,24;111:1;	168:20;189:8,21;	48:12,13;67:9;	67:20;129:24;131:4,
left (2)	112:17;113:18;	190:22;252:4,9	72:24;80:9;90:10;	11;137:11;163:23;
63:13:135:21	114:2.5.12:119:22:	limitation (3)	91:2:105:6:108:2:	181:10:208:16.16.22:
legal (8)	127.1.128.13.133.3	103.17.106.6	118.6.138.6.9.	242.15.243.2.247.8
16.22.100.6 10.	14 16:124:20:	201.22	142.15.147.6 16 21	2+2.13, 2+3.2, 2+7.0
10.22,100.0,10,	14,10,134.20,	201.23	143.13,147.0,10,21,	101gel (4)
135:9;136:6,11;	138:10;139:5,23;	limitations (2)	22;157:9;163:13;	104:/;159:8,1/;
169:5,14	140:1,16,23;141:1,	106:13,16	173:20;180:12;	249:10
legend (1)	12,16;142:12;144:1,	limited (1)	181:8;202:19;209:5;	longest (1)
217:23	3;151:11,12;155:1;	239:7	214:11	192:13
Lempster (5)	156:12:159:5:	limits (13)	live (10)	Longgood (13)
83.12.138.17.	160.17.161.13.22.	103.4 8 15.138.15	85.21.87.17.91.7.	7.19 20.85.17 18
120.24.141.15.186.6	160.17,161.13,22,	18 20:120:22:141:2:	08.10.145.5 16.	24.96.26 10 21 22
139.24,141.13,180.0	102.7,104.2,24,	18,20,139.23,141.3,	98.19,145.5,10,	24,80.3,0,19,21,23,
length (5)	165:6;166:20;	144:5;186:5,6;	146:14;151:7;252:5;	89:10;90:1;210:17
20:21;55:2;62:17;	167:16,19,20;174:21;	190:20,23	253:3	Longgood's (2)
128:20;130:9	179:22;198:16;	Line (18)	lives (1)	90:9;99:1
LEO (1)	201:6;203:18;	9:1,22:26:14:34:9;	90:1	Long-range (1)
141:16	205:11.19:206:6:	38:17:49:18:117:8.9	living (4)	245:18
less (10)	211.22.212.9 11 15	15:110:17 10:156:3:	35.9.92.2.150.23	long-term (7)
10.12.11.1.47.7.	22,212,5 8 12 24.	192.5.194.5.200.0.	160.6	07.4.202.2.207.10.
10.12,11.1,47.7,	23,213.3,6,12,24,	165.5,164.5,200.9,	109.0	97.4,202.3,207.19,
66:19;138:24;139:2;	214:/;215:8;230:10;	218:6;221:13;239:23	loading (1)	208:3,10,19;223:3
154:17;223:15;	231:19;232:15;	linear (1)	52:16	look (40)
224:15;234:20	238:19;241:10;	20:3	located (10)	22:2;28:7;36:10;
letter (8)	248:16:249:5	Lines (16)	14:12;26:18,19;	37:14:42:5,8,24;
50:16.18.20.22:	Leventhal (1)	9:2:13:21:16:4:	27:1:30:8:39:2:87:3	43:2:44:1:50:1:
51.1.200.2 24.244.9	161.4	17.22.24.11.34.0	150.3.223.17.224.22	62.12.80.16.83.2
$J_{1,1,2,0,0,2,2,4,2,4,4,7}$	$\mathbf{I}_{\text{OVOSOUD}}(1)$	61,12,72,14,77,01	150.5,225.17,224.22	00.20.02.1.05.2
101 15	Levesque (1)	01:15,/5:14;//:21;		90:20;95:1;95:0;
181:15	8:4	11/:18;119:10,14;	43:15;65:15;71:23;	111:22;113:18;
level (94)	Liability (2)	157.17 19.217.22	72:5.14:73:12:86:8:	114:5,10:143:19;
16.7.17.3 5.31.20.	nuonity (2)	137.17,17,217.22,	,.,.,.,,,,,,	, , , ,
10.7, 17.5, 5, 51.20,	172:14;173:1	221:4	88:19;90:3,11,11,15;	167:8,24;176:8;
39:14;44:8;56:20;	172:14;173:1 library (1)	221:4 Linowes (68)	88:19;90:3,11,11,15; 95:7,9,13;102:8;	167:8,24;176:8; 198:23;199:3;209:3;

218:20;221:2,11,12; lowe 226:18;228:24; 236:18;242:21;253:1 looked (10) 10:15;95:24;158:5; 209:5;212:2,5,7; 214:24;217:3;230:8 Looking (33) lowe 8:24;29:3;42:18; 45:16:56:15:65:2.7; low 102:6;107:6,22; 113:15;134:20; 172:1;173:18;188:5; 192:21;199:10; 202:14,15;203:3,4; low-204:13,14;209:16; 210:6;213:24; lunc 216:12;217:2,21; 218:6,15;239:1; 247:23 looks (5) 42:17;44:13;64:18; ma' 108:2;239:2 loop (2) 67:9,10 mac losing (3) 171:6,16,21 mac lost (2)156:9;177:15 mac lot (22) 43:8;59:24;60:1; Mad 64:23:68:22:81:10: 88:22;98:21;104:7; 106:9;118:10; 133:23;135:15,16; 153:20;154:4;163:4; mag 175:19:177:16; 197:3;198:3;237:15 mag lots (4) 72:6:84:19:120:15: mai 181:2 loud (5)Mai 111:17;112:4,9,14; 239:24 mai louder (7) 94:15;104:17; mai 110:12;112:11,11; 116:22;125:17 loudest (1) maj 213:16 loudness (1) mak 150:11 Loveren (2) mak 146:15;150:2 low (28) 84:2,9;102:14,24; mak 103:2,19;114:13; 119:2;127:17;157:2; 158:10,10;160:16; man 161:13,13,14;162:2; 163:1;213:6;227:5,8, man 9,12,17,18;231:9; 249:5,24

wer (14)	22;52:14;58:16
102:17;117:13,17;	manager (2)
118:11;143:5;	5:8;53:24
151:12;159:5;	managing (1)
161:23,23;168:15;	238:18
174:21;179:22;	mandate (1)
225:4;241:12	61:3
west (2)	man-made (1)
208:4,13	108:9
w-frequency (16)	manned (1)
127:15;128:3,6,9;	203:12
158:8;160:16;161:7;	manner (1)
162:10,20;163:9,14,	16:23
17;165:21;168:1,9,24	manning (1)
w-level (2)	200:19
159:16;161:18	Manual (6)
ncn(1)	9:13;22:10,19,22;
4:2	23:9,15
М	manufacturer(10)
IVI	//:24;118:13;
alam (1)	119:3,12,19;124:0;
a aiii (4) 15.24.17.24.21.16.	125:10;225:5;
15:24;17:24;21:10;	230.17,231.1
31.9 achina (1)	120.13.242.8
78.1	120.13,242.0 manufacturar's (1)
o.i ochinary (1)	118·17·223·2·
48.15	226.3.232.7
achines (1)	many (18)
174:16	10:10:31:12:46:16:
(adam (10)	99:2;106:7,14;
82:9;165:4;178:18;	120:16;182:6,8,14;
181:8;227:20;	185:2;194:24;
229:13;242:1,20;	215:13;219:2;221:9;
243:7;247:5	247:1;249:9,12
agenta (2)	Manzelli (23)
217:23;218:6	8:10,11,13,14;
agenta-colored (1)	21:13,24;22:1;99:13,
217:22	14,17,18;100:14,15,
ain (1)	18;109:13,14;110:1;
67:5	121:12;123:9;124:7;
aine (3)	141:8;100:11;109:4
4:17,20;5:19	map (15)
16,10,112,24	02.12,85.20,80.1, 90.22.00.6.02.1,
10.10,112.24	05.23,90.0,93.1, 05.24.107.0,11,17
18.2.53.20.55.5.	95.24,107.9,11,17, 22.112.15.117.7.
56·2·72·18·73·4	$118 \cdot 1 \cdot 247 \cdot 23$
aior(2)	manning $(1)$
91·9·176·7	180:20
akers (3)	margin (2)
244:20,21;246:4	119:5;133:18
akes (3)	marked (6)
18:12;223:13;	6:10,15;76:10;
248:24	77:6,11;237:18
aking (5)	Mars (1)
52:19;119:24;	44:4
131:8;203:14;225:8	Martin (237)
anage (2)	4:5,18,18,23;5:2,
133:24;243:1 anagement (11)	10,10,0.1,3,8,18,24;
14.19.15.3.18.1.	21.10.4 8 11 15 10
22:3.6.16:32:10:51:8	22.24:11:2.9.15.18
· · · · · · · · · · · · · · · · · · ·	

23:12:6.13.19.24: 13:3.8.12.16.20:14:7. 10,14,17,22;15:4,12, 17,19,24;16:7,15,19, 21;17:5,11,18,24; 18:4,8,10,13,20;19:6, 21;20:2,9,16,18;21:2, 6,16;22:14,20,23; 23:12,17,21;24:4,6, 10,14,23;25:11,15; 26:4,11,20;27:2,4,13, 17,19,24;28:4,9,12, 17;29:2,9,12,15,19, 24;30:3,5,11,15,19, 21;31:2,5,9,13,18,23; 32:2,6,8,12,16,21; 33:6,11,14,17;34:20; 35:1,7,12,16,23; 36:14,17;37:3,7,12, 18,23;38:2;39:1,9,16, 24;40:14;41:2,6,8,15, 19,22;42:4,12,17; 43:7,23;44:6,10,13, 18,21;45:1,8;46:2,6, 12,18,20,22;47:3,10, 14,17;48:1,7,17,21; 49:2,7,9,23;50:10,18, 21,23;51:10;53:4,16; 54:22;55:10,13,17; 56:7,13:57:5,11,13, 16,19;58:1,8,13,15, 18;59:6,17,23;60:19; 61:6,24;62:19,22; 63:8,12,14,21;64:1,8, 12,17;65:14;66:3,8, 21;67:4,10,14,22; 68:3,11,20;69:1,9; 1:99:13. 71:14;72:17,20; 73:17;74:12 4:110:1: mask (1) 208:6 Mass (2) 201:2,14 Massachusetts (4) 75:17;200:2,6; 203:6 master's (1) 183:5 material (2) 72:2;190:14 mathematical (3) 94:8;111:4;206:12 matter (10) 8:16;21:5;24:15; 27:7;33:16;49:5; 99:8,20;133:2;224:9 matters (1) 176:20 max (3) 3,18,24; 202:9,14:203:4 maximum (14) 59:2,3,6:117:21, 23;118:3;132:14;

179:17,18;180:1; 191:24:210:2: 211:15;213:7 may (27) 4:9;11:11,12; 19:22;46:9;84:13; 89:19,23;93:17; 102:5:112:9:115:7: 137:22;142:11; 158:1:161:13.14; 171:18;172:8;197:1, 2;200:18;203:22; 210:15,15;242:14; 249:5 maybe (17) 15:16;47:8;50:2; 62:14;66:5,15;76:18; 111:20;117:1; 142:17;145:21; 155:4;164:23,23; 173:21;188:7;249:11 Maynard (1) 75:16 McCabe (1) 166:9 mean (55) 33:22;44:20;45:6; 49:4;51:23;52:15,20, 22;54:2;68:21;69:3; 72:14,16;90:19; 91:13:94:17:96:13: 97:12:102:9.13: 103:14,16;105:21; 106:18;110:4; 116:20;117:10,11; 120:8;126:11; 134:11:135:11; 140:16;146:20; 151:21;172:19; 175:21:176:21; 198:2;211:13; 222:16;223:21; 224:10,11;236:8; 238:10;241:1; 242:24;248:16; 249:2,18;251:16,18; 252:3,15 Meaning (4) 111:5;134:3; 173:13;224:12 meaningful (1) 131:13 means (7) 11:13;70:18;90:17, 20;185:8,10;236:9 measure (24) 94:3,7;96:3; 101:16;103:18,19; 104:5,7;106:2,7,14; 110:24;115:22; 129:5,14;131:1; 159:7;169:10; 173:24;190:9;

206:20:208:15; 224:13:225:8 measured (28) 28:16;79:17;80:12; 95:11:101:24; 102:13:103:2.12: 104:9;106:9;107:14; 114:6;127:7;130:10; 150:21;151:17,18; 158:20:173:19; 205:19;206:5; 207:24;214:1; 223:21:224:18: 225:5;235:17;237:21 measurement (8) 20:4;70:5;88:18; 130:1,3,4;223:23; 251:4 measurements (21) 70:9;79:4,12; 89:12:91:5:98:13; 102:20:127:3: 129:15;131:9,13; 139:14;140:4; 150:13;153:14; 160:22;201:3; 203:16;232:8; 237:15:249:19 measures (1) 101:19 measuring (5) 103:9:130:6: 131:10:213:14:224:2 mechanical (4) 148:14;181:2; 182:4.5 median (2) 210:2:213:7 meet (5) 22:12;23:11;28:18; 171:3;185:23 megawatts (2) 167:13,15 member (4) 184:5,14;185:16, 19 Members (1) 254:9 memorized (1) 25:4 men (2) 44:17:45:4 mention (1) 22:17 mentioned (8) 25:23;40:9;49:18; 111:12;141:1;160:9; 185:22:228:2 mentions (1) 29:5 merriment (1) 70:22 met (9)

73:24:80:16:94:22; 125:16:126:1.7: 212:3;221:5,20 meteorological (8) 183:13,22;184:8; 220:13;224:13; 238:22;239:6,12 meteorologist (2) 183:7,19 meteorology (2) 75:24;184:3 meter (14) 89:19:90:4:103:17: 105:16:107:7; 146:24;150:22; 169:9;224:8,16,21; 240:16,21;241:2 meters (39) 80:20,21,24;81:5, 6;111:23;146:21; 148:24;192:12; 214:13:215:3: 221:14;227:8,11; 230:8;234:15,16,16, 20,21;235:2,4,5,18; 236:2,4,22,24; 237:17,18,20;240:12, 17,19;241:11,12,12, 13;242:19 method (5) 11:12,24;12:17,21; 18:14 methodology (1) 93:22 methods (8) 11:13,14,15,16,17; 27:13:40:20:153:16 Metson (1) 246:20 mic(2)62:20;223:13 mice (2)44:17:45:4 Michigan (3) 188:11,22;190:4 microphone (4) 76:13;86:5;223:11; 228:15 microphones (4) 159:18;224:15; 225:11;226:3 mid-20s (1) 89:2 mid-90 (1) 155:2 middle (3) 47:8,8;147:6 middle-of-the-night (1) 90:23 Midwest (1) 130:17 might (30)12:4;18:20;26:8;

64:14,20:69:17; 81:14:87:14:89:14: 91:23:105:24:108:2: 110:21:118:20: 142:3:151:17,24; 155:9;158:14;171:5; 182:20;191:11,15; 192:19:203:20; 207:18,23;210:18; 216:5;244:1 Mike (1) 187:10 mile (4) 92:17,18,19;224:8 miles (10) 81:1,6;178:9; 227:9,11,16;230:11; 240:19,22;241:1 Mill (2) 146:15;150:3 milliseconds (1) 154:17 mind (3) 42:13;65:1;142:24 mine (2) 156:10;242:6 minimize (1) 73:5 minimized (1) 71:22 minimum (5) 152:2:210:1.7: 211:14:213:6 minor (1) 77:16 minus (14) 78:7.8.13:119:1: 122:16:216:23: 218:23;237:2,3,10, 21,23;238:5,11 minute (9) 36:4;88:3;100:21; 107:2;120:24; 163:12;165:18; 169:3;181:20 minutes (5) 21:2,2;193:9,12,22 miss (1)122:19 mistake (2) 109:23:252:20 mistaken (2) 27:4;251:3 misunderstood (1) 117:1 mix (6) 18:14;24:12,16,19, 22;25:12 mode (1) 131:18 model (24) 96:10:118:1:127:4; 128:23;129:3,6,16;

130:12:152:8:153:7; 175:14:192:3:234:3: 235:24:236:18; 239:13:241:8: 244:24;246:23; 250:22;251:5,7,11; 253:8 modeled (5) 122:18;170:1,2; 239:15:247:2 modeling (23) 94:9;111:4;122:13; 128:21;183:12; 191:20;192:1; 194:17;213:21; 232:23;233:16; 234:10;237:24; 238:2,23;241:14; 244:23;246:1,2,3,4; 250:15,19 models (6) 127:2:129:7: 236:12,13,13;252:2 moderate (6) 132:21;239:10,17, 21;240:6,11 moderators (1) 154:11 modern (5) 127:17;128:5; 133:20:160:15,17 modified (1) 206:15 modulation (9) 128:17,24,24; 129:5,9;130:7,9,10; 131:2 Møller (5) 158:12;161:4; 167:9:168:2.18 moment (1) 100:16 momentarily (1) 172:9 moments (1) 209:6 money (1) 174:20 monitor (13) 40:10,12,14;41:1, 11.14:53:13:96:17: 224:3:227:3:230:20: 231:24;232:11 monitored (1) 148:7 monitoring (2) 149:9;235:15 monitors (12) 200:16,17;211:3; 220:5:222:3,7,13; 223:17;226:13,17; 229:22,24 monitor's (1)

25:21 month (1) 104:15 months (1) 239:13 moose (2) 42:9.13 more (52) 10:12;19:17;22:24; 25:20;32:1;38:15; 39:22;43:20,24; 45:12;47:7;62:6; 65:17;68:23;72:24; 73:19;83:10;96:22; 106:10;125:3; 141:22;143:12; 146:17;147:4;157:9; 158:14,16;164:13; 168:23,24;169:14; 184:2;188:24; 190:22,24;198:18; 202:5.7.19:204:10: 219:3,4;223:15; 224:15;225:1,5; 236:21,24;237:16; 241:13;243:9;247:19 morning (1) 254:22 Morse (1) 36:3 most (7) 23:23:65:21:73:21: 117:23:201:14; 226:20:233:21 motorized (5) 109:17,21;110:6,8, 11 Mount (1) 49:6 Mountain (3) 37:17;38:24;42:8 mountainside (1) 48:24 mouth (1) 23:6 moved (3) 37:10;191:2;243:8 Moving (2) 16:3;27:7 much (29) 9:14:15:14:30:6; 52:22:54:18:56:11: 59:15,23;65:3;66:15; 68:13;84:17;95:15; 102:7,21;103:22; 105:12,23;106:16; 116:2;122:9;137:2, 24;164:1,1;205:1; 242:22;247:19; 248:21 multiple (2) 92:21;148:23 Muni (1)

220:14	necessary (5)	13:9	93:3	observation (3)
music (1)	34:10:49:20:55:15:	nobody's (2)	note (3)	115:6:135:14:
159:13	59:16:206:7	129:11.13	89:15:161:6:	201:15
musical (1)	need (23)	no-go (1)	201.13	observations (5)
159:20	9.19.13.14.14.22.	101.18	notes (1)	1/8.22.1/10.3 /
139.20 must (2)	25.24.28.22.20.10	noise (114)	150.2	201.16.202.0
12(2, 19(2))	23:24;28:23;29:19,	1101Se (114)	139:2	201:10;202:9
130:3;180:3	24;41:2;43:23;45:9;	/5:23;80:4;84:13;	nouce (10)	observed (2)
myself (1)	48:5,19;59:19;60:3;	92:4;120:5;128:18;	35:6,7,9;60:13,16;	103:6;253:7
159:4	62:19;65:9,16,22;	130:7;133:11,17;	61:3;112:17;115:7;	obvious (1)
	139:17;161:19;	135:6;139:16;	197:12;253:12	136:13
Ν	171:9;229:5;254:18	141:23;143:16,17;	noticeable (1)	obviously (7)
	needed (4)	144:1,3;145:2,9;	150:8	68:6;106:6;131:15;
N5 (2)	16:8:25:1:71:18:	146:5:148:9.9.10.11.	notification (2)	143:4:160:2:176:7:
179:4:200:23	198:15	14:153:14:154:5:	34:17.24	226:15
N6 (1)	needs (4)	163.10.164.6.165.6	notified (1)	occasions (1)
187.12	56:1:63:19:100:6:	168:1 9 20 24:	31.19	218.17
107.12 N7 (2)	150.9	177.14 21.182.0 12.	57.1	210.17
170.5.204.5	137.0	177.14,21,105.9,15, 194.26,196,1215	10th y (1)	24.24.09.21.122.4
179:5;204:5	neglected (1)	184:3,0;180:13,15,	34:22	34:24;98:21;132:4;
name (9)	160:14	18,22;187:2;189:20,	nucleus (1)	189:23;195:20
4:14;8:14;75:14;	negotiate (1)	24;190:17;194:20,	248:9	occurred (2)
99:18;123:3,7,10;	25:8	22;195:4,7,20;	nuisance (3)	216:19;220:21
182:4;242:9	neighbor (1)	196:12,18,20,22;	92:4;177:14,22	occurrence (2)
name's (1)	173:19	197:5,7,9,15,16;	number (41)	128:19;130:8
4:18	neighborhood (1)	200:4.8.14.14:201:3:	15:11.19:59:4:	occurring (1)
Nancy (1)	26.21	202.18.203.21 21 22	70.15.71.10.86.14	32.7
200.8	neither (1)	23:204:22:205:18:	16.88.3.92.23.	occurs (1)
200:0 non (1)	105.9	206:5 6 13:207:5 8	107.11.116.12 14 15	180.5
115.12	105.8 Now (20)	14.209.6.210.10.12	117.4.122.15.	100.3
115:12	New (50)	14,208.6,210.10,13,	117:4;122:13;	octave (11)
narrow (1)	5:15;8:15;13:23;	15,16;211:8;213:12,	123:15;141:23;	116:12,17;158:19;
65:12	14:3;18:5;22:5,10,18,	16;220:5;223:7,19;	142:20;143:8,12,13;	160:22;197:19,22;
narrower (1)	21;23:8;30:18;31:19;	225:24;226:9;227:1;	155:19;174:16;	198:16;199:17;
63:23	32:24;33:12;34:15;	228:14;230:3,20;	179:4;187:18;	206:8,20;211:4
narrowest (1)	46:17;50:6;54:19;	231:10,23;232:2,11;	194:24;196:24;	October (6)
74:8	55:15;60:21;84:12;	234:11,13,14;235:24;	200:7;213:3;214:22,	6:15;26:13;77:10,
native (6)	99:19:112:24:	236:4.21.23:238:3:	22:218:12.13.22:	18:78:24:79:2
24.12.16.19.21.	129.10.138.15.	241.11.244.13.	219.1.249.23.251.7	off (16)
25:4 12	152.24.195.16.20.	245.21.248.13	7.253.4 22.254.1	11.18.16.14.20.20
noturally (1)	106:6:242:7	250:10:253:0	numbered (2)	66.3.72.20.80.20.
102.14	190.0,242.7	230.10,233.9	21,10,215,20	105.1.112.20,89.20,
102:14	$\frac{110}{21} \frac{10}{27} \frac{1450}{14}$	174.10	21.19,213.20	103.1,112.3,7,20, 174.7,224.7,227,14.
nature (4)	21:19;37:14;59:11;	1/4:19	numbers (14)	1/4:/;224:/;22/:14;
19:17;39:16;180:5;	130:18;137:10;	noises (3)	51:2;133:12;139:3;	231:19;237:12;249:9
211:10	148:4;173:19;184:4;	210:20,24;211:6	141:2,10;142:3;	offered (1)
NB (10)	251:13	nomenclature (1)	143:1,1,2;155:18;	251:6
36:3,7;139:8,8;	nice (1)	215:22	210:21;211:7;	offhand (1)
153:12;155:24;	167:11	non-binding (1)	227:13;253:8	225:21
157:22:179:5,6,6	night (8)	142:17	numerous (1)	office (4)
NB24 (1)	80:19:87:16:100:5:	non-complainant's (1)	178:8	112:2.6:133:10:
168.1	138.11.142.21.	190.10	NWS (1)	182.12
near (6)	149.9.150.23.151.16	none (3)	220.13	Officially (1)
80.10.07.1.108.0.	nighte (1)	135.7.146.1.170.4	220.13	18·1
172.14.190.5.224.14	219.21	non (2)	0	-70.1
1/5.14,100.3,224.14	210.21	80.12.105.0	0	
nearby (3)	nightume (5)	80:13;105:9		97:2
84:21;149:19;	81:20;142:22;	norm (1)	oath (3)	offsetting (1)
210:19	143:9;207:20;218:9	214:17	7:2;78:18;172:7	105:1
nearer (1)	Nine (1)	normal (2)	object (7)	off-the-beaten-path (1)
106:11	55:21	131:19;245:20	82:5;100:9;170:12;	108:11
nearest (1)	Ninety (1)	north (7)	181:13;236:20,22;	often (2)
83:5	235:1	98:4;113:23;147:2.	242:21	45:5;182:11
necessarily (10)	Ninety-two (1)	11,24;227:22:248:18	obligated (1)	oftentimes (1)
17:14:60:18:98:9	235:4	northeast (3)	189:18	125:22
102:16:112:15:				
	nitty-gritty (1)	90:10:93.12	obligation (4)	older (1)
126.5.135.10.	nitty-gritty (1)	90:10;93:12; 104·10	<b>obligation (4)</b> 186:12:189:3 5:	older (1) 128·2
126:5;135:10; 136:14 19:151:1	nitty-gritty (1) 157:9 nobody (1)	90:10;93:12; 104:10	<b>obligation (4)</b> 186:12;189:3,5; 190:15	older (1) 128:2 onboard (1)

68:10 one-third **Once** (12) 13:12:65:4:66:14; 68:21;71:9,20; online (1 106:19:110:23; 150:5;171:4;195:12; 234:4 only (28) one (113) 13:13;14:8;23:16; 27:13:38:15:39:1.2. 21;40:12,16;44:3; 47:20;49:16;51:16; 52:7,11;54:12,16; 57:4:59:10;61:9,11; 64:15,20;67:7;70:8; 71:15,18;73:20; 77:16;78:8,14;79:18; onto (1) 80:11;82:24;88:2,16; 89:20,23;90:12; open (8) 91:11,13;93:18; 95:23;96:19;100:3; 102:5.8:110:14: 113:23;114:22; operate 117:15;118:4,15,23; 120:16,22;129:2; operatin 141:14;146:6,15; 150:21;154:11,18; 155:15;158:13; 161:2,21;165:9; 176:10;177:7; 178:12;182:8; operation 183:18:184:21: 185:6.21:187:23.23; 188:24;190:18; operation 192:7,15:194:14; 197:1;199:4;200:16, 18:202:3:204:3: operation 205:23;207:18; 210:22;218:20; operator 221:3,4,6,9,12,20; 222:6;224:23;228:6, 21;229:1;232:3; opinion 233:20;234:1;238:7; 243:4;245:6;247:1; opinions 250:1 **O'Neal** (22) 75:5,7,10,13,15; opportu 76:7,12;77:4;99:21; 124:10;138:3; opposed 157:11;172:16; 191:4:208:17:211:1; option (4 223:6;225:7;228:5; 237:12;238:20; 247:23 orange (2 one-day (1) 185:12 order (6) one-number (1) 117:4 ones (7) 39:7:106:9:119:11; 178:3,8;199:8,17 ordinary one's (1) 82:22

one-third (7)	154.7
159.19.150.6	arganizations (1)
150.10,159.0,	organizations (1)
160:22;197:19;	185:20
198:16;199:22;211:4	original (6)
online (1)	6:21;17:12;34:7;
191:16	100:20;146:5;205:21
only (28)	Osler (2)
20.9.24.19.23.	7.24.85.14
28.15 16.38.8.40.8	others (6)
42.4.50.22.60.4	42.21.01.24.126.2
42.4, 59.25, 00.4,	45.21,71.24,120.5,
62:2;63:19,19;67:12;	158:3;160:23;217:18
74:4;99:4;103:18,19;	otherwise (2)
149:13;151:5;	10:17;167:7
189:24;192:19;	ought (2)
193:4;201:24;206:7;	243:18;254:1
237:17:239:8:249:17	out (73)
onto (1)	23.3.28.5.45.11
19.24	46.10.53.11.63.22
19.24	40.10, 55.11, 05.22, 65.10, 69.12, 70.2.
open (8)	03:12;08:15;72:5;
19:/;143:6;151:24;	80:15;82:23;84:21;
152:4;156:21;	87:22;88:17;90:2;
167:23;224:19;225:5	91:5,22;101:3;
operate (5)	105:16;107:9,16;
34:12:212:18:	114:11:119:9:120:1:
225:20:236:17:241:2	129:4:135:20:136:2:
operating $(9)$	140.21.161.4 7.
117.20.118.2.	162.5 14 24.168.6
100.7.101.14.200.5.	102.3, 14, 24, 108.0, 172.22, 24, 174.6
190:7;191:14;200:5;	175:22,24;174:0;
201:1;202:7;212:21;	1/5:21;1/6:2,4;
238:4	178:9;187:7;188:23;
operation (4)	189:2,10,13;193:20;
89:13,18;90:14;	194:21;195:10;
177:20	197:18;198:21;
operational (6)	200:16.18:201:3:
38.19.39.5 12.	207.4 7 24.210.11.
120.18.224.5.251.4	207.4,7,24,210.11, 211.22.212.11.
150.16,254.5,251.4	211.23,212.11, 212.7.214.2.215.1.
operations (1)	215:7,214:2,215:1;
16:10	216:18;220:4;230:7;
operator (4)	232:3;234:14;235:9;
94:23;97:23;	244:16;249:8;
177:13,19	251:12;252:8
opinion (7)	outcrop (14)
9:21:30:19.21.23:	9:7.7:10:2.3.6.6.20.
104.14.113.16.114.7	20.11.677.12.1718
oninions (1)	20,11:0,7,7,12:17,10,
46.2	2).17
40:5	outcropping (1)
opportunity (2)	8:21
79:7;208:24	outcrops (4)
opposed (1)	29:5,22;30:9,12
106:19	outdoor (1)
option (4)	232:8
24:21:29:12:169:8;	outdoors (2)
174:19	151:19.21
orange (2)	outer $(2)$
86.18.221.12	55.1.20
30.10,221.13	33.1,20
order (6)	outermost (1)
59:18;68:15;91:19;	28:8
92:5;121:20;160:24	outlined (1)
ordinarily (1)	238:16
35:3	output (1)
ordinary (1)	191:23
47:20	outside (7)
Oregon (1)	143.2 4.151.11.
~* <del>8</del> ~ (+)	····-, ·, ··· · · · · · · · · · · · · ·

190:15:241:15; 242:18:245:1 outside-to-inside (1) 152:3 over (34) 11:5;39:13;73:17; 81:16;83:1,21;87:11; 88:24;89:4;95:10; 97:4,5;102:10; 104:10:107:18; 115:11,14;128:4; 155:2:158:22; 171:21;196:4; 197:24;211:23; 214:12,18;223:10; 224:1,4,5;225:11; 230:1;237:18;239:13 over-estimate (2) 207:19,23 over-estimation (1) 118:6 overhead (10) 62:6;64:6,8;65:10, 18,22,24;74:16,17; 110:16 overly (1) 60:20 oversaw (1) 6:2 oversee (1) 52:5 overseeing (1) 53:24 oversight (1) 53:2 oversimplified (1) 71:15 overwhelm (1) 31:11 own (3) 65:1;160:11; 244:14 owned (1) 189:15 owner (8) 51:17;52:12;97:23; 126:20;176:4;177:5, 13,19 owner/developer (1) 125:23 owners (2) 34:22:52:18 owner's (6) 52:8,10;53:9;54:3, 4;58:3 oxygen (1) 164:24 Р P90(1) 188:3 pace (1)

66:3 package (3) 120:21;153:2; 246:24 pad (3)62:23;63:6,18 pads (2) 6:3:30:8 Page (67) 8:24;9:3;11:4; 13:21;15:18;16:4; 17:21:22:3,9:24:11; 26:14;34:7;36:11,22; 37:15;38:16;41:9; 45:17;49:17;59:10; 61:12;77:18,21;79:1, 24;80:18;81:24; 83:21;84:4,11;107:6; 122:8,8;127:20,22; 139:8,9;140:11; 146:22;155:17; 156:7,22;157:6,7,8, 16;160:12;183:4; 184:4;187:20; 188:15;199:4,5,14; 201:8,10;205:4,4,5,8; 209:3,16;211:16; 217:14;221:15; 233:6;234:7 Pages (7) 36:12:79:15:83:14: 122:8:148:4:199:4. 14 paid (1) 189:13 panel (2) 4:5;75:2 paper (27) 153:11,13,18,19; 154:8,15,23,24; 155:6,13;157:10,21; 158:14:163:21; 167:9,17,23;168:3,8, 19;205:9,10,13,21; 206:3;239:2;253:18 papers (1) 154:4 paragraph (10) 61:9;156:5;201:7, 10,21;205:9,14; 206:2;207:16,17 paraphrasing (1) 157:20 park (2) 222:10;224:20 part (29) 26:6,9;39:5,11; 40:16;47:15,15;77:6; 87:24;88:4;89:15; 91:7:97:20:113:8; 132:9;142:4;150:13; 153:20;154:22; 167:10;175:7;179:2;

183:14:208:19; 218:15:227:22: 239:6;245:19;248:23 participant (1) 141:20 particular (14) 12:1;18:13;22:17; 23:18;26:1;73:16; 81:10;124:4;129:16; 172:12,22;201:17; 243:16;252:16 particularly (7) 48:5,19;198:17; 207:20;211:2; 240:16;242:18 parties (3) 123:22;124:4,9 parts (2) 34:9;166:7 party (2) 125:23:176:5 pass (1) 175:22 passed (3) 126:5;185:8,13 passing (1) 128:4 **PATCH (42)** 4:7,9,10,12;5:4; 7:6;15:6,10,15;21:8, 18,21;69:13,16; 70:23.24:71:2:75:6. 12:77:3:81:22:82:8. 15:85:4:88:2.9.13: 100:8;109:22;123:5, 24;140:7;155:4; 165:4:170:11: 172:20;181:12; 216:2,5;242:20; 243:19:245:8 Patrick (4) 4:18,23;5:2;6:5 pause (4) 91:18;155:11; 165:11;178:13 paying (1) 41:22 peak (1) 156:15 Pedersen (5) 158:12;161:5; 163:6;167:9;168:3 peek (1) 156:11 peer-reviewed (1) 136:18 Pelletier (1) 50:17 people (30) 46:5;92:1,12,14; 113:3,4;114:19,23; 115:3,7;144:12,17, 20;145:3,15;149:14;

151:7;161:10; 162:11:163:3.7.18: 167:24;171:8;182:6; 196:24;197:11,12; 213:10:251:8 people's (1) 140:22 per (20) 80:20,24;81:1,5,6; 116:15:133:2:215:3; 224:8,9;227:8,11; 230:8;240:12,17,19, 21;241:1,2,11 percent (10) 23:22;38:5;56:23, 24;59:2,4,7,8;232:5; 237:13 percentage (2) 10:5;20:4 Perception (2) 153:18:158:1 performed (1) 202:4 perhaps (5) 62:13;83:5;105:3; 158:14;162:1 period (10) 79:22;89:11;97:5; 104:10,16;194:22; 210:14:211:24; 213:10:215:9 periods (5) 105:7;213:4; 216:19;218:13,19 permanent (1) 58:15 permeable (12) 17:23:18:3.12.19. 23;19:5,6,11,13,20; 20:6;21:15 permission (2) 96:20:97:22 permit (16) 35:19;46:7;51:2; 56:19,20;59:1;61:2; 141:3;186:2,19; 189:7,8,12;190:3; 252:3,8 permits (2) 13:20;40:22 permitting (4) 60:9:94:10:171:1: 185:24 persistent (1) 43:24 person (2) 169:13;186:21 personal (9) 30:19,21;115:6; 135:14,17;148:22; 172:14,24;173:1 personally (4) 54:9;92:12;103:6;

169:16 personnel (1) 149:7 perspective (5) 44:12;45:10;91:14, 20:120:15 phase (6) 62:16:65:3.5; 66:11,14;67:22 phenomenon (3) 128:19,21;162:8 photographs (10) 36:17,18,19,20; 37:1;42:6,7;243:12, 14,22 phrase (2) 125:17;136:16 phrased (1) 216:22 physical (4) 93:15:103:17; 106:6.13 pick (3) 61:20;117:8,14 picked (5) 104:4;148:8; 150:13;210:3;212:11 picture (7) 37:15;42:22;44:2; 163:15;222:5;248:5, 10 pictures (2) 44:9:243:17 pieces (1) 63:8 pin (1) 64:23 Pinello (5) 8:4,5,8;95:20,22 pinpoint (1) 64:22 place (5) 69:2;72:22;75:16; 110:13;114:19 placed (4) 138:19;146:18,22; 147:1 places (5) 31:12;43:20;47:5; 65:13;190:23 plain (1) 249:14 plaintiff (2) 178:5,7 plaintiffs (1) 177:12 plan (30) 13:2;15:3;16:13, 16;17:8,15,19;18:1; 22:3,6,16;23:1,14; 32:10;34:13;35:20, 21;38:22;45:8,12; 46:4;53:6,11,20,21;

56:24:59:14:60:12, 23:233:24 planes (2) 110:16:115:14 planning (3) 25:10;95:19; 254:19 plans (11) 13:5;20:18,20; 34:16:40:23:44:17; 45:4,23;60:6;64:18; 73:18 plants (1) 56:4 play (1) 72:8 please (24) 4:13,22;8:23; 15:18;20:3;21:14; 36:14;45:2;55:10; 62:21:75:13:81:1: 122:11;123:1,17,20; 126:11;127:24; 165:10;181:1;200:7; 209:8;219:22;229:11 plenty (2) 115:8;145:8 plug (1) 234:23 plus (18) 66:15:78:7.7.13; 80:8:81:15:118:24: 122:16:152:14; 216:23;218:23; 237:2,3,10,21,23; 238:5,11 plus-two (1) 119:5 pm (6) 4:2:69:22,23; 137:19.20:255:3 point (36) 59:17;64:3,22; 74:4;81:9;107:9,16; 111:19,23;114:14; 121:6;128:12;129:1; 142:17;149:6;150:7, 21;151:2;161:9; 166:20;168:6; 189:22;196:17; 203:11:213:13; 227:6,24;230:7; 235:19,20;243:20; 244:3;247:20; 248:13;250:7,10 pointed (2) 88:17;90:2 points (8) 48:9,11;82:23; 118:4:195:11; 214:23,24;235:15 pole (2) 62:8,8

policy (1) 214:14 **Pond** (41) 14:8,13,20;27:5; 79:6,18;81:17;84:20; 87:20;105:15;106:3; 107:16,18,19;108:6, 12,16,20;109:2,5,11, 19,21;110:15,20,23; 112:22;113:11,17,20, 23,24;114:2,11; 115:10;119:16,18; 248:2,14,17;250:9 pool (1) 70:15 portion (1) 73:9 portions (1) 82:10 Portland (2) 4:19:154:7 position (2) 104:3:160:21 possibility (1) 171:21 possible (26) 24:17;25:5;30:6,7; 37:13;69:5;72:18; 101:22;102:1,3; 103:10:131:1.3; 136:8,13,14,17; 142:15:145:15: 151:7.20:193:11: 207:3,4,11;231:22 possibly (2) 17:7;171:6 post(1)195:13 post-construction (11) 66:16:97:21; 173:23:175:20: 202:23;203:2; 204:23;205:2; 232:23;238:3,9 potentially (1) 169:6 **power** (20) 78:12;117:21; 118:18,19,24;119:8; 132:14,14;167:16,19; 174:20;179:18; 180:14,20;182:6,23; 183:1;191:21,23; 238:17 powered (1) 109:17 power-level (3) 122:16;181:4; 182:16 practice (4) 16:24;17:17,20; 238:13 practices (2)

51:8:52:16 precedent (1) 100:1precipitation (6) 31:17,22;32:5,17; 33:4;220:21 pre-construction (17) 38:21:96:23:98:2, 15;99:7;194:13,20; 195:13:202:13; 203:3;204:22;205:1; 213:20,23;216:17; 232:22;238:8 predict (5) 171:8;235:24: 236:3;237:3;241:9 predicted (10) 83:4;89:22;108:21; 113:18;127:1; 166:20;193:22,22; 238:19:251:6 predicting (2) 111:1;171:13 predictive (4) 191:20;194:16; 237:24;238:1 predominantly (1) 183:24 preface (1) 136:12 preferable (1) 39:21 preference (1) 39:13 prefiled (20) 6:5,13,21,22;8:19; 11:4;26:12;34:6; 38:16;49:17;76:8; 77:5,9,17;78:18; 79:8:101:7:133:7: 157:6;179:1 premise (3) 136:15;144:6; 168:7 premised (1) 46:4 prepare (1) 134:17 present (11) 55:4;154:8;158:20; 207:10,21;208:5,14, 15;210:14,15;211:21 presentation (2) 154:8,14 presented (5) 103:1;153:13; 154:5;177:17;197:23 preserved (1) 115:19 pressure (4) 119:22;155:1; 182:24:218:5 pressure-level (1)

119:10 pressurized (1) 11:16 pretty (10) 39:3;52:22;84:17; 105:12;110:2; 120:10;146:2;174:7, 8:240:23 prevail (1) 138:5 prevent (1) 25:14 previous (4) 46:16;50:2;83:11; 100:2primarily (1) 81:19 Primer (2) 33:2,13 principal (1) 75:20 principle (1) 105:2 Prior (3) 24:15;139:15; 143:16 priority (2) 39:15;186:23 privy (1) 126:19 probably (16) 13:13:38:13:53:9: 115:6,15:125:3; 137:14;146:1;148:1; 150:4;174:15; 176:10;197:11; 247:15;250:4;253:7 problem (15) 61:5;80:10;128:14; 159:23:168:17; 186:15,22;187:3; 189:19,20,24;190:17; 196:15;243:11; 254:16 problematic (1) 196:13 problems (1) 163:18 procedural (1) 169:15 procedure (1) 253:18 procedures (2) 52:15,15 proceed (4) 4:9;70:1;82:14; 137:22 proceeding (1) 124:3 proceedings (6) 4:4:155:11:165:11: 178:13;180:13;192:9 process (15)

18:17:35:20.22; 67:24.24:71:8.17: 72:9;127:9;131:10, 12:171:1:191:16: 194:12:219:6 produce (2) 154:16;179:15 produces (2) 132:11;182:5 producing (1) 236:21 product (3) 125:11;126:6; 233:20 production (1) 174:20 products (1) 214:14 professional (7) 30:22;173:5; 184:11,15;186:11,16; 189:17 profile (1) 71:23 prognosis (1) 38:1 program (2) 51:2:152:19 Project (83) 5:23;6:2;12:8; 13:22:14:2:18:16; 22:11:23:4.10.11: 29:22:30:23:34:13; 37:12;38:20;39:6,12; 40:13,17;41:1,9; 42:3;48:5;52:5; 53:24:55:5:60:7; 61:22;67:21;68:2,7; 71:18:76:4.6:82:2.3: 83:4,10,17,24:84:1; 94:12.19:99:24: 101:13,18;108:22; 111:2;114:2;115:22, 22;120:12;125:7,15; 129:2;132:1;133:1; 138:17,18;171:2,4,9; 180:6;186:2,7,8,17; 189:6,8,10,15;190:6; 191:2,5;195:20; 196:6;208:6;213:1; 252:4,7,16,21,24 projecting (1) 152:13 projects (19) 5:21;37:6;44:7; 48:2;54:6;73:21; 76:2;100:2;138:17, 19;141:4,16;152:19; 183:20,21;185:23; 190:21:205:12; 241:20 project's (2) 16:9;54:15

pronouncing (1) 94:4 propagating (1) 153:4 propagation (9) 132:18,20,22; 233:9,16;239:10,16, 23:245:18 properly (1) 40:21 property (4) 34:22;92:22; 112:24:180:6 proportions (1) 9:7 proposed (9) 20:9;28:24;36:24; 37:21;106:12;107:8; 108:24;129:16; 168:12 protect (1) 133:17 **Protection (2)** 133:10:200:3 protective (1) 121:20 proven (4) 94:6:163:10; 173:12;226:10 provide (13) 9:6:14:11,16:21:4. 9:51:19:52:13.17: 54:8:68:8:201:24: 202:5:216:14 provided (11) 34:13;35:11;40:12; 68:5;72:10;79:3; 83:15:90:7:94:11: 120:23:250:24 provides (1) 67:7 proximity (2) 86:12;92:2 PSNH(1) 74:3 public (5) 24:3;67:12;133:17; 177:3;254:21 publication (1) 33:1 pull (4)76:13;187:7;248:8, 18 pulled (1) 249:9 pulses (3) 154:17;155:1; 156:14 purchase (2) 251:8:252:21 purchased (1) 251:24 pure (1)

156:16 purpose (10) 94:8;100:19;101:2; 114:18:119:23: 189:9;194:20;195:6; 211:21;225:10 purposes (6) 61:10;96:23; 132:23;198:19; 210:22;224:6 put (19) 23:5:70:10:75:4; 91:14;94:19;96:17; 100:22;105:16; 118:1;140:21;150:6; 172:21;195:9; 200:16;229:23,24; 235:19;246:19,23 puts (2) 172:11;252:8 putting (7) 57:23;59:19;65:5; 167:21;169:19; 172:16;234:14 0 qualifications (5) 5:13;49:21;50:7; 75:22;185:12 qualified (6) 11:22:45:20:46:5, 9:49:18:251:18 quality (5) 24:9;31:1;53:22; 153:16:164:18 quantify (7) 10:9;14:19;20:16; 21:14:105:23; 115:23:122:7 quantifying (1) 106:1 quarter (4) 122:8;158:21; 166:12:193:1 questioner (1)

46:16 quick (3) 49:14;64:17;83:20 quickly (6) 25:2,6;32:14,18; 64:22:154:3 quiet (18) 81:13;87:17;91:17; 103:23;111:18; 112:5;113:8;114:24; 115:4,18;144:17,24; 145:5,8,21;146:2; 151:8,8 quieter (6) 101:23;104:16,24; 105:6;112:20;116:23 quietest (4)

79:21;90:23;104:4,	react (1)	rebuttals (1)	151:21;152:3	relatively (5)
8	197:11	253:15	re-established (1)	13:23;14:3;98:22;
quietude (1)	reaction (2)	recall (5)	73:7	181:11;224:19
91:8	196:23;245:7	23:19;38:3;89:18;	refer (2)	relevance (1)
quite $(7)$	reactions (2)	1/9:3;185:18	15/:1/;241:25	100:0
05:14;144:20;	140:22;190:24	<b>received (3)</b>	<b>reference</b> (12) 9.22.10.1.15.5.	relevant (1)
130.0,170.12,214.3, 0.240.18	14.6.16.5 14.	134.1,243.13,10	0.25, 10.1, 15.5, 0.25, 10.24, 10.26, 0.25, 0.	105.0 relies (1)
9,240.10	14.0, 10.3, 14, 20.20.24.8.02.12, 17.	22·1	25.10,24.12,50.2,	$201 \cdot 14$
24.17.42.23	20.20, 54.8, 92.13, 17, 122.11.123.5, 10, 15.	52.1 recentor (1)	138.12.155.10	201.14 relying (1)
24.17, 42.23	122.11,125.5,10,15, 124.12.133.13.	23/18/238/12	157.12.179.10	126.21
92.7.23	149.5 6.154.21	234.10,230.12,	referenced (1)	remain $(2)$
(1)	162:17:168:21:	recentors (7)	133.8	30.9.38.10
121.24	205:15 20:207:15	194.22.195.22	referencing (6)	remark (1)
	217:6:242:14:245:5.	197:16:198:8:235:5.	29:4:34:6:178:23:	84:11
R	14	11.14	221:13:227:21:233:1	remarks (1)
	readiness (1)	recess (2)	referred (4)	79:14
radar (1)	31:7	69:21;137:18	23:20;101:5;	remember (8)
12:6	reading (9)	recipients (1)	141:12;210:1	124:15;146:7;
radar-activated (2)	15:18;87:2;127:20;	243:4	referring (7)	159:19;180:24;
26:17,18	157:23;159:1,2;	recognize (5)	57:13;62:14;67:3;	189:21;194:24;
radii (1)	189:3;199:20;202:22	182:7;228:23;	88:8;139:12;140:8;	212:16;248:2
48:20	readings (1)	229:5;233:5;242:9	179:5	remembering (1)
radius (2)	201:16	recommend (1)	refers (1)	247:24
34:21,23	reads (1)	50:22	61:9	remind (1)
rainwater (1)	206:3	recommendation (4)	reflect (2)	15:2
19:14	ready (2)	142:16;171:22,23;	193:18;251:7	remote (1)
raised (3)	75:4;131:21	172:2	refraction (1)	81:15
186:8,14;242:15	real (2)	recommendations (1)	245:19	removal (2)
ran (1)	108:9;142:10	171:24	refrigerator (4)	11:9;12:1
214:13	realistic (1)	recommending (2)	145:19,21,24;	remove (3)
Ranch (1)	172:5	170:6;202:17	151:4	49:19;68:16;248:4
220:14	reality (2)	recommends (2)	refrigerators (1)	removed (10)
range (17)	93:17;238:13	50:23;80:6	145:11	9:15;16:21;17:6;
80:1;83:6;84:22;	realize (3)	reconstruct (1)	regard (8)	30:7;38:12;39:4,19;
96:9,12,14,15;	112:3,9,10	68:15	53:21;/1:0;/2:11, 12:79:1:70:11;	68:18;84:6;108:8
114:12;119:2;	really (29)	record (14)	13;/8:1;/9:11;	removing (2)
154:19;155:2;	19:10;21:22;25:20;	5:24;21:25;70:1;	1/9:12;204:21	12:17;248:19 Done (1)
107.12,196.9,255.6,	45.15,51.7,52.18,	37.10,121.0,21, 181.14,21.102.17.	32.10.70.2.87.1.	50:17
241.13,242.13,10	01.21,04.24,00.3,	101.14,21,193.17, 206.7.222.16,10.	$32.10, 79.3, 87.1, \\ 00.22.100.7.126.0.$	reapened (2)
178.5	$112 \cdot 1 \cdot 116 \cdot 15 \cdot 124 \cdot 1124$	2/3.13.255.1	135.6.202.9.243.14	5/1·19/23
170.5 ranges (1)	138.7.172.5.174.5	recorders (1)	registered (3)	reneat (4)
210.7	11.176.6.211.22	149.21	5.15 18.159.17	36.14.45.1.55.10
rare (1)	212.19.213.9.224.9	recording (1)	regular $(3)$	200.7
84:9	227:15:235:14:	159:24	19:8:25:16.22	repeating (1)
rarely (1)	245:11:251:19:	recordings (1)	regulations (1)	250:23
47:22	252:20	148:18	135:5	repetitive (1)
rated (3)	reason (12)	recourse (1)	regulatory (1)	194:5
118:21,23;179:20	73:1;83:9;91:7;	175:3	129:8	rephrase (3)
Rather (7)	115:1;117:17;	recreation (1)	reinforces (2)	170:18;181:19;
61:20;66:3;69:14;	125:20;169:20;	81:18	151:10;167:20	182:2
98:17;127:2;233:6;	176:3,14;181:8;	red (2)	relate (1)	replace (2)
246:9	195:9;246:18	156:3,10	141:11	54:20;55:8
rating (3)	reasonable (3)	Redirect (4)	related (4)	replaced (2)
118:20;180:16;	108:10;167:22;	69:12,15;70:2;71:1	129:15;136:23;	54:16;68:18
182:16	177:20	reduce (1)	165:20;202:10	replay (1)
ratings (1)	reasonably (1)	55:2	relates (2)	149:22
181:4	238:19	reduced (6)	19:17;191:23	reply (1)
rattle (2)	reasons (6)	38:13;39:19;	relation (2)	123:7
162:2,4	80:11;114:23;	127:17;128:7;	72:17;141:3	report (48)
reach (2)	141:14;197:1,3;	156:11;160:16	relative (2)	14:15,19;15:21,22;
	<b>aaa i i</b>		1 4 9 9 5 5 1 5	00 6 101 1 1

127:14;139:7; 140:11;146:5,22; 160:12:161:12; 179:2,7;197:24; 198:24;199:3,14; 204:13;205:5,6,8,14; 209:4,10;213:3; 215:4,15,17;217:8; 220:11,23;222:5; 226:18:228:3,8,11, 18,19;229:4,17,22; 230:16,23;231:5; 232:3 reporter (11) 4:22;5:1;14:1; 75:9;96:6;138:23; 181:1;219:9,13,17,20 reports (1) 204:24 represent (5) 8:15;90:6;98:3,6; 190:1 representative (1) 223:22 representing (1) 99:19 represents (1) 227:2 reputation (3) 173:9;174:14; 175:7 reputation-wise (1) 176:1request (12) 21:8,12,23;121:4; 123:6;187:4,17; 188:5;215:19;216:3, 11:217:6 requested (1) 18:15 requests (2) 187:14;222:17 require (5) 57:19;60:10;62:4, 24;158:19 required (11) 9:15;11:10;12:9; 35:8;40:16;60:4,16; 62:7,11;93:7;203:6 requirement (5) 23:7;52:6;60:11; 61:2;100:6 requirements (8) 16:11;22:24;35:18; 49:3;60:21;135:10; 136:7,11 requires (4) 40:24;41:11;51:11; 53:19 requisite (1) 133:17 research (7) 68:4;158:4,11;

162:5;163:5,21; 227:14 researchers (1) 165:15 reseeding (5) 24:13,16,20,22; 25:13 reserve (1) 21:9 residence (4) 87:14;97:13;98:16; 173:14 residences (7) 83:22;90:6;96:3, 12;97:20;98:7; 106:11 resident (4) 52:4;53:1,8,23 residents (7) 34:18;35:6,15; 97:19,22;98:13,23 residents' (1) 98:22 residual (1) 79:21 **Resources** (2) 33:2,13 respect (5) 46:3;48:3;111:11; 117:7:135:1 respond (1) 159:7 responded (2) 216:18;242:13 response (26) 7:16,18;8:2;33:24; 37:10;72:10;73:11; 79:10;82:17;83:18; 85:11,13,15,17;95:5, 6;121:15;122:22; 137:8;158:3,18; 176:17;189:4;200:4; 228:15;239:3 responsibility (7) 35:14,16;170:6,8, 14;173:1;175:23 responsible (1) 53:2 restore (1) 38:23 restored (3) 38:20;42:23;55:23 result (2) 13:23;14:2 results (8) 101:3,9;148:5; 156:1;177:17; 206:14;234:9;251:5 resumed (3) 4:1;69:22;137:19 retain (2) 27:15:45:19 retained (6)

46:9;71:5,9;76:5; 190:9:191:1 retention (3) 16:8;17:3,10 retrospect (2) 112:4.10 reveal (1) 177:1 revegetate (1) 43:12 revegetated (4) 42:20,24;55:23; 58:14 revegetation (2) 43:18;65:5 review (2) 58:4;64:17 reviewed (3) 34:14:154:2; 253:16 reviewer (1) 23:3 reviews (12) 14:24;27:3;41:7; 51:9;57:12;64:16; 101:1;107:4;121:2; 140:6;156:24;222:24 **Revision** (2) 123:12,18 Rick (1) 139:7 **rid** (1) 211:6 ridge (4) 132:4;212:4,13; 213:19 ridgeline (2) 214:5;239:19 ridgetop (6) 93:4;132:5,10; 212:2;221:5,20 right (103) 4:8;8:22;9:3;12:6, 19;18:3;22:7,14; 24:13,24;28:6,24; 32:13;37:21;39:22; 41:6;43:3;45:6; 47:18;53:15;58:5; 59:4,9,11;60:6;63:12, 17;64:4,10;66:7; 67:9:69:14,18:70:14; 76:20;87:16;95:1; 106:3:109:8:110:2: 113:12,21;116:14; 122:2,3,5;126:23; 127:10;129:12,20; 130:16,19;131:23; 133:9;134:6;135:6; 137:16;141:6; 144:23:149:15; 150:19,20;152:16,16, 18;156:2,17;157:19; 163:15;165:23;

179:23:183:3:186:1: 189:8;191:8;192:6; 199:24:200:20: 204:2;213:17;214:3, 3;215:23;216:20; 219:10,18;222:9,21; 224:23;225:1; 226:22;231:5; 233:21:236:12; 248:10;249:3;251:3; 252:3;254:10,20 right-hand (1) 86:18 right-of-way (1) 74:3 risk (3) 167:2,4,5 road (102) 6:2;13:8,10;17:23; 18:3,12,19:19:4,9,13, 14,18,19,23,24;20:4, 5,6,8,12,19;21:15; 23:2;27:19;28:18; 30:5;36:24;37:9; 38:3,14;39:10,11,20; 46:24,24;47:2,7,17, 18,20,23;48:4,10,16, 19,24;49:4,6;54:18, 22:55:3,19:56:22; 57:6:58:24:59:20; 62:3.4.10.18.22:63:3. 7,10,11,19,23;64:10; 66:18,18;67:1,5,5,6, 12;68:8,15;70:19; 71:11,21,24;73:2,22, 24;74:5,11,12,13,17, 18,20;95:14;146:15; 147:1,16,17,18,20, 21;148:2,13;150:3 roadbed (1) 28:17 roads (6) 18:8,10;61:18; 62:9;67:1;71:7 roadway (4) 18:24;56:17;62:1; 73:10 roadways (1) 19:2 **ROBERT (5)** 75:7,10,15;76:7; 77:4 Robinson (4) 54:11,12,14;56:5 rock (23) 8:21;9:7,7,14;10:2, 3,6,6,20,20;11:6,7,7, 9,24;12:17,17;29:17, 21:30:3,7,12:39:17 rocks (1) 39:14 role (3)

166:6,16:169:13;

5:22;76:3;171:13 room (15) 66:1,20;70:6,13, 20;91:18;111:12,20; 128:12;144:11,11,19; 150:23;182:6;243:8 rooms (1) 144:23 rotator (1) 192:12 rotator-swept (1) 128:16 Roth (15) 40:5,7;70:18;82:5; 172:8;193:17;194:8; 197:24;243:7;247:8, 10,14,18,22;254:4 rotor (2) 127:11;192:13 rough (2) 59:14:91:20 roughly (5) 62:11,24;63:21; 74:15:81:6 rounds (1) 78:2 Route (7) 54:17;63:10,12,18; 67:13;108:8;148:10 routinely (1) 246:23 ruckus (1) 150:6 rule (1) 99:23 run (6) 62:7;68:2;80:22; 142:20;251:10,11 running (17) 54:15:81:11:93:2; 106:16:111:11: 117:19;129:18,22; 130:20;131:17,17,22; 148:24;151:2,3; 251:12;252:12 runoff (3) 19:12;27:9;57:10 runs (3) 65:18;151:5;212:4 rural (2) 144:4:145:5 rustle (1) 148:9 rustling (3) 148:11,20;149:19 rye (1) 25:5 S Safety (4) 34:15;35:23,24; 133:18

sake (1) 85:20 Salmon (1) 91:22 same (38) 6:4;7:1,3;11:3; 17:2;18:21;49:3,4; 57:5;72:22;76:7; 77:4;78:17,19,23; 81:23:93:10,14:99:6, 10;102:11;107:24; 110:9:116:6.8; 118:22;127:4,8; 132:3;165:15; 199:14:215:9: 221:19,21;224:20; 228:21;229:1;243:11 sampling (3) 53:21;106:19,22 Sanctuary (4) 112:22;113:12,17; 114:23 satisfactory (1) 175:5 satisfied (1) 100:7 save (1) 215:16 saw (1) 115:8 saving (21) 26:8:38:11:55:17: 96:4:97:16:112:13; 124:19;135:13,23; 136:2;152:8;170:23; 179:14,17;226:13,16; 227:17:231:22; 246:4;252:6;253:22 scale (4) 218:2,10,16,20 scanned (1) 154:3 scenario (1) 252:18 scenarios (2) 128:21;132:6 Schloss (1) 253:17 Schomer (2) 204:11;253:17 school (1) 182:21 science (1) 183:6 scientific (3) 33:9;134:10;136:3 scientist (2) 225:7;236:11 scientists (1) 157:4 screaming (1) 115:9 screen (9)

222:12;223:4;	:
225:18,24;228:14;	
230:4,5;231:18;	
screens (7)	
225:11,12,13,23;	
228:20;229:24;232:4	:
scrutiny (1)	
172:25 se (2)	
116:15;133:2	
Sean (1)	•
166:9	
182:8	ì
season (1)	:
43:8	
SEC (1)	:
83:11 second (44)	
41:9;67:7;80:20,	
24;81:5,6;89:23;	
91:16;118:15;	
123:13;154:18;	:
165:9;166:12;178:6,	
7,12;194:16;201:7,8,	
8,10,10,10,20,21;	:
204:3;205:23;215:3;	
227:8.11:230:9:	,
240:12,17,19,21;	;
241:3,11	
Section (10)	:
18:2;22:21;20:5; 41:8:61:8:74:1:	
155:19,24;156:5;	:
240:9	
sections (5) $20.10, 11.47.1.$	-
20:10,11;47:1; 64:20:65:21	
sector (1)	
133:21	;
sediment (1)	
40:19 seeds (1)	
25:18	•
seeing (2)	
152:12;175:18	
seem (3) $1/1/2/186/1$	
242:22	
seems (4)	
91:9;149:5;243:10;	:
245:10	
59:7	
select (1)	:
96:16	
selected (2)	:
13:12,13 selection (1)	
51:18	:

self (1) 205:20 self-generated (1) 223:7 self-induced (2) 206:6;223:7 sell (3) 251:13,16;252:15 sense (6) 19:13:53:6;65:1; 80:10;137:15;215:11 sensitive (1) 193:19 Sensitivities (1) 153:17 sent (1) 242:5 sentence (18) 16:5;154:21;201:8, 11,22;202:12; 207:16:208:3.13: 244:5,6,8;245:6,14, 18,23;246:15,17 sentences (1) 177:8 separate (1) 184:23 separated (1) 188:8 September (1) 149:10 September/October (1) 104:16 series (4) 42:6:133:12; 183:10;229:22 serve (1) 176:24 Service (2) 9:13:136:22 Services' (1) 50:16 session (6) 121:4,11,15; 154:11;188:5;233:4 set (18) 22:12;23:7,9;68:9, 12;81:8;87:15; 156:16;185:21; 189:18;194:21; 200:24;229:20; 235:7,17,19;242:1; 247:6 setbacks (1) 162:6 sets (1) 193:4 settings (1) 160:3 seven (3) 219:16;232:19; 247:15 seventh (2)

36:11,22 several (6) 71:17:97:6:161:1; 176:20:185:22: 235:10 shakedown (1) 131:19 shall (1) 139:2 shape (1) 111:5 shapes (1) 182:13 share (1) 244:15 sheets (1) 120:23 sheltered (3) 95:2,9;225:2 shift (1) 219:8 short (6) 59:7;122:10; 152:20:159:23: 181:11;202:16 shorten (1) 194:5 shorter (1) 43:9 short-term (1) 201:24 shot (1) 46:14 show (12) 62:13;64:14;67:2; 85:21;86:6;205:12; 228:5,6,22;229:4,11; 254:7 showed (1) 233:4 showing (5) 140:7;156:11; 216:13;217:15; 246:22 shown (4) 59:1;80:17;156:5; 163:6 shows (9) 88:23;140:15; 156:2;167:11,16,17; 226:19:229:9:234:8 shut (1) 112:6 shuts (1) 112:3 sick (3) 164:9;165:6,13 side (8) 57:1;66:6,6; 115:13:147:2,11; 176:21;218:7 sides (1) 19:23

signal (1) 158:22 Signals (1) 153:15 significant (1) 232:16 significantly (3) 128:6:195:21.23 Silver (1) 220:14 similar (6) 84:7:91:1:100:2; 142:3;144:3;166:24 similarly (2) 48:18;53:18 Simpkins (4) 49:12,13,15;50:11 simple (1) 231:12 simpler (1) 116:20 simplifying (1) 168:22 simultaneously (1) 93:17 sit (2) 86:7;226:6 site (41) 9:15;10:18;16:22; 17:7:27:9,15,17,22; 37:10,21;40:18; 41:12:42:19:48:8: 56:12:63:9:64:2.3: 69:6;72:2,3;98:5; 104:9;106:8,8,23; 107:1,20,23,24; 108:1,3,7;109:1; 110:17;138:15; 150:3;200:17;201:4; 207:21:213:1 sites (8) 25:18;44:5;47:22; 106:14,19;108:5,15, 20 sits (1) 87:19 sitting (1) 32:18 situation (5) 28:21;144:18; 163:16;186:12;187:1 situations (2) 159:20:163:13 six (9) 36:24;106:19,21; 193:1;214:20,21; 215:23,24;216:1 Sixteen (1) 55:14 sixth (2) 36:11.22 size (2) 48:14;222:15

sizes (2)	somewhere (6)	153:16:155:1:158:8	89:4:108:9:110:13:	215:2.5:221:5.21:
167:13:182:13	25:23:89:20:	22:159:5.7.8.12:	134:15.18:153:3:	223:21:224:18:
sizing (1)	120:20:180:5:	160:13.16:162:10:	157:5:164:7:201:17:	230:11:240:10
57:14	194:23:226:14	163:4:164:2.7:	203:23:247:1	speeds (10)
skirt (1)	somewheres (1)	166:10.20:167:16.19	South (3)	80:17.18:179:21:
39:8	166:12	20:168:24:171:14:	4:19:98:4:119:19	212:5:224:14:225:4:
slash (1)	soon (3)	173:24:174:21:	Southborough (1)	226:19:227:5:
201:16	129:18.19:192:8	179:15.16.18.19.22.	4:19	231:10:241:5
sled (1)	sorry (27)	23:180:1.14.20:	southeast (2)	spent (2)
150:4	17:21:33:23:66:17:	181:3:182:5.16.23.	93:11:107:14	72:4:184:2
slices (1)	77:2:88:13:96:7:	24:183:1:186:5:	southern (2)	splashing (1)
214:17	97:11:105:21:117:2:	191:20.24:194:13.17:	107:18:113:22	115:9
slightly (1)	162:17:181:6:199:1:	195:10:197:1.4:	southwest (1)	spread (1)
74:1	200:11:204:10:	198:16:201:6.15.15.	93:11	17:7
slippery (1)	209:10,16,21;210:9;	17;202:6,10,13;	southwesterly (1)	spreaders (4)
115:20	212:3;219:19;	203:18;205:11,19;	93:3	16:7;17:3,5;58:11
slope (4)	220:11:224:10;	206:6,8,10,15;208:4,	southwestern (1)	spur (5)
57:5;59:2,3;115:20	225:3;231:1;244:21;	7,13;211:22;212:6,9,	248:6	67:1,5,6;73:24;
slopes (3)	251:17;254:13	11,15,22,22,23;	space (3)	74:17
28:18;29:6;60:2	sort (15)	213:5,8,24;214:7;	61:8;65:11;164:20	square (1)
SM (2)	18:17;28:15;47:6;	215:8;216:16,19;	Spain (2)	90:10
36:10,16	50:5;73:9;108:11;	218:5,14,22;223:10,	191:15;192:7	squares (2)
small (3)	118:15;131:9;	13;225:3,9;227:4;	speak (3)	90:5,12
13:23;14:3;201:24	147:22;152:2;	230:13;231:18;	11:22;42:12;	squeezed (1)
smaller (1)	172:14;174:14;	233:17,24;234:4;	141:21	218:19
168:10	175:10;250:22;	238:17;240:1,2;	speaking (4)	stability (1)
smarter (1)	253:24	241:9;252:11	121:4;145:3;	132:7
135:19	sorted (1)	sounded (2)	158:16;248:20	staff (1)
snapshot (1)	213:5	57:7;139:22	spec (2)	200:20
211:21	sought (2)	sound-level (28)	57:23,24	stage (1)
Society (2)	13:6;208:7	76:6;79:4,11;	specialist (1)	94:9
184.78	sound (222)	87.23.88.5.90.4.	40.15	stake (1)
104.7,0	50unu (===)	07.25,00.5,70.4,	40.15	SLANC (1)
software (15)	45:12;76:22;78:1,	93:4;101:4,6;103:17;	specialized (1)	38:8
software (15) 153:2;233:14,19,	45:12;76:22;78:1, 2,6,12;79:17,20,21,	93:4;101:4,6;103:17; 107:7;111:22;	<b>specialized (1)</b> 11:24	38:8 stamp (2)
<b>software (15)</b> 153:2;233:14,19, 20;237:7;242:11;	45:12;76:22;78:1, 2,6,12;79:17,20,21, 21,23;81:9,20;82:3,	93:4;101:4,6;103:17; 107:7;111:22; 113:19;120:23;	specialized (1) 11:24 species (6)	<b>stane (1)</b> 38:8 <b>stamp (2)</b> 172:11,17
software (15) 153:2;233:14,19, 20;237:7;242:11; 244:21,22,23,24;	45:12;76:22;78:1, 2,6,12;79:17,20,21, 21,23;81:9,20;82:3, 21;83:1,2,3;84:1,5,6,	93:4;101:4,6;103:17; 107:7;111:22; 113:19;120:23; 121:16;126:1;	specialized (1) 11:24 species (6) 24:2,4,8;25:4,14,18	38:8 stamp (2) 172:11,17 stand (5)
software (15) 153:2;233:14,19, 20;237:7;242:11; 244:21,22,23,24; 246:1,2,4,19,24	45:12;76:22;78:1, 2,6,12;79:17,20,21, 21,23;81:9,20;82:3, 21;83:1,2,3;84:1,5,6, 16;86:2;87:9,11;	93:4;101:4,6;103:17; 107:7;111:22; 113:19;120:23; 121:16;126:1; 127:14;132:6;	specialized (1) 11:24 species (6) 24:2,4,8;25:4,14,18 specific (11)	state (1) 38:8 stamp (2) 172:11,17 stand (5) 169:17;170:23;
software (15) 153:2;233:14,19, 20;237:7;242:11; 244:21,22,23,24; 246:1,2,4,19,24 soil (3)	45:12;76:22;78:1, 2,6,12;79:17,20,21, 21,23;81:9,20;82:3, 21;83:1,2,3;84:1,5,6, 16;86:2;87:9,11; 88:23;89:1,5,6,12,22;	93:4;101:4,6;103:17; 107:7;111:22; 113:19;120:23; 121:16;126:1; 127:14;132:6; 138:14,18;140:19;	specialized (1) 11:24 species (6) 24:2,4,8;25:4,14,18 specific (11) 22:24;41:9;82:17;	<b>state (1)</b> 38:8 <b>stamp (2)</b> 172:11,17 <b>stand (5)</b> 169:17;170:23; 171:24;172:13,22
software (15) 153:2;233:14,19, 20;237:7;242:11; 244:21,22,23,24; 246:1,2,4,19,24 soil (3) 9:12,13;60:2	45:12;76:22;78:1, 2,6,12;79:17,20,21, 21,23;81:9,20;82:3, 21;83:1,2,3;84:1,5,6, 16;86:2;87:9,11; 88:23;89:1,5,6,12,22; 90:13,16,23;91:18;	93:4;101:4,6;103:17; 107:7;111:22; 113:19;120:23; 121:16;126:1; 127:14;132:6; 138:14,18;140:19; 190:20;203:15;	specialized (1) 11:24 species (6) 24:2,4,8;25:4,14,18 specific (11) 22:24;41:9;82:17; 83:15,19;97:2;	state (1) 38:8 stamp (2) 172:11,17 stand (5) 169:17;170:23; 171:24;172:13,22 standard (33)
software (15) 153:2;233:14,19, 20;237:7;242:11; 244:21,22,23,24; 246:1,2,4,19,24 soil (3) 9:12,13;60:2 sold (1)	45:12;76:22;78:1, 2,6,12;79:17,20,21, 21,23;81:9,20;82:3, 21;83:1,2,3;84:1,5,6, 16;86:2;87:9,11; 88:23;89:1,5,6,12,22; 90:13,16,23;91:18; 92:14;93:13;94:7,11,	93:4;101:4,6;103:17; 107:7;111:22; 113:19;120:23; 121:16;126:1; 127:14;132:6; 138:14,18;140:19; 190:20;203:15; 214:13;223:23;	specialized (1) 11:24 species (6) 24:2,4,8;25:4,14,18 specific (11) 22:24;41:9;82:17; 83:15,19;97:2; 143:18;147:4;	state (1) 38:8 stamp (2) 172:11,17 stand (5) 169:17;170:23; 171:24;172:13,22 standard (33) 16:24;17:17,20;
software (15) 153:2;233:14,19, 20;237:7;242:11; 244:21,22,23,24; 246:1,2,4,19,24 soil (3) 9:12,13;60:2 sold (1) 191:2	45:12;76:22;78:1, 2,6,12;79:17,20,21, 21,23;81:9,20;82:3, 21;83:1,2,3;84:1,5,6, 16;86:2;87:9,11; 88:23;89:1,5,6,12,22; 90:13,16,23;91:18; 92:14;93:13;94:7,11, 20,20;97:2;98:6,10,	93:4;101:4,6;103:17; 107:7;111:22; 113:19;120:23; 121:16;126:1; 127:14;132:6; 138:14,18;140:19; 190:20;203:15; 214:13;223:23; 224:16,21;252:4	specialized (1) 11:24 species (6) 24:2,4,8;25:4,14,18 specific (11) 22:24;41:9;82:17; 83:15,19;97:2; 143:18;147:4; 157:17;202:10;	<b>state (1)</b> 38:8 <b>stamp (2)</b> 172:11,17 <b>stand (5)</b> 169:17;170:23; 171:24;172:13,22 <b>standard (33)</b> 16:24;17:17,20; 19:8;23:8;93:7,8;
software (15) 153:2;233:14,19, 20;237:7;242:11; 244:21,22,23,24; 246:1,2,4,19,24 soil (3) 9:12,13;60:2 sold (1) 191:2 somebody (5)	45:12;76:22;78:1, 2,6,12;79:17,20,21, 21,23;81:9,20;82:3, 21;83:1,2,3;84:1,5,6, 16;86:2;87:9,11; 88:23;89:1,5,6,12,22; 90:13,16,23;91:18; 92:14;93:13;94:7,11, 20,20;97:2;98:6,10, 13,19;99:22;100:7;	93:4;101:4,6;103:17; 107:7;111:22; 113:19;120:23; 121:16;126:1; 127:14;132:6; 138:14,18;140:19; 190:20;203:15; 214:13;223:23; 224:16,21;252:4 sounds (25)	specialized (1) 11:24 species (6) 24:2,4,8;25:4,14,18 specific (11) 22:24;41:9;82:17; 83:15,19;97:2; 143:18;147:4; 157:17;202:10; 230:17	<b>state (1)</b> 38:8 <b>stamp (2)</b> 172:11,17 <b>stand (5)</b> 169:17;170:23; 171:24;172:13,22 <b>standard (33)</b> 16:24;17:17,20; 19:8;23:8;93:7,8; 99:21;100:3;120:10;
software (15) 153:2;233:14,19, 20;237:7;242:11; 244:21,22,23,24; 246:1,2,4,19,24 soil (3) 9:12,13;60:2 sold (1) 191:2 somebody (5) 45:23;70:8;115:12;	45:12;76:22;78:1, 2,6,12;79:17,20,21, 21,23;81:9,20;82:3, 21;83:1,2,3;84:1,5,6, 16;86:2;87:9,11; 88:23;89:1,5,6,12,22; 90:13,16,23;91:18; 92:14;93:13;94:7,11, 20,20;97:2;98:6,10, 13,19;99:22;100:7; 101:10,23;102:7;	93:4;101:4,6;103:17; 107:7;111:22; 113:19;120:23; 121:16;126:1; 127:14;132:6; 138:14,18;140:19; 190:20;203:15; 214:13;223:23; 224:16,21;252:4 sounds (25) 32:13;84:19;	specialized (1) 11:24 species (6) 24:2,4,8;25:4,14,18 specific (11) 22:24;41:9;82:17; 83:15,19;97:2; 143:18;147:4; 157:17;202:10; 230:17 specifically (10)	<b>state (1)</b> 38:8 <b>stamp (2)</b> 172:11,17 <b>stand (5)</b> 169:17;170:23; 171:24;172:13,22 <b>standard (33)</b> 16:24;17:17,20; 19:8;23:8;93:7,8; 99:21;100:3;120:10; 124:5;125:9;129:9;
software (15) 153:2;233:14,19, 20;237:7;242:11; 244:21,22,23,24; 246:1,2,4,19,24 soil (3) 9:12,13;60:2 sold (1) 191:2 somebody (5) 45:23;70:8;115:12; 169:6;245:10	45:12;76:22;78:1, 2,6,12;79:17,20,21, 21,23;81:9,20;82:3, 21;83:1,2,3;84:1,5,6, 16;86:2;87:9,11; 88:23;89:1,5,6,12,22; 90:13,16,23;91:18; 92:14;93:13;94:7,11, 20,20;97:2;98:6,10, 13,19;99:22;100:7; 101:10,23;102:7; 104:5,9,21;106:2;	93:4;101:4,6;103:17; 107:7;111:22; 113:19;120:23; 121:16;126:1; 127:14;132:6; 138:14,18;140:19; 190:20;203:15; 214:13;223:23; 224:16,21;252:4 <b>sounds (25)</b> 32:13;84:19; 104:23;110:21,22;	specialized (1) 11:24 species (6) 24:2,4,8;25:4,14,18 specific (11) 22:24;41:9;82:17; 83:15,19;97:2; 143:18;147:4; 157:17;202:10; 230:17 specifically (10) 11:19;36:9;38:2;	state (1) 38:8 stamp (2) 172:11,17 stand (5) 169:17;170:23; 171:24;172:13,22 standard (33) 16:24;17:17,20; 19:8;23:8;93:7,8; 99:21;100:3;120:10; 124:5;125:9;129:9; 132:18,20;233:9,11,
software (15) 153:2;233:14,19, 20;237:7;242:11; 244:21,22,23,24; 246:1,2,4,19,24 soil (3) 9:12,13;60:2 sold (1) 191:2 somebody (5) 45:23;70:8;115:12; 169:6;245:10 somehow (1)	45:12;76:22;78:1, 2,6,12;79:17,20,21, 21,23;81:9,20;82:3, 21;83:1,2,3;84:1,5,6, 16;86:2;87:9,11; 88:23;89:1,5,6,12,22; 90:13,16,23;91:18; 92:14;93:13;94:7,11, 20,20;97:2;98:6,10, 13,19;99:22;100:7; 101:10,23;102:7; 104:5,9,21;106:2; 108:5,10,15,19,21,	93:4;101:4,6;103:17; 107:7;111:22; 113:19;120:23; 121:16;126:1; 127:14;132:6; 138:14,18;140:19; 190:20;203:15; 214:13;223:23; 224:16,21;252:4 sounds (25) 32:13;84:19; 104:23;110:21,22; 136:1;145:17;	specialized (1) 11:24 species (6) 24:2,4,8;25:4,14,18 specific (11) 22:24;41:9;82:17; 83:15,19;97:2; 143:18;147:4; 157:17;202:10; 230:17 specifically (10) 11:19;36:9;38:2; 60:22;76:1;82:10;	state (1) 38:8 stamp (2) 172:11,17 stand (5) 169:17;170:23; 171:24;172:13,22 standard (33) 16:24;17:17,20; 19:8;23:8;93:7,8; 99:21;100:3;120:10; 124:5;125:9;129:9; 132:18,20;233:9,11, 12,12,14;236:6,19;
software (15) 153:2;233:14,19, 20;237:7;242:11; 244:21,22,23,24; 246:1,2,4,19,24 soil (3) 9:12,13;60:2 sold (1) 191:2 somebody (5) 45:23;70:8;115:12; 169:6;245:10 somehow (1) 139:24	45:12;76:22;78:1, 2,6,12;79:17,20,21, 21,23;81:9,20;82:3, 21;83:1,2,3;84:1,5,6, 16;86:2;87:9,11; 88:23;89:1,5,6,12,22; 90:13,16,23;91:18; 92:14;93:13;94:7,11, 20,20;97:2;98:6,10, 13,19;99:22;100:7; 101:10,23;102:7; 104:5,9,21;106:2; 108:5,10,15,19,21, 23;109:4;110:5,7,9,	93:4;101:4,6;103:17; 107:7;111:22; 113:19;120:23; 121:16;126:1; 127:14;132:6; 138:14,18;140:19; 190:20;203:15; 214:13;223:23; 224:16,21;252:4 sounds (25) 32:13;84:19; 104:23;110:21,22; 136:1;145:17; 146:10;148:7,17;	specialized (1) 11:24 species (6) 24:2,4,8;25:4,14,18 specific (11) 22:24;41:9;82:17; 83:15,19;97:2; 143:18;147:4; 157:17;202:10; 230:17 specifically (10) 11:19;36:9;38:2; 60:22;76:1;82:10; 146:17;217:2,4;	state (1) 38:8 stamp (2) 172:11,17 stand (5) 169:17;170:23; 171:24;172:13,22 standard (33) 16:24;17:17,20; 19:8;23:8;93:7,8; 99:21;100:3;120:10; 124:5;125:9;129:9; 132:18,20;233:9,11, 12,12,14;236:6,19; 237:10;238:11;
software (15) 153:2;233:14,19, 20;237:7;242:11; 244:21,22,23,24; 246:1,2,4,19,24 soil (3) 9:12,13;60:2 sold (1) 191:2 somebody (5) 45:23;70:8;115:12; 169:6;245:10 somehow (1) 139:24 some-odd (1)	45:12;76:22;78:1, 2,6,12;79:17,20,21, 21,23;81:9,20;82:3, 21;83:1,2,3;84:1,5,6, 16;86:2;87:9,11; 88:23;89:1,5,6,12,22; 90:13,16,23;91:18; 92:14;93:13;94:7,11, 20,20;97:2;98:6,10, 13,19;99:22;100:7; 101:10,23;102:7; 104:5,9,21;106:2; 108:5,10,15,19,21, 23;109:4;110:5,7,9, 11,22;111:1,14;	93:4;101:4,6;103:17; 107:7;111:22; 113:19;120:23; 121:16;126:1; 127:14;132:6; 138:14,18;140:19; 190:20;203:15; 214:13;223:23; 224:16,21;252:4 <b>sounds (25)</b> 32:13;84:19; 104:23;110:21,22; 136:1;145:17; 146:10;148:7,17; 158:19,22;159:16,22;	specialized (1) 11:24 species (6) 24:2,4,8;25:4,14,18 specific (11) 22:24;41:9;82:17; 83:15,19;97:2; 143:18;147:4; 157:17;202:10; 230:17 specifically (10) 11:19;36:9;38:2; 60:22;76:1;82:10; 146:17;217:2,4; 229:16	state (1) 38:8 stamp (2) 172:11,17 stand (5) 169:17;170:23; 171:24;172:13,22 standard (33) 16:24;17:17,20; 19:8;23:8;93:7,8; 99:21;100:3;120:10; 124:5;125:9;129:9; 132:18,20;233:9,11, 12,12,14;236:6,19; 237:10;238:11; 239:18;240:15;
software (15) 153:2;233:14,19, 20;237:7;242:11; 244:21,22,23,24; 246:1,2,4,19,24 soil (3) 9:12,13;60:2 sold (1) 191:2 somebody (5) 45:23;70:8;115:12; 169:6;245:10 somehow (1) 139:24 some-odd (1) 29:17	45:12;76:22;78:1, 2,6,12;79:17,20,21, 21,23;81:9,20;82:3, 21;83:1,2,3;84:1,5,6, 16;86:2;87:9,11; 88:23;89:1,5,6,12,22; 90:13,16,23;91:18; 92:14;93:13;94:7,11, 20,20;97:2;98:6,10, 13,19;99:22;100:7; 101:10,23;102:7; 104:5,9,21;106:2; 108:5,10,15,19,21, 23;109:4;110:5,7,9, 11,22;111:1,14; 112:17;113:18;	93:4;101:4,6;103:17; 107:7;111:22; 113:19;120:23; 121:16;126:1; 127:14;132:6; 138:14,18;140:19; 190:20;203:15; 214:13;223:23; 224:16,21;252:4 <b>sounds (25)</b> 32:13;84:19; 104:23;110:21,22; 136:1;145:17; 146:10;148:7,17; 158:19,22;159:16,22; 161:18;162:20;	specialized (1) 11:24 species (6) 24:2,4,8;25:4,14,18 specific (11) 22:24;41:9;82:17; 83:15,19;97:2; 143:18;147:4; 157:17;202:10; 230:17 specifically (10) 11:19;36:9;38:2; 60:22;76:1;82:10; 146:17;217:2,4; 229:16 specifications (1)	state (1) 38:8 stamp (2) 172:11,17 stand (5) 169:17;170:23; 171:24;172:13,22 standard (33) 16:24;17:17,20; 19:8;23:8;93:7,8; 99:21;100:3;120:10; 124:5;125:9;129:9; 132:18,20;233:9,11, 12,12,14;236:6,19; 237:10;238:11; 239:18;240:15; 241:16;242:13; 241:16;242:13;
software (15) 153:2;233:14,19, 20;237:7;242:11; 244:21,22,23,24; 246:1,2,4,19,24 soil (3) 9:12,13;60:2 sold (1) 191:2 somebody (5) 45:23;70:8;115:12; 169:6;245:10 somehow (1) 139:24 some-odd (1) 29:17 someone (9)	45:12;76:22;78:1, 2,6,12;79:17,20,21, 21,23;81:9,20;82:3, 21;83:1,2,3;84:1,5,6, 16;86:2;87:9,11; 88:23;89:1,5,6,12,22; 90:13,16,23;91:18; 92:14;93:13;94:7,11, 20,20;97:2;98:6,10, 13,19;99:22;100:7; 101:10,23;102:7; 104:5,9,21;106:2; 108:5,10,15,19,21, 23;109:4;110:5,7,9, 11,22;111:1,14; 112:17;113:18; 114:1,5,12,15;	93:4;101:4,6;103:17; 107:7;111:22; 113:19;120:23; 121:16;126:1; 127:14;132:6; 138:14,18;140:19; 190:20;203:15; 214:13;223:23; 224:16,21;252:4 <b>sounds (25)</b> 32:13;84:19; 104:23;110:21,22; 136:1;145:17; 146:10;148:7,17; 158:19,22;159:16,22; 161:18;162:20; 163:14,17;165:21;	specialized (1) 11:24 species (6) 24:2,4,8;25:4,14,18 specific (11) 22:24;41:9;82:17; 83:15,19;97:2; 143:18;147:4; 157:17;202:10; 230:17 specifically (10) 11:19;36:9;38:2; 60:22;76:1;82:10; 146:17;217:2,4; 229:16 specifications (1) 47:19	state (1) 38:8 stamp (2) 172:11,17 stand (5) 169:17;170:23; 171:24;172:13,22 standard (33) 16:24;17:17,20; 19:8;23:8;93:7,8; 99:21;100:3;120:10; 124:5;125:9;129:9; 132:18,20;233:9,11, 12,12,14;236:6,19; 237:10;238:11; 239:18;240:15; 241:16;242:13; 244:22;245:2,20; 241:22;245:2,20;
software (15) 153:2;233:14,19, 20;237:7;242:11; 244:21,22,23,24; 246:1,2,4,19,24 soil (3) 9:12,13;60:2 sold (1) 191:2 somebody (5) 45:23;70:8;115:12; 169:6;245:10 somehow (1) 139:24 some-odd (1) 29:17 someone (9) 41:17,20,24;89:6;	45:12;76:22;78:1, 2,6,12;79:17,20,21, 21,23;81:9,20;82:3, 21;83:1,2,3;84:1,5,6, 16;86:2;87:9,11; 88:23;89:1,5,6,12,22; 90:13,16,23;91:18; 92:14;93:13;94:7,11, 20,20;97:2;98:6,10, 13,19;99:22;100:7; 101:10,23;102:7; 104:5,9,21;106:2; 108:5,10,15,19,21, 23;109:4;110:5,7,9, 11,22;111:1,14; 112:17;113:18; 114:1,5,12,15; 115:11;116:5,6;	93:4;101:4,6;103:17; 107:7;111:22; 113:19;120:23; 121:16;126:1; 127:14;132:6; 138:14,18;140:19; 190:20;203:15; 214:13;223:23; 224:16,21;252:4 <b>sounds (25)</b> 32:13;84:19; 104:23;110:21,22; 136:1;145:17; 146:10;148:7,17; 158:19,22;159:16,22; 161:18;162:20; 163:14,17;165:21; 177:17;189:4;198:9;	specialized (1) 11:24 species (6) 24:2,4,8;25:4,14,18 specific (11) 22:24;41:9;82:17; 83:15,19;97:2; 143:18;147:4; 157:17;202:10; 230:17 specifically (10) 11:19;36:9;38:2; 60:22;76:1;82:10; 146:17;217:2,4; 229:16 specifications (1) 47:19 specified (2)	state (1) 38:8 stamp (2) 172:11,17 stand (5) 169:17;170:23; 171:24;172:13,22 standard (33) 16:24;17:17,20; 19:8;23:8;93:7,8; 99:21;100:3;120:10; 124:5;125:9;129:9; 132:18,20;233:9,11, 12,12,14;236:6,19; 237:10;238:11; 239:18;240:15; 241:16;242:13; 244:22;245:2,20; 246:3,5
software (15) 153:2;233:14,19, 20;237:7;242:11; 244:21,22,23,24; 246:1,2,4,19,24 soil (3) 9:12,13;60:2 sold (1) 191:2 somebody (5) 45:23;70:8;115:12; 169:6;245:10 somehow (1) 139:24 some-odd (1) 29:17 someone (9) 41:17,20,24;89:6; 124:21;186:14;	45:12;76:22;78:1, 2,6,12;79:17,20,21, 21,23;81:9,20;82:3, 21;83:1,2,3;84:1,5,6, 16;86:2;87:9,11; 88:23;89:1,5,6,12,22; 90:13,16,23;91:18; 92:14;93:13;94:7,11, 20,20;97:2;98:6,10, 13,19;99:22;100:7; 101:10,23;102:7; 104:5,9,21;106:2; 108:5,10,15,19,21, 23;109:4;110:5,7,9, 11,22;111:1,14; 112:17;113:18; 114:1,5,12,15; 115:11;116:5,6; 117:10,12,16,21,23;	93:4;101:4,6;103:17; 107:7;111:22; 113:19;120:23; 121:16;126:1; 127:14;132:6; 138:14,18;140:19; 190:20;203:15; 214:13;223:23; 224:16,21;252:4 <b>sounds (25)</b> 32:13;84:19; 104:23;110:21,22; 136:1;145:17; 146:10;148:7,17; 158:19,22;159:16,22; 161:18;162:20; 163:14,17;165:21; 177:17;189:4;198:9; 213:22;219:8;231:17	specialized (1) 11:24 species (6) 24:2,4,8;25:4,14,18 specific (11) 22:24;41:9;82:17; 83:15,19;97:2; 143:18;147:4; 157:17;202:10; 230:17 specifically (10) 11:19;36:9;38:2; 60:22;76:1;82:10; 146:17;217:2,4; 229:16 specifications (1) 47:19 specified (2) 236:9;240:15	state (1) 38:8 stamp (2) 172:11,17 stand (5) 169:17;170:23; 171:24;172:13,22 standard (33) 16:24;17:17,20; 19:8;23:8;93:7,8; 99:21;100:3;120:10; 124:5;125:9;129:9; 132:18,20;233:9,11, 12,12,14;236:6,19; 237:10;238:11; 239:18;240:15; 241:16;242:13; 244:22;245:2,20; 246:3,5 standards (10)
software (15) 153:2;233:14,19, 20;237:7;242:11; 244:21,22,23,24; 246:1,2,4,19,24 soil (3) 9:12,13;60:2 sold (1) 191:2 somebody (5) 45:23;70:8;115:12; 169:6;245:10 somehow (1) 139:24 some-odd (1) 29:17 someone (9) 41:17,20,24;89:6; 124:21;186:14; 196:17;203:15; 20:237:7;242:11; 20:237:7;242:12; 20:237:7;242:12; 20:237:7;242:12; 20:237:7;242:12; 20:237:7;242:12; 20:237:7;242:12; 20:237:7;242:12; 20:237:7;24; 20:237;24; 20:	45:12;76:22;78:1, 2,6,12;79:17,20,21, 21,23;81:9,20;82:3, 21;83:1,2,3;84:1,5,6, 16;86:2;87:9,11; 88:23;89:1,5,6,12,22; 90:13,16,23;91:18; 92:14;93:13;94:7,11, 20,20;97:2;98:6,10, 13,19;99:22;100:7; 101:10,23;102:7; 104:5,9,21;106:2; 108:5,10,15,19,21, 23;109:4;110:5,7,9, 11,22;111:1,14; 112:17;113:18; 114:1,5,12,15; 115:11;116:5,6; 117:10,12,16,21,23; 118:3,14,17,19,24;	93:4;101:4,6;103:17; 107:7;111:22; 113:19;120:23; 121:16;126:1; 127:14;132:6; 138:14,18;140:19; 190:20;203:15; 214:13;223:23; 224:16,21;252:4 <b>sounds (25)</b> 32:13;84:19; 104:23;110:21,22; 136:1;145:17; 146:10;148:7,17; 158:19,22;159:16,22; 161:18;162:20; 163:14,17;165:21; 177:17;189:4;198:9; 213:22;219:8;231:17 <b>sound's (1)</b>	specialized (1) 11:24 species (6) 24:2,4,8;25:4,14,18 specific (11) 22:24;41:9;82:17; 83:15,19;97:2; 143:18;147:4; 157:17;202:10; 230:17 specifically (10) 11:19;36:9;38:2; 60:22;76:1;82:10; 146:17;217:2,4; 229:16 specifications (1) 47:19 specified (2) 236:9;240:15 specs (3)	state (1) 38:8 stamp (2) 172:11,17 stand (5) 169:17;170:23; 171:24;172:13,22 standard (33) 16:24;17:17,20; 19:8;23:8;93:7,8; 99:21;100:3;120:10; 124:5;125:9;129:9; 132:18,20;233:9,11, 12,12,14;236:6,19; 237:10;238:11; 239:18;240:15; 241:16;242:13; 244:22;245:2,20; 246:3,5 standards (10) 22:12;23:23;33:7, 22:12;23:23;33:7, 22:12;23:23;33:7, 22:12;23:23;33:7, 23:11,172 38:8 38:8 standards (10) 22:12;23:23;33:7, 24:12,24 52:12;23:23;33:7, 24:12,24 52:12;23:23;33:7, 24:12,24 52:12;23:23;33:7, 24:12,24 52:12;23:23;33:7, 24:12,24 52:12;23:23;33:7, 24:12,24 52:12;23:23;23;23 53:7, 53:7, 53:7, 53:7, 53:7, 54:7, 55
software (15) 153:2;233:14,19, 20;237:7;242:11; 244:21,22,23,24; 246:1,2,4,19,24 soil (3) 9:12,13;60:2 sold (1) 191:2 somebody (5) 45:23;70:8;115:12; 169:6;245:10 somehow (1) 139:24 some-odd (1) 29:17 someone (9) 41:17,20,24;89:6; 124:21;186:14; 196:17;203:15; 204:21 (2)	45:12;76:22;78:1, 2,6,12;79:17,20,21, 21,23;81:9,20;82:3, 21;83:1,2,3;84:1,5,6, 16;86:2;87:9,11; 88:23;89:1,5,6,12,22; 90:13,16,23;91:18; 92:14;93:13;94:7,11, 20,20;97:2;98:6,10, 13,19;99:22;100:7; 101:10,23;102:7; 104:5,9,21;106:2; 108:5,10,15,19,21, 23;109:4;110:5,7,9, 11,22;111:1,14; 112:17;113:18; 114:1,5,12,15; 115:11;116:5,6; 117:10,12,16,21,23; 118:3,14,17,19,24; 119:8,10,21;120:6,	93:4;101:4,6;103:17; 107:7;111:22; 113:19;120:23; 121:16;126:1; 127:14;132:6; 138:14,18;140:19; 190:20;203:15; 214:13;223:23; 224:16,21;252:4 <b>sounds (25)</b> 32:13;84:19; 104:23;110:21,22; 136:1;145:17; 146:10;148:7,17; 158:19,22;159:16,22; 161:18;162:20; 163:14,17;165:21; 177:17;189:4;198:9; 213:22;219:8;231:17 <b>sound's (1)</b> 120:16	specialized (1) 11:24 species (6) 24:2,4,8;25:4,14,18 specific (11) 22:24;41:9;82:17; 83:15,19;97:2; 143:18;147:4; 157:17;202:10; 230:17 specifically (10) 11:19;36:9;38:2; 60:22;76:1;82:10; 146:17;217:2,4; 229:16 specifications (1) 47:19 specified (2) 236:9;240:15 specs (3) 59:1;120:5;166:10	state (1) 38:8 stamp (2) 172:11,17 stand (5) 169:17;170:23; 171:24;172:13,22 standard (33) 16:24;17:17,20; 19:8;23:8;93:7,8; 99:21;100:3;120:10; 124:5;125:9;129:9; 132:18,20;233:9,11, 12,12,14;236:6,19; 237:10;238:11; 239:18;240:15; 241:16;242:13; 244:22;245:2,20; 246:3,5 standards (10) 22:12;23:23;33:7, 9;53:22;101:9;134:7; 151:22,245:2,20; 246:2,5 246:3,5 246:3,5 247:22;245:2,20; 247:22;245:2,20; 247:22;245:2,20; 247:22;245:2,20; 247:22;245:2,20; 247:22;245:2,20; 247:22;245:2,20; 247:22;245:2,20; 247:22;245:2,20; 247:22;245:2,20; 247:22;245:2,20; 247:22;245:2,20; 247:22;245:2,20; 247:22;245:2,20; 247:22;245:2,20; 247:22;245:2,20; 247:22;245:2,20; 247:22;245:2,20; 247:22;245:22;245:2,20; 247:22;245:22;245:2,20; 247:22;245:22;245:2,20; 247:22;245:22;245:2,20; 247:22;245:22;245:22;20; 247:22;245:22;245:22;20; 247:22;245:22;245:22;20; 247:22;245:22;245:22;20; 247:22;245:22;245:22;20; 247:22;245:22;245:22;20; 247:22;245:22;245:22;20; 247:22;245:22;245:22;20; 247:22;245:22;245:22;20; 247:22;245:22;245:22;20; 247:22;245:22;245:22;20; 247:22;245:22;245:22;245:22;245;22;20; 247:22;245:22;245:22;245:22;245;22;245;22;245;22;245;22;245;22;245;22;245;22;245;22;245;245
software (15) 153:2;233:14,19, 20;237:7;242:11; 244:21,22,23,24; 246:1,2,4,19,24 soil (3) 9:12,13;60:2 sold (1) 191:2 somebody (5) 45:23;70:8;115:12; 169:6;245:10 somehow (1) 139:24 some-odd (1) 29:17 someone (9) 41:17,20,24;89:6; 124:21;186:14; 196:17;203:15; 204:21 someone's (2) 0.6 (19.22.2)	45:12;76:22;78:1, 2,6,12;79:17,20,21, 21,23;81:9,20;82:3, 21;83:1,2,3;84:1,5,6, 16;86:2;87:9,11; 88:23;89:1,5,6,12,22; 90:13,16,23;91:18; 92:14;93:13;94:7,11, 20,20;97:2;98:6,10, 13,19;99:22;100:7; 101:10,23;102:7; 104:5,9,21;106:2; 108:5,10,15,19,21, 23;109:4;110:5,7,9, 11,22;111:1,14; 112:17;113:18; 114:1,5,12,15; 115:11;116:5,6; 117:10,12,16,21,23; 118:3,14,17,19,24; 119:8,10,21;120:6, 14;122:13,15;	93:4;101:4,6;103:17; 107:7;111:22; 113:19;120:23; 121:16;126:1; 127:14;132:6; 138:14,18;140:19; 190:20;203:15; 214:13;223:23; 224:16,21;252:4 <b>sounds (25)</b> 32:13;84:19; 104:23;110:21,22; 136:1;145:17; 146:10;148:7,17; 158:19,22;159:16,22; 161:18;162:20; 163:14,17;165:21; 177:17;189:4;198:9; 213:22;219:8;231:17 <b>sound's (1)</b> 120:16 <b>source (25)</b>	specialized (1) 11:24 species (6) 24:2,4,8;25:4,14,18 specific (11) 22:24;41:9;82:17; 83:15,19;97:2; 143:18;147:4; 157:17;202:10; 230:17 specifically (10) 11:19;36:9;38:2; 60:22;76:1;82:10; 146:17;217:2,4; 229:16 specifications (1) 47:19 specified (2) 236:9;240:15 specs (3) 59:1;120:5;166:10 spectra (3)	state (1) 38:8 stamp (2) 172:11,17 stand (5) 169:17;170:23; 171:24;172:13,22 standard (33) 16:24;17:17,20; 19:8;23:8;93:7,8; 99:21;100:3;120:10; 124:5;125:9;129:9; 132:18,20;233:9,11, 12,12,14;236:6,19; 237:10;238:11; 239:18;240:15; 241:16;242:13; 244:22;245:2,20; 246:3,5 standards (10) 22:12;23:23;33:7, 9;53:22;101:9;134:7; 171:3,3;245:20
software (15) 153:2;233:14,19, 20;237:7;242:11; 244:21,22,23,24; 246:1,2,4,19,24 soil (3) 9:12,13;60:2 sold (1) 191:2 somebody (5) 45:23;70:8;115:12; 169:6;245:10 somehow (1) 139:24 some-odd (1) 29:17 someone (9) 41:17,20,24;89:6; 124:21;186:14; 196:17;203:15; 204:21 someone's (2) 96:18;98:8 someone'(10)	45:12;76:22;78:1, 2,6,12;79:17,20,21, 21,23;81:9,20;82:3, 21;83:1,2,3;84:1,5,6, 16;86:2;87:9,11; 88:23;89:1,5,6,12,22; 90:13,16,23;91:18; 92:14;93:13;94:7,11, 20,20;97:2;98:6,10, 13,19;99:22;100:7; 101:10,23;102:7; 104:5,9,21;106:2; 108:5,10,15,19,21, 23;109:4;110:5,7,9, 11,22;111:1,14; 112:17;113:18; 114:1,5,12,15; 115:11;116:5,6; 117:10,12,16,21,23; 118:3,14,17,19,24; 119:8,10,21;120:6, 14;122:13,15; 124:20;125:13,17; 126:27,10,15,24	93:4;101:4,6;103:17; 107:7;111:22; 113:19;120:23; 121:16;126:1; 127:14;132:6; 138:14,18;140:19; 190:20;203:15; 214:13;223:23; 224:16,21;252:4 <b>sounds (25)</b> 32:13;84:19; 104:23;110:21,22; 136:1;145:17; 146:10;148:7,17; 158:19,22;159:16,22; 161:18;162:20; 163:14,17;165:21; 177:17;189:4;198:9; 213:22;219:8;231:17 <b>sound's (1)</b> 120:16 <b>source (25)</b> 32:19,19,21,23; 07:0:122,4,124,24	specialized (1) 11:24 species (6) 24:2,4,8;25:4,14,18 specific (11) 22:24;41:9;82:17; 83:15,19;97:2; 143:18;147:4; 157:17;202:10; 230:17 specifically (10) 11:19;36:9;38:2; 60:22;76:1;82:10; 146:17;217:2,4; 229:16 specifications (1) 47:19 specified (2) 236:9;240:15 specs (3) 59:1;120:5;166:10 spectra (3) 197:16;198:7; 100:9	38:8 stamp (2) 172:11,17 stand (5) 169:17;170:23; 171:24;172:13,22 standard (33) 16:24;17:17,20; 19:8;23:8;93:7,8; 99:21;100:3;120:10; 124:5;125:9;129:9; 132:18,20;233:9,11, 12,12,14;236:6,19; 237:10;238:11; 239:18;240:15; 241:16;242:13; 244:22;245:2,20; 246:3,5 standards (10) 22:12;23:23;33:7, 9;53:22;101:9;134:7; 171:3,3;245:20 Standing (2) 84:20:226 1
software (15) 153:2;233:14,19, 20;237:7;242:11; 244:21,22,23,24; 246:1,2,4,19,24 soil (3) 9:12,13;60:2 sold (1) 191:2 somebody (5) 45:23;70:8;115:12; 169:6;245:10 somehow (1) 139:24 some-odd (1) 29:17 someone (9) 41:17,20,24;89:6; 124:21;186:14; 196:17;203:15; 204:21 someone's (2) 96:18;98:8 sometimes (19) 42:10,17,20,24;6,0	45:12;76:22;78:1, 2,6,12;79:17,20,21, 21,23;81:9,20;82:3, 21;83:1,2,3;84:1,5,6, 16;86:2;87:9,11; 88:23;89:1,5,6,12,22; 90:13,16,23;91:18; 92:14;93:13;94:7,11, 20,20;97:2;98:6,10, 13,19;99:22;100:7; 101:10,23;102:7; 104:5,9,21;106:2; 108:5,10,15,19,21, 23;109:4;110:5,7,9, 11,22;111:1,14; 112:17;113:18; 114:1,5,12,15; 115:11;116:5,6; 117:10,12,16,21,23; 118:3,14,17,19,24; 119:8,10,21;120:6, 14;122:13,15; 124:20;125:13,17; 126:7,10,15,24;	93:4;101:4,6;103:17; 107:7;111:22; 113:19;120:23; 121:16;126:1; 127:14;132:6; 138:14,18;140:19; 190:20;203:15; 214:13;223:23; 224:16,21;252:4 <b>sounds (25)</b> 32:13;84:19; 104:23;110:21,22; 136:1;145:17; 146:10;148:7,17; 158:19,22;159:16,22; 161:18;162:20; 163:14,17;165:21; 177:17;189:4;198:9; 213:22;219:8;231:17 <b>sound's (1)</b> 120:16 <b>source (25)</b> 32:19,19,21,23; 97:2;133:4;134:24; 186:17:105:15	specialized (1) 11:24 species (6) 24:2,4,8;25:4,14,18 specific (11) 22:24;41:9;82:17; 83:15,19;97:2; 143:18;147:4; 157:17;202:10; 230:17 specifically (10) 11:19;36:9;38:2; 60:22;76:1;82:10; 146:17;217:2,4; 229:16 specifications (1) 47:19 specified (2) 236:9;240:15 specs (3) 59:1;120:5;166:10 spectra (3) 197:16;198:7; 199:8 magedities (1)	38:8   stamp (2)   172:11,17   stand (5)   169:17;170:23;   171:24;172:13,22   standard (33)   16:24;17:17,20;   19:8;23:8;93:7,8;   99:21;100:3;120:10;   124:5;125:9;129:9;   132:18,20;233:9,11,   12,12,14;236:6,19;   237:10;238:11;   239:18;240:15;   241:16;242:13;   244:22;245:2,20;   246:3,5   standards (10)   22:12;23:23;33:7,   9;53:22;101:9;134:7;   171:3,3;245:20   Standing (2)   84:20;236:1
software (15) 153:2;233:14,19, 20;237:7;242:11; 244:21,22,23,24; 246:1,2,4,19,24 soil (3) 9:12,13;60:2 sold (1) 191:2 somebody (5) 45:23;70:8;115:12; 169:6;245:10 somehow (1) 139:24 some-odd (1) 29:17 someone (9) 41:17,20,24;89:6; 124:21;186:14; 196:17;203:15; 204:21 someone's (2) 96:18;98:8 sometimes (19) 43:10,17,23;46:8, 12:00:21:01:11:11:15	45:12;76:22;78:1, 2,6,12;79:17,20,21, 21,23;81:9,20;82:3, 21;83:1,2,3;84:1,5,6, 16;86:2;87:9,11; 88:23;89:1,5,6,12,22; 90:13,16,23;91:18; 92:14;93:13;94:7,11, 20,20;97:2;98:6,10, 13,19;99:22;100:7; 101:10,23;102:7; 104:5,9,21;106:2; 108:5,10,15,19,21, 23;109:4;110:5,7,9, 11,22;111:1,14; 112:17;113:18; 114:1,5,12,15; 115:11;116:5,6; 117:10,12,16,21,23; 118:3,14,17,19,24; 119:8,10,21;120:6, 14;122:13,15; 124:20;125:13,17; 126:7,10,15,24; 127:15;128:4,6,9; 122:11:12:14,122:2	93:4;101:4,6;103:17; 107:7;111:22; 113:19;120:23; 121:16;126:1; 127:14;132:6; 138:14,18;140:19; 190:20;203:15; 214:13;223:23; 224:16,21;252:4 <b>sounds (25)</b> 32:13;84:19; 104:23;110:21,22; 136:1;145:17; 146:10;148:7,17; 158:19,22;159:16,22; 161:18;162:20; 163:14,17;165:21; 177:17;189:4;198:9; 213:22;219:8;231:17 <b>sound's (1)</b> 120:16 <b>source (25)</b> 32:19,19,21,23; 97:2;133:4;134:24; 186:17;195:16;	specialized (1) 11:24 species (6) 24:2,4,8;25:4,14,18 specific (11) 22:24;41:9;82:17; 83:15,19;97:2; 143:18;147:4; 157:17;202:10; 230:17 specifically (10) 11:19;36:9;38:2; 60:22;76:1;82:10; 146:17;217:2,4; 229:16 specifications (1) 47:19 specified (2) 236:9;240:15 specs (3) 59:1;120:5;166:10 spectra (3) 197:16;198:7; 199:8 speculating (1) 60:24	state (1) 38:8 stamp (2) 172:11,17 stand (5) 169:17;170:23; 171:24;172:13,22 standard (33) 16:24;17:17,20; 19:8;23:8;93:7,8; 99:21;100:3;120:10; 124:5;125:9;129:9; 132:18,20;233:9,11, 12,12,14;236:6,19; 237:10;238:11; 239:18;240:15; 241:16;242:13; 244:22;245:2,20; 246:3,5 standards (10) 22:12;23:23;33:7, 9;53:22;101:9;134:7; 171:3,3;245:20 Standing (2) 84:20;236:1 start (8)
software (15) 153:2;233:14,19, 20;237:7;242:11; 244:21,22,23,24; 246:1,2,4,19,24 soil (3) 9:12,13;60:2 sold (1) 191:2 somebody (5) 45:23;70:8;115:12; 169:6;245:10 somehow (1) 139:24 some-odd (1) 29:17 someone (9) 41:17,20,24;89:6; 124:21;186:14; 196:17;203:15; 204:21 someone's (2) 96:18;98:8 sometimes (19) 43:10,17,23;46:8, 12;90:21;91:1;116:4, 20:22:21:17:12:12;	$\begin{array}{l} 45:12;76:22;78:1,\\ 2,6,12;79:17,20,21,\\ 21,23;81:9,20;82:3,\\ 21;83:1,2,3;84:1,5,6,\\ 16;86:2;87:9,11;\\ 88:23;89:1,5,6,12,22;\\ 90:13,16,23;91:18;\\ 92:14;93:13;94:7,11,\\ 20,20;97:2;98:6,10,\\ 13,19;99:22;100:7;\\ 101:10,23;102:7;\\ 104:5,9,21;106:2;\\ 108:5,10,15,19,21,\\ 23;109:4;110:5,7,9,\\ 11,22;111:1,14;\\ 112:17;113:18;\\ 114:1,5,12,15;\\ 115:11;116:5,6;\\ 117:10,12,16,21,23;\\ 118:3,14,17,19,24;\\ 119:8,10,21;120:6,\\ 14;122:13,15;\\ 124:20;125:13,17;\\ 126:7,10,15,24;\\ 127:15;1128:4,69;\\ 132:11,13,14;133:3,\\ 4124:15,19,24\end{array}$	93:4;101:4,6;103:17; 107:7;111:22; 113:19;120:23; 121:16;126:1; 127:14;132:6; 138:14,18;140:19; 190:20;203:15; 214:13;223:23; 224:16,21;252:4 <b>sounds (25)</b> 32:13;84:19; 104:23;110:21,22; 136:1;145:17; 146:10;148:7,17; 158:19,22;159:16,22; 161:18;162:20; 163:14,17;165:21; 177:17;189:4;198:9; 213:22;219:8;231:17 <b>sound's (1)</b> 120:16 <b>source (25)</b> 32:19,19,21,23; 97:2;133:4;134:24; 186:17;195:16; 196:12;197:5;202:7, 10:202:16:201:2	specialized (1) 11:24 species (6) 24:2,4,8;25:4,14,18 specific (11) 22:24;41:9;82:17; 83:15,19;97:2; 143:18;147:4; 157:17;202:10; 230:17 specifically (10) 11:19;36:9;38:2; 60:22;76:1;82:10; 146:17;217:2,4; 229:16 specifications (1) 47:19 specified (2) 236:9;240:15 specs (3) 59:1;120:5;166:10 spectra (3) 197:16;198:7; 199:8 speculating (1) 60:24 cmaculating (1)	38:8   stamp (2)   172:11,17   stand (5)   169:17;170:23;   171:24;172:13,22   standard (33)   16:24;17:17,20;   19:8;23:8;93:7,8;   99:21;100:3;120:10;   124:5;125:9;129:9;   132:18,20;233:9,11,   12,12,14;236:6,19;   237:10;238:11;   239:18;240:15;   241:16;242:13;   244:22;245:2,20;   246:3,5   standards (10)   22:12;23:23;33:7,   9;53:22;101:9;134:7;   171:3,3;245:20   Standing (2)   84:20;236:1   start (8)   8:18;44:13;130:23;   12:2:0.152:10
software (15) 153:2;233:14,19, 20;237:7;242:11; 244:21,22,23,24; 246:1,2,4,19,24 soil (3) 9:12,13;60:2 sold (1) 191:2 somebody (5) 45:23;70:8;115:12; 169:6;245:10 somehow (1) 139:24 some-odd (1) 29:17 someone (9) 41:17,20,24;89:6; 124:21;186:14; 196:17;203:15; 204:21 someone's (2) 96:18;98:8 sometimes (19) 43:10,17,23;46:8, 12;90:21;91:1;116:4, 20,22,22;117:13,13; 118:12:125:22	45:12;76:22;78:1, 2,6,12;79:17,20,21, 21,23;81:9,20;82:3, 21;83:1,2,3;84:1,5,6, 16;86:2;87:9,11; 88:23;89:1,5,6,12,22; 90:13,16,23;91:18; 92:14;93:13;94:7,11, 20,20;97:2;98:6,10, 13,19;99:22;100:7; 101:10,23;102:7; 104:5,9,21;106:2; 108:5,10,15,19,21, 23;109:4;110:5,7,9, 11,22;111:1,14; 112:17;113:18; 114:1,5,12,15; 115:11;116:5,6; 117:10,12,16,21,23; 118:3,14,17,19,24; 119:8,10,21;120:6, 14;122:13,15; 124:20;125:13,17; 126:7,10,15,24; 127:15;128:4,6,9; 132:11,13,14;133:3, 4;134:15,18,24;	93:4;101:4,6;103:17; 107:7;111:22; 113:19;120:23; 121:16;126:1; 127:14;132:6; 138:14,18;140:19; 190:20;203:15; 214:13;223:23; 224:16,21;252:4 <b>sounds (25)</b> 32:13;84:19; 104:23;110:21,22; 136:1;145:17; 146:10;148:7,17; 158:19,22;159:16,22; 161:18;162:20; 163:14,17;165:21; 177:17;189:4;198:9; 213:22;219:8;231:17 <b>sound's (1)</b> 120:16 <b>source (25)</b> 32:19,19,21,23; 97:2;133:4;134:24; 186:17;195:16; 196:12;197:5;202:7, 10;203:16;211:3; 22411:12,222:12	specialized (1) 11:24 species (6) 24:2,4,8;25:4,14,18 specific (11) 22:24;41:9;82:17; 83:15,19;97:2; 143:18;147:4; 157:17;202:10; 230:17 specifically (10) 11:19;36:9;38:2; 60:22;76:1;82:10; 146:17;217:2,4; 229:16 specifications (1) 47:19 specified (2) 236:9;240:15 specs (3) 59:1;120:5;166:10 spectra (3) 197:16;198:7; 199:8 speculating (1) 60:24 speculative (1) 245:11	38:8   stamp (2)   172:11,17   stand (5)   169:17;170:23;   171:24;172:13,22   standard (33)   16:24;17:17,20;   19:8;23:8;93:7,8;   99:21;100:3;120:10;   124:5;125:9;129:9;   132:18,20;233:9,11,   12,12,14;236:6,19;   237:10;238:11;   239:18;240:15;   241:16;242:13;   244:22;245:2,20;   246:3,5   standards (10)   22:12;23:23;33:7,   9;53:22;101:9;134:7;   171:3,3;245:20   Standing (2)   84:20;236:1   start (8)   8:18;44:13;130:23;   132:9;152:10;   172:32:240:11
software (15) 153:2;233:14,19, 20;237:7;242:11; 244:21,22,23,24; 246:1,2,4,19,24 soil (3) 9:12,13;60:2 sold (1) 191:2 somebody (5) 45:23;70:8;115:12; 169:6;245:10 somehow (1) 139:24 some-odd (1) 29:17 someone (9) 41:17,20,24;89:6; 124:21;186:14; 196:17;203:15; 204:21 someone's (2) 96:18;98:8 sometimes (19) 43:10,17,23;46:8, 12;90:21;91:1;116:4, 20,22,22;117:13,13; 118:12;125:22; 145:78:15:2240 2	$\begin{array}{l} 45:12;76:22;78:1,\\ 2,6,12;79:17,20,21,\\ 21,23;81:9,20;82:3,\\ 21;83:1,2,3;84:1,5,6,\\ 16;86:2;87:9,11;\\ 88:23;89:1,5,6,12,22;\\ 90:13,16,23;91:18;\\ 92:14;93:13;94:7,11,\\ 20,20;97:2;98:6,10,\\ 13,19;99:22;100:7;\\ 101:10,23;102:7;\\ 104:5,9,21;106:2;\\ 108:5,10,15,19,21,\\ 23;109:4;110:5,7,9,\\ 11,22;111:1,14;\\ 112:17;113:18;\\ 114:1,5,12,15;\\ 115:11;116:5,6;\\ 117:10,12,16,21,23;\\ 118:3,14,17,19,24;\\ 119:8,10,21;120:6,\\ 14;122:13,15;\\ 124:20;125:13,17;\\ 126:7,10,15,24;\\ 127:15;128:4,6,9;\\ 132:11,13,14;133:3,\\ 4;134:15,18,24;\\ 135:12;136:9,24;\\ 120:140:18:20;24\end{array}$	93:4;101:4,6;103:17; 107:7;111:22; 113:19;120:23; 121:16;126:1; 127:14;132:6; 138:14,18;140:19; 190:20;203:15; 214:13;223:23; 224:16,21;252:4 <b>sounds (25)</b> 32:13;84:19; 104:23;110:21,22; 136:1;145:17; 146:10;148:7,17; 158:19,22;159:16,22; 161:18;162:20; 163:14,17;165:21; 177:17;189:4;198:9; 213:22;219:8;231:17 <b>sound's (1)</b> 120:16 <b>source (25)</b> 32:19,19,21,23; 97:2;133:4;134:24; 186:17;195:16; 196:12;197:5;202:7, 10;203:16;211:3; 234:11,12,13;238:12; 240:12;241:11;	specialized (1) 11:24 species (6) 24:2,4,8;25:4,14,18 specific (11) 22:24;41:9;82:17; 83:15,19;97:2; 143:18;147:4; 157:17;202:10; 230:17 specifically (10) 11:19;36:9;38:2; 60:22;76:1;82:10; 146:17;217:2,4; 229:16 specifications (1) 47:19 specified (2) 236:9;240:15 specs (3) 59:1;120:5;166:10 spectra (3) 197:16;198:7; 199:8 speculating (1) 60:24 speculative (1) 245:11 cmaad (12)	stake (1) 38:8 stamp (2) 172:11,17 stand (5) 169:17;170:23; 171:24;172:13,22 standard (33) 16:24;17:17,20; 19:8;23:8;93:7,8; 99:21;100:3;120:10; 124:5;125:9;129:9; 132:18,20;233:9,11, 12,12,14;236:6,19; 237:10;238:11; 239:18;240:15; 241:16;242:13; 244:22;245:2,20; 246:3,5 standards (10) 22:12;23:23;33:7, 9;53:22;101:9;134:7; 171:3,3;245:20 Standing (2) 8:18;44:13;130:23; 132:9;152:10; 178:22;249:11; 254:18
software (15) 153:2;233:14,19, 20;237:7;242:11; 244:21,22,23,24; 246:1,2,4,19,24 soil (3) 9:12,13;60:2 sold (1) 191:2 somebody (5) 45:23;70:8;115:12; 169:6;245:10 somehow (1) 139:24 some-odd (1) 29:17 someone (9) 41:17,20,24;89:6; 124:21;186:14; 196:17;203:15; 204:21 someone's (2) 96:18;98:8 sometimes (19) 43:10,17,23;46:8, 12;90:21;91:1;116:4, 20,22,22;117:13,13; 118:12;125:22; 145:7,8;155:2;249:2	$\begin{array}{l} 45:12;76:22;78:1,\\ 2,6,12;79:17,20,21,\\ 21,23;81:9,20;82:3,\\ 21;83:1,2,3;84:1,5,6,\\ 16;86:2;87:9,11;\\ 88:23;89:1,5,6,12,22;\\ 90:13,16,23;91:18;\\ 92:14;93:13;94:7,11,\\ 20,20;97:2;98:6,10,\\ 13,19;99:22;100:7;\\ 101:10,23;102:7;\\ 104:5,9,21;106:2;\\ 108:5,10,15,19,21,\\ 23;109:4;110:5,7,9,\\ 11,22;111:1,14;\\ 112:17;113:18;\\ 114:1,5,12,15;\\ 115:11;116:5,6;\\ 117:10,12,16,21,23;\\ 118:3,14,17,19,24;\\ 119:8,10,21;120:6,\\ 14;122:13,15;\\ 124:20;125:13,17;\\ 126:7,10,15,24;\\ 127:15;128:4,6,9;\\ 132:11,13,14;133:3,\\ 4;134:15,18,24;\\ 135:12;136:9,24;\\ 139:20;140:18,22,24;\\ 1422:14:10;\\ \end{array}$	93:4;101:4,6;103:17; 107:7;111:22; 113:19;120:23; 121:16;126:1; 127:14;132:6; 138:14,18;140:19; 190:20;203:15; 214:13;223:23; 224:16,21;252:4 <b>sounds (25)</b> 32:13;84:19; 104:23;110:21,22; 136:1;145:17; 146:10;148:7,17; 158:19,22;159:16,22; 161:18;162:20; 163:14,17;165:21; 177:17;189:4;198:9; 213:22;219:8;231:17 <b>sound's (1)</b> 120:16 <b>source (25)</b> 32:19,19,21,23; 97:2;133:4;134:24; 186:17;195:16; 196:12;197:5;202:7, 10;203:16;211:3; 234:11,12,13;238:12; 240:1,3;241:11; 242:17;18:50:10	specialized (1) 11:24 species (6) 24:2,4,8;25:4,14,18 specific (11) 22:24;41:9;82:17; 83:15,19;97:2; 143:18;147:4; 157:17;202:10; 230:17 specifically (10) 11:19;36:9;38:2; 60:22;76:1;82:10; 146:17;217:2,4; 229:16 specifications (1) 47:19 specified (2) 236:9;240:15 specs (3) 59:1;120:5;166:10 spectra (3) 197:16;198:7; 199:8 speculating (1) 60:24 speculative (1) 245:11 speed (13) 117:22:128:16;	stake (1) 38:8 stamp (2) 172:11,17 stand (5) 169:17;170:23; 171:24;172:13,22 standard (33) 16:24;17:17,20; 19:8;23:8;93:7,8; 99:21;100:3;120:10; 124:5;125:9;129:9; 132:18,20;233:9,11, 12,12,14;236:6,19; 237:10;238:11; 239:18;240:15; 241:16;242:13; 244:22;245:2,20; 246:3,5 standards (10) 22:12;23:23;33:7, 9;53:22;101:9;134:7; 171:3,3;245:20 Standing (2) 84:20;236:1 start (8) 8:18;44:13;130:23; 132:9;152:10; 178:22;249:11; 254:18 standards (4)
software (15) 153:2;233:14,19, 20;237:7;242:11; 244:21,22,23,24; 246:1,2,4,19,24 soil (3) 9:12,13;60:2 sold (1) 191:2 somebody (5) 45:23;70:8;115:12; 169:6;245:10 somehow (1) 139:24 some-odd (1) 29:17 someone (9) 41:17,20,24;89:6; 124:21;186:14; 196:17;203:15; 204:21 someone's (2) 96:18;98:8 sometimes (19) 43:10,17,23;46:8, 12;90:21;91:1;116:4, 20,22,2;117:13,13; 118:12;125:22; 145:7,8;155:2;249:2 somewhat (2) 11:11:118:11	$\begin{array}{l} 45:12:76:22:78:1,\\ 2,6,12:79:17,20,21,\\ 21,23;81:9,20;82:3,\\ 21;83:1,2,3;84:1,5,6,\\ 16;86:2;87:9,11;\\ 88:23;89:1,5,6,12,22;\\ 90:13,16,23;91:18;\\ 92:14;93:13;94:7,11,\\ 20,20;97:2;98:6,10,\\ 13,19;99:22;100:7;\\ 101:10,23;102:7;\\ 104:5,9,21;106:2;\\ 108:5,10,15,19,21,\\ 23;109:4;110:5,7,9,\\ 11,22;111:1,14;\\ 112:17;113:18;\\ 114:1,5,12,15;\\ 115:11;116:5,6;\\ 117:10,12,16,21,23;\\ 118:3,14,17,19,24;\\ 119:8,10,21;120:6,\\ 14;122:13,15;\\ 124:20;125:13,17;\\ 126:7,10,15,24;\\ 127:15;128:4,6,9;\\ 132:11,13,14;133:3,\\ 4;134:15,18,24;\\ 135:12;136:9,24;\\ 139:20;140:18,22,24;\\ 142:12;144:19;\\ 149:16:152:12:13.12;\\ 142:12;144:19;\\ 149:16:152:12;\\ 140:152:12;120:12;\\ 142:12;144:19;\\ 149:16:152:12;\\ 140:$	93:4;101:4,6;103:17; 107:7;111:22; 113:19;120:23; 121:16;126:1; 127:14;132:6; 138:14,18;140:19; 190:20;203:15; 214:13;223:23; 224:16,21;252:4 <b>sounds (25)</b> 32:13;84:19; 104:23;110:21,22; 136:1;145:17; 146:10;148:7,17; 158:19,22;159:16,22; 161:18;162:20; 163:14,17;165:21; 177:17;189:4;198:9; 213:22;219:8;231:17 <b>sound's (1)</b> 120:16 <b>source (25)</b> 32:19,19,21,23; 97:2;133:4;134:24; 186:17;195:16; 196:12;197:5;202:7, 10;203:16;211:3; 234:11,12,13;238:12; 240:1,3;241:11; 242:17,18;250:10	specialized (1) 11:24 species (6) 24:2,4,8;25:4,14,18 specific (11) 22:24;41:9;82:17; 83:15,19;97:2; 143:18;147:4; 157:17;202:10; 230:17 specifically (10) 11:19;36:9;38:2; 60:22;76:1;82:10; 146:17;217:2,4; 229:16 specifications (1) 47:19 specified (2) 236:9;240:15 specs (3) 59:1;120:5;166:10 spectra (3) 197:16;198:7; 199:8 speculating (1) 60:24 speculative (1) 245:11 speed (13) 117:23;128:16; 123:2;101:04:212:15	state (1) 38:8 stamp (2) 172:11,17 stand (5) 169:17;170:23; 171:24;172:13,22 standard (33) 16:24;17:17,20; 19:8;23:8;93:7,8; 99:21;100:3;120:10; 124:5;125:9;129:9; 132:18,20;233:9,11, 12,12,14;236:6,19; 237:10;238:11; 239:18;240:15; 241:16;242:13; 244:22;245:2,20; 246:3,5 standards (10) 22:12;23:23;33:7, 9;53:22;101:9;134:7; 171:3,3;245:20 Standing (2) 84:20;236:1 start (8) 8:18;44:13;130:23; 132:9;152:10; 178:22;249:11; 254:18 started (4) 81:4:4170:9:102:4

23 starters (2) 96:21:174:15 starting (2) 63:6:157:5 starts (2) 201:9;205:16 state (25) 4:13;10:5;13:17, 22;16:11;20:3;32:24; 42:10,13,24,24;50:4; 53:8,13:60:12:75:14: 87:10;94:15;104:14; 152:24;160:18; 183:5;187:22; 191:19;242:7 stated (7) 78:8;87:2;94:2; 122:23;160:13; 186:14;191:21 statement (13) 22:4,9,13;27:11; 29:8;33:4;47:11; 127:15;134:11; 161:11;195:22,24; 208:18 states (4) 14:2;33:2;179:24; 191:14 state's (1) 35:24 station (2) 64:14:221:20 stationed (1) 20:19 stations (1) 20:21 statistic (1) 140:19 statistical (1) 211:11 stay (2) 40:17;158:20 stays (1) 72:3 steady (2) 148:8;156:16 Stearns (4) 7:21,23;95:17,18 steep (2) 29:6:57:3 steepest (2) 56:21;57:3 step (3) 62:19;125:8; 184:23 steps (1) 53:12 Stetson (1) 44:3 Stewart (3) 50:13,14:66:7 stick (1)

227.16
sticker (1)
86·18
still (13)
54.24.55.3.24.
74.17 22.78.6.97.17
128.9.166.21.237.7
21.238.18.240.24
21,230.10,249.24
247.15
247.13
stone (10)
1/:0;18:0,9,10,13;
19:7,9;38:13;39:20;
58:17
stop (1)
88:2
stopped (3)
91:15,15;190:13
stopping (1)
230:5
stops (3)
28:1,2;59:10
storm (5)
32:11:57:8.10.17.
20
storms (6)
31.16 21 24.32.5
31.10,21,24,32.3,
55.5,40.10 stormwator (20)
14:14 10:15:2 20
14:14,19;15:2,20,
22;18:1;19:22,24;
22:3,5,10,16,19,22;
23:9,15;27:8;31:11;
32:10;58:15
strange (1)
42:10
strategy (2)
97:20;98:16
stream (2)
148:20;243:3
stretch (1)
62:22
strict (1)
34:12
strike (2)
104.2.181.21
string (2)
248.6.250.2
240.0,230.2 strong (1)
122.4 10.212.1 12
132:4,10;212:1,13
strongly (1)
84:23
struck (1)
181:13
structurally (2)
55:4,24
Structure (9)
26:21;62:23;64:19,
19;67:8;72:18;73:3;
74:16;182:4
Structures (1)
67:6
struggling (1)

100:22 studies (7) 136:18:177:16; 201:15,23;202:3,18, 20 study (9) 76:6;87:23;102:7; 160:5;194:13; 203:13;221:7;227:1; 228:13 studying (1) 228:20 stuff (1) 138:6 subdivision (1) 23:1 subject (2) 157:3;171:5 submit (2) 6:13;77:9 submittal (2) 52:13:179:3 submitted (8) 6:5;76:8;77:5; 146:6;153:11,20; 154:4;167:10 subset (1) 213:9 substantially (3) 128:17:134:3; 202:5 substation (6) 65:23;72:5;74:4,7, 9.13 subtract (2) 207:4,7 subtracted (2) 139:18:210:11 subtraction (1) 206:12 succeed (1) 44:21 successful (1) 43:20 sued (2) 177:5,13 sufficient (3) 150:11;162:3; 238:14 sufficiently (2) 128:13;161:9 sugar (1) 116:19 suggest (4) 82:24;83:9;84:18; 241:18 suggested (2) 84:8;210:17 suggesting (1) 43:16 suggestion (3) 81:12;84:14,24 Sullivan (2)

7:17:85:16 summarize (3) 121:14:146:24; 211:17 summary (6) 5:13;24:18;75:22; 101:3,8;212:14 summer (2) 104:15;151:24 summertime (1) 206:14 summit (2) 37:16,20 supervise (1) 45:24 supplement (1) 6:17 supplemental (14) 6:13,22;26:12; 77:9,17;78:4,9;79:1; 83:14;156:18,20,21; 157:6;253:6 supplied (2) 77:24;78:2 supplier (2) 126:1,20 support (2) 121:19;159:13 suppose (3) 44:23:47:6:68:20 supposed (2) 82:9:171:7 Sure (74) 8:24:9:3:12:20: 14:17:15:8:17:1; 22:7;23:22;25:17; 27:1:29:21:30:11; 38:5:40:19:41:3: 49:23;52:19;53:11; 61:11,24;71:21; 75:23:76:14:77:21: 87:15.21;96:13; 100:12,22;102:17; 105:5,10,10,13,18; 107:12;110:3;121:1; 122:12;126:11,13; 127:22;131:3;134:6; 138:14;139:21; 144:9;146:20; 147:19;160:4; 169:13:175:11; 181:2:182:21.23: 186:24;192:8;198:2; 203:14;205:1;206:1; 214:11;218:18; 219:10,11,11,12; 223:20;229:1,18; 246:20;248:15,21,22 surface (5) 14:12,21;18:22,23; 19:2 surmise (1) 249:17

surmising (1) 252:23 surprise (2) 144:16:150:24 surprised (1) 113:4 surrogate (1) 108:10 surrounding (3) 92:22;110:20; 180:6 surroundings (1) 147:5 survey (8) 194:13,20;195:14; 197:17;200:14; 202:13;206:14;208:8 surveys (1) 238:3 Susan (1) 36:3 suspect (4) 52:7;60:8;105:17; 114:15 swear (1) 4:22 swimming (2) 113:3:115:9 swing (1) 93:2 sworn (5) 4:24:5:2.3:75:8.10 syndrome (4) 164:10;165:6,13, 14 system (12) 26:17,19;61:17; 62:5:64:6:91:17: 111:11;112:2,10; 116:7;128:11;254:2 Т Tab (6) 6:11,16;15:9; 76:11;77:7,11 table (11) 84:4;199:5;209:4; 214:1;215:11;233:3, 5,19;234:7;236:5,10 tables (2) 211:20.20 tabs (2) 204:10;215:22 talk (11) 40:11;45:18;158:1; 192:18;194:10; 215:3;219:5;225:16; 232:23;240:8;241:22 talked (8) 58:12;73:12;92:12;

169:5;232:22;235:16

138:10:156:17;

talking (34) 18:20,22;19:1; 81:21:91:15.16; 116:21:120:12: 127:1;130:4;133:14; 141:5,8;144:12,20; 157:16,22;160:7; 162:7;164:2;168:3; 169:5;179:11;190:5; 197:4;202:24; 206:17;213:20,21,22; 224:23;237:5,6; 248:16 talks (5) 83:21;121:18; 142:12;162:15;240:9 tall (1) 237:17 team (2) 11:21;13:19 tech (5) 121:4,11,15; 166:10;188:5 technical (6) 47:19;77:23; 121:19;152:6; 197:14;233:4 technicians' (1) 149:3 technique (1) 140:20 techniques (1) 247:2 telling (9) 126:16;154:22; 169:16,18;171:2; 190:2;192:23; 241:16;246:10 tells (2) 126:21:199:17 temperature (2) 132:22;240:11 temporarily (1) 56:1 ten (1) 93:23 tends (1) 181:9 tenth (1) 154:18 term (1) 164:9 terms (13) 10:9;47:18;51:18; 81:2;87:22;92:4; 110:24;122:7; 134:12;143:14; 160:5;164:6;252:9 terrain (6) 37:11:51:6:59:21; 68:23;111:8;153:3 test (11) 31:7;96:11;97:16,

19.23;98:16.17; 160:24:176:5: 185:13:202:23 tested (8) 94:22:99:4:101:8, 23;146:11;167:12, 14:175:15 testified (4) 11:6;113:10;125:9; 135:4 testifies (1) 173:6 testify (2) 29:16:244:2 testifying (1) 230:24 testimonies (3) 7:2;77:15;78:18 testimony (74) 6:6,14,22;8:19,22; 11:4;16:3;17:13,18; 20:7;22:17;23:15; 24:11,15;26:10,13; 34:7,8;36:3,9;38:16; 45:17;46:23;49:18; 59:2;60:10;61:8; 66:24;72:11;73:9; 75:3;76:8;77:5,10,17, 18;78:5,22,24;79:1,3, 8,10,16;80:18;81:23, 24:82:11,17:83:15, 19:100:20.20:101:2. 7:133:7:135:3; 136:10;143:20; 153:22;156:18,20,21; 165:23;172:7;179:1; 183:4:191:10; 208:18:244:11.14: 250:20;253:7;254:12 testing (20) 96:10;97:20;98:3, 15,21;110:18; 125:24;126:2;146:4, 19;148:6;150:21; 159:18,24;166:24; 173:23;175:20; 184:23;230:2;251:4 tests (2) 251:2,9 Texas (3) 177:2,14,23 Thanks (5) 15:14;27:6;58:19; 137:2;220:2 thereabouts (1) 215:5 therefore (7) 35:14;122:17; 150:5;166:10; 174:20;225:2;249:22 thinking (8) 11:5;72:20,24; 148:1;175:8;226:15;

229:2:238:7 third (6) 17:9:66:15:149:8: 176:4:197:22:199:17 Thirteen (2) 56:23.24 though (10) 12:7,12:41:3; 74:21;129:6;136:9; 190:13:213:21; 235:12;249:5 thought (11) 66:12;83:16; 109:20;112:12; 130:16;149:6;160:7; 190:16;227:22; 249:6,10 thoughts (1) 158:6 thousand (1) 214:23 threat (1) 171:20 three (14) 23:16,16;62:1; 75:16;197:20,21; 198:11;207:2; 209:18;211:3; 218:23;223:5; 224:23:248:19 threshold (1) 157:24 thresholds (1) 156:15 **Throughout** (2) 27:17;239:5 Thumb (2) 188:11.22 thus (1)40:23 tightly (1) 48:13 till (3) 194:7;219:16; 254:19 timbering (1) 210:18 times (22) 81:10;90:24;91:12, 13;101:23;102:12; 104:19,22;105:2,14; 114:14;118:10; 149:14,15,16;185:22; 196:15;202:7;212:6; 214:18,19;215:1 title (2) 15:23;22:7 Tocci (7) 79:2;80:6,17; 83:15:113:13:209:1; 253:16 Tocci's (6) 79:10;81:23;95:4; traffic (5)

110:18:114:6:253:6 today (24) 7:2:10:11:91:1; 114:6:133:22:134:2. 4,14;136:2;183:19; 190:2;191:12; 195:11;198:22; 211:23;214:2; 226:24;227:23; 237:19:243:12; 248:16;254:12,23; 255:1 together (1) 118:1 toilet (1) 174:14 told (9) 95:1;124:13,18,21; 170:21;171:1;193:8; 215:15;220:7 tomorrow (8) 194:8:228:4:229:6. 18;231:6;243:4; 254:14,18 tones (1) 156:16 tonight (1) 194:1 took (4) 45:11:119:5:213:4: 229:22 top (12) 11:18:19:7,18,19; 20:1;37:15;72:20; 182:11,20;212:4; 227:14;250:2 topic (1) 136:11 topics (1) 232:19 topography (7) 95:13:110:20; 111:2,8;131:24; 152:21;153:1 tops (1) 132:4 toward (1) 65:19 towards (4) 36:10,16;77:21; 113:22 tower (13) 26:19,20;39:3; 73:24;75:16;80:16; 182:17;212:3;221:5, 6,8;223:22;224:13 towers (2) 69:7;182:11 Town (8) 12:24:34:14:35:10, 11;142:10,14,18; 169:11

48:24:49:1:87:18; 148:10.13 trails (1) 84:13 training (3) 183:11,23;246:19 transient (4) 210:16,20,24; 211:10 translate (1) 80:24 Transmission (1) 5:8 transport (1) 73:10 travel (2) 55:7,11 **TRC (2)** 5:7,10 treated (2) 21:23;27:9 treating (1) 213:15 trees (6) 49:19;111:10,10; 147:7,12,13 tremendous (1) 86:24 trial (1) 177:18 trouble (1) 76:22 truck (1) 49:1 trucks (1) 56:2 true (12) 47:10,23;48:3; 102:11;118:9; 144:23:152:15; 154:12,13;169:1,2; 231:20 truly (1) 163:1 trust (1) 243:5 truth (1) 247:12 try (14) 14:17;15:16;43:12; 44:21,22;76:16; 88:16;89:21;121:7; 170:19;173:4;195:9; 211:17;247:20 trying (22) 48:11;52:22;64:23, 24;72:4;82:11,24; 116:19;124:3,10; 129:22;142:1;159:4; 163:20;186:19; 195:8;198:6;215:16; 236:3;241:7;244:16; 249:8

**TS (2)** 215:20:216:8 TS1-42A (1) 122:14 Tuesday (1) 166:8 tunnel (1) 230:1 turbidity (1) 53:21 turbine (82) 30:8;37:9,22:38:9; 54:17,19;55:16;63:6, 18,22;65:15;68:5,9, 16,18;71:10;74:13; 77:24;78:12;81:11; 84:13;87:4,7,8;92:6; 93:9;97:14,15;107:8; 108:3;109:5;110:22; 118:5;119:7;120:11; 122:12;125:10; 127:4.8:128:18: 129:4,10;130:7,12; 133:5;153:15;156:1; 165:14;168:20; 170:2,7;176:5; 177:17;179:12,13,15; 180:22:191:13; 192:4,11;200:5; 201:1,2:203:19; 204:22;205:12; 213:22:228:16: 234:4,23:235:1,24; 238:4;239:20;241:2; 248:13:250:1,17; 251:1,11;252:12; 253:3 turbines (89) 54:16;62:17;69:7; 71:10;73:14;74:10; 80:22:81:4:85:22: 90:15:92:3,15,19,21; 93:2,14,20,24;94:5; 96:24;97:9;98:20; 106:12;108:24; 109:1;113:11,16; 114:8,15;115:5,11; 117:19,20;118:23; 122:18;124:20; 127:3,17;128:3,10; 130:11:131:2,16; 132:12;135:15; 142:20;152:9,14; 154:16;157:4;158:9; 160:15,17;162:16; 163:4,7,15;164:3; 166:21;167:12; 168:2,10,10,12,23; 169:9,24;174:1,4; 175:18:176:19; 177:24:211:24: 212:17,21;235:3,9; 237:16,17;246:23,24;

248:5,19;249:22; 250:8:251:8.13: 252:14,16 turn (5) 8:7;45:11;121:10; 204:10:219:8 turned (1) 197:24 Turning (3) 11:4;16:3;26:12 turns (2) 112:19:175:21 Tuttle (1) 180:5 **TV**(1) 146:3 Twenty (1) 103:23 Twenty-five (1) 57:11 twice (1) 216:20 two (51) 23:16;48:9,10; 59:7;64:20;67:1; 77:15;78:2,7;79:23; 80:14;88:20,24; 95:10;96:19;102:10; 104:4,8;118:16; 119:1;120:22;124:9; 129:20:130:16; 131:2:141:14:174:8. 16:177:8:192:5.17; 193:4;194:10,11; 197:18,22;198:8; 206:24;211:17,20; 218:23;219:3,4; 221:4;224:23;233:1, 22;234:10;235:14; 239:8:240:22 two-to-one (1) 81:7 type (17) 23:1;37:4;43:9; 48:4,4;55:5;68:23; 108:11;111:6; 129:24;130:3,4; 131:1;140:19; 183:22;250:18,19 typed (1) 251:2 typical (3) 48:23;98:10; 214:14 typically (15) 34:16;35:1;58:2; 60:13,17,19;61:15; 62:3,10;82:21;97:23; 103:20;124:9;152:4; 222:23 U

unable (2) 244:24:245:1 unanswered (1) 202:8 unattendant (2) 202:3,20 uncertainty (2) 78:6:122:17 uncomfortable (1) 248:24 uncommon (1) 132:2 under (24) 7:2;18:5;19:12,23; 20:10;41:9;73:22; 78:18;83:23;116:24; 121:19;126:13; 128:2,4;129:21; 130:19;172:7,23; 179:17;187:1;192:5; 239:7:249:3:252:18 underground (8) 64:9,13,19;65:9, 13;73:22;74:2,21 undergrounding (1) 73:13 underlying (1) 111:5 underneath (2) 18:24;20:8 understandable (1) 168:17 understate (1) 82:3 understood (7) 24:15;29:20;82:8; 98:1,12:189:19; 250:14 undeveloped (1) 14:5 undisturbed (5) 27:10.23:28:4.11; 30:10 unfair (1) 172:21 United (1) 191:14 units (4) 127:10;129:20; 148:6;167:1 unknown (3) 97:10,13;236:7 unless (4) 82:3;97:1;167:4; 208:15 unlikely (1) 196:10 unmanned (2) 200:15;203:12 unreasonable (1) 101:14 unusual (1) 151:22

up (89) 11:5.11:13:16: 17:7.21:19:6:33:9: 37:19:46:15:48:15. 24;49:6;54:15,19; 57:23;62:22;63:5,8, 18;64:4,14;65:2,6,11, 23;68:16,21,22; 71:11;72:22;73:19; 74:9:80:20:85:20; 86:4,4;89:3,23;94:6; 113:23:114:13: 115:12;117:22; 129:17,22;130:20; 131:16,22;132:10,13; 134:9;135:3;137:10; 139:18;143:3;148:8; 150:7,13;157:1; 166:8;167:13,14,24; 169:10;173:7,14,18; 187:6;190:6;194:21; 196:11:200:24: 208:23;210:3;212:1, 4,13;213:2,6;215:10, 16;217:3;235:7,18, 19;237:1;239:19; 248:8;251:5 update (2) 77:16,20 updates (2) 6:20;77:14 uphill (1) 95:12 upon (6) 46:4;136:1;138:5, 19;250:15,16 Upper (1) 86:17 ups(1)145:7 upwind (1) 160:15 urban (7) 139:13;140:3,4; 143:12,23;144:2,7 use (26) 12:4;24:24;27:14; 49:5;68:18;69:8; 73:2;81:5,19;108:21; 115:21;122:21; 129:8,11;133:3; 155:18:161:21: 173:16:187:2; 191:24;222:23; 224:13;234:1;237:8; 240:2;247:1 used (37) 12:1;24:16,22; 25:7,13;32:9,22; 38:13;55:5;56:1; 57:8,16;94:13; 101:10:109:2:111:3; 119:4;122:12;

124:15:127:4,5; 130:13:132:19: 147:21:160:23; 169:9:198:18: 206:16;220:19; 223:1;229:23; 233:21,23;234:2; 235:5;241:19;245:20 useful (2) 168:19:183:23 uses (3) 98:5;113:6;229:20 using (11) 22:7:25:12:39:1; 46:4;127:2;152:8; 160:22;238:17; 246:1,2;247:2 usual (1) 48:23 utility (1) 63:15 utilizing (1) 27:10 V vaguely (1) 42:4 validate (2) 95:3:192:3 vallev (4) 95:9;132:2;212:10, 12 value (1) 117:8 values (1) 198:19 variation (1) 102:24 varied (2) 88:24:89:2 variety (2) 5:20;239:11 various (4) 148:7;152:14; 230:10;249:19 various-sized (1) 229:23 vary (7) 89:8;91:24;102:8, 9,20;211:22;249:18 vegetated (1) 44:14 vegetating (1) 55:1 vegetation (11) 42:21;43:9,11; 44:8;73:6;148:12; 153:5,6,8,10;238:17 vegetative (1) 111:6 vehicles (6) 25:17,22;109:16;

110:6,8,12 vendor (2) 94:10:253:1 verbal (10) 7:16,18;8:2;33:24; 85:11,13,15,17; 137:8;239:3 verbiage (4) 121:17,22;122:6,9 verification (2) 200:13;245:9 verified (1) 94:21 verify (5) 14:22:229:4; 242:23;243:22;244:4 verifying (1) 27:6 version (4) 139:9;188:16; 199:11:240:11 versus (3) 83:1;134:14; 249:22 vibration (1) 162:1 vicinity (1) 132:1 view (2) 197:2,2 violated (1) 171:4visibility (1) 163:6 visit (1) 149:10 visited (1) 110:17 visits (3) 148:23:149:2,3 visual (3) 66:9:85:22:197:1 visualize (1) 146:19 voice (1) 86:4 Volume (6) 6:11;15:4;23:19, 21;76:11;88:15 volumes (3) 22:5,10:23:16 voluntary (1) 50:9 W wait (3) 131:15;165:17; 181:20 waiting (1) 214:4 wandering (1) 42:10

wants (1) 174:12 Washington (2) 49:6:133:11 water (13) 11:16;18:24;20:11; 24:9;26:16;31:1,4; 33:2,13:53:22; 115:10;148:8;149:19 watershed (7) 14:9,13,20;15:24; 26:16,23:27:5 watersheds (2) 14:5,8 watts (1) 118:21 way (35) 20:21;28:15,23; 38:7,9;39:7,9,18; 55:7,11;73:2;87:19; 91:11,13;94:17; 96:10;99:7;106:1; 128:23;133:22; 136:15;148:19; 149:17;150:15; 152:23;168:19; 170:24;171:19; 174:22;192:2; 211:11;233:19; 237:14:244:3:253:11 ways (3) 68:1:88:16:147:23 weather (2) 30:18:238:22 website (1) 32:17 week (3) 79:18;80:2;191:10 weeks (8) 80:14:88:20:89:1; 95:10:97:6:102:10: 104:5,8 weight (2) 245:13,16 welcome (2) 86:21;95:16 welfare (1) 133:18 west (1) 98:5 Western (1) 4:16 wetlands (4) 20:14;71:19,20; 72:6 whatnot (1) 55:9 what's (23) 28:5;61:21;96:22; 100:6:103:24; 112:14.14:113:15: 123:6;131:8;165:13; 176:22;196:14;

198:21;203:17; 208:14:214:2.16: 235:18:239:18.24; 245:3.22 whatsoever (1) 170:4 Whereupon (6) 4:1,23:69:21:75:7; 137:18;255:2 whipping (1) 239:20 whole (5) 59:24;205:5;227:6; 243:2,3 who's (2) 115:12;120:11 whose (2) 35:14;51:15 wide (8) 5:20;47:6;48:20; 55:14,18;65:3,16; 167:12 widened (1) 55:8 widens (1) 65:12 wider (7) 63:4,23;65:9,23; 70:19;74:1,19 width (17)54:24:55:24:61:7. 22:62:10.24:66:1.19: 70:13:74:8,9,11,12, 14.14.20.22 widths (1) 73:10 wilderness (1) 81:15 Wildlife (11) 27:8:29:3,4:135:1, 6.12.16:136:1.8.22. 23 Willard (41) 14:8,12,20;27:5; 37:16;38:24;79:6,18; 81:17;84:20;105:14; 106:2;107:16,18,19; 108:6,12,16,20; 109:1,5,19,21; 110:15,20,23;112:22; 113:11,17,20,23,24; 114:2,11;115:10; 119:16,18;248:1,14, 17;250:8 willing (7) 167:1;169:17; 170:5,8,22;172:13; 243:13 Wind (171) 5:22;11:21;15:1; 25:24;37:21;42:23; 69:7:76:2,3:80:17, 18;84:13;92:14;93:8,

11,11,12,12,18;95:3; 97:18:105:9:106:12: 107:8:108:24: 113:10:116:6: 117:22;118:22; 120:10,19,21;122:12, 17;123:2,21;125:4; 126:4:127:5.17; 128:5,10,16;129:2,4, 10;130:13;132:1,12; 133:2,21;135:11,15; 136:1,9,22;138:17; 141:4;146:6;153:15; 154:15;156:1;157:4; 160:12,17;162:16; 163:4,14;164:3; 165:14;168:2,20,23; 169:9,23;170:2,7; 172:4;176:19;177:4, 6,13,16,21;179:18, 21;183:21;188:22; 189:14:190:4:191:5. 24;200:5;201:1; 203:18;205:12; 206:6;212:1,4,5,8,17, 20;213:13,14,18; 214:14;215:2,2,5; 220:6,15,22;221:5,6, 8,14,21,23;222:12; 223:3,7,10,16,16,21, 22;224:2,4,4,14,18; 225:4.10.18.19.22.23. 24;226:1,15,17,19; 227:2.5:228:14.16. 20;229:23;230:1,1,3, 4,5,6,10;231:9,18,23; 232:4,7,11,15: 234:23:240:10: 241:5;246:23,24; 248:13:251:16.17 windier (1) 105:3 wind-induced (4) 223:19;225:9; 226:9;228:14 windows (4) 143:6;151:24; 152:3;162:4 winds (8) 132:4,10;212:12, 18;214:4;226:12; 239:19:241:10 windy (1) 174:2 winner (1) 70:16 winter (2) 25:2;152:1 wire (1) 65:24 wires (1) 62:7 wiring (1)

64:7 within (12) 14:20:96:3,12,15; 98:19,20;128:16; 157:13:164:19; 237:3.21:238:5 without (9) 63:6;74:5;109:5; 110:22;124:14; 195:23;199:20; 207:18;253:8 Witness (43) 14:24;15:12,16; 27:3;41:7;51:9; 57:12;64:16;76:14, 16,20,23;81:3;82:7, 10;85:4;88:7;100:11, 11;101:1;107:4; 121:2,7;123:24; 140:6,8;155:7; 156:24;172:22; 173:11:174:13: 175:2;181:16,23; 188:2,17;222:24; 229:9;243:20;244:3; 245:4;251:19;254:15 witnessed (1) 110:17 witnesses (4) 4:22;7:6;243:14,21 wonder (2) 71:7:73:14 wondering (6) 35:13;37:4;38:6; 92:20:150:2:228:3 wooded (1) 147:12 woods (3) 97:3;147:2;225:2 word (7) 18:4;122:21; 124:15;143:22; 154:20,23;195:23 words (22) 23:5;78:11;80:20; 83:23;92:24;93:10; 109:6;117:21;122:3; 132:12;138:20; 153:10;155:8; 161:14;163:3; 164:15:179:20; 205:16;212:2;236:8; 237:8;239:24 work (19) 4:18;5:10;46:10; 52:12,18;53:9,11; 67:20;75:23,24; 183:10,18,20;204:21; 236:12;241:9;252:6, 11,17 worked (13) 23:2:37:6:61:1: 69:6;126:4;159:14;

163.24.176.17 20 21.	<b>Vun</b> (1)	167.17.180.7.11	16 (24)	228.12
177.3 6.192.15	27.18	14.182.15.251.14	38.17.53.18 19.	2010 (1)
workers (2)	27.10	252.1 20	55.3 11 12 13.65.20	46.21
163.21.23	Z	109 4 (11)	74.5 14.77.18 22.	2011 (3)
working (11)	<b>Ľ</b>	119.1 5 8 12.	103.5.104.1.194.23	80:15:153:14:
163.22.165.16	zero (3)	121.18 24.122.18	196.5 10.200.14 21	154.6
166.16 18.175.13 15	153.10.154.19	132:13:152:8:170:1:	212.15.214.12.18	2012 (8)
183.24.187.1.192.3	235.8	179.15	215.7.218.4	6.9 15.8.20.11.3
241.14.253.8	233.0	10-meter (1)	16-day (1)	50.17.76.9.77.10
works (5)	0	240:14	213:10	134:16
41:24:92:10:197:9:	<b>v</b>	10-minute (9)	16-foot (5)	2013 (1)
236:13:241:17	0(1)	69:19:79:22:	46:24:62:3.24:	166:12
work's (1)	234:15	137:17:210:14:	63:19:73:2	20-hertz (1)
58:9	037 (1)	214:15.17.23:216:18:	17 (5)	158:21
world (4)	15:17	218:19	13:21;53:18,20;	20s (3)
129:2;180:11,21;		10-year (1)	84:8;151:21	83:24:114:3,13
191:15	1	57:19	18 (9)	21 (3)
worry (1)		11 (6)	13:22;17:22,24;	5:16:83:14:84:11
203:20	1 (29)	24:12;45:18;49:17;	81:24;150:23;	2-1/2 (2)
worst (1)	6:10,11;22:10;	157:6;227:11;240:19	151:17;177:12;	227:8;230:8
238:17	64:19:76:10.11:77:7:	110 (2)	188:15:230:21	22 (1)
worst-case (5)	80:20:83:20:88:4:	181:4;182:15	19 (5)	77:22
83:3;90:13,16;	139:8.8:166:23:	110-decibel (1)	83:14,21;84:8;	22-mile (1)
133:3;212:22	167:17:168:14:	182:15	146:7;187:20	230:10
worth (1)	179:6:183:4:188:22:	115 (5)	1974 (8)	22nd (1)
212:15	190:4:199:22.23:	251:12,15,24;	133:9,20,23;134:1,	79:5
writes (1)	209:15:217:9:	252:12,20	15,16;139:6,10	24 (12)
201:22	226:23:240:12.16.21:	115.4 (1)	1986 (2)	89:3;200:20;210:8,
written (4)	241:2.10	176:6	32:11.19	9:214:13.18:216:13.
120:4:200:2:	1.000 (3)	116 (1)	1-to-5-meter-per-second (1)	22:217:2.4:218:14.23
205:10;228:1	234:21:237:20:	192:12	240:10	24/7 (1)
	041.12	1 10 (3)		200 17
wrong (ð)	241:1.5	1-18 (2)		200:17
173:7,12;174:22,	241:13 1.700 (1)	1-18 (2) 187:8,18	2	200:17 249 (1)
173:7,12;174:22, 23;175:22;176:6;	241:13 <b>1,700 (1)</b> 178:6	1-18 (2) 187:8,18 11-mile (1)	2	<b>200:</b> 17 <b>249 (1)</b> 4:16
wrong (8) 173:7,12;174:22, 23;175:22;176:6; 187:11,23	241:13 1,700 (1) 178:6 1:35 (1)	<b>1-18 (2)</b> 187:8,18 <b>11-mile (1)</b> 230:9	2 (19)	200:17 249 (1) 4:16 24-decibel (2)
wrong (8) 173:7,12;174:22, 23;175:22;176:6; 187:11,23 wrote (1)	241:13 1,700 (1) 178:6 1:35 (1) 4:2	<b>1-18 (2)</b> 187:8,18 <b>11-mile (1)</b> 230:9 <b>11th (6)</b>	<b>2</b> <b>2 (19)</b> 15:4,7;22:10,18;	<b>200:</b> 17 <b>249 (1)</b> 4:16 <b>24-decibel (2)</b> 216:16,19
wrong (8) 173:7,12;174:22, 23;175:22;176:6; 187:11,23 wrote (1) 206:3	241:13 1,700 (1) 178:6 1:35 (1) 4:2 10 (38)	<b>1-18 (2)</b> 187:8,18 <b>11-mile (1)</b> 230:9 <b>11th (6)</b> 6:15;26:13;77:10,	<b>2</b> <b>2 (19)</b> 15:4,7;22:10,18; 23:18,21;67:6;78:13;	200:17 249 (1) 4:16 24-decibel (2) 216:16,19 25 (6)
wrong (3) 173:7,12;174:22, 23;175:22;176:6; 187:11,23 wrote (1) 206:3	241:13 <b>1,700 (1)</b> 178:6 <b>1:35 (1)</b> 4:2 <b>10 (38)</b> 10:13;24:11;26:21;	<b>1-18 (2)</b> 187:8,18 <b>11-mile (1)</b> 230:9 <b>11th (6)</b> 6:15;26:13;77:10, 18;78:24;79:2	<b>2</b> <b>2 (19)</b> 15:4,7;22:10,18; 23:18,21;67:6;78:13; 122:16;139:8,9;	200:17 <b>249 (1)</b> 4:16 <b>24-decibel (2)</b> 216:16,19 <b>25 (6)</b> 66:4,12;89:3;
wrong (6) 173:7,12;174:22, 23;175:22;176:6; 187:11,23 wrote (1) 206:3 Y	241:13 <b>1,700 (1)</b> 178:6 <b>1:35 (1)</b> 4:2 <b>10 (38)</b> 10:13;24:11;26:21; 34:7,9:37:22;38:16;	<b>1-18 (2)</b> 187:8,18 <b>11-mile (1)</b> 230:9 <b>11th (6)</b> 6:15;26:13;77:10, 18;78:24;79:2 <b>12 (7)</b>	<b>2</b> <b>2 (19)</b> 15:4,7;22:10,18; 23:18,21;67:6;78:13; 122:16;139:8,9; 140:11;167:8;184:4;	<b>200:</b> 17 <b>249 (1)</b> 4:16 <b>24-decibel (2)</b> 216:16,19 <b>25 (6)</b> 66:4,12;89:3; 137:17;199:11;
wrong (6) 173:7,12;174:22, 23;175:22;176:6; 187:11,23 wrote (1) 206:3 Y	241:13 <b>1,700 (1)</b> 178:6 <b>1:35 (1)</b> 4:2 <b>10 (38)</b> 10:13;24:11;26:21; 34:7,9;37:22;38:16; 49:17;61:12,14;	<b>1-18 (2)</b> 187:8,18 <b>11-mile (1)</b> 230:9 <b>11th (6)</b> 6:15;26:13;77:10, 18;78:24;79:2 <b>12 (7)</b> 5:19;41:5,9;50:15;	<b>2</b> <b>2 (19)</b> 15:4,7;22:10,18; 23:18,21;67:6;78:13; 122:16;139:8,9; 140:11;167:8;184:4; 220:11;221:12,14;	200:17 <b>249 (1)</b> 4:16 <b>24-decibel (2)</b> 216:16,19 <b>25 (6)</b> 66:4,12;89:3; 137:17;199:11; 217:11
wrong (3) 173:7,12;174:22, 23;175:22;176:6; 187:11,23 wrote (1) 206:3 Y yards (2)	241:13 <b>1,700 (1)</b> 178:6 <b>1:35 (1)</b> 4:2 <b>10 (38)</b> 10:13;24:11;26:21; 34:7,9;37:22;38:16; 49:17;61:12,14; 64:19;70:14;72:18;	<b>1-18 (2)</b> 187:8,18 <b>11-mile (1)</b> 230:9 <b>11th (6)</b> 6:15;26:13;77:10, 18;78:24;79:2 <b>12 (7)</b> 5:19;41:5,9;50:15; 55:11;59:3,6	<b>2</b> <b>2 (19)</b> 15:4,7;22:10,18; 23:18,21;67:6;78:13; 122:16;139:8,9; 140:11;167:8;184:4; 220:11;221:12,14; 226:23;241:1	200:17 249 (1) 4:16 24-decibel (2) 216:16,19 25 (6) 66:4,12;89:3; 137:17;199:11; 217:11 25-year (1)
wrong (3) 173:7,12;174:22, 23;175:22;176:6; 187:11,23 wrote (1) 206:3 Y yards (2) 37:24;38:8	241:13 <b>1,700 (1)</b> 178:6 <b>1:35 (1)</b> 4:2 <b>10 (38)</b> 10:13;24:11;26:21; 34:7,9;37:22;38:16; 49:17;61:12,14; 64:19;70:14;72:18; 76:11;77:7,12;81:6;	<b>1-18 (2)</b> 187:8,18 <b>11-mile (1)</b> 230:9 <b>11th (6)</b> 6:15;26:13;77:10, 18;78:24;79:2 <b>12 (7)</b> 5:19;41:5,9;50:15; 55:11;59:3,6 <b>13 (2)</b>	<b>2</b> <b>2 (19)</b> 15:4,7;22:10,18; 23:18,21;67:6;78:13; 122:16;139:8,9; 140:11;167:8;184:4; 220:11;221:12,14; 226:23;241:1 <b>2,000 (2)</b>	200:17 249 (1) 4:16 24-decibel (2) 216:16,19 25 (6) 66:4,12;89:3; 137:17;199:11; 217:11 25-year (1) 57:16
wrong (3) 173:7,12;174:22, 23;175:22;176:6; 187:11,23 wrote (1) 206:3 Y yards (2) 37:24;38:8 Year (23)	241:13 <b>1,700 (1)</b> 178:6 <b>1:35 (1)</b> 4:2 <b>10 (38)</b> 10:13;24:11;26:21; 34:7,9;37:22;38:16; 49:17;61:12,14; 64:19;70:14;72:18; 76:11;77:7,12;81:6; 90:22;91:3;108:3;	<b>1-18 (2)</b> 187:8,18 <b>11-mile (1)</b> 230:9 <b>11th (6)</b> 6:15;26:13;77:10, 18;78:24;79:2 <b>12 (7)</b> 5:19;41:5,9;50:15; 55:11;59:3,6 <b>13 (2)</b> 59:2,7	<b>2</b> <b>2 (19)</b> 15:4,7;22:10,18; 23:18,21;67:6;78:13; 122:16;139:8,9; 140:11;167:8;184:4; 220:11;221:12,14; 226:23;241:1 <b>2,000 (2)</b> 178:7;236:4	200:17 249 (1) 4:16 24-decibel (2) 216:16,19 25 (6) 66:4,12;89:3; 137:17;199:11; 217:11 25-year (1) 57:16 26 (3)
wrong (3) 173:7,12;174:22, 23;175:22;176:6; 187:11,23 wrote (1) 206:3 Y yards (2) 37:24;38:8 Year (23) 54:15;67:23;	241:13 <b>1,700 (1)</b> 178:6 <b>1:35 (1)</b> 4:2 <b>10 (38)</b> 10:13;24:11;26:21; 34:7,9;37:22;38:16; 49:17;61:12,14; 64:19;70:14;72:18; 76:11;77:7,12;81:6; 90:22;91:3;108:3; 117:19,20;118:2;	<b>1-18 (2)</b> 187:8,18 <b>11-mile (1)</b> 230:9 <b>11th (6)</b> 6:15;26:13;77:10, 18;78:24;79:2 <b>12 (7)</b> 5:19;41:5,9;50:15; 55:11;59:3,6 <b>13 (2)</b> 59:2,7 <b>13A (9)</b>	<b>2</b> <b>2 (19)</b> 15:4,7;22:10,18; 23:18,21;67:6;78:13; 122:16;139:8,9; 140:11;167:8;184:4; 220:11;221:12,14; 226:23;241:1 <b>2,000 (2)</b> 178:7;236:4 <b>2,583 (2)</b>	200:17 249 (1) 4:16 24-decibel (2) 216:16,19 25 (6) 66:4,12;89:3; 137:17;199:11; 217:11 25-year (1) 57:16 26 (3) 5:17;75:24;196:6
wrong (s) 173:7,12;174:22, 23;175:22;176:6; 187:11,23 wrote (1) 206:3 Y yards (2) 37:24;38:8 Year (23) 54:15;67:23; 101:24;102:12;	241:13 <b>1,700 (1)</b> 178:6 <b>1:35 (1)</b> 4:2 <b>10 (38)</b> 10:13;24:11;26:21; 34:7,9;37:22;38:16; 49:17;61:12,14; 64:19;70:14;72:18; 76:11;77:7,12;81:6; 90:22;91:3;108:3; 117:19,20;118:2; 127:16;143:5;	<b>1-18 (2)</b> 187:8,18 <b>11-mile (1)</b> 230:9 <b>11th (6)</b> 6:15;26:13;77:10, 18;78:24;79:2 <b>12 (7)</b> 5:19;41:5,9;50:15; 55:11;59:3,6 <b>13 (2)</b> 59:2,7 <b>13A (9)</b> 88:5,10;101:5;	<b>2</b> <b>2 (19)</b> 15:4,7;22:10,18; 23:18,21;67:6;78:13; 122:16;139:8,9; 140:11;167:8;184:4; 220:11;221:12,14; 226:23;241:1 <b>2,000 (2)</b> 178:7;236:4 <b>2,583 (2)</b> 216:18;218:19	200:17 249 (1) 4:16 24-decibel (2) 216:16,19 25 (6) 66:4,12;89:3; 137:17;199:11; 217:11 25-year (1) 57:16 26 (3) 5:17;75:24;196:6 27 (1)
wrong (5) 173:7,12;174:22, 23;175:22;176:6; 187:11,23 wrote (1) 206:3 Y yards (2) 37:24;38:8 Year (23) 54:15;67:23; 101:24;102:12; 104:5,11,12,15,20,	241:13 1,700 (1) 178:6 1:35 (1) 4:2 10 (38) 10:13;24:11;26:21; 34:7,9;37:22;38:16; 49:17;61:12,14; 64:19;70:14;72:18; 76:11;77:7,12;81:6; 90:22;91:3;108:3; 117:19,20;118:2; 127:16;143:5; 151:13;152:4;	<b>1-18 (2)</b> 187:8,18 <b>11-mile (1)</b> 230:9 <b>11th (6)</b> 6:15;26:13;77:10, 18;78:24;79:2 <b>12 (7)</b> 5:19;41:5,9;50:15; 55:11;59:3,6 <b>13 (2)</b> 59:2,7 <b>13A (9)</b> 88:5,10;101:5; 107:5;146:9;209:12,	<b>2</b> <b>2 (19)</b> 15:4,7;22:10,18; 23:18,21;67:6;78:13; 122:16;139:8,9; 140:11;167:8;184:4; 220:11;221:12,14; 226:23;241:1 <b>2,000 (2)</b> 178:7;236:4 <b>2,583 (2)</b> 216:18;218:19 <b>2:53 (1)</b>	200:17 249 (1) 4:16 24-decibel (2) 216:16,19 25 (6) 66:4,12;89:3; 137:17;199:11; 217:11 25-year (1) 57:16 26 (3) 5:17;75:24;196:6 27 (1) 210:7
wrong (5) 173:7,12;174:22, 23;175:22;176:6; 187:11,23 wrote (1) 206:3 yards (2) 37:24;38:8 Year (23) 54:15;67:23; 101:24;102:12; 104:5,11,12,15,20, 23;105:2,8,12,13,17,	241:13 1,700 (1) 178:6 1:35 (1) 4:2 10 (38) 10:13;24:11;26:21; 34:7,9;37:22;38:16; 49:17;61:12,14; 64:19;70:14;72:18; 76:11;77:7,12;81:6; 90:22;91:3;108:3; 117:19,20;118:2; 127:16;143:5; 151:13;152:4; 153:12;155:24;	<b>1-18 (2)</b> 187:8,18 <b>11-mile (1)</b> 230:9 <b>11th (6)</b> 6:15;26:13;77:10, 18;78:24;79:2 <b>12 (7)</b> 5:19;41:5,9;50:15; 55:11;59:3,6 <b>13 (2)</b> 59:2,7 <b>13A (9)</b> 88:5,10;101:5; 107:5;146:9;209:12, 13;217:8,11	<b>2</b> <b>2 (19)</b> 15:4,7;22:10,18; 23:18,21;67:6;78:13; 122:16;139:8,9; 140:11;167:8;184:4; 220:11;221:12,14; 226:23;241:1 <b>2,000 (2)</b> 178:7;236:4 <b>2,583 (2)</b> 216:18;218:19 <b>2:53 (1)</b> 69:22	200:17 249 (1) 4:16 24-decibel (2) 216:16,19 25 (6) 66:4,12;89:3; 137:17;199:11; 217:11 25-year (1) 57:16 26 (3) 5:17;75:24;196:6 27 (1) 210:7 28 (1)
wrong (6) 173:7,12;174:22, 23;175:22;176:6; 187:11,23 wrote (1) 206:3 yards (2) 37:24;38:8 Year (23) 54:15;67:23; 101:24;102:12; 104:5,11,12,15,20, 23;105:2,8,12,13,17, 23;118:9;129:23;	241:13 1,700 (1) 178:6 1:35 (1) 4:2 10 (38) 10:13;24:11;26:21; 34:7,9;37:22;38:16; 49:17;61:12,14; 64:19;70:14;72:18; 76:11;77:7,12;81:6; 90:22;91:3;108:3; 117:19,20;118:2; 127:16;143:5; 151:13;152:4; 153:12;155:24; 157:22;179:6;193:8;	<b>1-18 (2)</b> 187:8,18 <b>11-mile (1)</b> 230:9 <b>11th (6)</b> 6:15;26:13;77:10, 18;78:24;79:2 <b>12 (7)</b> 5:19;41:5,9;50:15; 55:11;59:3,6 <b>13 (2)</b> 59:2,7 <b>13A (9)</b> 88:5,10;101:5; 107:5;146:9;209:12, 13;217:8,11 <b>14 (6)</b>	<b>2</b> <b>2 (19)</b> 15:4,7;22:10,18; 23:18,21;67:6;78:13; 122:16;139:8,9; 140:11;167:8;184:4; 220:11;221:12,14; 226:23;241:1 <b>2,000 (2)</b> 178:7;236:4 <b>2,583 (2)</b> 216:18;218:19 <b>2:53 (1)</b> 69:22 <b>20 (14)</b>	200:17 249 (1) 4:16 24-decibel (2) 216:16,19 25 (6) 66:4,12;89:3; 137:17;199:11; 217:11 25-year (1) 57:16 26 (3) 5:17;75:24;196:6 27 (1) 210:7 28 (1) 231:19
wrong (6) 173:7,12;174:22, 23;175:22;176:6; 187:11,23 wrote (1) 206:3 yards (2) 37:24;38:8 Year (23) 54:15;67:23; 101:24;102:12; 104:5,11,12,15,20, 23;105:2,8,12,13,17, 23;118:9;129:23; 130:18,21,22;131:22;	241:13 1,700 (1) 178:6 1:35 (1) 4:2 10 (38) 10:13;24:11;26:21; 34:7,9;37:22;38:16; 49:17;61:12,14; 64:19;70:14;72:18; 76:11;77:7,12;81:6; 90:22;91:3;108:3; 117:19,20;118:2; 127:16;143:5; 151:13;152:4; 153:12;155:24; 157:22;179:6;193:8; 196:4,21;197:7;	<b>1-18 (2)</b> 187:8,18 <b>11-mile (1)</b> 230:9 <b>11th (6)</b> 6:15;26:13;77:10, 18;78:24;79:2 <b>12 (7)</b> 5:19;41:5,9;50:15; 55:11;59:3,6 <b>13 (2)</b> 59:2,7 <b>13A (9)</b> 88:5,10;101:5; 107:5;146:9;209:12, 13;217:8,11 <b>14 (6)</b> 34:9;51:5;157:7,8,	<b>2</b> <b>2 (19)</b> 15:4,7;22:10,18; 23:18,21;67:6;78:13; 122:16;139:8,9; 140:11;167:8;184:4; 220:11;221:12,14; 226:23;241:1 <b>2,000 (2)</b> 178:7;236:4 <b>2,583 (2)</b> 216:18;218:19 <b>2:53 (1)</b> 69:22 <b>20 (14)</b> 5:15;17:22,24;	200:17 249 (1) 4:16 24-decibel (2) 216:16,19 25 (6) 66:4,12;89:3; 137:17;199:11; 217:11 25-year (1) 57:16 26 (3) 5:17;75:24;196:6 27 (1) 210:7 28 (1) 231:19 28/05/12 (1)
wrong (6) 173:7,12;174:22, 23;175:22;176:6; 187:11,23 wrote (1) 206:3 yards (2) 37:24;38:8 Year (23) 54:15;67:23; 101:24;102:12; 104:5,11,12,15,20, 23;105:2,8,12,13,17, 23;118:9;129:23; 130:18,21,22;131:22; 208:22	241:13 1,700 (1) 178:6 1:35 (1) 4:2 10 (38) 10:13;24:11;26:21; 34:7,9;37:22;38:16; 49:17;61:12,14; 64:19;70:14;72:18; 76:11;77:7,12;81:6; 90:22;91:3;108:3; 117:19,20;118:2; 127:16;143:5; 151:13;152:4; 153:12;155:24; 157:22;179:6;193:8; 196:4,21;197:7; 240:19;241:1;248:5	<b>1-18 (2)</b> 187:8,18 <b>11-mile (1)</b> 230:9 <b>11th (6)</b> 6:15;26:13;77:10, 18;78:24;79:2 <b>12 (7)</b> 5:19;41:5,9;50:15; 55:11;59:3,6 <b>13 (2)</b> 59:2,7 <b>13A (9)</b> 88:5,10;101:5; 107:5;146:9;209:12, 13;217:8,11 <b>14 (6)</b> 34:9;51:5;157:7,8, 16,20	<b>2</b> <b>2 (19)</b> 15:4,7;22:10,18; 23:18,21;67:6;78:13; 122:16;139:8,9; 140:11;167:8;184:4; 220:11;221:12,14; 226:23;241:1 <b>2,000 (2)</b> 178:7;236:4 <b>2,583 (2)</b> 216:18;218:19 <b>2:53 (1)</b> 69:22 <b>20 (14)</b> 5:15;17:22,24; 21:2;80:1;83:7;84:4;	200:17 249 (1) 4:16 24-decibel (2) 216:16,19 25 (6) 66:4,12;89:3; 137:17;199:11; 217:11 25-year (1) 57:16 26 (3) 5:17;75:24;196:6 27 (1) 210:7 28 (1) 231:19 28/05/12 (1) 123:19
wrong (6) 173:7,12;174:22, 23;175:22;176:6; 187:11,23 wrote (1) 206:3 yards (2) 37:24;38:8 Year (23) 54:15;67:23; 101:24;102:12; 104:5,11,12,15,20, 23;105:2,8,12,13,17, 23;118:9;129:23; 130:18,21,22;131:22; 208:22 year-round (1)	241:13 1,700 (1) 178:6 1:35 (1) 4:2 10 (38) 10:13;24:11;26:21; 34:7,9;37:22;38:16; 49:17;61:12,14; 64:19;70:14;72:18; 76:11;77:7,12;81:6; 90:22;91:3;108:3; 117:19,20;118:2; 127:16;143:5; 151:13;152:4; 153:12;155:24; 157:22;179:6;193:8; 196:4,21;197:7; 240:19;241:1;248:5 100 (4)	<b>1-18 (2)</b> 187:8,18 <b>11-mile (1)</b> 230:9 <b>11th (6)</b> 6:15;26:13;77:10, 18;78:24;79:2 <b>12 (7)</b> 5:19;41:5,9;50:15; 55:11;59:3,6 <b>13 (2)</b> 59:2,7 <b>13A (9)</b> 88:5,10;101:5; 107:5;146:9;209:12, 13;217:8,11 <b>14 (6)</b> 34:9;51:5;157:7,8, 16,20 <b>1-42 (1)</b>	<b>2</b> <b>2 (19)</b> 15:4,7;22:10,18; 23:18,21;67:6;78:13; 122:16;139:8,9; 140:11;167:8;184:4; 220:11;221:12,14; 226:23;241:1 <b>2,000 (2)</b> 178:7;236:4 <b>2,583 (2)</b> 216:18;218:19 <b>2:53 (1)</b> 69:22 <b>20 (14)</b> 5:15;17:22,24; 21:2;80:1;83:7;84:4; 102:9,21;103:22;	200:17 249 (1) 4:16 24-decibel (2) 216:16,19 25 (6) 66:4,12;89:3; 137:17;199:11; 217:11 25-year (1) 57:16 26 (3) 5:17;75:24;196:6 27 (1) 210:7 28 (1) 231:19 28/05/12 (1) 123:19 28-decibel (1)
wrong (6) 173:7,12;174:22, 23;175:22;176:6; 187:11,23 wrote (1) 206:3 yards (2) 37:24;38:8 Year (23) 54:15;67:23; 101:24;102:12; 104:5,11,12,15,20, 23;105:2,8,12,13,17, 23;118:9;129:23; 130:18,21,22;131:22; 208:22 year-round (1) 206:16	241:13 1,700 (1) 178:6 1:35 (1) 4:2 10 (38) 10:13;24:11;26:21; 34:7,9;37:22;38:16; 49:17;61:12,14; 64:19;70:14;72:18; 76:11;77:7,12;81:6; 90:22;91:3;108:3; 117:19,20;118:2; 127:16;143:5; 151:13;152:4; 153:12;155:24; 157:22;179:6;193:8; 196:4,21;197:7; 240:19;241:1;248:5 100 (4) 154:17;155:3;	1-18 (2) 187:8,18 11-mile (1) 230:9 11th (6) 6:15;26:13;77:10, 18;78:24;79:2 12 (7) 5:19;41:5,9;50:15; 55:11;59:3,6 13 (2) 59:2,7 13A (9) 88:5,10;101:5; 107:5;146:9;209:12, 13;217:8,11 14 (6) 34:9;51:5;157:7,8, 16,20 1-42 (1) 121:15	<b>2</b> <b>2 (19)</b> 15:4,7;22:10,18; 23:18,21;67:6;78:13; 122:16;139:8,9; 140:11;167:8;184:4; 220:11;221:12,14; 226:23;241:1 <b>2,000 (2)</b> 178:7;236:4 <b>2,583 (2)</b> 216:18;218:19 <b>2:53 (1)</b> 69:22 <b>20 (14)</b> 5:15;17:22,24; 21:2;80:1;83:7;84:4; 102:9,21;103:22; 147:24;160:14;	200:17 249 (1) 4:16 24-decibel (2) 216:16,19 25 (6) 66:4,12;89:3; 137:17;199:11; 217:11 25-year (1) 57:16 26 (3) 5:17;75:24;196:6 27 (1) 210:7 28 (1) 231:19 28/05/12 (1) 123:19 28-decibel (1) 230:13
wrong (6) 173:7,12;174:22, 23;175:22;176:6; 187:11,23 wrote (1) 206:3 yards (2) 37:24;38:8 Year (23) 54:15;67:23; 101:24;102:12; 104:5,11,12,15,20, 23;105:2,8,12,13,17, 23;118:9;129:23; 130:18,21,22;131:22; 208:22 year-round (1) 206:16 years (10)	241:13 1,700 (1) 178:6 1:35 (1) 4:2 10 (38) 10:13;24:11;26:21; 34:7,9;37:22;38:16; 49:17;61:12,14; 64:19;70:14;72:18; 76:11;77:7,12;81:6; 90:22;91:3;108:3; 117:19,20;118:2; 127:16;143:5; 151:13;152:4; 153:12;155:24; 157:22;179:6;193:8; 196:4,21;197:7; 240:19;241:1;248:5 100 (4) 154:17;155:3; 234:20,21	1-18 (2) 187:8,18 11-mile (1) 230:9 11th (6) 6:15;26:13;77:10, 18;78:24;79:2 12 (7) 5:19;41:5,9;50:15; 55:11;59:3,6 13 (2) 59:2,7 13A (9) 88:5,10;101:5; 107:5;146:9;209:12, 13;217:8,11 14 (6) 34:9;51:5;157:7,8, 16,20 1-42 (1) 121:15 1-44 (3)	<b>2</b> <b>2 (19)</b> 15:4,7;22:10,18; 23:18,21;67:6;78:13; 122:16;139:8,9; 140:11;167:8;184:4; 220:11;221:12,14; 226:23;241:1 <b>2,000 (2)</b> 178:7;236:4 <b>2,583 (2)</b> 216:18;218:19 <b>2:53 (1)</b> 69:22 <b>20 (14)</b> 5:15;17:22,24; 21:2;80:1;83:7;84:4; 102:9,21;103:22; 147:24;160:14; 193:9;235:18	200:17 249 (1) 4:16 24-decibel (2) 216:16,19 25 (6) 66:4,12;89:3; 137:17;199:11; 217:11 25-year (1) 57:16 26 (3) 5:17;75:24;196:6 27 (1) 210:7 28 (1) 231:19 28/05/12 (1) 123:19 28-decibel (1) 230:13 29 (1)
wrong (6) 173:7,12;174:22, 23;175:22;176:6; 187:11,23 wrote (1) 206:3 yards (2) 37:24;38:8 Year (23) 54:15;67:23; 101:24;102:12; 104:5,11,12,15,20, 23;105:2,8,12,13,17, 23;118:9;129:23; 130:18,21,22;131:22; 208:22 year-round (1) 206:16 years (10) 5:16,17,19;32:1;	241:13 1,700 (1) 178:6 1:35 (1) 4:2 10 (38) 10:13;24:11;26:21; 34:7,9;37:22;38:16; 49:17;61:12,14; 64:19;70:14;72:18; 76:11;77:7,12;81:6; 90:22;91:3;108:3; 117:19,20;118:2; 127:16;143:5; 151:13;152:4; 153:12;155:24; 157:22;179:6;193:8; 196:4,21;197:7; 240:19;241:1;248:5 100 (4) 154:17;155:3; 234:20,21 100-foot (1)	1-18 (2) 187:8,18 11-mile (1) 230:9 11th (6) 6:15;26:13;77:10, 18;78:24;79:2 12 (7) 5:19;41:5,9;50:15; 55:11;59:3,6 13 (2) 59:2,7 13A (9) 88:5,10;101:5; 107:5;146:9;209:12, 13;217:8,11 14 (6) 34:9;51:5;157:7,8, 16,20 1-42 (1) 121:15 1-44 (3) 215:20;216:3,8	<b>2</b> <b>2 (19)</b> 15:4,7;22:10,18; 23:18,21;67:6;78:13; 122:16;139:8,9; 140:11;167:8;184:4; 220:11;221:12,14; 226:23;241:1 <b>2,000 (2)</b> 178:7;236:4 <b>2,583 (2)</b> 216:18;218:19 <b>2:53 (1)</b> 69:22 <b>20 (14)</b> 5:15;17:22,24; 21:2;80:1;83:7;84:4; 102:9,21;103:22; 147:24;160:14; 193:9;235:18 <b>20/05/11 (1)</b>	200:17 249 (1) 4:16 24-decibel (2) 216:16,19 25 (6) 66:4,12;89:3; 137:17;199:11; 217:11 25-year (1) 57:16 26 (3) 5:17;75:24;196:6 27 (1) 210:7 28 (1) 231:19 28/05/12 (1) 123:19 28-decibel (1) 230:13 29 (1) 248:17
wrong (6) 173:7,12;174:22, 23;175:22;176:6; 187:11,23 wrote (1) 206:3 yards (2) 37:24;38:8 Year (23) 54:15;67:23; 101:24;102:12; 104:5,11,12,15,20, 23;105:2,8,12,13,17, 23;118:9;129:23; 130:18,21,22;131:22; 208:22 year-round (1) 206:16 years (10) 5:16,17,19;32:1; 50:1;75:24;76:1;	241:13 1,700 (1) 178:6 1:35 (1) 4:2 10 (38) 10:13;24:11;26:21; 34:7,9;37:22;38:16; 49:17;61:12,14; 64:19;70:14;72:18; 76:11;77:7,12;81:6; 90:22;91:3;108:3; 117:19,20;118:2; 127:16;143:5; 151:13;152:4; 153:12;155:24; 157:22;179:6;193:8; 196:4,21;197:7; 240:19;241:1;248:5 100 (4) 154:17;155:3; 234:20,21 100-foot (1) 47:6	<b>1-18 (2)</b> 187:8,18 <b>11-mile (1)</b> 230:9 <b>11th (6)</b> 6:15;26:13;77:10, 18;78:24;79:2 <b>12 (7)</b> 5:19;41:5,9;50:15; 55:11;59:3,6 <b>13 (2)</b> 59:2,7 <b>13A (9)</b> 88:5,10;101:5; 107:5;146:9;209:12, 13;217:8,11 <b>14 (6)</b> 34:9;51:5;157:7,8, 16,20 <b>1-42 (1)</b> 121:15 <b>1-44 (3)</b> 215:20;216:3,8 <b>15 (21)</b>	2 2 (19) 15:4,7;22:10,18; 23:18,21;67:6;78:13; 122:16;139:8,9; 140:11;167:8;184:4; 220:11;221:12,14; 226:23;241:1 2,000 (2) 178:7;236:4 2,583 (2) 216:18;218:19 2:53 (1) 69:22 20 (14) 5:15;17:22,24; 21:2;80:1;83:7;84:4; 102:9,21;103:22; 147:24;160:14; 193:9;235:18 20/05/11 (1) 123:12	200:17 249 (1) 4:16 24-decibel (2) 216:16,19 25 (6) 66:4,12;89:3; 137:17;199:11; 217:11 25-year (1) 57:16 26 (3) 5:17;75:24;196:6 27 (1) 210:7 28 (1) 231:19 28-decibel (1) 230:13 29 (1) 248:17 29th (1)
wrong (6) 173:7,12;174:22, 23;175:22;176:6; 187:11,23 wrote (1) 206:3 yards (2) 37:24;38:8 Year (23) 54:15;67:23; 101:24;102:12; 104:5,11,12,15,20, 23;105:2,8,12,13,17, 23;118:9;129:23; 130:18,21,22;131:22; 208:22 year-round (1) 206:16 years (10) 5:16,17,19;32:1; 50:1;75:24;76:1; 159:12;163:21;	241:13 1,700 (1) 178:6 1:35 (1) 4:2 10 (38) 10:13;24:11;26:21; 34:7,9;37:22;38:16; 49:17;61:12,14; 64:19;70:14;72:18; 76:11;77:7,12;81:6; 90:22;91:3;108:3; 117:19,20;118:2; 127:16;143:5; 151:13;152:4; 153:12;155:24; 157:22;179:6;193:8; 196:4,21;197:7; 240:19;241:1;248:5 100 (4) 154:17;155:3; 234:20,21 100-foot (1) 47:6 100-foot-wide (1)	1-18 (2) 187:8,18 11-mile (1) 230:9 11th (6) 6:15;26:13;77:10, 18;78:24;79:2 12 (7) 5:19;41:5,9;50:15; 55:11;59:3,6 13 (2) 59:2,7 13A (9) 88:5,10;101:5; 107:5;146:9;209:12, 13;217:8,11 14 (6) 34:9;51:5;157:7,8, 16,20 1-42 (1) 121:15 1-44 (3) 215:20;216:3,8 15 (21) 38:17;42:5;80:7,	2 2 (19) 15:4,7;22:10,18; 23:18,21;67:6;78:13; 122:16;139:8,9; 140:11;167:8;184:4; 220:11;221:12,14; 226:23;241:1 2,000 (2) 178:7;236:4 2,583 (2) 216:18;218:19 2:53 (1) 69:22 20 (14) 5:15;17:22,24; 21:2;80:1;83:7;84:4; 102:9,21;103:22; 147:24;160:14; 193:9;235:18 20/05/11 (1) 123:12 200 (5)	200:17 249 (1) 4:16 24-decibel (2) 216:16,19 25 (6) 66:4,12;89:3; 137:17;199:11; 217:11 25-year (1) 57:16 26 (3) 5:17;75:24;196:6 27 (1) 210:7 28 (1) 231:19 28-decibel (1) 230:13 29 (1) 248:17 29th (1) 79:6
wrong (6) 173:7,12;174:22, 23;175:22;176:6; 187:11,23 wrote (1) 206:3 yards (2) 37:24;38:8 Year (23) 54:15;67:23; 101:24;102:12; 104:5,11,12,15,20, 23;105:2,8,12,13,17, 23;118:9;129:23; 130:18,21,22;131:22; 208:22 year-round (1) 206:16 years (10) 5:16,17,19;32:1; 50:1;75:24;76:1; 159:12;163:21; 239:13	241:13 1,700 (1) 178:6 1:35 (1) 4:2 10 (38) 10:13;24:11;26:21; 34:7,9;37:22;38:16; 49:17;61:12,14; 64:19;70:14;72:18; 76:11;77:7,12;81:6; 90:22;91:3;108:3; 117:19,20;118:2; 127:16;143:5; 151:13;152:4; 153:12;155:24; 153:12;155:24; 157:22;179:6;193:8; 196:4,21;197:7; 240:19;241:1;248:5 100 (4) 154:17;155:3; 234:20,21 100-foot (1) 47:6 100-foot-wide (1) 47:13	<b>1-18 (2)</b> 187:8,18 <b>11-mile (1)</b> 230:9 <b>11th (6)</b> 6:15;26:13;77:10, 18;78:24;79:2 <b>12 (7)</b> 5:19;41:5,9;50:15; 55:11;59:3,6 <b>13 (2)</b> 59:2,7 <b>13A (9)</b> 88:5,10;101:5; 107:5;146:9;209:12, 13;217:8,11 <b>14 (6)</b> 34:9;51:5;157:7,8, 16,20 <b>1-42 (1)</b> 121:15 <b>1-44 (3)</b> 215:20;216:3,8 <b>15 (21)</b> 38:17;42:5;80:7, 11;81:13;84:8;90:22;	<b>2</b> <b>2 (19)</b> 15:4,7;22:10,18; 23:18,21;67:6;78:13; 122:16;139:8,9; 140:11;167:8;184:4; 220:11;221:12,14; 226:23;241:1 <b>2,000 (2)</b> 178:7;236:4 <b>2,583 (2)</b> 216:18;218:19 <b>2:53 (1)</b> 69:22 <b>20 (14)</b> 5:15;17:22,24; 21:2;80:1;83:7;84:4; 102:9,21;103:22; 147:24;160:14; 193:9;235:18 <b>20/05/11 (1)</b> 123:12 <b>200 (5)</b> 92:9;96:9;99:5;	200:17 249 (1) 4:16 24-decibel (2) 216:16,19 25 (6) 66:4,12;89:3; 137:17;199:11; 217:11 25-year (1) 57:16 26 (3) 5:17;75:24;196:6 27 (1) 210:7 28 (1) 231:19 28-decibel (1) 230:13 29 (1) 248:17 29th (1) 79:6 2B (1)
wrong (6) 173:7,12;174:22, 23;175:22;176:6; 187:11,23 wrote (1) 206:3 yards (2) 37:24;38:8 Year (23) 54:15;67:23; 101:24;102:12; 104:5,11,12,15,20, 23;105:2,8,12,13,17, 23;118:9;129:23; 130:18,21,22;131:22; 208:22 year-round (1) 206:16 years (10) 5:16,17,19;32:1; 50:1;75:24;76:1; 159:12;163:21; 239:13 yelling (1)	241:13 1,700 (1) 178:6 1:35 (1) 4:2 10 (38) 10:13;24:11;26:21; 34:7,9;37:22;38:16; 49:17;61:12,14; 64:19;70:14;72:18; 76:11;77:7,12;81:6; 90:22;91:3;108:3; 117:19,20;118:2; 127:16;143:5; 151:13;152:4; 153:12;155:24; 157:22;179:6;193:8; 196:4,21;197:7; 240:19;241:1;248:5 100 (4) 154:17;155:3; 234:20,21 100-foot (1) 47:6 100-foot-wide (1) 47:13 105.4 (1)	<b>1-18 (2)</b> 187:8,18 <b>11-mile (1)</b> 230:9 <b>11th (6)</b> 6:15;26:13;77:10, 18;78:24;79:2 <b>12 (7)</b> 5:19;41:5,9;50:15; 55:11;59:3,6 <b>13 (2)</b> 59:2,7 <b>13A (9)</b> 88:5,10;101:5; 107:5;146:9;209:12, 13;217:8,11 <b>14 (6)</b> 34:9;51:5;157:7,8, 16,20 <b>1-42 (1)</b> 121:15 <b>1-44 (3)</b> 215:20;216:3,8 <b>15 (21)</b> 38:17;42:5;80:7, 11;81:13;84:8;90:22; 91:3;95:4;102:15,16;	2 2 (19) 15:4,7;22:10,18; 23:18,21;67:6;78:13; 122:16;139:8,9; 140:11;167:8;184:4; 220:11;221:12,14; 226:23;241:1 2,000 (2) 178:7;236:4 2,583 (2) 216:18;218:19 2:53 (1) 69:22 20 (14) 5:15;17:22,24; 21:2;80:1;83:7;84:4; 102:9,21;103:22; 147:24;160:14; 193:9;235:18 20/05/11 (1) 123:12 200 (5) 92:9;96:9;99:5; 127:16;154:19	200:17 249 (1) 4:16 24-decibel (2) 216:16,19 25 (6) 66:4,12;89:3; 137:17;199:11; 217:11 25-year (1) 57:16 26 (3) 5:17;75:24;196:6 27 (1) 210:7 28 (1) 231:19 28/05/12 (1) 123:19 28/decibel (1) 230:13 29 (1) 248:17 29th (1) 79:6 2B (1) 15:13
wrong (6) 173:7,12;174:22, 23;175:22;176:6; 187:11,23 wrote (1) 206:3 yards (2) 37:24;38:8 Year (23) 54:15;67:23; 101:24;102:12; 104:5,11,12,15,20, 23;105:2,8,12,13,17, 23;118:9;129:23; 130:18,21,22;131:22; 208:22 year-round (1) 206:16 years (10) 5:16,17,19;32:1; 50:1;75:24;76:1; 159:12;163:21; 239:13 yelling (1) 115:9	241:13 1,700 (1) 178:6 1:35 (1) 4:2 10 (38) 10:13;24:11;26:21; 34:7,9;37:22;38:16; 49:17;61:12,14; 64:19;70:14;72:18; 76:11;77:7,12;81:6; 90:22;91:3;108:3; 117:19,20;118:2; 127:16;143:5; 151:13;152:4; 153:12;155:24; 157:22;179:6;193:8; 196:4,21;197:7; 240:19;241:1;248:5 100 (4) 154:17;155:3; 234:20,21 100-foot (1) 47:6 100-foot-wide (1) 47:13 105.4 (1) 119:2	1-18 (2) 187:8,18 11-mile (1) 230:9 11th (6) 6:15;26:13;77:10, 18;78:24;79:2 12 (7) 5:19;41:5,9;50:15; 55:11;59:3,6 13 (2) 59:2,7 13A (9) 88:5,10;101:5; 107:5;146:9;209:12, 13;217:8,11 14 (6) 34:9;51:5;157:7,8, 16,20 1-42 (1) 121:15 1-44 (3) 215:20;216:3,8 15 (21) 38:17;42:5;80:7, 11;81:13;84:8;90:22; 91:3;95:4;102:15,16; 103:5,6,11;104:1;	2 2 (19) 15:4,7;22:10,18; 23:18,21;67:6;78:13; 122:16;139:8,9; 140:11;167:8;184:4; 220:11;221:12,14; 226:23;241:1 2,000 (2) 178:7;236:4 2,583 (2) 216:18;218:19 2:53 (1) 69:22 20 (14) 5:15;17:22,24; 21:2;80:1;83:7;84:4; 102:9,21;103:22; 147:24;160:14; 193:9;235:18 20/05/11 (1) 123:12 200 (5) 92:9;96:9;99:5; 127:16;154:19 2000 (1)	200:17 249 (1) 4:16 24-decibel (2) 216:16,19 25 (6) 66:4,12;89:3; 137:17;199:11; 217:11 25-year (1) 57:16 26 (3) 5:17;75:24;196:6 27 (1) 210:7 28 (1) 231:19 28/05/12 (1) 123:19 28-decibel (1) 230:13 29 (1) 248:17 29th (1) 79:6 2B (1) 15:13 2-meter (6)
wrong (6) 173:7,12;174:22, 23;175:22;176:6; 187:11,23 wrote (1) 206:3 yards (2) 37:24;38:8 Year (23) 54:15;67:23; 101:24;102:12; 104:5,11,12,15,20, 23;105:2,8,12,13,17, 23;118:9;129:23; 130:18,21,22;131:22; 208:22 year-round (1) 206:16 years (10) 5:16,17,19;32:1; 50:1;75:24;76:1; 159:12;163:21; 239:13 yelling (1) 115:9 yielding (1)	241:13 1,700 (1) 178:6 1:35 (1) 4:2 10 (38) 10:13;24:11;26:21; 34:7,9;37:22;38:16; 49:17;61:12,14; 64:19;70:14;72:18; 76:11;77:7,12;81:6; 90:22;91:3;108:3; 117:19,20;118:2; 127:16;143:5; 151:13;152:4; 153:12;155:24; 157:22;179:6;193:8; 196:4,21;197:7; 240:19;241:1;248:5 100 (4) 154:17;155:3; 234:20,21 100-foot (1) 47:6 100-foot-wide (1) 47:13 105.4 (1) 119:2 107.4 (3)	<b>1-18 (2)</b> 187:8,18 <b>11-mile (1)</b> 230:9 <b>11th (6)</b> 6:15;26:13;77:10, 18;78:24;79:2 <b>12 (7)</b> 5:19;41:5,9;50:15; 55:11;59:3,6 <b>13 (2)</b> 59:2,7 <b>13A (9)</b> 88:5,10;101:5; 107:5;146:9;209:12, 13;217:8,11 <b>14 (6)</b> 34:9;51:5;157:7,8, 16,20 <b>1-42 (1)</b> 121:15 <b>1-44 (3)</b> 215:20;216:3,8 <b>15 (21)</b> 38:17;42:5;80:7, 11;81:13;84:8;90:22; 91:3;95:4;102:15,16; 103:5,6,11;104:1; 105:15,18,24;139:17;	2 2 (19) 15:4,7;22:10,18; 23:18,21;67:6;78:13; 122:16;139:8,9; 140:11;167:8;184:4; 220:11;221:12,14; 226:23;241:1 2,000 (2) 178:7;236:4 2,583 (2) 216:18;218:19 2:53 (1) 69:22 20 (14) 5:15;17:22,24; 21:2;80:1;83:7;84:4; 102:9,21;103:22; 147:24;160:14; 193:9;235:18 20/05/11 (1) 123:12 200 (5) 92:9;96:9;99:5; 127:16;154:19 2000 (1) 46:17 2000 (1)	200:17 249 (1) 4:16 24-decibel (2) 216:16,19 25 (6) 66:4,12;89:3; 137:17;199:11; 217:11 25-year (1) 57:16 26 (3) 5:17;75:24;196:6 27 (1) 210:7 28 (1) 231:19 28/05/12 (1) 123:19 28-decibel (1) 230:13 29 (1) 248:17 29th (1) 79:6 2B (1) 15:13 2-meter (6) 221:6,8,23;223:22;
wrong (6) 173:7,12;174:22, 23;175:22;176:6; 187:11,23 wrote (1) 206:3 yards (2) 37:24;38:8 Year (23) 54:15;67:23; 101:24;102:12; 104:5,11,12,15,20, 23;105:2,8,12,13,17, 23;118:9;129:23; 130:18,21,22;131:22; 208:22 year-round (1) 206:16 years (10) 5:16,17,19;32:1; 50:1;75:24;76:1; 159:12;163:21; 239:13 yelling (1) 115:9 yielding (1) 206:14	241:13 1,700 (1) 178:6 1:35 (1) 4:2 10 (38) 10:13;24:11;26:21; 34:7,9;37:22;38:16; 49:17;61:12,14; 64:19;70:14;72:18; 76:11;77:7,12;81:6; 90:22;91:3;108:3; 117:19,20;118:2; 127:16;143:5; 151:13;152:4; 153:12;155:24; 157:22;179:6;193:8; 196:4,21;197:7; 240:19;241:1;248:5 100 (4) 154:17;155:3; 234:20,21 100-foot (1) 47:6 100-foot-wide (1) 47:13 105.4 (1) 119:2 107.4 (3) 78:13;118:23;	<b>1-18 (2)</b> 187:8,18 <b>11-mile (1)</b> 230:9 <b>11th (6)</b> 6:15;26:13;77:10, 18;78:24;79:2 <b>12 (7)</b> 5:19;41:5,9;50:15; 55:11;59:3,6 <b>13 (2)</b> 59:2,7 <b>13A (9)</b> 88:5,10;101:5; 107:5;146:9;209:12, 13;217:8,11 <b>14 (6)</b> 34:9;51:5;157:7,8, 16,20 <b>1-42 (1)</b> 121:15 <b>1-44 (3)</b> 215:20;216:3,8 <b>15 (21)</b> 38:17;42:5;80:7, 11;81:13;84:8;90:22; 91:3;95:4;102:15,16; 103:5,6,11;104:1; 105:15,18,24;139:17; 143:5;151:13	2 2 (19) 15:4,7;22:10,18; 23:18,21;67:6;78:13; 122:16;139:8,9; 140:11;167:8;184:4; 220:11;221:12,14; 226:23;241:1 2,000 (2) 178:7;236:4 2,583 (2) 216:18;218:19 2:53 (1) 69:22 20 (14) 5:15;17:22,24; 21:2;80:1;83:7;84:4; 102:9,21;103:22; 147:24;160:14; 193:9;235:18 20/05/11 (1) 123:12 200 (5) 92:9;96:9;99:5; 127:16;154:19 2000 (1) 46:17 2005 (1)	200:17 249 (1) 4:16 24-decibel (2) 216:16,19 25 (6) 66:4,12;89:3; 137:17;199:11; 217:11 25-year (1) 57:16 26 (3) 5:17;75:24;196:6 27 (1) 210:7 28 (1) 231:19 28/05/12 (1) 123:19 28-decibel (1) 230:13 29 (1) 248:17 29th (1) 79:6 2B (1) 15:13 2-meter (6) 221:6,8,23;223:22; 224:1,12
wrong (6) 173:7,12;174:22, 23;175:22;176:6; 187:11,23 wrote (1) 206:3 yards (2) 37:24;38:8 Year (23) 54:15;67:23; 101:24;102:12; 104:5,11,12,15,20, 23;105:2,8,12,13,17, 23;118:9;129:23; 130:18,21,22;131:22; 208:22 year-round (1) 206:16 years (10) 5:16,17,19;32:1; 50:1;75:24;76:1; 159:12;163:21; 239:13 yelling (1) 115:9 yielding (1) 206:14 York (1)	241:13 1,700 (1) 178:6 1:35 (1) 4:2 10 (38) 10:13;24:11;26:21; 34:7,9;37:22;38:16; 49:17;61:12,14; 64:19;70:14;72:18; 76:11;77:7,12;81:6; 90:22;91:3;108:3; 117:19,20;118:2; 127:16;143:5; 151:13;152:4; 153:12;155:24; 157:22;179:6;193:8; 196:4,21;197:7; 240:19;241:1;248:5 100 (4) 154:17;155:3; 234:20,21 100-foot (1) 47:6 100-foot-wide (1) 47:13 105.4 (1) 119:2 107.4 (3) 78:13;118:23; 122:16	$\begin{array}{llllllllllllllllllllllllllllllllllll$	2 2 (19) 15:4,7;22:10,18; 23:18,21;67:6;78:13; 122:16;139:8,9; 140:11;167:8;184:4; 220:11;221:12,14; 226:23;241:1 2,000 (2) 178:7;236:4 2,583 (2) 216:18;218:19 2:53 (1) 69:22 20 (14) 5:15;17:22,24; 21:2;80:1;83:7;84:4; 102:9,21;103:22; 147:24;160:14; 193:9;235:18 20/05/11 (1) 123:12 200 (5) 92:9;96:9;99:5; 127:16;154:19 2000 (1) 46:17 2005 (1) 46:19	200:17 249 (1) 4:16 24-decibel (2) 216:16,19 25 (6) 66:4,12;89:3; 137:17;199:11; 217:11 25-year (1) 57:16 26 (3) 5:17;75:24;196:6 27 (1) 210:7 28 (1) 231:19 28/05/12 (1) 123:19 28-decibel (1) 230:13 29 (1) 248:17 29th (1) 79:6 2B (1) 15:13 2-meter (6) 221:6,8,23;223:22; 224:1,12

	191.13	8.24.9.2.22.3 9.	6-3 (2)
2	3rd (1)	28.8 11.77.18.80.1	199.5.209.20
3	149.10	81.6.87.4 8.158.23	<b>65</b> (1)
	149.10	188.8.200.8.216.23	89.4
3 (22)	4	221.13.222.4	07.4
22:11;49:18;67:6;		221.13,222.7, 224.22.206.21.	7
79:1;86:8;88:12,15;	4 (17)	224.22,220.21, 227.9,11,16.230.11.	1
95:/;16/:13,15;	(17) 0.1 2.16.5.22.18.	227.9,11,10,230.11, 234.15,16.240.8,12	7 (8)
168:15;199:10;	7.1,2,10.3,22.10, 22.10.26.27.70.24.	234.13,10,240.0,12, 17.241.11	7(0) 6.11 16.0.22.11.4.
209:22;217:10;	23.19,30.3,7,79.24,	<b>5,30</b> (1)	0.11,10,9.22,11.4, 12,21,17,22,67,9.0
221:13;223:4;	00.20,104.5,100.15, 100.22,22.221.12,	102.22	<b>1</b> 5.21,17.22,07.6,9 <b>7.00 (3)</b>
225:23;226:23;	199.22,25,221.15, 222.4,5.226.22	<b>50 (15)</b>	102.1.104.7.255.2
237:3,21,23;238:5	225:4,5;220:25 4 000 (3)	30(13) 20.1.27.04.20.0.	195:1;194:7;255:5
3-(2)	4,000 (3)	57.11.61.10.10	<b>7-IIICII (2)</b>
225:13;240:14	92.0,0,90.0	57.11,01.10,19, 62.11.72.11.114.12.	222.23,230.19
3,000 (1)	4,200 (1)	02.11,75.11,114.15, 147.1.180.22.	8
43:4	87.5 4 3 2 (1)	147.1,109.22, 100.22,22.212.2.	0
3,843 (1)	4.3.2 (1)	190:25,25;215:5;	9 (9)
87:8	18:2	222:10 50 (2)	
3,883 (1)	4:27 (1)	50-(2)	30:10,10;41:10; (1,12,157,10,10;
92:7	13/:19	47.3,12 500 (1)	01:15;15/:19,19;
3:00 (1)	<b>4.40 (1)</b> 137.20	150.4	185:5;248:5
69:20	157.20 <b>40 (12)</b>	130.4 50-foot (4)	0,/UU (1) 107.7
3:06 (1)	<b>HU (14)</b> 61.0.72.10.74.15.	50-1001 (4)	10/:/ 800 (1)
69:23	01.7,75.10,74.15;	39.10,02.10,74.19, 22	86.0
30 (23)	85:0;91:19;102:9,21;	$\frac{22}{50}$ year (3)	$800.f_{\text{pot}}(1)$
61:9;62:4;63:1,21;	111:13;144:11;	21.24.46.16.57.9	800-1001 (1) 96.11
66:4;70:13;73:10;	131:18,20,190:12	51.24,40.10,57.8 <b>5 2 (1)</b>	80:11
83:8,23;102:9,13,21;	<b>40/00</b> (1)	<b>5-2 (1)</b>	0
103:3,9,12,12;150:4;	139.19	5 3 (2)	7
196:11;234:16;	400 (2)	146.23.100.14	0 (17)
236:22;237:17,18;	4.19,195.2	<b>5-4 (1)</b>	9(17) 6.16.16.4.24.11.
241:12	400-1001 (1)	100.15	0.10, 10.4, 24.11,
30/night (1)	40 desibel (1)	<b>55 (10)</b>	43.17, 54.17, 55.22, 62.10, 12, 19.67.12,
139:19	117.15	80.1.100.3.138.10	05:10,12,18,07:15,
<b>30-decibel (3)</b>	11/.13	130.1.100.5.158.10,	148.10.157.12 10.
113:21;119:17,18	40-1001(2)	15.142.6 18.180.22	148:10;137:13,19;
<b>30-foot</b> (2)	<i>4</i> 1 (15)	<b>56 (1)</b>	246.5 0 3 (1)
61:16;63:20	83.6.86.10.00.16	36.13	215.3
31 (3)	93.5.107.12.108.23	57 (3)	9.00 (2)
210:7,8,9	113.19.116.5 5 7 8	29.17.36.13.80.21	254.1022
31st (8)	13 22 23.132.17	57 9 (5)	<b>90</b> ( <b>1</b> )
6:9;8:20;11:3;	4-1 (2)	9.22.10.1 6 21.	$193.12\ 22.241.12.$
34:8;45:17;50:17;	127.22.160.12	11.8	242.10
/0:9;155:8 22 (1)	<b>41-decibel</b> (1)	5-mile (1)	92 (4)
<b>34 (1)</b> 114.4	116:21	230:9	235:2:236.1.2.2
114:4 22 (2)	42 (5)		9613 (1)
33(3)	91:19:111:15:	6	239.6
<b>34 (7)</b>	174:1.2.3		9613-2 (3)
64·1·65·16·157·13·	44 (1)	6 (6)	132:20:233:10.12
173.21.205.4 5	211:15	16:5:155:24:156:5:	9-meter-per-second (1)
217.15	45 (15)	187:9,12,16	215:5
34-foot (7)	100:4;138:11;	6.2 (1)	
46.24.54.24.55.18	139:12;140:2;141:1,	209:4	
23.62.10.63.3.74.18	19;142:6,17,19,22;	6.3 (3)	
35 (3)	143:8;144:7;151:18;	209:3,17,20	
151:20.173.17	190:22,23	6:00 (1)	
174:7	4-inch (2)	254:19	
35-decibel (1)	225:14,23	<b>6-1</b> (1)	
113:24		211:20	
3-inch (2)	5	6-2 (3)	
222:22;230:12		199:5;211:20;	
3-megawatt (1)	5 (29)	214:1	