

1 NATIONAL RADIO ASTRONOMY OBSERVATORY
2 (GREEN BANK OBSERVATORY)
3 EIS PUBLIC SCOPING MEETING - NUMBER 1
4
5 HELD AT THE
6 GREEN BANK SCIENCE CENTER
7 155 Observatory Road
8 Arbovale, West Virginia 24915
9
10 Wednesday, November 9, 2016
11 3:30 p.m.
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PAGE

PROCEEDINGS 4

P R O C E E D I N G S

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Whereupon,

DR. EDWARD AJHAR: Thank you everybody for attending our Environmental Impact Statement Public Scoping Meeting. I also want to take this moment to thank our host, the Green Bank Observatory and the director, Karen O'Neil. They've been great hosts in helping us get all of these logistics set up.

The other thing I want to mention just before we get started is that you know you've heard a lot of things or read a lot of things in the news. Not everything gets translated perfectly so I'm going to try to clarify some of those things for you today. I just want to emphasize how important your comments are to us because contrary to some of the things you may have heard, right, there has been no decision made regarding Green Bank Observatory's future. We have not decided to close it and that's why your public comments are a very important part of this whole process. You know, it's a challenging process for all of us right now, but again, I appreciate your presence.

So what we're going to do I'm going to introduce myself and the rest of the team. I'm going to go over some background information so that you understand why we're here and I will discuss what the preliminary proposal

1 alternatives and the resource areas that are going to be
2 studied as a part of this Environmental Impact Statement.
3 We will talk about the Environmental Impact Statement
4 process, and when all of that is done we will open the
5 floor to public comments.

6 So first of all my name. I'm Edward Ajhar. I am an
7 astronomer in the Division of Astronomical Sciences at the
8 National Science Foundation, and I'm the program officer
9 for Green Bank Observatory.

10 Joining me from our Division of Astronomical Sciences
11 is Liz Pentecost. Liz is back there. Thank you, Liz. And
12 we have Caroline Blanco and Christin Hamilton from our
13 Office of General Counsel. From our Office of Legislative
14 and Public Affairs we have Karen Pearce and Ivy Kupec.
15 Karen, Ivy, thank you. We also have a couple of
16 contractors with us Michelle Rouwe and Chris McDonough. I
17 don't know if any of them are here. They're sitting out
18 probably welcoming other people.

19 Let me now start talking about the role of the
20 National Science Foundation. We serve as the federal
21 stewards of ground-based astronomy and astrophysics, and
22 NSF provides funding for national and international
23 telescopes and facilities and provides funding for research
24 that allow individuals and groups to conduct

1 specific science investigations.

2 So what is our stewardship role of NSF's astronomy
3 portfolio? Over the past decade the National Science
4 Foundation has received advice from several external review
5 committees. These are made up of members of the
6 astronomical research community. In the 2010 decadal
7 survey titled New Worlds, New Horizons in Astronomy and
8 Astrophysics stated that, "NSF astronomy should complete
9 its next senior review so as to determine which, if any,
10 facilities astronomy should cease to support in order to
11 release funds for one, the construction and ongoing
12 operation of new telescopes and instruments; and two, the
13 science analysis needed to capitalize on the results from
14 existing and future facilities."

15 The 2010 report reports recommended review of the
16 National Science Foundation Astronomical Sciences Portfolio
17 was completed in 2012. That 2012 portfolio review was
18 titled, Advancing Astronomy in the Coming Decade:
19 Opportunities and Challenges. "Regarding the Green Bank
20 Telescope, the 2012 review recommended divestment and
21 stated the following, "The GBT is the world's most
22 sensitive single-dish radio telescope at wavelengths
23 shorter than ten centimeters; however, its capabilities are
24 not as critical to the decadal survey science goals as

1 higher-ranked facilities."

2 In August of this year, 2016, the National Academies
3 of Sciences, Engineering, and Medicine published their
4 midterm assessment of the 2010 decadal survey and
5 reaffirmed the 2012 portfolio reviews recommendation for
6 divestment of these astronomy facilities. To quote from
7 that report, "The NSF should proceed with divestment from
8 ground-based facilities that have a lower scientific impact
9 implementing the recommendations of the NSF Portfolio
10 Review, which is essential to sustaining a scientific
11 vitality of the U.S. ground-based astronomy program as new
12 facilities come into operation."

13 So given all of that input over the past several years
14 that I just tried to summarize very quickly for you, what
15 are the resulting developments here at Green Bank? Well,
16 going back to fiscal year 2012, the National Science
17 Foundation provided about 95 percent of this site's
18 funding, and on March 22nd, 2013, in a Dear Colleague
19 Letter that the National Science Foundation announced that
20 the Green Bank Telescope would be separated from the
21 National Radio Astronomy Observatory competition and
22 requested ideas for collaborations involving GBT. I will
23 have more to say about that in a second.

24 October 1st of this year following the path that was

1 published in that 2013 Dear Colleague Letter, the National
2 Science Foundation separated NRAO Green Bank from the whole
3 NRAO and this site was renamed the Green Bank Observatory.
4 Associated Universities Incorporated, AUI, continues to
5 manage the Green Bank Observatory under a cooperative
6 agreement with the National Science Foundation. I know
7 many of you were here. I was here last month when we had a
8 very nice inauguration ceremony for that
9 event. So those are the things that happened.

10 I want to give you some information about the current
11 budget for Green Bank Observatory. In the fiscal year
12 2017, President's Request Budget of other astronomical
13 facilities, that budget asked for \$11.5 million total for
14 the Green Bank Observatory and the Long Baseline
15 Observatory. In this fiscal 2017 President's Request
16 Budget, it also shows an increase to \$11.85 million in the
17 following fiscal year of 2018 for planning purposes. So
18 that's published. You can see that.

19 Following a review of AUI, that's the managing
20 organization, following review of their proposal that
21 provides the exact division between Green Bank Observatory
22 and Long Baseline Observatory for the current fiscal year
23 2017 and fiscal year 2018, the National Science Foundation
24 allocated \$8.2 million in the current fiscal year should

1 the President's Request Budget be appropriated. Of course,
2 that hasn't happened yet. We're operating under a
3 continuing resolution as many people are aware so the \$8.2
4 million level represents approximately 75 percent of the
5 base budget for Green Bank Observatory that was part of the
6 previous appropriations for the National Radio Astronomy
7 Observatory.

8 Another very important part of what's a part of Green
9 Bank Observatory now is that GBO has established
10 collaborations with Breakthrough Listen, which you've heard
11 a lot about probably in the news, and West Virginia
12 University and the North American Nanoherzt Gravitational
13 Wave Project known as NANOGrav. GBO continues to seek new
14 funding sources so that's where we are today.

15 So what are the National Science Foundation's plans
16 moving forward which is bringing us to one of the reasons
17 why we're here today. So given the previous astronomical
18 community's recommendations that I summarized very briefly
19 for you today, combined with the current budget
20 constraints, NSF has a need to reduce funding for a number
21 of its astronomical telescopes and facilities so that's why
22 the NSF is now initiating the Environmental Impact
23 Statement Section 106 consultation process which involves
24 you, the public, for the Green Bank Observatory. This is

1 in addition to similar processes which we've already
2 initiated for the Arecibo Observatory and the Sacramento
3 Peak Observatory so that's why we're here today.

4 The Environmental Impact Statement Preliminary
5 Proposed Alternatives for operations at Green Bank that are
6 being considered are the following, and I will go through
7 them with you, and these are preliminary and that's why
8 this is one of the important things that your comments will
9 be considered for these alternatives and other ones that
10 may come up in this process.

11 The first one is continued NSF investment for science-
12 focused operations. That's the no action alternative.
13 That's continuing what we are doing today.

14 Number two is the collaboration with interested
15 parties for science- and education-focused operations with
16 reduced NSF-funded scope.

17 Third one, collaboration with interested parties for
18 operation as a technology and education park.

19 The fourth one is mothballing of facilities. By that
20 we mean the suspension of the operations in a manner such
21 that operations could resume efficiently at some future
22 time.

23 The last alternative that we're looking at is
24 construction -- deconstruction of the site and site

1 restoration.

2 That's the range that we're looking at, and at this
3 point I would like to turn over the presentation to our
4 general counsel, Caroline Blanco, to go through some of the
5 details of this process. Thanks.

6 CAROLINE BLANCO: Well, thank you so much, and thank
7 you to you, Dr. Ajhar, who just gave me a promotion. I'm
8 the assistant general counsel for the National Science
9 Foundation. I oversee environmental matters.

10 My name again is Caroline Blanco, and I, too, would
11 like to thank you very much for coming this afternoon. I'm
12 going to speak a little bit about the process. This is an
13 unusual type of process perhaps for some folks, but it does
14 look at the environmental consequences to proposed
15 alternatives so these alternatives came from the
16 national -- or as a result of the National Environmental
17 Policy Act.

18 This is a statute that requires federal agencies to
19 consider the potential environmental consequences of their
20 proposed actions before a decision has been made. NSF has
21 decided to prepare an Environmental Impact Study -- an
22 Environmental Impact Statement to evaluate the potential
23 environmental effects of proposed operational changes due
24 to funding constraints for the Green Bank Observatory.

1 There is a set process that's established by law and
2 the process starts out with this very one which is the
3 scoping process. There is a 30-day public comment period.
4 It has been extended a little bit due to a technological
5 glitch but it's extended to November 25th, and you are
6 invited and welcome, encouraged to send public comments.
7 The comments really largely are focused on how the scope of
8 the Environmental Impact Statement will be shaped. Two
9 main things to look at are the proposed alternatives that
10 Dr. Ajhar just mentioned and any other viable alternatives
11 that you may suggest. Also the different resource areas to
12 be studied, and we will go through that in a moment.

13 So on October 19th is when we announced the beginning
14 of this scoping process and the development of the
15 Environmental Impact Statement. And, again, we invite your
16 comments on them on these relevant issues. Again,
17 including -- this is not just -- to be as clear as I can be
18 about it, it's not -- this process is focused on
19 environmental impacts. It's not a process to debate the
20 merits of science and, you know, those types of things.
21 We're looking at environmental impacts associated with
22 proposed alternatives so your thoughts on a range of viable
23 alternatives would be most welcome as well as resource
24 areas to be studied.

1 So looking to the resource areas that we preliminarily
2 identified that need to be analyzed in our Environmental
3 Impact Statement are air quality, biological resources,
4 cultural resources, geological resources, solid waste
5 generation, health and safety issues, socioeconomic
6 impacts, traffic, and groundwater resources.

7 What will happen after this is we will prepare a draft
8 Environmental Impact Statement and then there will be a 45
9 day for the comment period. The issuance of that draft EIS
10 will be announced, again, in the Federal Register. Also
11 you can see, and I will mention this again at the end, that
12 there will be the availability of the website NSF.gov/AST?
13 Yeah. You will be able to see ongoing documents there.
14 The draft EIS will be posted there as well. Then we will
15 come back and have another meeting, probably two meetings
16 afternoon and evening, and allow for more public comments
17 then.

18 Another process that we're doing at the same time is
19 Section 106 of the National Historic Preservation Act.
20 What 106 is is a consultation process that requires federal
21 agencies to consult with interested parties in the State
22 Historic Preservation Office regarding potential effects of
23 their proposed actions on nationally significant historic
24 properties.

1 There are four basic steps to this process. We
2 initiate our consultation process and then we identify an
3 area of potential effects, the ATE, which is likely going
4 to be within the boundaries of this observatory, and the
5 nationally significant properties within the area of
6 potential effects. The EIS process in contrast doesn't
7 look at the significance level of those historic resources,
8 but Section 106 does focus on those resources on the
9 nationally significant ones. Then we assess whether there
10 are effects. If so, whether they are adverse to those
11 nationally significant historic properties, and they can
12 include archeological, historic, or cultural resources.
13 Then we resolve those adverse effects with consulting
14 parties and through typically a memorandum of agreements.

15 You may have noticed when you signed in, and hopefully
16 everybody signed in, that's one way we can make sure we
17 communicate with you. When the draft EIS comes out we will
18 notify you. There's also a box or a column there where you
19 will see that there is a request did you want to be a
20 consulting party and that simply means that you would be
21 interested in participating in this process, the Section
22 106 one.

23 The other process that we're taking a look at is the
24 Endangered Species Act. This is an Act that NSF as a

1 federal agency is also required to comply with. It
2 considers whether the proposed activities impact threatened
3 or endangered species or their habitats, and if so, then we
4 consult with the Fish and Wildlife Service, the U.S. Fish
5 and Wildlife Service and look at ways to address those
6 impacts.

7 So looking forward, our target dates, as we mentioned,
8 the scoping process started October 19th and it will
9 continue through November 25th. We're having this public
10 meeting as well as the one beginning at 6 p.m. tonight.

11 Moving forward after that, we will accumulate your
12 comments, we will review them, consider them. We will be
13 working with our environmental contractors, CH 2 M Hill,
14 and we will prepare a draft Environmental Impact Statement
15 that will analyze, take a look at all of those proposed
16 alternatives that will hopefully be more typed up as a
17 result of this process, and then we will take a look at
18 impacts associated with each of those alternatives. The
19 resource areas that we listed if those change as a result
20 of the public comments we receive here we will take a look
21 at that as well.

22 We expect roughly that that will be published and
23 available in the spring of 2017, and that will, as I said,
24 that will start off the 45-day public comment period and

1 public meetings and then we will prepare a final EIS. That
2 process takes a bit and we're looking at publishing the
3 final EIS sometime in the fall of 2017. These are merely
4 target dates. Things may shift depending upon the number
5 of comments we received and how much information we may
6 need to complete our process.

7 After that, by law, we have to wait at least 30 days
8 before a Record of Decision is issued. That Record of
9 Decision is expected sometime in early 2018. That Record
10 of Decision will select ultimately an action. The process
11 for doing it will include several components, one of which
12 is the environmental consequences, but there will be other
13 factors such as scientific policies and budget issues and
14 NSF submission, a whole host of things will go and be
15 wrapped into that final Record of Decision.

16 As you can see at the base of the slide concurrently
17 we will be completing our National Historic Preservation
18 Act compliance. That's the Section 106 compliance
19 process. Again, if you're interested in participating in
20 that process, please make sure that you let us know.
21 Endangered Species Act as well we will be compliant with.

22 So how do you submit your comments? You can provide
23 verbal comments today. You can submit written comments
24 today. We have a written comment form. Also, just as a

1 note, hopefully all of you will have -- these are also
2 available on the website. This particulate is a fact
3 sheet, several pages that explain a little bit more about
4 this process and provides some additional information. You
5 can mail or e-mail your comments to NSF by November 25th.
6 You can submit them by e-mail or by regular mail but those
7 are the two addresses there.

8 Again, we have the fact sheet. We have informational
9 boards, the boards that are out there, all of that
10 information including this PowerPoint presentation will be
11 posted after today on our website and that's the
12 NSF.gov/AST website. The documents and meeting information
13 will be posted on that same website throughout this
14 process.

15 So now we're at the public comment portion of this
16 meeting. We have a court reporter here to transcribe.
17 This will become part of the public record and Elizabeth
18 Pentecost from the National Science Foundation will call
19 your name for those folks who have indicated that they
20 would like to provide oral comments.

21 If you would, please, when your name is called please
22 come here, take the microphone, and go ahead and provide
23 your comments. We have roughly about 27, 28 people that
24 indicated they wanted to comment so we're looking at --

1 we're not going to be hard and fast about it, but if you
2 could try to limit your comments to about three minutes,
3 that would be great. If we have more time left over at the
4 end we can always have you supplement and, again, just
5 because you provide oral comments here doesn't mean you
6 can't add additional written comments before November 25th
7 as well. That will be great. Thank you so much.

8 ELIZABETH PENTECOST: I would like to introduce
9 Congressman Evan Jenkins.

10 CONGRESSMAN EVAN JENKINS: Well, thank you very much.
11 Good afternoon. I'm Evan Jenkins. I'm the congressman
12 from the Third Congressional District. That goes from
13 Mason and Cabell County over on the west all the way right
14 here to Pocahontas County.

15 To all of the Pocahontas County residents, to the
16 employees of Green Bank, to those who have traveled from
17 out of state to come here to have your voice heard, thank
18 you. This was important for me as well to come over to
19 make sure that I join your voices to make sure that this
20 critically important asset is preserved.

21 I appreciate the Green Bank Observatory for hosting
22 this event and the wonderful accommodations, and I
23 appreciate, again, all that you do.

24 I want to thank the National Science Foundation for

1 their work and for their engagement in this facility. I
2 welcome you to this wonderful State of West Virginia. This
3 is a very special place. Green Bank Observatory is the
4 reason that the United States is a global leader in radio
5 astronomy. The Green Bank Telescope is leading the way in
6 tracking pulsars, investigating star formation, exploring
7 our galaxy, and even looking for alien life.

8 I understand that this is about an Environmental
9 Impact Statement. This is about impact. Without this
10 critical asset, the United States would lose its footing in
11 radio astronomy, a position that could take decades to
12 reclaim. Scientists from all over the world use the Green
13 Bank for cutting-edge research. Many of these scientists
14 at one time or another find themselves in this beautiful
15 mountainous area of Pocahontas County.

16 This bridge has been of key importance for the
17 students from our state and many others. Every year Green
18 Bank brings in 3 to 5,000 students and teachers to
19 participate in educational programs. Students are given
20 the opportunity to use the equipment and look for
21 astronomical bodies including discovering pulsars. These
22 educational programs are giving West Virginia students the
23 opportunity to have hands-on experience in science and
24 research fields. For many students, especially

1 underprivileged and female, these students, they need these
2 opportunities, and these are opportunities that they can't
3 get or have copied simply in the classroom or at home.

4 The Green Bank Observatory is giving a chance to
5 students that will truly change their lives. Green Bank
6 provides even more to the community than creating the next
7 generation of scientists. The facility provides an
8 irreplaceable economic boost to Pocahontas County and West
9 Virginia.

10 Green Bank as we know employs over 100 people year-
11 round and during the busy season about 400 -- 40 additional
12 seasonal jobs. During this time Green Bank is the largest
13 private employer in this county. The Green Bank
14 Observatory's employees contribute an all important \$17.1
15 million to the local economy and when included with the
16 economic impact from tourism, the Green Bank Observatory
17 adds nearly \$30 million to the West Virginia economy.

18 Our state is hurting right now. We are hurting.
19 Green Bank is the shining beacon for our future and for
20 hope for that future. There is a continued need for Green
21 Bank and it could not be more apparent than the recent
22 efforts being undertaken by the Breakthrough Listening
23 Project. Green Bank is a key part of investigating the
24 skies for intelligent life. The impacts of science for

1 education and for the community is why there is such an
2 outpouring as shown here today for this facility.

3 I want to make it perfectly clear, I think options
4 four and five on the chart are simply unacceptable. I
5 fully support the Green Bank Observatory and know that it
6 can be a critical asset for science and West Virginia for
7 decades to come. Thank you.

8 ELIZABETH PENTECOST: Okay, the next person is J.T
9 Jezierski from Senator Capito's office.

10 J.T. JEZIERSKI: I was going to make a
11 lame joke about finding pulsars was easier than saying my
12 last name but since this is public I won't make that joke.

13 My name is J.T. Jezierski. I'm born and raised in
14 Weirton, West Virginia, Hancock County. I work for Senator
15 Shelley Moore Capito. I'm in her Washington, DC office and
16 I support her work on the appropriations committee.
17 Unfortunately, she couldn't be here today so she asked me
18 to read this statement if I could.

19 "Ladies and gentlemen, fellow West Virginians. I am
20 sorry I am unable to attend today's meeting. Although I
21 regret not being there, I am glad you all are, particularly
22 the team from the National Science Foundation. They will
23 see how important and impactful the work of the Green Bank
24 Observatory is to our world, to West Virginia, and to

1 Pocahontas County.

2 There are many impressive stats and facts that one can
3 recite about this facility, but to be here, to see the
4 structure in person and to hear your stories, that is worth
5 more than any statistics.

6 It was my pleasure to experience this just a few weeks
7 ago when I visited Green Bank. You cannot help but be
8 inspired and excited for our future by seeing this unique
9 equipment or meeting the men and women who make it work.

10 We are gathered to talk about the future of the Green
11 Bank Observatory, but we are also here to talk about the
12 future of scientific research in the United States. I have
13 long advocated for the continued operation of this facility
14 supporting robust levels of funding and research. Doing so
15 will not only employ West Virginians but it keeps people
16 inspired whether current researchers or the thousands of
17 students who come through here wanting to become
18 researchers. We have to invest in science research in our
19 nation. The promise of discoveries are beyond our
20 imagination if we make the right investments.

21 Whether on the appropriations committee where I am a
22 member or working with my partners in this effort, Senator
23 Manchin and Congressman Jenkins, I will convey -- continue
24 to convey my support for Green Bank.

1 I look forward to reconnecting with Director Cordova
2 tomorrow to discuss the significance of this observatory.
3 I know there's a process to write this Environmental Impact
4 Study, and I plan to be involved every step of the way. I
5 recognize the challenges presented by a limited federal
6 budget and support any and all efforts to reduce waste and
7 inefficiencies; however, investment in Green Bank does not
8 fall into either of those categories. Every dollar
9 invested here is spent wisely. Meanwhile, Green Bank has
10 been a responsible partner with the National Science
11 Foundation in recognizing the budgetary challenges we all
12 face.

13 Green Bank has been extremely aggressive and forward
14 thinking to partner with educational institutions like West
15 Virginia University and with organizations such as the
16 Breakthrough Foundation to balance government investment
17 with private funds.

18 There are many quantifiable impacts of this facility
19 on this community and we know your study will factor and
20 measure them all. As you complete your study, we ask that
21 you please not overlook the less easily measured impacts.

22 Green Bank is not just looking towards the stars to
23 discover new worlds but looking towards students in West
24 Virginia and across our nation for new scientists,

1 astronomers, researchers, and teachers. May their
2 discoveries continue to inspire us all. Senator Shelley
3 Moore Capito."

4 Thank you for your time.

5 ELIZABETH PENTECOST: The next person is Peggy Hawse
6 from Senator Manchin's office.

7 PEGGY HAWSE: Good afternoon. I'm Peggy Hawse and I'm
8 a regional coordinator for Senator Joe Manchin. I live
9 about 80 miles from here in Hardy County, so please don't
10 hold that against me. I know Moorefield plays Pocahontas
11 County, that's why I threw that out there.

12 The Senator is very committed to Green Bank
13 Observatory. He sent not only myself today but the
14 legislative director from Washington on the senator staff,
15 Wes Congle, and I am very happy to be here.

16 GBO, Green Bank Observatory, is very near and dear to
17 my heart. I kind of consider it a friend and when you have
18 a friend sometimes you give them a nickname. I understand
19 that the nickname of the Green Bank Telescope is the Great
20 Big Thing. The first time I said that at my home my
21 husband said what in the world are you talking about. I
22 said it is the Great Big Thing and you have to see it, you
23 have to experience it to really understand that.
24 Obviously, U-Haul did because they chose the Green Bank

1 Telescope as the symbol of West Virginia to put on the
2 sides of their trucks so it is a friend. It is a status of
3 pride for all of us that live in West Virginia and also in
4 the USA.

5 I do have some comments from the Senator. The NRAO
6 was established here in Green Bank in 1956. The people of
7 this community and this region have made many sacrifices
8 and they have embraced it. Obviously, there's no cellphone
9 coverage, but if you ask anyone in this area they will say
10 that is not a big deal.

11 I want to emphasize the economic impact, what happens
12 here at GBO. Well, first of all, there is a \$17 million
13 contribution to the local economy. Taking this a little
14 bit further, there are over 50,000 visitors to GBO every
15 year so if you equate that to the impact on the economy of
16 this area, \$8 million turns into 30 million. Now, I don't
17 know about you, but my economics says if you take eight and
18 you turn it into 30, you're doing something right.

19 Tomorrow afternoon Senator Manchin along with Senator
20 Capito and Congressman Jenkins will speak directly to
21 Dr. France Cordova, the director of the National Science
22 Foundation, to ensure that she understands the importance
23 of the Green Bank Observatory to this community and to the
24 surrounding region and West Virginia.

1 Senator Manchin thanks all of you for taking your time
2 out of your busy schedules to come and make your voice
3 known in this process. We would welcome any additional
4 information you would like to share with us about how this
5 facility has impacted you and your family.

6 As a member of the Commerce Committee, Senator Manchin
7 will have the responsibility of interviewing and confirming
8 the next director of the National Science Foundation, and
9 we would like to do everything we can to ensure your voice
10 and your concerns are heard at the highest levels. So on
11 behalf of Senator Manchin, I strongly encourage the
12 National Science Foundation to maintain their commitment to
13 this facility and to the critical contributions it makes to
14 the international, and I will say that again, to the
15 international scientific community throughout this review
16 process. Thank you.

17 I want to recognize the members of West Virginia
18 University staff. I understand there's a large delegation
19 of students coming later and I appreciate that effort on
20 their behalf, so thank you all for coming, and as I say,
21 the Great Big Thing is one of my friends.

22 ELIZABETH PENTECOST: The next person is Senator Greg
23 Boso.

24 SENATOR GREG BOSO: Good afternoon. I am Senator Greg

1 Boso and it is a privilege to be with you this evening to
2 be able to talk about this essential piece of
3 infrastructure, scientific infrastructure that has an
4 impact worldwide on science, on education, on technology,
5 and on my profession which is as an engineer.

6 I'm a registered civil engineer, professional engineer
7 working in West Virginia, but I also get to serve as a West
8 Virginia Senator. As an engineer, I've learned that
9 science has as an impact on our society, on our people, on
10 our world. Why, because we get to take the science and
11 adapt it so that it's useful in today's society.

12 I have already gone on record by providing a letter to
13 Ms. Pentecost that she should have already received and
14 made that letter aware -- or distributed it as well on to
15 our congressional delegation. Our congressional delegation
16 has already done a good job of making you aware of some of
17 the key aspects, but this is an Environmental Impact
18 Statement.

19 I've prepared environmental impact statements and I'm
20 really concerned about the impacts that this facility --
21 any potential closure that's contemplated would have on
22 Pocahontas County and on the region of the 11th Senatorial
23 District in which I represent. Why, because when you get
24 to looking at just a hundred jobs, it's not just a hundred

1 jobs. We get to looking at the economic impact. We've
2 already mentioned the fact that there's a \$30 million
3 ancillary investment within the community. You pull that
4 out, all of a sudden we would be losing our firefighters,
5 our EMTs, and the local community, those people who invest
6 their philanthropic efforts back into the community so that
7 this community thrives.

8 The National Radio Quiet Zone was established when
9 this particular facility was established. In doing so, it
10 made radio communications very limited. Does that mean
11 that Pocahontas County has suffered as a result of that? I
12 don't think so. And the reason I say that is because
13 people talk to people. They interact. You know, I love
14 coming to Pocahontas County. Why, because we don't have
15 telephones, we don't have wireless communications, and so
16 guess what? I get to shake hands, we smile, we talk, we
17 enjoy a cup of coffee. Those are things -- those are key
18 human interactions that the rest of the world is suffering
19 from.

20 When you get to looking at the rest of the world it's
21 breaking down. Why, because they don't interrelate with
22 one another, but I can tell you that that is just a part of
23 why this particular facility is so quiet.

24 When we get to looking at the environmental impact if

1 we start talking about removing this particular facility
2 we're going to remove the financial flow of money into the
3 local businesses. We're going to see businesses within
4 Pocahontas County, Green Bank, Durbin, Bartow, Dunmore
5 closing. Why, because there's no money to support this
6 particular area.

7 We're going to see Green Bank Elementary School
8 suffer. Why, because the population of the workforce here
9 provides people in the local school. Then we're going to
10 see school closures. These are impacts that we cannot, we
11 must not allow.

12 When we started talking about closure we talked about
13 the environmental impacts. We're going to start seeing
14 things happen here in Pocahontas County like is happening
15 already in Southern West Virginia as a result of the loss
16 of coal jobs. People are picking up and leaving,
17. •abandoning their homes, and we're seeing structures
18. •deteriorate in local landscapes, and as a result, the
19. •environmental impacts as those structures begin to decay
20. •impacts our water, our groundwater, and other -- creating
21. •other environmental problems.

22 It's for these reasons that I support a no action
23 alternative that is proposed as a part of this
24 Environmental Impact Statement. Thank you. And I will

1 continue to support Pocahontas County and the State of West
2 Virginia.

3 ELIZABETH PENTECOST: Mr. Fred King.

4 DR. FRED KING: Good afternoon, everyone. I'm Fred
5 King. I'm the vice president of research at West Virginia
6 University, and I am here to talk to you about what I
7 consider to be the socioeconomic impacts as opposed to
8 necessarily the research impacts although these things run
9 together, and of course, being from the University it's
10 really in terms of the educational impact and workforce
11 development.

12 Over the last 15 years the University has worked,
13 collaborating with Green Bank as we've grown astrophysics
14 at our university. We've created a university center for
15 astrophysics and we've also renamed the Department of
16 Physics as the Department of Physics and Astronomy,
17 because of the growth of this at the university.

18 We've moved from one faculty member working the area
19 of astrophysics to seven who are now engaged in
20 astrophysics. These faculty have secured funding and
21 awards over that time and perhaps most significant among
22 those are National Science Foundation PIRE award for
23 International Research Collaborations focused on the Green
24 Bank Observatory as well as in last year a National Science

1 Foundation Physics Frontier Center award. This focused on
2 gravitational wave research.

3 I want to point out that the National Science
4 Foundation's Physics Frontier Center awards are given to
5 the most important problems being addressed within the
6 physics community. A large part of that work is done in
7 collaboration with the Green Bank Observatory.

8 To date, our faculty have brought in some \$14.5
9 million to the State of West Virginia in support of
10 research at the Green Bank facility. The work has also
11 provided our state with an international reputation in the
12 study of physics of pulsars and their potential use in the
13 study of gravitational waves.

14 You may recall back in the fall there was a great
15 fanfare about gravitational wave detections. Scientists
16 working here at Green Bank are working in an alternative
17 approach to that detection at a different part of the
18 gravitational wave spectrum. To date, there have been some
19 56 journal articles that have come out of the collaboration
20 between WVU faculty and the staff at the Green Bank
21 Observatory. And, of course, as you grow faculty, you're
22 going to grow more importantly student impact.

23 Over the last decade since we've been working
24 together, there have been some 6,000 undergraduate students

1 that have gone through the intro course at the
2 university. For some of these it has opened a new career
3 path. A path in science, technology, engineering, and
4 mathematics that they may not have previously considered.

5 The number of students graduating with an
6 undergraduate degree in physics during this time has
7 tripled and the diversity of students pursuing those
8 degrees has doubled.

9 To date, ten students have completed their Ph.D. to
10 this program. We currently have nine in the pipeline.
11 These Ph.D. graduates have gone on to more faculty
12 positions at other universities, to serve at staff at a
13 variety of observatories, or to translate their skills in
14 signal detection and processing into positions within the
15 industry.

16 Perhaps one of the most significant broader impacts
17 that I'm aware of is the Pulsar Search Collaboratory. It
18 is a joint effort between the University and the Green Bank
19 Observatory to engage K to 12 students and teachers in the
20 quest for pulsars.

21 If you have not already done so, I recommend you to
22 view the documentary that's available on-line called Little
23 Green Men. This documentary provides a great overview of
24 the pulsar research collaboratory in its efforts to engage

1 students and their teachers in this quest for new pulsar
2 discoveries. This is a fabulous example of hands-on
3 science. More significantly, you hear from these students
4 how it has profoundly impacted their lives.

5 Many of them, particularly those from rural areas and
6 potential first-generation students, have come to see that
7 they can be a part of the scientific enterprise. They can
8 pursue a career in science and technology, and oftentimes
9 this was something that prior to engagement of the pulsar
10 research collaborative effort, they never dreamed of.

11 Some of these have discovered new pulsars, but that is
12 less important than the competence and skills that they
13 have developed as participants and as future members of our
14 nation's workforce and lead us as a nation.

15 They also gain hands-on experience in the increasingly
16 important area of data science and analytics. They realize
17 that they can do this kind of work. Remember I mentioned
18 the confidence building aspect of this. These are not just
19 schools in West Virginia, but there are schools across the
20 country where they're using software, analyzing data, and
21 looking for signs of a pulsar. They appreciate the need to
22 document what they observe and to verify what they believe
23 they have discovered. But also importantly is in this film
24 you see the true joy and inspiration that arises from their

1 participation in the program. This is really encouraging
2 students to think about science, technology, engineering,
3 and mathematics as a way to the future.

4 It is also clear that those who spend time at the
5 Observatory are inspired with a sense of awe at the
6 phenomenal engineering accomplishment that is the Green
7 Bank Telescope. It lets them see what human endeavor can
8 result and what we as humans can accomplish. That's
9 important these days.

10 To date, more than 2,000 students have participated in
11 this program. In terms of diversity roughly 50 percent of
12 these students come from underrepresented or
13 underprivileged groups. From a workforce development
14 perspective, 99 percent of these students are either in
15 college or plan to attend college. Of those, 68 percent
16 plan to pursue a post-secondary education in STEM or STEM-
17 related fields such as medicine. To date we've had roughly
18 20 of these students attend West Virginia University and
19 eight of them major in physics and astronomy. They're a
20 real joy to have around I must say.

21 The Green Bank Telescope is certainly a point of pride
22 for the State of West Virginia. It profoundly impacts our
23 efforts to grow technology in a STEM workforce across the
24 state. The educational outreach provided both within West

1 Virginia and regionally continues to change the lives for
2 students who come from rural and underserved areas.

3 I notice that Jan Taylor is here from the State
4 Science and Technology Office. I serve on the Science and
5 Technology Counsel, and when we recently selected topics
6 for the NSF, RII EPSCoR opportunity, those are clients that
7 we use to build infrastructure within the state to promote
8 science and technology. We recognize the potential that
9 astronomy had for developing these skills and the
10 collaboration with Green Bank, and for that reason, we
11 focused our proposal in this area and we were successful
12 and won this.

13 Certainly as we heard before there's a great economic
14 impact locally of the Green Bank Observatory. High wage,
15 high quality jobs are few and far between in Pocahontas
16 County, but equally important, as the Senator noted, is the
17 social impact that the staff of Green Bank Observatory has
18 in the local community and the roles these provide in terms
19 of community service and engagement of citizens within this
20 community. Outside of the work that they do at the
21 Observatory, the telescope and its staff provide this
22 community with a quality of life that would simply not
23 exist absent the telescope and the Observatory.

24 As West Virginia works --

1 ELIZABETH PENTECOST: Excuse me. If I could just ask,
2 we have over 20 more people signed up and if we have time
3 left over --

4 DR. FRED KING: I will conclude.

5 ELIZABETH PENTECOST: Thank you so much. Again,
6 please provide written comments. We are going to have to
7 limit comments to three minutes from this time forward to
8 allow everybody the opportunity to participate.

9 DR. FRED KING: Thank you.

10 ELIZABETH PENTECOST: Thank you so much.

11 DR. FRED KING: I appreciate that over six years Green
12 Bank Observatory has provided the state with great
13 opportunities and hope it continues to do so, and I agree
14 that options four and five are really not viable options
15 for the state. Thank you.

16 ELIZABETH PENTECOST: The next speaker is Mark
17 Devlin.

18 DR. MARK DEVLIN: Hello. I guess I'm the first person
19 who is not from West Virginia so I hope you don't hold that
20 against me. I come from Philadelphia, Pennsylvania. I'm
21 an astronomer. I teach physics and astronomy at the
22 University of Pennsylvania. I've been doing that for 20
23 years. I've been coming to Green Bank for ten years to do
24 research on the telescope.

1 I want to say over the course of ten years I've met a
2 lot of people here. I've become friends with the staff and
3 with the astronomers here. I know them. I've met some of
4 their families. Even though I have a vested interest in
5 what's going on, I do research on the telescope, what would
6 happen to me pales in comparison to what would happen to my
7 friends and colleagues here if this observatory were to
8 close. It also pales in comparison to how it would damage
9 the international astronomical community which I'm not
10 supposed to talk about science but I'm going to talk about
11 it anyway because I can ignore them.

12 So what I want to point out is that during the
13 initial -- during the first couple of minutes of the
14 presentations you might have gotten the impression that the
15 entire astronomical community has just basically written
16 off the Green Bank Observatory; we had a meeting, we all
17 voted, and we said forget this place, we don't want it
18 anymore. I'm here to tell you that can't be further from
19 the truth. In fact, a large percentage of the astronomical
20 community finds that some of the reports that were gathered
21 were deeply flawed and did not represent what was actually
22 going on and what the impacts on the community would be,
23 and I say community because it is an astronomical
24 community. Includes astronomers from all over the world,

1 okay. Not just obviously here at the Green Bank
2 Observatory. All over the country, in Europe, I've got
3 letters here from South Africa and Japan from people who
4 support what is going on here. Clearly they don't know the
5 staff and people around here as well as I do, but they do
6 care what happens at this observatory.

7 What I would like to do is to read -- I have pages and
8 pages of letters from astronomers, again, from all over the
9 world. I want to read just a few of their comments on
10 what's going to go on and I will be ending with the -- with
11 what's going on with the alternative, some of the
12 alternatives that are proposed.

13 From around the world: A decision to drop any one of
14 the current facilities such as the GBT would leave a
15 distressing and unfillable hole in the field of radio
16 astronomy. The most impressive upgrades of the GBT have
17 only recently been commissioned and are still undergoing
18 commissioning keeping the GBT poised for great discoveries
19 and new capabilities. What I mean by that -- what this
20 person means by that is that when the study that was done
21 to determine whether this Observatory was competitive was
22 done before the Observatory was working, okay. That's not
23 fair. It needs to be redone in the context of what the
24 Observatory is currently capable of doing which is

1 expensive.

2 I don't want to get cut off by that woman over there
3 so I'm going to skip forward here. She's going to cut me
4 off already? What? I can have your three? I'm going to
5 take his three.

6 Speaking to what we plan for the Observatory, theGBT
7 has been an excellent observatory for hands-on student
8 training; however, we would like to strongly discourage its
9 usage of a world-leading observatory as a pure educational
10 site, let alone an amusement park. Science and its high
11 technology facilities serve the public best when focusing
12 on breaking the frontiers of our very understanding of how
13 nature works. This can only be achieved by using
14 facilities for research, not by making them silent
15 monuments or tearing them down.

16 Another person comments imagine the impression on kids
17 and other visitors if all they see is a mothball or
18 dismantled instruments. What better way to reveal that the
19 U.S. is letting its lead in science slowly slip away.

20 I'm in trouble. I will stop. But I'm here to let you
21 know that you're not alone. There's people all over the
22 world care what happens here and I especially do, too.
23 Thank you very much.

24 ELIZABETH PENTECOST: Mr. Charles Sheets.

1 CHARLES SHEETS: Thank you all. Thanks for coming.
2 I'm Charles Sheets as she said. I'm a resident of Green
3 Bank. About a month ago we were here and we heard a lot of
4 scientists, researchers talking in glowing terms about the
5 Green Bank Observatory and all the efforts that they have
6 done and all the latest in technology experiences and
7 things in particular GBT can do.

8 I'm astonished to hear now as you all just have heard
9 that the National Science Foundation has made up its mind.
10 We just saw attorneys on the board there. Now if there
11 wasn't the federal law or federal regulations we wouldn't
12 be here today and they had already made up their minds to
13 this decision.

14 I was in Green Bank High School when the grounds broke
15 for this Observatory. All kind of rumors were going around
16 at that time; it was going to be a nudist colony coming in
17 here, all kinds of things. Our great principal, Virgil B.
18 Harris, called all the students together in the assembly
19 hall in old Green Bank High School and laid out the plans
20 of what was going to happen. It was a great time. It was
21 a great time celebration for the young kids in high school
22 to see what -- and we had no idea what a radio telescope
23 was at the time.

24 I just want to refer back to the three options. The

1 first two options are the only viable options for the
2 National Science Foundation. Robert C. Byrd right now when
3 he hears those last two options he's rolling around in his
4 grave. He is absolutely rolling around in his grave
5 because he was a friend of the National Science Foundation
6 apparently because he had \$95 million to build this great
7 GBT telescope. Thank you all very much.

8 ELIZABETH PENTECOST: Mr. Skip Crilly, C-R-I-L-L-Y.

9 SKIP CRILLY: Hello. Thank you for the opportunity
10 here to say a few words. I will make it short. I'm a
11 volunteer here. I've been working at GBO for two years.
12 I'm a retired electrical engineer and I decided to take
13 advantage of a fantastic opportunity to help work on the
14 40-foot telescope and improve it so as a volunteer, and I
15 want to specifically address the idea that the science
16 outreach volunteers need to have an observatory. They need
17 to have something that they can work with, a facility that
18 they can work with. It's very difficult to volunteer
19 otherwise.

20 As a volunteer, I have decided to essentially
21 volunteer my time and my money so I don't request any money
22 from the Observatory. I don't file expense reports. The
23 equipment that I've installed on the 40-foot telescope, the
24 educational telescope, is all equipment that I purchased.

1 This is what volunteers very often do. They need a
2 facility, they need something that they can work towards,
3 and without that, you know, what can they do.

4 I would like to use one quick example. I brought with
5 me another example of volunteer work. These are the
6 journals, the proceedings of the Society of Amateur Radio
7 Astronomers and I brought ten years of proceedings. This
8 organization is the premiere organization for radio
9 astronomy -- for amateur radio astronomy in the world and
10 it meets here in Green Bank every year, June-July time
11 frame and it's been doing that since the mid-1980s. So
12 I've got one-third of the proceedings here with me and this
13 is hundreds of papers are written.

14 We've been continuing to improve the telescopes on the
15 site for educational outreach and I've had two requests
16 from universities to try out the mobile interferometer that
17 we built here in SARA this year and we're going
18 to extend that.

19 So I would just like to say that, you know, it's
20 really important for the work of an organization like this
21 that are all volunteers that a place like this, the Green
22 Bank Observatory is available to do this science outreach.
23 Thank you very much.

24 ELIZABETH PENTECOST: Mr. John Dennis.

1 JOHN DENNIS: Hi. My name is John Dennis. I'm just a
2 citizen of West Virginia. I live in Parkersburg, West
3 Virginia. It's three-and-a-half hours west of here right
4 on the Ohio River, but I was born right over the mountain
5 here in Elkins.

6 My grandparents were from the Belington area and when
7 this place was built they brought me over here. They made
8 sure that I saw this place in the '60s when it was first
9 built so I've been coming back here as often as I can.
10 I've brought my children here. I will bring my grand kids
11 here when I come over.

12 As an amateur astronomer, optical, I don't do the SARA
13 radio stuff, but I'm an optical astronomer, I've got to
14 come over here with our two astronomy clubs that West
15 Virginia has, one in the Clarksburg area and one in the
16 Charleston area, and we bring in between 100 and 300 people
17 for a week over here. We have speakers nationally known.
18 We've had Seth Shostak here. We've had several of the
19 Ph.D. guys that are talking about pulsars from WVU. We've
20 had one of the students in our club that she grew up is now
21 working -- has worked through the WVU program undergrad,
22 Caitlin Aarons, and she is now working in planetary
23 sciences. She worked on the Mars' systems and now she's
24 working on the information that came back from Pluto so

1 it's fantastic to see what impact small places like this
2 do. It is a small area, just a few hundred square -- or
3 just a few square miles over here but it is impacting
4 people throughout the world.

5 In my family, you know, I hope that one of my kids
6 will eventually see this and turn into a scientist somehow
7 so that's all I can say. Thank you very much.

8 ELIZABETH PENTECOST: Carla Beaudet.

9 CARLA BEAUDET: So my name is Carla Beaudet. I'm an
10 engineer here at the Green Bank Observatory and I'm here to
11 talk about the socioeconomic impact to the local community
12 under any scenario in which the GBT were to cease
13 operations. The losses needed to be estimated in dollars
14 and these estimates need to make it into the Green Bank
15 EIS.

16 I have read the socioeconomic section of the draft
17 EIS for the funding of Arecibo Observatory and
18 a number of things concern me. Under housing it reads, "An
19 indirect effect of alternatives three, four, and five."
20 These are the alternatives where the science operations go
21 away. "Could be an increase in housing vacancies as the
22 workforce potentially relocates over time in search of
23 comparable employment." Could be. Yeah. Exactly. Could
24 be. Potentially relocates. I do not want to see this kind

1 of language in the EIS for Green Bank. A little research
2 will assure you that anyone employed at the professional
3 level and not prepared to retire will have to move to find
4 comparable employment. This will have a significant impact
5 on the local real estate market as it is flooded with homes
6 for sale. This impact can be estimated and it is your job
7 to do so.

8 In the same section under population, the Arecibo EIS
9 reads it is difficult to predict when and how many
10 workforce personnel were to relocate, therefore, the
11 potential loss of population is addressed qualitatively in
12 this section. Again, there is no excuse for not estimating
13 and quantifying this loss. If the only costs that can be
14 quantified are the costs to the NSF then the EIS is
15 designed to support a foregone conclusion.

16 A quick hand-waving estimate for you. The GBO
17 currently has 108 permanent full-time employees, offers an
18 additional 40 seasonal positions which all account for
19 giving us a nominal 148. Maybe ten percent of
20 those employees would choose and be able to find a way to
21 stay in the area. That's a loss of 106 people from the
22 Green Bank Arbovale area whose combined population in 2014
23 was 303, a loss of 34 percent of the total population.
24 This number is probably inflated because we don't all live

1 in Green Bank or Arbovale, but it's easy to find out where
2 118 people live and adjust these numbers.

3 In Section 4.9 economy, employment, and income are
4 lumped together, but only employment and income are
5 quantitatively addressed. It reads the direct effect of
6 the proposed alternatives on the employment and income of
7 the population of the municipality of Arecibo are
8 quantified while the effects on economy are qualitatively
9 described to account for the secondary indirect and educed
10 economic effects. Economic impacts are necessarily the
11 indirect product of employment or lack thereof and deserve
12 their own section as well as best estimates.

13 I know of at least one community sponsored agriculture
14 operation that would not likely be in business if it
15 weren't for the GBO. You could ask the local branch of
16 First Citizens Bank what the impact would be if they lost
17 all their Observatory employee accounts.

18 There are other quantifiable losses to the area that
19 come from losing the many volunteer services of Observatory
20 employees and the sharing of our facilities with the
21 community. Observatory employees volunteer as firefighters
22 and EMTs, as volunteers of yoga, aerobics, Zumba,
23 Taekwondo, as sound and lighting engineers at the Marlinton
24 Opera House, as soccer, basketball, football coaches and

1 that by no means is an exhaustive list.

2 CAROLINE BLANCO: Excuse me. Could you hold the
3 balance of your comments either for written submission or
4 if we have time left over. We're almost at four minutes.

5 CARLA BEAUDET: Okay. Thanks.

6 ELIZABETH PENTECOST: Sue Ann Heatherly.

7 CAROLINE BLANCO: We really appreciate it, folks. We
8 hate to cut people off but --

9 UNIDENTIFIED SPEAKER: You're cutting our community
10 off though.

11 SUE ANN HEATHERLY: I just want to make one point and
12 that is about those last three options and why they're not
13 good ones for us. My name is Sue Ann Heatherly. I'm the
14 education officer here at the Observatory. A lot of the
15 programs you've been hearing about, thank you so much for
16 bringing them up, are part of what I do for my job, the
17 Pulsar Search Collaboratory and other programs that we do
18 that I will put into the record.

19 The reason why options one and two are really
20 necessary is that the reason why our programs are so
21 impactful for the students that participate in them is
22 because they are in a working research facility. They're
23 not just pretending to be scientists and they're not just
24 playing at it. They're part of the community where you've

1 got professional scientists, professional engineers,
2 professional technicians, machinists, mechanics, the whole
3 STEM village here, and that's what makes our program so
4 impactful. Thank you.

5 ELIZABETH PENTECOST: Janet Ghigo. Sorry if I
6 mispronounced it.

7 JANET GHIGO: I'm Janet Ghigo and I'm just going to
8 say a few things about the community. First, a few of the
9 issues that have been brought up that had to do with health
10 and safety which was one of those items that were
11 mentioned, and I wanted to just briefly mention the Green
12 Bank Observatory and emergency medical services in the
13 area. I'm not going to do it all. I will send this in.

14 But I just wanted to mention that when EMS was first
15 invented in West Virginia in 1975 we had -- the local fire
16 department had a man that was an EMT. At that time the
17 Observatory had their own fire -- well, had two fire trucks
18 and an ambulance, but the local medic who started -- got
19 things started at the local fire department was associated
20 with the Observatory. She also became -- several of her
21 colleagues who are also associated with the Observatory
22 either employees or spouses became medics. She became an
23 instructor. She taught classes and her students then
24 became instructors, taught classes.

1 In one of my estimates recently is that if you count
2 the EMTs in the county that have been taught by Observatory
3 people we're talking 200 to 300 people. The backbone of
4 every agency is students of these instructors. Sorry.

5 I also wanted to mention the EMS Authority which is an
6 organization that represents all of the EMS services, and
7 if you look at the people who are members of that you can
8 go back to the very beginning with Tom who was an Observatory
9 employee. We had the people who are representing all of
10 their squads are students of NRAO spouse instructors.
11 For example, we also have -- I will submit this, but all
12 of the members and how they are -- all have ties to the
13 Observatory in one way.

14 Just as a final thing, I want to mention this past
15 year the county squads responded to over 1600 calls,
16 traveling close to a hundred thousand miles. Paid
17 paramedic service is now available from four of the
18 County's six squads along with continued volunteer
19 service. A majority of these squad leaders and active
20 members can trace their training back to NRAO spouses and
21 employees. At present, the assisted fire chief, rescue
22 chief, and assistant rescue chief for the local ambulance
23 service, and that includes that building you saw just
24 across the road there, which provides EMS and fire service

1 to this site which means that NSF does not have to provide
2 that money for that are all NRAO employees or spouses.

3 It's not the main role of NSF to provide community
4 services, but closing the Observatory for the necessary
5 movement of these employees as Carla mentioned, moving the
6 employees and spouses out of the county would be a
7 devastating blow to the network that's been built over 40
8 years.

9 ELIZABETH PENTECOST: Hanna Sizemore.

10 DR. HANNA SIZEMORE: Hi, everyone. My name is Hanna
11 Sizemore. I'm a planetary scientist which is a little bit
12 different than any of the other scientists here at Green
13 Bank. Basically I study planets, Mars, and asteroids based
14 on data from space craft missions flown by NASA. I'm also
15 a Pocahontas County native. I grew up here and I attended
16 local schools, kindergarten through 12th grade, and as a
17 high school student I had the opportunity to do research
18 here in Green Bank working with Ron Maddalena who is a
19 permanent member of the science staff and an active
20 researcher.

21 Now the training, the advice, and the exposure to the
22 international scientific community that I received here
23 were ultimately instrumental in me being accepted to
24 college, receiving the scholarships and grants that paid

1 for me to go to college, and ultimately getting advanced
2 degrees and working at NASA Ames Research Center.

3 Now about 16 years ago for personal reasons I decided
4 to move my family from California back to Pocahontas
5 County. When I did that people -- NRAO reached out to me
6 and offered me an adjunct position here in Green Bank, and
7 I want to emphasize this is a free unpaid position that
8 provides very cheap nominal administrative support for me,
9 but thanks to that position I was able to bring my mass of
10 work back here with me to the county and the grant money
11 that I bring in came back with me. I'm able to raise my
12 children here where I grew up and keep them in the public
13 schools and are allowed to be a part of this community
14 again.

15 My life would be very different if there were not a
16 world-class research facility staffed by active scientists
17 here in Green Bank. I think the importance of the
18 Observatory in my life personally is a microcosm of the
19 importance of the Observatory to the local community and to
20 the state as a whole. A reduction of science activities or
21 staff at GBO would be culturally and socioeconomically
22 devastating. Thank you.

23 ELIZABETH PENTECOST: Father Arthur Bufogle.

24 FATHER ARTHUR BUFOGLE: I'm Father Arthur. I'm the

1 Catholic priest here in Pocahontas County. I love a
2 pulpit, but I'm not going to preach to you today. I'm
3 going to talk about the second favorite topic of any
4 preacher and that is money.

5 We heard a lot about the economic benefits of GBO for
6 the county and the community. I second all of that, so add
7 all of that to my comments and that will make it sound like
8 I was really preaching for a long time.

9 There's a second area that I think got some expression
10 but not enough, and that is the economic benefit of this
11 facility not just to the area but to the nation. We heard
12 so much about making America great. Well, this place helps
13 makes America great. I'm a priest but I come from a
14 science background. I was a science teacher for many years
15 and then in plant science and soil science both at LSU and
16 Mississippi State, and I know what basic science does and
17 it's expensive. It doesn't have immediate results, but
18 it's the basis of what others use for the economic
19 benefits, and for our country something like this is not
20 just for us and our community but it is for the entire
21 nation and the entire world so I think it's very important
22 that we not be shortsighted and maybe save a few pennies
23 but lose a fortune and so I really support this place, and
24 I hope the National Science Foundation will look at the

1 wisdom that the people here, local people who are often
2 dismissed and limited to three minutes or less but really
3 have a lot to say and a lot of wisdom that you might
4 benefit from hearing. Thank you.

5 ELIZABETH PENTECOST: Mr. Ryan Lynch.

6 DR. RYAN LYNCH: My name is Ryan Lynch. I'm a staff
7 scientist here and I will try and make this brief and just
8 summarize my comments and submit the rest in writing.

9 I just want to say a little bit in my role as the
10 summer student program coordinator here at Green Bank so I
11 want to stress that the EIS really needs to include
12 education as its own impact area but as well as how
13 education intersects with socioeconomic and cultural
14 impacts.

15 I just want to summarize a little bit about the summer
16 student program here. We've had hundreds of summer
17 students come through Green Bank in the years that it
18 exists. For the last 25 years, 40 percent of those have
19 been women which is the highest percentage than the rest of
20 the astronomy field as a whole. Some of those students
21 have come back to Green Bank and to West Virginia because
22 they realized this is a special place but the impact -- the
23 region of impact is not just Pocahontas County or West
24 Virginia. It's the whole United States and really the

1 whole world.

2 Even though that's only looking at the summer students
3 here, hundreds of other students at research universities
4 across the nation and across the world rely on this
5 facility to advance their careers. Some of them go into
6 professional astronomy, many of them go into other STEM
7 fields in finance, in education, in journalism, and that
8 has a huge socioeconomic impact on the rest of the country
9 because those are high value jobs and they give back to the
10 rest of the economy.

11 Any reduction negatively impacts
12 those careers because the students are coming from
13 institutions that do not have the resources to necessarily
14 buy time on the telescope or to join up with another
15 private institution to offer its own facility so I'm going
16 to strongly urge that you include education as an explicit
17 area tied into the other areas of the impact statement and
18 that you recommend option one, no action alternative.
19 Thank you.

20 ELIZABETH PENTECOST: Ms. Savannah Horton.

21 SAVANNAH HORTON: Hello. My name is Savannah Horton.
22 I'm a 17-year-old student and I drove two hours and left
23 school early to come and attend this seminar. I live in
24 rural Broadway, Virginia, and it is so imperative that

1 Green Bank remains open and operative for women and STEM.
2 The Green Bank Observatory has profoundly impacted
3 the scientists. My research partner, Dana Jones,
4 is here today. We attend Massanutten Regional Governor's
5 School for integrated science and technology, and Green
6 Bank Observatory was our first view into the world of
7 astronomy.

8 Green Bank Observatory is what led us to go this
9 summer to go and work at Caltech and study active galactic
10 nuclei at the age of 17. I advocate for continued
11 investment and the no action alternative for Green Bank.

12 Jocelyn Bell Burnell who was a Cambridge student and a
13 young woman in the 1960s who discovered pulsars but was
14 wrongfully robbed of her Nobel prize. It would be an
15 embarrassment for a facility like GBO to be shut down as it
16 provides women in STEM an opportunity to succeed in a field
17 that was once dominated by men.

18 The GBO is critical to the next generation of
19 scientists and I stand here as an example of a young woman
20 who once doubted my abilities in science but Green Bank
21 opened the doors. Ryan Lynch was my mentor that has led me
22 to a complete world of astronomy that I once never expected
23 for myself.

24 Restricted funding harms cultural resources and

1 socioeconomic resources for students like Dana and I who
2 would never have had the abilities because of where we come
3 from to be able to study astronomy so I think it is
4 imperative to preserve science in rural areas and it is so
5 important that option one is considered today. Thank you.

6 ELIZABETH PENTECOST: Ricky Sharp.

7 RICKY SHARP: I am Ricky Sharp. I'm the principal at
8 Green Bank Elementary Middle School next door. I hope that
9 the NSF really steps back and they think about how deep-
10 rooted the GBO is in our community. Your ASB extends well
11 beyond the fence of this facility.

12 At our school we have 16 students that are
13 decedents -- or I'm sorry, their parents work here at the
14 scope. That's six percent of our student population. We
15 talk about tax base and how that is going to affect our
16 schools, but just pulling those students out alone if they
17 had to relocate would be a huge impact on our school. The
18 tax base for our school systems we're already struggling as
19 it is. We can't afford to have an additional cut.
20 Whenever we're talking \$17 million and \$30 million as it
21 comes across that's huge. That means a lot for our
22 system.

23 We talked -- Mr. Boso, Senator Boso talked about the
24 students and how it affects the students here, and yes,

1 we've had some struggles here with the Observatory and not
2 having wireless and not having some of the technologies
3 that other facilities do, but if you were to ask our
4 students which happens often because of the national
5 publicity that the National Science Foundation gains, we
6 see it time in and time out with the British Broadcast
7 Television, PBS, CNN, Chinese reporters come in, it's all
8 these different international broadcast facilities come in
9 and they ask questions to our students, how are you
10 affected by this. Do you know what our students say time
11 in and time out? Whenever our cousins or our relatives
12 come in all they want to do is they want to be stuck on
13 their phones and they're looking down. We want to talk to
14 them and we want to visit with them. We want to go out and
15 we want to play outside. We want to have a conversation
16 and they're not able to do that.

17 I'm proud to say that my students at my school can sit
18 and have a conversation with you and don't have to have the
19 interruptions of today's technology and they can operate
20 without that. What an important skill that we miss out on
21 in today's society.

22 The school and GBO, we talk about what they do for our
23 school, the location. They allow us to have our county
24 social studies fair, our math field days, our science

1 fairs. They offer their facilities for incentives to our
2 students which means a lot. In a community that does not
3 have a lot of funding for their schools and to offer these
4 programs and additional opportunities and we have to travel
5 so far and we pay for transportation and then we pay for
6 the fees, it's nice to have something in your backdoor to
7 where you can come over and you can encourage students and
8 you can have a video on the screen here and offer the
9 auditorium to them. You can use the pool, you can use the
10 rec area. What a nice thing to have in our backdoor.

11 We talk about the hundred staff members here and one
12 key part of our community that we don't have and we don't
13 recognize is there's a hundred people employed by this
14 facility and every single one of them value the importance
15 of education and play a crucial part in each student's life
16 that come into that building. They're volunteering their
17 time at our doors, they're serving as judges in science
18 fair, social studies fair. Their own kids. What they
19 offer goes well beyond what is here.

20 You talk about health and safety as being one of the
21 impacts and the things here. We're a very rural community,
22 very rural school. If we have to evacuate our building we
23 come to this site and different locations on this site.
24 That needs to be taken into consideration. There's not a

1 place with our community a close distance that I could
2 evacuate my students to if need be.

3 They assist with repairs on electronic equipment, they
4 assist with our radios for safety. In repairing those
5 radios -- and even school furniture they help with
6 construction, different projects. They're really crucial.
7 I know I have to cut it off. I will tell you that I have
8 listed all of this and this is on the site and everything
9 and --

10 CAROLINE BLANCO: If you can submit them written or --

11 RICKY SHARP: I have. I have. I've submitted them
12 written. I left a copy here and I also posted on-line,
13 too. Thank you.

14 ELIZABETH PENTECOST: Maury Johnson.

15 MAURY JOHNSON: My name is Maury Johnson. I come from
16 and bring greetings from your neighbors in Monroe County.
17 A few days ago I read an article in the Charleston Gazette
18 and I was astounded that options three, four, and five are
19 even thought of.

20 The first time I came to Green Bank I was about nine
21 years old, 1969, weeks before the Apollo moon mission
22 landed on the moon. My father brought myself, my brothers
23 up here. Coming around the bend I see this great big
24 telescope thing. It inspired us.

1 My brother, my older brother became a science
2 teacher. Teaches science in Monroe County and now
3 Greenbrier County. I became a teacher. I've taught
4 science. This has been a world of -- to so many students
5 across the area. Monroe, all the counties nearby, it's a
6 gem.

7 Now let's talk about something. Who wants to know
8 something about biological resources? This area mainly
9 because of this facility has some very unique endangered
10 species in the area. It's very diverse because of the no
11 pollution we have here. The cultural resources, well, the
12 cultural of the entire area is around this Green Bank is as
13 many people said, people talk to each other. We're
14 isolated. A lot of areas are not isolated anymore. You
15 have a culture here going back to pioneer days
16 and stuff, you've got a culture here that has found no
17 other place mainly because of this Green Bank facility.

18 There's a lot of things to say. I will let other
19 people speak. I will let you know that folks in Monroe
20 County a lot of them wanted to be here today. We have an
21 article in the Monroe Watchman and we will be with you. No
22 action alternative. Do not do anything with this facility
23 to hinder the science work it's doing and inspiring young
24 ladies.

1 ELIZABETH PENTECOST: Tracie Shrader Flack.

2 TRACIE SHRADER FLACK: Good afternoon. My name is
3 Tracie Shrader Flack and I, too, come from Monroe County.
4 I am the president of the Friends of the Second Creek,
5 Inc. We are a nonprofit organization whose mission is
6 water and water life preservation as well as historical
7 preservation of the Second Creek Watershed.

8 If you've never been to Monroe County I strongly
9 encourage you to come visit us where we have some of the
10 most beautiful farmlands like right here in Pocahontas
11 County. I noticed that when I was driving up here today.
12 So you come to visit us. We also have historically
13 significant features in Monroe County as well as here in
14 Pocahontas County.

15 West Virginia, Monroe County, and the Friends of the
16 Second Creek depend upon tourism as a major source of
17 income and support. I realize that the Green Bank
18 Observatory has been -- long been a tourism draw for the
19 state. I can remember as a small child my parents bringing
20 me up here and I stood in awe of this place and I still
21 brag about it. I lived in Arizona for 40 years and, of
22 course, you know, there's observatories out there and I was
23 talking about this place when I was out there. It's a big
24 tourism draw.

1 I support keeping this site open and operational as it
2 stands as a tourism source, and if you need more money see
3 if the state has got some tourism money to give you.
4 That's about all I got to say. I thank you all for coming.

5 ELIZABETH PENTECOST: Robert Sheets.

6 ROBERT SHEETS: Thank you all. I'm Bob Sheets. I'm a
7 lifelong resident of Green Bank, West Virginia. I sat on
8 my grandmother's porch right across from the entrance and
9 watched them tear down the fence and build the road for the
10 GBO. My mother was employee number three here at Green
11 Bank. I'm often asked what it's like to live near a radio
12 free quiet zone without cellphones. My answer is quite
13 simple, you should have been here before the Observatory.
14 It was really quiet.

15 My sister and I used to sit in the barn loft down the
16 road here and write down license plate numbers and if we
17 got an out-of-state plate we got really excited. Now when
18 I pull out my driveway below Green Bank I see people stop
19 their vehicle, jump out, pose, and take a selfie under the
20 Green Bank, Unincorporated sign. That speaks to our
21 national and international presence. It speaks to the
22 educational opportunities that are available here.

23 I taught English for 40 years, 35 of them in
24 Pocahontas County High School. I was a recipient of one of

1 the AUI scholarships in the 1960s to further my education.
2 I came back here. I've seen so many of our students
3 complete mentorships here. I was a member of the first
4 class at Green Bank High School that benefited from the
5 technological expertise of observatory techs. They came,
6 they taught me electricity and electronics. I still see
7 that going on as many of the programmers here are
8 volunteering their time to work with computer programming
9 classes at the high school. You cannot underestimate the
10 educational, the socioeconomic impact of the National Radio
11 Astronomy Observatory or as it is now called the Green Bank
12 Observatory which actually makes me kind of proud.

13 Now I will give you one other tidbit because not too
14 many people have talked about the historical component of
15 this particular place, but if you are so fortunate as to
16 pick up a copy of the Pocahontas Times today you will see
17 unfortunately my face on the front cover beside an
18 (inaudible) of King George III because about one-half mile
19 off the Green Bank Observatory site is actually the largest
20 governmental institution ever here in Pocahontas County.
21 In 1774 there were over 125 colonial militia stationed
22 there. This is a historic site. It's been that way for a
23 long time and it's been further enhanced by the presence of
24 the GBO. Thank you.

1 ELIZABETH PENTECOST: Paul Marganian.

2 PAUL MARGANIAN: Hi. I'm Paul Marganian. A lot of
3 you know me. I am a software engineer here at the
4 Observatory. Obviously, you know, options four and five
5 would have a huge impact on me personally, but I want to
6 talk -- I don't want to talk about the impact of me or
7 Green Bank or even West Virginia. I want to talk about the
8 impact on our nation.

9 My father was an immigrant. He came to this country
10 in part because at the time in the 1950s this was where you
11 went to get a cutting edge education. This was the center
12 of science and research, and I'm proud to say we still are
13 in my lifetime.

14 This time last year I happened to be in China on
15 observatory business. I was in China because they're
16 investing in science and research. They're building
17 facilities larger than ours. One day I was sitting in the
18 Xixiang astronomy building and there was this huge
19 construction site next to us and this huge 30-story
20 building. I said, you know, what's going on there. They
21 said, oh, that's our new lab. I come back here and options
22 four and five are staring at us in the face. That doesn't
23 make a lot of sense to me. So I would like to ask why
24 we're abdicating our leadership role in the world as

1 leaders in science and technology.

2 If my own children want to go into science and
3 research, are they going to have to go to China to receive
4 that best education? I certainly hope not.

5 Now the Father already stole my punch-line, but I just
6 wanted to say, you know, there's been a lot of talk about
7 making America great again. Options four and five are
8 obviously steps in the wrong direction. Thank you.

9 ELIZABETH PENTECOST: Larry Garretson.

10 LARRY GARRETSON: Hi. My name is Larry Garretson. My
11 wife and I live here in Pocahontas County. My wife Paula
12 and I have been here in Northern Pocahontas County for ten
13 years and have been operating a bed and breakfast the
14 entire time we have been here.

15 We settled in this area because the importance of
16 tourism with the GBO being one of the primary destinations
17 for our guests. We've seen a steady increase of visitors
18 both tourists staying with us who want to visit the GBO and
19 to see for themselves the science and technology that's on
20 display here. Also scientists and engineers who come here
21 to work and stay with us during their visit. Our business
22 depends on the continuation of the GBO's existence and
23 enjoys a good relationship with the GBO and the employees
24 that work here both at the facility and in the community

1 which we all live. We enjoy ten to 15 percent of our
2 business coming from the existence of GBO and expect that
3 to grow each year primarily from tourism.

4 We respectfully request that you consider the economic
5 impact of small businesses like ours and the ability to
6 continue to grow and to draw visitors to our beautiful
7 county.

8 We have to say that guests walk in the door those that
9 are not aware of GBO existence and ask what that giant
10 telescope here is and must say that they are all inspired
11 by the technology that's located here.

12 Speaking of guests that stay with us, not only do we
13 have tourists, not only do we have scientists who stay with
14 us, we have also had a quite a number of people stay with
15 us who are what I term electronic -- electromagnetically
16 sensitive. In other words, they come here to get away from
17 the noise, the pollution of the rest of the world. That's
18 not just a few guests. We've had probably ten to 20
19 couples come here and stay with us that are like that.

20 The other thing about our list of guests is that we've
21 had quite a number of people that come here because the GBO
22 is -- creates the quiet zone. To list a few, NBC has been
23 here and stayed with us, BBC was here and stayed with us,
24 Al Jazeera film crew was here and stayed with us. There

1 are others that I can't remember but we've had quite a
2 few.

3 So all I ask is your careful consideration of the
4 personal and economic impact of the GBO on our small
5 community and consider us when you do finalize your EIS.
6 Thank you.

7 CAROLINE BLANCO: Folks, just to let you know what's
8 going on, it is five o'clock and our next meeting is at 6.
9 We realize we have about 20 more people to comment. We
10 were going to take a break for an hour in between. We're
11 just going to keep on going to allow you to comment but at
12 six o'clock we have to stop because the next meeting
13 starts.

14 We're going to take five to give the court reporter a
15 break so he doesn't hurt his fingers. When we do come back
16 please, please, please, so many people are going over and
17 we would like to get everybody as much of an opportunity --

18 UNIDENTIFIED SPEAKER: Wait a minute, everybody. This
19 gentleman needs to leave and what is your name.

20 JOSEPH RILEY: Joseph Riley.

21 ELIZABETH PENTECOST: Joseph Riley.

22 JOSEPH RILEY: Thank you for letting me step up here a
23 little bit because I'm supposed to be at a board meeting in
24 Marlinton at six and I saw the superintendent already

1 leave.

2 My name is Joseph Riley. I'm the principal at
3 Pocahontas County High School and prior to that was
4 principal at Marlinton Middle School. I just want to take
5 and add to what Sue Ann Heatherly talked about.

6 Whenever we look at the opportunity students have we
7 can do a lot with teachers and we can do a lot in our labs,
8 but we don't have quite what they have here. To give you
9 an example, my little daughter just came back on two
10 occasions where she came to a science day here at the
11 Observatory and came back one time with a toothbrush that
12 had wires all over it and she put a battery out of a watch
13 in it and it run all over the table and she could explain
14 how all of that worked. Another year she come back with a
15 Christmas ornament that blinked different colors and would
16 do different sequences and that was something that she
17 learned here. I don't know that we could have did that
18 within the labs we have at Marlinton Middle School.

19 Moving on through, I mean, even with the science fair
20 they sent people down to help students with projects at the
21 science fair so if they made it on to the state level they
22 could keep moving so they give support in that.

23 Looking at the high school standpoint, one thing that
24 the Department of Education is wanting us to do is to get

1 more computer science involved. Well, this is not
2 something that we're getting a lot of training in so I have
3 teachers that are struggling trying to get into saying
4 okay, what do we do in order to get this STEM in, what are
5 we going to do for computer science. We have people that
6 come from the Observatory on a weekly basis to give kids
7 this is more information and this is what we can do so that
8 aspect.

9 Memberships. We sent out memberships to come to the
10 Observatory to get training whenever they're seniors to say
11 okay, is this really something you want to do, and we did
12 from the science aspect, but we also did from the machinist
13 side. I had kids that learned things about welding that
14 they never even knew existed because they were working with
15 a machinist in the machine shop here at the Observatory.

16 To end with, I want to talk about one little aspect
17 that really hit home with me. We were at math field day
18 last year and this was all full of kids from across the
19 county when they were announcing who had won and all that,
20 and Hanna Sizemore came up here to the front and she did a
21 presentation and had a picture of Mars and she talked to
22 the kids about this is what I'm studying, does anyone know
23 what it was. Once she said it was Mars and the kids were
24 like -- and she was telling them everything they were

1 doing, she had them. Then the last thing she said was and
2 I was sitting in the seats that you all are one day back
3 before I was a participant in math field day and look what
4 I'm able to do.

5 At Pocahontas High School we're trying to figure out
6 how we can keep kids here that want to stay here. This can
7 be avenues for it so I would really like for to you think
8 about our kids also in being able to keep them within the
9 county. Thank you.

10 ELIZABETH PENTECOST: One more before the break.

11 CAROLINE BLANCO: One more and then we will take a
12 five-minute break.

13 ELIZABETH PENTECOST: Sarah Riley.

14 SARAH RILEY: Thank you all for your patience for one
15 more. If anybody else is going to Hillsboro I'm having to
16 get a ride; otherwise, I have to take him to the board
17 meeting because we only have one car. But my name is Sarah
18 Riley. I'm the executive director of the High Rocks
19 Educational Corporation which is a regional nonprofit that
20 is dedicated to educating and empowering and inspiring
21 young people in West Virginia so what I have tried to do
22 for the last 20 years is move young people from the very
23 first beginning of adulthood when they're about 12 years
24 old up until about the time they're 35 when they're

1 establishing their career.

2 What I want to talk about is access and equity in
3 education and that is both cultural and socioeconomic.
4 There is -- the Green Bank Observatory has been an
5 incredible partner both as a business partner for us as a
6 business from everything from providing volunteers, board
7 members, I can certainly speak to that, and even they
8 looked over our personnel policy and helped us make it
9 better so they're sharing all those resources, but as an
10 education partner in helping us think about how we can
11 serve these communities.

12 West Virginia and Appalachia are in a really, really
13 hard place. The programs that I run are reflective of the
14 communities that we serve. That means 70 percent of the
15 kids that we serve are free and reduced price lunch. It
16 means that more than half of the children that we serve are
17 first-generation college students and the idea that you
18 could not only go to college but you could have a
19 professional pathway ahead of you, you can't introduce
20 that. You can't have people understand that unless they
21 can be here and be experiencing it.

22 I'm really honored to be a formal partner with the
23 Green Bank Observatory and a new program that we're doing
24 to help first-generation West Virginia students complete

1 their first two years in an undergraduate level of STEM and
2 to have a hundred percent retention of this new pilot that
3 we're going to do and to be working with them. I'm really
4 thinking about for rural America, for Appalachia and for
5 West Virginia specifically how we can build computers,
6 science, education pathways so that our kids can grow up
7 and my kids can live two miles away from me and have a
8 great life, and I'm really looking forward to it so there
9 is so much opportunity for growth and partnership here and
10 there's such important and deep issues about equity and
11 access so thank you.

12 ELIZABETH PENTECOST: We will take a ten-minute break.
13 (Recess was had.)

14 CAROLINE BLANCO: Thank you for your patience. We
15 have now I understand about 11 people still but we're
16 really going to try to stick to the three minutes as much
17 as possible. Thank you.

18 ELIZABETH PENTECOST: You have the opportunity to send
19 in your comments as well.

20 The next person is Mali Minter.

21 MALI MINTER: I'm Mali Minter. I've lived in Green
22 Bank for 21 years or the Greater Green Bank Arbovale
23 Metropolitan Area as we like to call it, and I don't know
24 if I can add much more than Carla or the young lady

1 Savannah spoke about because they just said things so much
2 better than I could so I'm just going to talk about one
3 little thing, which is that I have nine nieces and
4 nephews, and every single one of them, every one, from the
5 youngest all the way through out of school are in STEM-type
6 programs because of the GBO.

7 My nephew Conner has Asperger's, and I get emotional.
8 Sorry. He comes every year from Minnesota for a week and
9 all he wants to do is go to the telescope, can we go to the
10 telescope, can we go to the science center, I need to see
11 that stuff. He is so excited about science and it focuses
12 him. It's just the science is here. Keep it here.

13 I know they keep saying talk about viable options.
14 Three, four, and five are awful. I really think there
15 should be a zero. Honestly. I don't know how viable it
16 is, but honestly there should be a zero, one, and two.
17 Zero should be go back and fund us fully. Do it. Find the
18 money. Find it. Fund us. Help us.

19 ELIZABETH PENTECOST: Rodney Waugh.

20 RODNEY WAUGH: Yes, my name is Rodney Waugh. I'm a
21 lifelong West Virginia resident. I'm an amateur
22 astronomer. I've taken part in Star Quest. It's been here
23 for 13 years. It's an optical astronomy educational
24 undertaking.

1 As a West Virginian and American, I'm very proud of
2 this facility. There's cutting edge research that takes
3 place here. It adds to the culture of the local area.
4 This is something that all West Virginians can be proud of
5 and I'm going to leave before my three minutes are up.
6 Thank you.

7 ELIZABETH PENTECOST: Brynn Kusic.

8 BRYNN KUSIC: Hi there. My name is Brynn Kusic. I'm
9 the operations manager of the Pocahontas County Opera House
10 in Marlinton, West Virginia. The opera house is a center
11 for performing arts in our county but it is also a center
12 for civic and cultural engagement. People are surprised to
13 hear that Pocahontas County has an opera house like they're
14 surprised to hear that the Green Bank Observatory exists
15 here.

16 I just wanted to say that it's been very inspiring to
17 be here. The Green Bank Observatory is a very important
18 part of our community. It's a great neighbor and we've
19 heard that from many different voices whether it be in our
20 schools or in areas of performing arts. I say that whether
21 it's a performance series event at the opera house or a
22 Chamber of Commerce dinner, Green Bank Observatory
23 employees are present.

24 Green Bank Observatory makes it possible for people of

1 the highest caliber to live and work in Pocahontas County.
2 These community members are not only making great
3 contributions in the field of science, but they are
4 dedicated to participating in the community in real ways
5 that matter and that affect positive change both for our
6 students and for all of our community members, and like I
7 said, the Green Bank Observatory employees are integral in
8 every part of the opera house. They donate their time,
9 their technical expertise. They attend performances. They
10 are the performers on the stage. They organize events.
11 They are us. It is our community. We are a community
12 together, and I think that is something that I hope you
13 hear and that you take away from today.

14 This is not just a place where people come and work.
15 This is the people who work in this place, our community,
16 and they're making our community a really -- a place to
17 feel proud of living and they're enriching the people that
18 live here in every element and in every way they
19 participate in our community.

20 I also want to say that we have board members at the
21 Pocahontas County Opera House that are employees. The
22 Green Bank Observatory and the National Radio Astronomy
23 Observatory have been local business sponsors of our
24 performance series for the last 16 years which is the

1 entire time that we've been presenting performing arts
2 opportunities and cultural experiences in this community so
3 the opera house is now we actually -- people know about us
4 in other parts of the state, in the rest of the country,
5 and that would not be true if we did not have the technical
6 expertise and volunteered time and dedicated energy of
7 volunteers who are literally at the opera house from the
8 minute that the door opens until after everybody has
9 cleared out when the doors are closed, and that's true for
10 everything that we do there, so I just can't imagine
11 Pocahontas County without this place.

12 I hope that you choose option one and keep it going as
13 it is to continue to inspire people not only in this
14 country and this county but across the country and around
15 the world. Thank you.

16 ELIZABETH PENTECOST: Judith Clark. She wasn't sure
17 if she could stay.

18 UNIDENTIFIED SPEAKER: She doesn't like to drive when
19 it's dark.

20 ELIZABETH PENTECOST: Okay. Maybe she can submit her
21 comments.

22 Erica Engquist.

23 ERICA ENGQUIST: Thank you all for giving me the
24 opportunity to speak today. I would like to voice my

1 strong support for full NSF funding and continued operation
2 of the Green Bank Observatory, option one.

3 Ever since I first became interested in the field of
4 astrophysics and technology, the Green Bank Observatory has
5 been an absolutely tremendous resource in so many ways. As
6 a young student from rural West Virginia, the Green Bank
7 Observatory's education and science center staff have
8 provided me with so many amazing and inspiring educational
9 opportunities like none other in the state or region.

10 From starting out with the Radio Astronomer for a Day
11 program and the Skynet Junior Scholars programs to get
12 to participate in the summer long radio frequency
13 interference litigation project under a talented and an
14 accomplished astronomer here, Dr. Richard Prestage, all of
15 these opportunities are continued not only to teach but to
16 inspire and encourage me to want to pursue a career in
17 STEM.

18 I'm not the only one that GBO's STEM education
19 opportunities have touched. Students of all backgrounds
20 from around the country benefit from these programs and
21 camps every year. One particularly shining example is the
22 Physicists Inspiring the Next Generation or PING camp which
23 brings underserved, minority, and female students from
24 across the country together and gives them extremely

1 valuable exposure to a world-class research facility while
2 introducing them to several fields of science.

3 Over the time I've been coming to Green Bank I've
4 started hearing stories of other young people particularly
5 two women from rural West Virginia who the GBO has inspired
6 to pursue careers in STEM. These two women, Hanna
7 Sizemore, who you heard from earlier, and Naomi Bates,
8 worked on projects here at the Observatory as high school
9 students like me and went on to get their Ph.D.s and pursue
10 successful careers at the Planetary Science Institute and
11 the Delaware Geological Survey.

12 These scientists are an inspiration to me and many
13 others and are a great testament to the tremendous
14 effectiveness of the educational programs at Green Bank.

15 As a young female hoping to pursue a career in a
16 historically male dominated field, my experiences at the
17 GBO have been extremely heartening. The atmosphere is very
18 open and all-inclusive. In my time here I've had many very
19 rewarding interactions with scientists and students alike
20 and never felt that I was treated differently because of my
21 gender.

22 In a similar vein, it is very unusual and
23 exciting that the GBO is currently home to three female
24 scientists from around the world. Clearly, the GBO is

1 helping grow the next generation of women scientists from
2 grade school to grad school and beyond.

3 I see the Green Bank Observatory is playing a key role
4 in ensuring that in the future the scientific community
5 will fully reflect there was diversity and
6 inclusiveness.

7 In addition to this, the GBO is also a top-of-the-line
8 science facility with uniquely versatile and cutting edge
9 capabilities for research and everything from planet
10 formation to cosmology to searching for life beyond earth,
11 and it's really still a very up-to-date and tremendous
12 facility. It's not even fully reached its full
13 capability. It's still growing and spawning these new
14 technologies for radio astronomy across the country and
15 across the world in a way that no other research facility
16 can do because of its unique nature.

17 The single dish steerable structure is very unusual.
18 It's the largest one of its kind in the world and it's just
19 extremely important to the field of radio astronomy and
20 astronomy in general really.

21 So for all these reasons I think it is absolutely
22 essential to the State of West Virginia, the United States,
23 and the entire scientific establishment that Green Bank
24 Observatory continues to receive full NSF funding for years

1 from now.

2 ELIZABETH PENTECOST: Deanna White.

3 DEANNA WHITE: Thank you all for having me. We've
4 driven four hours this evening and will be driving four
5 hours back. We wanted to -- this is very important to us.
6 We've been coming here for 18 years as a family. That was
7 my daughter.

8 So I want to thank you for allowing me to have the
9 opportunity to go on public record to register my strong
10 support for the National Science Foundation to provide full
11 funding for the Green Bank Observatory. I've already
12 submitted a written comment. That was from the head. This
13 one is from the heart.

14 Each time my family and I visit I'm more and more
15 convinced this place is magical. Bear with me. To start
16 simply, just from using your senses you can see the
17 beauty. The juxtaposition with the technological wonders
18 of each decade represented by each of the telescopes
19 against the majestic quiet mountains. Imagine taking a
20 walk down the Observatory road, listening to the breeze
21 whispering through the pines, seeing the sun reflect at all
22 different angles off the hills and telescopes whenever so
23 quietly one of the telescopes turns to its next
24 (inaudible). Right there and then in the peace and beauty

1 of your evening stroll it could be that the next discovery
2 of an exotic binary pulsar system, the secret to dark
3 matter, or even the first sign that we are not alone could
4 be happening. This is exciting, all inspiring magic.

5 Seeing a group of young students gather together
6 around the display and the science exhibit hall, receiving
7 instruction from a staff member, participating in a STEM
8 activity, or independently operating the 40-foot telescope
9 is magic. This is not your typical
10 experience. It is beyond that. Young minds are learning
11 and being challenged to learn concepts, operate equipment,
12 and analyze data in a way that is satisfying by seeing real
13 unique results that only their decisions and actions
14 yield.

15 College undergraduates have the opportunity to design
16 features that will put in place in an actual operating
17 facility. High school students have the opportunity
18 through the Pulsar Search Collaboratory to analyze data
19 that could yield fascinating new discoveries. Middle
20 school students from all over the country representing
21 minority and female future scientists can participate in a
22 Physicists Inspiring the Next Generation camp each summer.

23 There are many more unique programs available here
24 that thousands of students have had the opportunity to

1 participate in and regain excitement about learning and
2 problem solving that are more traditional methods of
3 teaching that teachers are struggling with. This is
4 magic.

5 To see my own daughter and son both have -- both have
6 always been artistically inclined. To grow and learn from
7 their experiences at the Green Bank Observatory has been
8 utter magic. My daughter has had the amazing opportunity
9 at 16 to work alongside of an undergraduate student from
10 Oregon Tech and under the leadership of a highly
11 accomplished astronomer, Dr. Richard Prestage, to learn
12 computer coding, statistical analysis, research paper
13 protocol, and presentation skills. She has been aspired to
14 pursue a career in engineering and science from her first
15 visits to the Green Bank Observatory and these experiences
16 only increase her enthusiasm about this field of study.

17 My son, a computer animator and enthusiast, is
18 encouraged by his exposure to the multiple uses of
19 computers and coding to process and analyze the tremendous
20 amount of data generated from observing the GBT.

21 The Green Bank Observatory inspires students of all
22 backgrounds to learn about or even pursue careers in
23 science, technology, engineering, and math. The
24 inspiration experienced at Green Bank in turn enriches

1 those fields by benefit of incorporating art and other
2 talents to solve our future challenges. This again, is
3 magic.

4 To learn about distinguished scientists whose careers
5 began at the Green Bank Observatory particularly two
6 accomplished women who you've heard about, Hanna Sizemore
7 with the Planetary Science Institute who works on site, and
8 Naomi Bates, (inaudible) educated Ph.D. in civil and
9 environmental engineering who now works at the Delaware
10 Geological Survey at the University of Delaware.

11 CAROLINE BLANCO: Excuse me.

12 DEANNA WHITE: I'm almost finished. Both of whom will
13 readily tell you the invaluable experiences that they
14 (inaudible) research methodology and (inaudible) skills as
15 level high school students is inspiring.

16 So the Green Bank Observatory arising in the midst of
17 this rural out-of-the-way radio quiet zone where
18 groundbreaking scientific discovery and innovation is
19 happening, where students are being inspired, satisfied by
20 their contributions and challenge to think deeper in more
21 complicated ways, where a community thrives to its very
22 existence must be fully funded by the NSF to continue to
23 provide this magical experience. Thank you.

24 ELIZABETH PENTECOST: Grayg Rousnyder.

1 GRAYG ROUSNYDER: Hello. My name is Grayg Rousnyder,
2 KCSVT, and I am a -- one of the volunteer people after
3 work. Go out and I like working with kids and working 4-H,
4 and scouting and different areas, different STEM
5 activities, and this facility has been awesome for that.

6 I come from -- I live in Kanawha County and came over
7 for this. We bring kids over here and we have like a girls
8 (inaudible) code class learning to program PYTHON, you
9 young girls in middle school, and they come out here and
10 they were able to go up to the GBT the control room and
11 look at the same programming code that they're working with
12 is the same stuff that runs it. A lot of what this
13 facility does is let kids see that these things are
14 accessible to them. The telescope and the science and the
15 professors, you know, we have some of the world leaders in
16 astronomy are here -- or at Morgantown and come here and
17 these kids can come and sit right with them, you know, like
18 (inaudible) other people and sit right with people that are
19 (inaudible) top people in the fields and have published
20 books, etcetera, so they see it's accessible and so they're
21 willing to try to do something so try to make things equal
22 access, equal opportunity for everyone and that's part of
23 that.

24 You know, this is -- also the Society of Amateur Radio

1 Astronomers they have their annual meetings here. We come
2 here every year. Have one of our annual meetings. These
3 are people from all around the world come just for a club.
4 They're in a club, Amateur Radio Astronomy Club, and they
5 come here. This is the place they want to go.

6 Also another thing to get involved with is the Pulsar
7 Search Collaboratory which was mentioned before which
8 students from all around the country come to this thing
9 every year. Students get to work with real data that
10 astronomers have not looked at that have been collected by
11 the GBT and they get the first crack of looking at data and
12 a lot of these kids have found pulsars and other
13 astronomical events and it's like that is so awesome.
14 These are kids. They get the first crack at this stuff.
15 Nobody else has seen any of this information before that
16 was collected.

17 You know, this is -- I'm going to say this is on my
18 list as a kid of things to do in life was to go to Green
19 Bank. Grew up in Ohio. Go to Green Bank, hamfests, go to
20 McMurdo one day, but you know, this was the place that I
21 always wanted to go.

22 Like the previous lady said, it is a magical place.
23 You come here every time, it's like this is exciting. You
24 bring kids. We bring different groups of kids out here and

1 we have an awesome staff here that just does whatever to
2 help any kid and things come out of kids, you know, that
3 how smart and how bright they are and what they can do.

4 Real quick example, they have the 40-foot teaching
5 telescope down here which is accessible to the public to
6 use with some training, and my 12-year-old son, you know,
7 we had class with Sue Ann here one day and that evening he
8 and I went down and got on the telescope. He said, Dad, I
9 got this, and he produced these really nice graphs. Let me
10 show them here. But a whole bunch of nice graphs of
11 looking at hydrogen clouds in the spiral arms of the
12 galaxy, you know, like that and the astronomer is like wow,
13 that's cool, this kid is 12 and first time. So now he sees
14 wow, this is accessible, I can do this kind of stuff. Take
15 the mystery away from it. I think, you know, that's --

16 CAROLINE BLANCO: If you could please wrap up. We've
17 got two more.

18 GRAYG ROUSNYDER: Yeah, I will. I apologize. I
19 will. Sorry. So just as part of your potential resources
20 to be considered should be the educational impact.
21 Probably add that to that. That's so important. This is
22 just a hidden treasure in West Virginia. Thank you.

23 ELIZABETH PENTECOST: John Taylor.

24 JOHN TAYLOR: Hello. My name is John Taylor. I'm the

1 vice president of the Central Appalachian Astronomy Club.
2 We're centered out of Clarksburg, West Virginia. I would
3 like to urge you to fully fund this facility. If you can't
4 fully fund it, keep it operating. It's vital to our
5 organization and to amateur astronomers all around.

6 Let me say that we operate a little star party called
7 Star Quest every year right here at Green Bank. Star Quest
8 is we inundate this place with several hundred people and
9 we receive just fabulous cooperation from this facility.
10 We do this in partnership with Kanawha Valley Astronomical
11 Society and also with some support through several years
12 from Dominion Energy and we bring a number of people in and
13 do an educational operation. We like to think of it as the
14 largest optical and radio star party in the nation and we
15 can only do it because we have this marvelous magical
16 facility here. We have speakers for four nights. We have
17 speakers all day for four days. We have an absolutely
18 fantastic event and it's only because of this facility.
19 Our people -- amateur astronomers come in and get trained
20 and work the 40-foot telescope. You know, this next coming
21 year will be the Star Quest 14. We've been doing this for
22 quite sometime now and it's only from this facility that we
23 can do this.

24 Now, let me tell you, this is a world-class science

1 facility. I'm sure others can speak much better to this,
2 but it boggles my mind to think that one would even say
3 they were considering shutting down the largest fully
4 steerable radio telescope in the whole world. How could
5 you even think of that? It's disgraceful to even say it.

6 I can't speak to this as an education facility near as
7 much as some other people probably already have, but about
8 25 years ago I came here as a classroom teacher for a
9 weeklong National Science Foundation funded science
10 facility, science workshop, and ran the radio telescope
11 every night for a week. It was a marvelous experience that
12 I took back to my classroom and shared with my students.
13 Many other students -- many students, actual high school
14 students, come here for programs. They have a nice
15 bunkhouse down there to house them in and they come here
16 for programs. It's a fantastic experience for those kids.

17 Please, please fully fund this facility, and if you
18 can't fully fund it, keep it operating. This is a vital
19 magical facility that needs to be here in West Virginia.
20 This is the only radio quiet zone in the whole world.
21 Where else can you have a facility like this? Keep it
22 going. Thank you.

23 ELIZABETH PENTECOST: Anthony Minter.

24 DR. ANTHONY MINTER: I'm privileged to be an

1 astronomer here at Green Bank Observatory. Astronomy gets
2 kids interested in science very early in their
3 development. What three-year-old hasn't grabbed a
4 cardboard box and taken that rocket ship to the stars just
5 because they saw a picture of a planet or an image of a
6 galaxy, but that's not enough to get them into science,
7 keep them there, and get them to a STEM education. The
8 programs here in Green Bank do that extremely well.

9 We have programs for elementary schools, middle
10 schools, high schools, kids in college. All get to come
11 here and those programs work because we have telescopes
12 they have access to because we are a science facility. You
13 take that science away, those telescopes go away, those
14 opportunities to get the kids interested in science is
15 diminished greatly if it doesn't go away itself.

16 Now why did I say it was a privilege to be an
17 astronomer here? It's because I get to interact with those
18 kids that come here all the time. That's one of the
19 greatest things about working here is working with the
20 youngsters and getting them interested in science or
21 keeping them interested in science. We have had kids come
22 through our programs at various levels. One was an
23 astronaut. Several have gone on as you've heard to get
24 their degrees in various fields. We've had medical

1 doctors. We've had lots of engineers. Even a few
2 astronomers have come through here. The privilege is to
3 take that three-year-old sitting in a box and help guide
4 them through their whole educational career and see them
5 become world-class scientists. You cannot produce that in
6 any other facility that I'm aware of other than here at
7 Green Bank. It is a tremendous privilege to work here.
8 Thank you.

9 CAROLINE BLANCO: Okay, folks, thank you so much for
10 staying. It's an hour after our specified time. The next
11 meeting is going to start now. They will be reviewing the
12 boards outside and then we will come back here for our
13 presentation again (inaudible) the one we started at three
14 o'clock today. Thank you all so much for coming.

15 If you didn't have a chance to either complete your
16 comments please put those in writing. I hope you
17 understand there are a lot of people that want that
18 opportunity and we're trying to accommodate (inaudible) but
19 we do look forward to having you participate as fully as
20 you can, and remember we will be taking these comments back
21 and reviewing them, preparing a draft Environmental Impact
22 Statement, and at some point in the spring when it's ready
23 it will be issued. If you've signed up you have the e-mail
24 address on there. We will notify you when it's ready and

1 then we will have another meeting that will be heard at the
2 45-day time period. Thank you again.

3 (Whereupon, this public meeting
4 was concluded at 6:00 p.m.)

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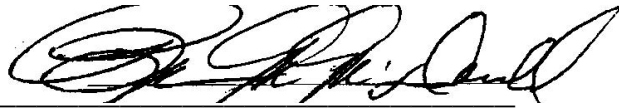
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CERTIFICATION OF REPORTER

I do hereby certify that the above and foregoing is a true and complete transcription of my stenotype notes and electronic recording of the meeting held at the time and place aforesaid.

I further certify that I am not interested in the outcome of this case, nor am I related to any of the parties herein.



Brian M. McDonald

Certified Shorthand Reporter

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\$11.5 8:13	<hr/> 2 <hr/>	400 20:11	access 71:2
\$11.85 8:16	2 15:13	45 13:8	72:11 84:22
\$14.5 31:8	2,000 34:10	45-day 15:24	89:12
\$17 25:12 56:20	20 34:18 36:2,	<hr/> 5 <hr/>	accessible
\$17.1 20:14	22 66:18 67:9	5,000 19:18	84:14,20 86:5,
\$30 20:17 28:2	70:22	50 34:11	14
56:20	200 49:3	50,000 25:14	accommodate
\$8 25:16	2010 6:6,15 7:4	56 31:19	90:18
\$8.2 8:24 9:3	2012 6:17,20	<hr/> 6 <hr/>	accommodations
\$95 41:6	7:5,16	6 15:10 67:8	18:22
<hr/> 1 <hr/>	2013 7:18 8:1	6,000 31:24	accomplish 34:8
100 20:10 43:16	2014 45:22	60s 43:8	accomplished
106 9:23 13:19,	2016 7:2	68 34:15	77:14 82:11
20 14:8,22	2017 8:12,15,23	<hr/> 7 <hr/>	83:6
16:18 45:21	15:23 16:3	70 71:14	accomplishment
108 45:17	2018 8:17,23	75 9:4	34:6
11 72:15	16:9	<hr/> 8 <hr/>	account 45:18
118 45:19 46:2	21 72:22	80 24:9	46:9
11th 27:22	22nd 7:18	<hr/> 9 <hr/>	accounts 46:17
12 32:19 70:23	25 53:18 88:8	95 7:17	accumulate
86:13	25th 12:5 15:9	99 34:14	15:11
12-year-old	17:5 18:6	<hr/> A <hr/>	achieved 39:13
86:6	27 17:23	Aarons 43:22	Act 11:17 13:19
125 63:21	28 17:23	abandoning	14:24 16:18,21
12th 50:16	<hr/> 3 <hr/>	29:17	action 10:12
13 73:23	3 19:18	64:24	16:10 29:22
14 87:21	30 16:7 25:16,	abilities 55:20	54:18 55:11
15 30:12 66:1	18	56:2	60:22
16 51:3 56:12	30-day 12:3	ability 66:5	actions 11:20
75:24 82:9	30-story 64:19	absent 35:23	13:23 81:13
1600 49:15	300 43:16 49:3	absolutely 41:4	active 49:19
17 55:10	303 45:23	77:5 79:21	50:19 51:16
17-year-old	34 45:23	87:17	55:9
54:22	35 62:23 70:24	Academies 7:2	activities 15:2
1774 63:21	<hr/> 4 <hr/>	58:13	51:20 84:5
18 80:6	4-H 84:3	activity 81:8	actual 81:16
1950s 64:10	4.9 46:3	88:13	88:13
1956 25:6	40 20:11 45:18	adapt 27:11	adapt 27:11
1960s 55:13	50:7 53:18	add 18:6 52:6	50:19 51:16
63:1	61:21 62:23	68:5 72:24	55:9
1969 59:21	40-foot 41:14,	86:21	activities 15:2
1975 48:15	23 81:8 86:4	addition 10:1	51:20 84:5
19th 12:13 15:8		79:7	activity 81:8
		additional 17:4	actual 81:16
		18:6 20:11	88:13
		26:3 45:18	adapt 27:11
		56:19 58:4	add 18:6 52:6
		address 15:5	68:5 72:24
		41:15 90:24	86:21

addressed 31:5 45:11 46:5	alien 19:7	annual 85:1,2	art 83:1
addresses 17:7	alike 78:19	Anthony 88:23, 24	Arthur 51:23,24
adds 20:17 74:3	all-inclusive 78:18	anymore 37:18 60:14	article 59:17 60:21
adjunct 51:6	allocated 8:24	Apollo 59:21	articles 31:19
adjust 46:2	allowed 51:13	apologize 86:18	artistically 82:6
administrative 51:8	allowing 80:8	Appalachia 71:12 72:4	arts 74:11,20 76:1
adulthood 70:23	alongside 82:9	Appalachian 87:1	ASB 56:10
advance 54:5	alternative 10:12,23 29:23 31:16 38:11 54:18 55:11 60:22	apparent 20:21	aspect 33:18 69:8,12,16
advanced 51:1	alternatives 5:1 10:5,9 11:15 12:9,10, 22,23 15:16,18 38:12 44:19,20 46:6	apparently 41:6	aspects 27:17
Advancing 6:18	amateur 42:6,9 43:12 73:21 84:24 85:4 87:5,19	approach 31:17	Asperger's 73:7
advantage 41:13	amazing 77:8 82:8	appropriated 9:1	aspired 82:13
adverse 14:10, 13	ambulance 48:18 49:22	appropriations 9:6 21:16 22:21	assembly 40:18
advice 6:4 50:21	America 52:12, 13 65:7 72:4	approximately 9:4	assess 14:9
advocate 55:10	American 9:12 74:1	Arbovale 45:22 46:1 72:22	assessment 7:4
advocated 22:13	Ames 51:2	archeological 14:12	asset 18:20 19:10 21:6
aerobics 46:22	amount 82:20	area 14:3,5 19:15 25:9,16 29:6 30:18 33:16 35:11 43:6,15,16 44:2 45:21,22 46:18 48:13 52:9,11 53:12 54:17 58:10 60:5,8,10,12 65:15 72:23 74:3	assist 59:3,4
Affairs 5:14	amusement 39:10	areas 5:1 12:11,24 13:1 15:19 33:5 35:2 54:17 56:4 60:14 74:20 84:4	assistant 11:8 49:22
affect 56:15 75:5	analysis 6:13 82:12	Arecibo 10:2 44:17 45:8 46:7	assisted 49:21
affected 57:10	analytics 33:16	arises 33:24	assure 45:2
affects 56:24	analyze 15:15 81:12,18 82:19	arising 83:16	asteroids 50:13
afford 56:19	analyzed 13:2	Arizona 61:21	astonished 40:8
Africa 38:3	analyzing 33:20	arms 86:11	astounded 59:18
afternoon 11:11 13:16 18:11 24:7 25:19 26:24 30:4 61:2	ancillary 28:3		astronaut 89:23
age 55:10	angles 80:22		astronomer 5:7 36:21 43:12,13 73:22 77:10,14 82:11 86:12 89:1,17
agencies 11:18 13:21	animator 82:17		astronomers 24:1 37:3,24 38:8 42:7 85:1,10 87:5, 19 90:2
agency 15:1 49:4	Ann 47:6,11,13 68:5 86:7		astronomical 5:7,10 6:6,16 8:12 9:17,21 19:21 37:9,15, 19,23 85:13 87:10
aggressive 23:13	announced 7:19 12:13 13:10		astronomy 5:21 6:2,7,8,10,18 7:6,11,21 9:6 19:5,11 30:16 34:19 35:9 36:21 38:16
agree 36:13	announcing 69:19		
agreement 8:6			
agreements 14:14			
agriculture 46:13			
ahead 17:22 71:19			
air 13:3			
Ajhar 4:3 5:6 11:7 12:10			

42:9 43:14 53:20 54:6 55:7,22 56:3 63:11 64:18 73:23 75:22 79:14,19,20 84:16 85:4 87:1 89:1 astrophysics 5:21 6:8 30:13,15,19,20 77:4 ATE 14:3 atmosphere 78:17 attend 21:20 34:15,18 54:23 55:4 75:9 attended 50:15 attending 4:3 attorneys 40:10 auditorium 58:9 August 7:2 AUI 8:4,19 63:1 Authority 49:5 availability 13:12 avenues 70:7 award 30:22 31:1 awards 30:21 31:4 aware 9:3 27:14,16 32:17 66:9 90:6 awe 34:5 61:20 awesome 84:5 85:13 86:1 awful 73:14	14 70:2 73:17 80:5 88:12 90:12,20 backbone 49:3 backdoor 58:6, 10 background 4:23 52:14 backgrounds 77:19 82:22 balance 23:16 47:3 Bank 4:6,16 5:9 6:19 7:15,20 8:2,3,5,11,14, 21 9:5,9,24 10:5 11:24 18:16,21 19:3, 5,13,18 20:4, 5,10,12,13,16, 19,21,23 21:5, 23 22:7,11,24 23:7,9,13,22 24:12,16,19,24 25:6,23 29:4,7 30:13,24 31:7, 10,16,20 32:18 34:7,21 35:10, 14,17 36:12,23 37:16 38:1 40:3,5,14,19 42:10,22 44:10,14 45:1, 22 46:1,16 48:12 50:13,18 51:6,17 53:10, 17,21 55:1,2, 6,8,11,20 56:8 59:20 60:12,17 61:17 62:7,11, 18,20 63:4,11, 19 64:7 71:4, 23 72:22 74:14,17,22,24 75:7,22 77:2, 4,6 78:3,14 79:3,23 80:11 82:7,15,21,24 83:5,16 85:19 87:7 89:1,8 90:7 barn 62:15	Bartow 29:4 base 9:5 16:16 56:15,18 based 50:13 Baseline 8:14, 22 basic 14:1 52:16 basically 37:15 50:13 basis 52:18 69:6 basketball 46:24 Bates 78:7 83:8 battery 68:12 BBC 66:23 beacon 20:19 Bear 80:15 Beaudet 44:8,9 47:5 beautiful 19:14 61:10 66:6 beauty 80:17,24 bed 65:13 began 83:5 begin 29:19 beginning 12:13 15:10 49:8 70:23 behalf 26:11,20 Belington 43:6 Bell 55:12 bend 59:23 benefit 52:10 53:4 77:20 83:1 benefited 63:4 benefits 52:5, 19 big 24:20,22 25:10 26:21 59:23 61:23 binary 81:2 biological 13:3 60:8 bit 11:12 12:4 16:2 17:3 25:14 50:11 53:9,15 67:23	Blanco 5:12 11:4,6,10 47:2,7 59:10 67:7 70:11 72:14 83:11 86:16 90:9 blinked 68:15 blow 50:7 board 40:10 67:23 70:16 71:6 75:20 boards 17:9 90:12 Bob 62:6 bodies 19:21 boggles 88:2 books 84:20 boost 20:8 born 21:13 43:4 Boso 26:23,24 27:1 56:23 boundaries 14:4 box 14:18 89:4 90:3 brag 61:21 branch 46:15 break 67:10,15 70:10,12 72:12 breakfast 65:13 breaking 28:21 39:12 Breakthrough 9:10 20:22 23:16 breeze 80:20 bridge 19:16 briefly 9:18 48:11 bright 86:3 bring 43:10,16 51:9,11 59:16 84:7 85:24 87:12 bringing 9:16 47:16 61:19 brings 19:18 77:23 British 57:6 broadcast 57:6, 8
--	--	--	--

broader 32:16	Caltech 55:9	Central 87:1	clear 12:17
Broadway 54:24	Cambridge 55:12	ceremony 8:8	21:3 34:4
broke 40:14	camp 77:22	CH 15:13	cleared 76:9
brother 60:1	81:22	challenge 83:20	clients 35:6
brothers 59:22	camps 77:21	challenged	close 4:17 37:8
brought 31:8	capabilities	81:11	49:16 59:1
42:4,7 43:7,10	6:23 38:19	challenges 6:19	closed 76:9
48:9 59:22	79:9	23:5,11 83:2	closing 29:5
Brynn 74:7,8	capability	challenging	50:4
budget 8:11,12,	79:13	4:19	closure 27:21
13,16 9:1,5,19	capable 38:24	Chamber 74:22	29:12
16:13 23:6	capitalize 6:13	chance 20:4	closures 29:10
budgetary 23:11	Capito 21:15	90:15	clouds 86:11
Bufogle 51:23,	24:3 25:20	change 15:19	club 43:20
24	Capito's 21:9	20:5 35:1 75:5	85:3,4 87:1
build 35:7 41:6	car 70:17	Charles 39:24	clubs 43:14
62:9 72:5	cardboard 89:4	40:1,2	CNN 57:7
building 33:18	care 38:6 39:22	Charleston	coaches 46:24
49:23 58:16,22	career 32:2	43:16 59:17	coal 29:16
64:16,18,20	33:8 71:1	chart 21:4	code 84:8,11
built 42:17	77:16 78:15	cheap 51:8	coding 82:12,19
43:7,9 50:7	82:14 90:4	chief 49:21,22	coffee 28:17
bunch 86:10	careers 54:5,12	child 61:19	collaborating
bunkhouse 88:15	78:6,10 82:22	children 43:10	30:13
Burnell 55:12	83:4	51:12 65:2	collaboration
business 46:14	careful 67:3	71:16	10:14,17 31:7,
64:15 65:21	Carla 44:8,9	China 64:14,15	19 35:10
66:2 71:5,6	47:5 50:5	65:3	collaborations
75:23	72:24	Chinese 57:7	7:22 9:10
businesses 29:3	Caroline 5:12	choose 45:20	30:23
66:5	11:4,6,10	76:12	collaboratory
busy 20:11 26:2	47:2,7 59:10	chose 24:24	32:17,24 33:10
buy 54:14	67:7 70:11	Chris 5:16	47:17 81:18
Byrd 41:2	72:14 83:11	Christin 5:12	85:7
	86:16 90:9	Christmas 68:15	Colleague 7:18
	categories 23:8	citizen 43:2	8:1
	Catholic 52:1	citizens 35:19	colleagues 37:7
	cease 6:10	46:16	48:21
	44:12	civic 74:12	collected
	celebration	74:12	85:10,16
	40:21	civil 27:6 83:8	college 34:15
	cellphone 25:8	clarify 4:12	50:24 51:1
	cellphones	Clark 76:16	71:17,18 81:15
	62:12	Clarksburg	89:10
	center 30:14	43:15 87:2	colonial 63:21
	31:1,4 51:2	class 63:4 84:8	colony 40:16
	64:11 73:10	86:7	colors 68:15
	74:10,11 77:7	classes 48:23,	column 14:18
	centered 87:2	24 63:9	combined 9:19
	centimeters	classroom 20:3	45:22
	6:23	88:8,12	
C			
C-R-I-L-L-Y			
41:8			
Cabell 18:13			
Caitlin 43:22			
caliber 75:1			
California 51:4			
call 17:18			
72:23			
called 17:21			
32:22 40:18			
63:11 87:6			
calls 49:15			

comment 12:3 13:9 15:24 16:24 17:15,24 67:9,11 80:12	community's 9:18	congressman 18:9,10,11 22:23 25:20	contributions 26:13 75:3 83:20
comments 4:14, 18 5:5 10:8 12:6,7,16 13:16 15:12,20 16:5,22,23 17:5,20,23 18:2,5,6 25:5 36:6,7 38:9 39:16 47:3 52:7 53:8 72:19 76:21 90:16,20	comparable 44:23 45:4	Conner 73:7	control 84:10
Commerce 26:6 74:22	comparison 37:6,8	consequences 11:14,19 16:12	conversation 57:15,18
commissioned 38:17	competence 33:12	consideration 58:24 67:3	convey 22:23,24
commissioning 38:18	competition 7:21	considered 10:6,9 32:4 56:5 86:20	convinced 80:15
commitment 26:12	competitive 38:21	considers 15:2	cool 86:13
committed 24:12	complete 6:8 16:6 23:20 55:22 63:3 71:24 90:15	constraints 9:20 11:24	cooperation 87:9
committee 21:16 22:21 26:6	completed 6:17 32:9	construction 6:11 10:24 59:6 64:19	cooperative 8:5
committees 6:5	completing 16:17	consult 13:21 15:4	coordinator 24:8 53:10
communicate 14:17	compliance 16:18	consultation 9:23 13:20 14:2	copied 20:3
communications 28:10,15	compliant 16:21	consulting 14:13,20	copy 59:12 63:16
communities 71:11,14	complicated 83:21	contemplated 27:21	Cordova 23:1 25:21
community 6:6 20:6 21:1 23:19 25:7,23 26:15 28:3,5, 6,7 31:6 35:18,19,20,22 37:9,15,20,22, 23,24 44:11 46:13,21 47:9, 24 48:8 50:3, 22 51:13,19 52:6,20 56:10 58:2,12,21 59:1 65:24 67:5 74:18 75:2,4,6,11, 15,16,19 76:2 79:4 83:21	comply 15:1	context 38:23	Corporation 70:19
	component 63:14	continuation 65:22	cosmology 79:10
	components 16:11	continue 15:9 22:23 24:2 30:1 66:6 76:13 83:22	costs 45:13,14
	computer 63:8 69:1,5 82:12, 17	continued 10:11 20:20 22:13 49:18 55:10 77:1,15	counsel 5:13 11:4,8 35:5
	computers 72:5 82:19	continues 8:4 9:13 35:1 36:13 79:24	count 49:1
	concepts 81:11	continuing 9:3 10:13 42:14	counties 60:5
	concern 44:18	contractors 5:16 15:13	country 33:20 38:2 52:19 54:8 64:9 76:4,14 77:20, 24 79:14 81:20 85:8
	concerned 27:20	contrary 4:14	county 18:13, 14,15 19:15 20:8,13 21:14 22:1 24:9,11 27:22 28:11,14 29:4,14 30:1 35:16 49:2,15 50:6,15 51:5, 10 52:1,6 53:23 57:23 59:16 60:2,3, 20 61:3,8,11, 13,14,15 62:24 63:20 65:11,12 66:7 68:3 69:19 70:9 74:9,11,13 75:1,21 76:11, 14 84:6
	concerns 26:10	contrast 14:6	
	conclude 36:4	contribute 20:14	
	conclusion 45:15	contribution 25:13	
	concurrently 16:16		
	conduct 5:24		
	confidence 33:18		
	confirming 26:7		
	Congle 24:15		
	congressional 18:12 27:15		

County's 49:18	Dana 55:3 56:1	degrees 32:8	25:21 26:8
couple 5:15	dark 76:19 81:2	51:2 89:24	70:18
37:13	data 33:16,20	Delaware 78:11	discourage 39:8
couples 66:19	50:14 81:12,18	83:9,10	discover 23:23
court 17:16	82:20 85:9,11	delegation	discovered
67:14	date 31:8,18	26:18 27:15	33:11,23 55:13
cousins 57:11	32:9 34:10,17	Dennis 42:24	discoveries
cover 63:17	dates 15:7 16:4	43:1	22:19 24:2
coverage 25:9	daughter 68:9	department	33:2 38:18
crack 85:11,14	80:7 82:5,8	30:15,16	81:19
craft 50:14	day 13:9 64:17	48:16,19 68:24	discovering
created 30:14	68:10 69:17	depend 61:16	19:21
creates 66:22	70:2,3 77:10	depending 16:4	discovery 81:1
creating 20:6	85:20 86:7	depends 65:22	83:18
29:20	87:17	deserve 46:11	discuss 4:24
Creek 61:4,7,16	days 16:7 34:9	design 81:15	23:2
crew 66:24	57:24 59:17	designed 45:15	disgraceful
Crilly 41:8,9	60:15 87:17	destinations	88:5
critical 6:24	DC 21:15	65:16	dish 79:17
19:10 21:6	deal 25:10	details 11:5	dismantled
26:13 55:18	Deanna 80:2,3	detection 31:17	39:18
critically	83:12	32:14	dismissed 53:2
18:20	dear 7:18 8:1	detections	display 65:20
crucial 58:15	24:16	31:15	81:6
59:6	debate 12:19	deteriorate	distance 59:1
cultural 13:4	decadal 6:6,24	29:18	distinguished
14:12 53:13	7:4	determine 6:9	83:4
55:24 60:11,12	decade 6:3,18	38:21	distressing
71:3 74:12	31:23 80:18	devastating	38:15
76:2	decades 19:11	50:7 51:22	distributed
culturally	21:7	developed 33:13	27:14
51:21	decay 29:19	developing 35:9	District 18:12
culture 60:15,	decedents 56:13	development	27:23
16 74:3	decided 4:17	12:14 30:11	diverse 60:10
cup 28:17	11:21 41:12,20	34:13 89:3	diversity 32:7
current 8:10,	51:3	developments	34:11 79:5
22,24 9:19	decision 4:16	7:15	divestment 6:20
22:16 38:14	11:20 16:8,9,	Devlin 36:17,18	7:6,7
cut 39:2,3 47:8	10,15 38:13	differently	division 5:7,10
56:19 59:7	40:13	78:20	8:21
cutting 47:9	decisions 81:13	difficult 41:18	doctors 90:1
64:11 74:2	deconstruction	45:9	document 33:22
79:8	10:24	diminished	documentary
cutting-edge	dedicated 70:20	89:15	32:22,23
19:13	75:4 76:6	dinner 74:22	documents 13:13
	deep 72:10	direct 46:5	17:12
	deep- 56:9	direction 65:8	dollar 23:8
	deeper 83:20	directly 25:20	dollars 44:13
	deeply 37:21	director 4:6	dominated 55:17
	degree 32:6	23:1 24:14	78:16
D			
Dad 86:8			
damage 37:8			

entrance 62:8	event 8:9 18:22	explicit 54:16	fair 38:23
environmental	74:21 87:18	exploring 19:6	57:24 58:18
4:4 5:2,3 9:22	events 75:10	exposure 50:21	68:19,21
10:4 11:9,14,	85:13	78:1 82:18	fairs 58:1
16,19,21,22,23	eventually 44:6	expression 52:9	fall 16:3 23:8
12:8,15,19,21	exact 8:21	extend 42:18	31:14
13:2,8 15:13,	excellent 39:7	extended 12:4,5	families 37:4
14 16:12 19:8	excited 22:8	extends 56:10	family 26:5
23:3 27:17,19	62:17 73:11	external 6:4	44:5 51:4
28:24 29:13,	excitement 82:1	extremely 23:13	80:6,14
19,21,24 83:9	exciting 78:23	77:24 78:17	fanfare 31:15
90:21	81:4 85:23	79:19 89:8	fantastic 41:13
EPSCOR 35:6	excuse 36:1		44:1 87:18
equal 84:21,22	45:12 47:2	F	88:16
equally 35:16	83:11	fabulous 33:2	farmlands 61:10
equate 25:15	executive 70:18	87:9	fascinating
equipment 19:20	exhaustive 47:1	face 23:12	81:19
22:9 41:23,24	exhibit 81:6	63:17 64:22	fast 18:1
59:3 81:11	exist 35:23	facilities 5:23	father 51:23,24
equity 71:2	existed 69:14	6:10,14 7:1,6,	59:22 64:9
72:10	existence 65:22	8,12 8:13 9:21	65:5
Erica 76:22,23	66:2,9 83:22	10:19 38:14	favorite 52:3
essential 7:10	existing 6:14	39:11,14 46:20	features 61:13
27:2 79:22	exists 53:18	57:3,8 58:1	81:16
essentially	74:14	64:17	federal 5:20
41:20	exotic 81:2	facility 19:1	11:18 13:10,20
established 9:9	expect 15:22	20:7 21:2	15:1 23:5
12:1 25:6	66:2	22:3,13 23:18	40:11
28:8,9	expected 16:9	26:5,13 27:20	feel 75:17
establishing	55:22	28:9,23 29:1	fees 58:6
71:1	expense 41:22	31:10 41:17	fellow 21:19
establishment	expensive 39:1	42:2 47:22	felt 78:20
79:23	52:17	51:16 52:11	female 20:1
estate 45:5	experience	54:5,15 55:15	77:23 78:15,23
estimate 45:16	19:23 22:6	56:11 58:14	81:21
estimated 44:13	24:23 33:15	60:9,17,22	fence 56:11
45:6	81:10 83:23	65:24 74:2	62:9
estimates 44:14	88:11,16	78:1 79:8,12,	field 38:15
46:12 49:1	experienced	15 81:17 84:5,	53:20 55:16
estimating	82:24	13 87:3,9,16,	57:24 69:17
45:12	experiences	18,22 88:1,6,	70:3 75:3 77:3
etcetera 84:20	40:6 76:2	10,17,19,21	78:16 79:19
Europe 38:2	78:16 82:7,15	89:12 90:6	82:16
evacuate 58:22	83:13	fact 17:2,8	fields 19:24
59:2	experiencing	28:2 37:19	34:17 54:7
evaluate 11:22	71:21	factor 23:19	78:2 83:1
Evan 18:9,10,11	expertise 63:5	factors 16:13	84:19 89:24
evening 13:16	75:9 76:6	facts 22:2	figure 70:5
27:1 80:4 81:1	explain 17:3	faculty 30:18,	file 41:22
86:7	68:13	20 31:8,20,21	film 33:23
		32:11	66:24

final 16:1,3,15 49:14	fortune 52:23	11:24 22:14	generated 82:20
finalize 67:5	forward 9:16	30:20 44:17	generation 13:5
finance 54:7	15:7,11 23:1,	55:24 58:3	20:7 55:18
financial 29:2	13 36:7 39:3	77:1 79:24	77:22 79:1
find 19:14	72:8 90:19	80:11	81:22
45:3,20 46:1	found 60:16	funds 6:11	gentleman 67:19
73:17,18	85:12	23:17	gentlemen 21:19
finding 21:11	Foundation 5:8,	furniture 59:5	geological 13:4
finds 37:20	20 6:4,16	future 4:16	78:11 83:10
fingers 67:15	7:17,19 8:2,6,	6:14 10:21	George 63:18
finished 83:12	23 11:9 17:18	20:19,20 22:8,	get all 4:7
fire 48:15,17,	18:24 21:22	10,12 33:13	Ghigo 48:5,7
19 49:21,24	23:11,16 25:22	34:3 79:4	giant 66:9
firefighters	26:8,12 30:22	81:21 83:2	girls 84:7,9
28:4 46:21	31:1 40:9		give 8:10 24:18
first-generation	41:2,5 52:24	G	54:9 62:3
33:6 71:17,24	57:5 80:10		63:13 67:14
fiscal 7:16	88:9	gain 33:15	68:8,22 69:6
8:11,15,17,22,	Foundation's	gains 57:5	giving 19:22
23,24	9:15 31:4	galactic 55:9	20:4 45:19
Fish 15:4	fourth 10:19	galaxy 19:7	76:23
five-minute	frame 42:11	86:12 89:6	glad 21:21
70:12	France 25:21	Garretson 65:9,	glitch 12:5
Flack 61:1,2,3	Fred 30:3,4	10	global 19:4
flawed 37:21	36:4,9,11	gather 81:5	glowing 40:4
flooded 45:5	free 51:7 62:12	gathered 22:10	goals 6:24
floor 5:5	71:15	37:20	good 18:11 24:7
flow 29:2	frequency 77:12	gave 11:7	26:24 27:16
flown 50:14	friend 24:17,18	Gazette 59:17	30:4 47:13
focus 14:8	25:2 41:5	GBO 9:9,13	61:2 65:23
focused 10:12	friends 26:21	24:16 25:12,14	government
12:7,18 30:23	37:2,7 61:4,15	41:11 45:16	23:16
31:1 35:11	front 63:17	46:15 51:21	governmental
focuses 73:11	69:20	52:5 55:15,18	63:20
focusing 39:11	Frontier 31:1,4	56:10 57:22	Governor's 55:4
folks 11:13	frontiers 39:12	62:10 63:24	grabbed 89:3
17:19 47:7	full 69:18 77:1	65:16,18,23	grad 79:2
60:19 67:7	79:12,24 80:10	66:2,9,21 67:4	grade 50:16
90:9	full-time 45:17	73:6 78:5,17,	79:2
football 46:24	fully 21:5	23,24 79:7	graduates 32:11
footing 19:10	73:17 79:5,12	GBO's 65:22	graduating 32:5
foregone 45:15	83:22 87:3,4	77:18	grand 43:10
forget 37:17	88:3,17,18	GBT 6:21 7:22	grandmother's
form 16:24	90:19	38:14,16,18	62:8
formal 71:22	fund 73:17,18	39:6 40:7 41:7	grandparents
formation 19:6	87:3,4 88:17,	44:12 82:20	43:6
79:10	18	84:10 85:11	grant 51:10
fortunate 63:15	funded 83:22	gem 60:6	grants 50:24
	88:9	gender 78:21	graphs 86:9,10
	funding 5:22,23	general 5:13	
	7:18 9:14,20	11:4,8 79:20	

grave 41:4	79:3,23 80:11	happen 13:7	highest 26:10
gravitational	82:7,15,21,24	29:14 37:6	53:19 75:1
9:12 31:2,13,	83:5,16 85:18,	40:20	highly 82:10
15,18	19 87:7 89:1,8	happened 8:9	Hill 15:13
Grayg 83:24	90:7	9:2 64:14	hills 80:22
84:1 86:18	Greenbrier 60:3	happening 29:14	Hillsboro 70:15
great 4:7 18:3,	Greg 26:22,24	81:4 83:19	hinder 60:23
7 24:19,22	grew 43:20	happy 24:15	historic 13:19,
26:21 31:14	50:15 51:12	hard 18:1 71:13	22,23 14:7,11,
32:23 35:13	85:19	Hardy 24:9	12 16:17 63:22
36:12 38:18	ground-based	harms 55:24	historical 61:6
40:17,20,21	5:21 7:8,11	Harris 40:18	63:14
41:6 52:12,13	groundbreaking	hate 47:8	historically
59:23 65:7	83:18	Hawse 24:5,7	61:12 78:16
72:8 74:18	grounds 40:14	head 80:12	hit 69:17
75:2 78:13	groundwater	health 13:5	hold 24:10
Greater 72:22	13:6 29:20	48:9 58:20	36:19 47:2
greatest 89:19	group 81:5	hear 22:4 33:3	hole 38:15
greatly 89:15	groups 5:24	40:8 74:13,14	home 20:3 24:20
Green 4:6,16	34:13 85:24	75:13	69:17 78:23
5:9 6:19 7:15,	grow 31:21,22	heard 4:10,15	homes 29:17
20 8:2,3,5,11,	34:23 66:3,6	9:10 18:17	45:5
14,21 9:5,8,24	72:6 79:1 82:6	26:10 35:13	honestly 73:15,
10:5 11:24	growing 79:13	40:3,8 52:5,11	16
18:16,21 19:3,	grown 30:13	74:19 78:7	honored 71:22
5,12,17 20:4,	growth 30:17	83:6 89:23	hope 20:20
5,10,12,13,16,	72:9	hearing 47:15	36:13,19 44:5
19,20,23 21:5,	guess 28:16	53:4 78:4	52:24 56:8
23 22:7,10,24	36:18	hears 41:3	65:4 75:12
23:7,9,13,22	guests 65:17	heart 24:17	76:12 90:16
24:12,16,19,24	66:8,12,18,20	80:13	hoping 78:15
25:6,23 29:4,7	guide 90:3	heartening	Horizons 6:7
30:13,23 31:7,	guys 43:19	78:17	Horton 54:20,21
10,16,20		Heatherly 47:6,	host 4:5 16:14
32:18,23 34:6,	H	11,13 68:5	hosting 18:21
21 35:10,14,17	habitats 15:3	helped 71:8	hosts 4:7
36:11,23 37:16	half 71:16	helping 4:7	hour 67:10
38:1 40:2,5,	hall 40:19 81:6	71:10 79:1	90:10
14,19 42:10,21	hamfests 85:19	helps 52:12	hours 43:3
44:10,14 45:1,	Hamilton 5:12	hidden 86:22	54:22 80:4,5
22 46:1 48:11	Hancock 21:14	high 35:14,15	house 46:24
50:12,18 51:6,	hand-waving	39:10 40:14,	74:9,10,13,21
17 53:10,17,21	45:16	19,21 50:17	75:8,21 76:3,7
55:1,2,5,8,11,	hands 28:16	54:9 62:24	88:15
20 56:8 59:20	hands-on 19:23	63:4,9 68:3,23	housing 44:18,
60:12,17 61:17	33:2,15 39:7	70:5,18 78:8	21
62:7,10,18,20	Hanna 50:9,10	81:17 83:15	huge 54:8
63:4,11,19	69:20 78:6	88:13 89:10	56:17,21 64:5,
64:7 71:4,23	83:6	higher-ranked	18,19
72:21,22		7:1	human 28:18
74:14,17,22,24			34:7
75:7,22 77:2,			
4,6 78:3,14			

humans 34:8	18 20:24	income 46:3,4,6	22 83:15
hundred 27:24	23:18,21 27:20	61:17	installed 41:23
44:2 49:16	29:10,13,19,20	Incorporated	Institute 78:10
58:11,13 72:2	30:7,8 32:16	8:4	83:7
87:8	34:22 37:22	incorporating	institution
hundreds 42:13	46:10 53:14	83:1	54:15 63:20
53:16 54:3	54:11 58:21	increase 8:16	institutions
hurt 67:15	imperative	44:21 65:17	23:14 54:13
hurting 20:18	54:24 56:4	82:16	instruction
husband 24:21	implementing	increasingly	81:7
hydrogen 86:11	7:9	33:15	instructor
	importance	incredible 71:5	48:23
	19:16 25:22	independently	instructors
	51:17,19 58:14	81:8	48:24 49:4,10
	65:15	indirect 44:19	instrumental
	important 4:14,	46:9,11	50:23
	18 9:8 10:8	individuals	instruments
	18:18,20 20:14	5:24	6:12 39:18
	21:23 31:5	industry 32:15	integral 75:7
	33:12,16 34:9	inefficiencies	integrated 55:5
	35:16 42:20	23:7	intelligent
	52:21 56:5	inflated 45:24	20:24
	57:20 72:10	information	interact 28:13
	74:17 79:19	4:23 8:10 16:5	89:17
	80:5 86:21	17:4,10,12	interactions
	importantly	26:4 43:24	28:18 78:19
	31:22 33:23	69:7 85:15	interest 37:4
	impression	informational	interested
	37:14 39:16	17:8	10:14,17 13:21
	impressive 22:2	infrastructure	14:21 16:19
	38:16	27:3 35:7	77:3 89:2,14,
	improve 41:14	initial 37:13	20,21
	42:14	initiate 14:2	interference
	inaudible 63:18	initiated 10:2	77:13
	80:24 83:8,14	initiating 9:22	interferometer
	84:8,18,19	innovation	42:16
	90:13,18	83:18	international
	inauguration	input 7:13	5:22 26:14,15
	8:8	inspiration	30:23 31:11
	incentives 58:1	33:24 78:12	37:9 50:22
	inclined 82:6	82:24	57:8 62:21
	include 14:12	inspire 24:2	interrelate
	16:11 53:11	76:13 77:16	28:21
	54:16	inspired 22:8,	interruptions
	included 20:15	16 34:5 59:24	57:19
	includes 37:24	66:10 78:5	intersects
	49:23	83:19	53:13
	including 12:17	inspires 82:21	interviewing
	17:10 19:21	inspiring 60:23	26:7
	inclusiveness	70:20 74:16	intro 32:1
	79:6	77:8,22 81:4,	
I			
idea 40:22			
41:15 71:17			
ideas 7:22			
identified 13:2			
identify 14:2			
ignore 37:11			
III 63:18			
image 89:5			
imagination			
22:20			
imagine 39:16			
76:10 80:19			
immigrant 64:9			
impact 4:4 5:2,			
3 7:8 9:22			
10:4 11:21,22			
12:8,15 13:3,8			
15:2,14 19:9			
20:16 23:3			
25:11,15 27:4,			
9,17,19 28:1,			
24 29:24 30:10			
31:22 35:14,17			
44:1,11 45:4,6			
46:16 53:12,			
22,23 54:8,17			
56:17 63:10			
64:5,6,8 66:5			
67:4 86:20			
90:21			
impacted 26:5			
33:4 55:2			
impactful 21:23			
47:21 48:4			
impacting 44:3			
impacts 12:19,			
21 13:6 15:6,			

listed 15:19 59:8	lot 4:10,11 9:11 37:2 40:3 47:14 52:5 53:3 56:21 58:2,3 60:14, 18,20 64:2,23 65:6 68:7 69:2 84:12 85:12 90:17	makes 26:13 48:3 52:13 63:12 74:24	measured 23:21
Listen 9:10	love 28:13 52:1	making 27:16 39:14 52:12 65:7 75:2,16	mechanics 48:2
listening 20:22 80:20	lower 7:8	male 78:16	medic 48:18
literally 76:7	LSU 52:15	Mali 72:20,21	medical 48:12 89:24
litigation 77:13	lumped 46:4	man 48:16	medicine 7:3 34:17
live 24:8 25:3 43:2 45:24 46:2 54:23 62:11 65:11 66:1 72:7 75:1,18 84:6	lunch 71:15	manage 8:5	medics 48:22
lived 61:21 72:21	Lynch 53:5,6 55:21	manager 74:9	meeting 4:4 13:15 15:10 17:12,16 21:20 22:9 37:16 67:8,12,23 70:17 90:11
lives 20:5 33:4 35:1	M	managing 8:19	meetings 13:15 16:1 85:1,2
living 75:17	machine 69:15	Manchin 22:23 24:8 25:19 26:1,6,11	meets 42:10
Liz 5:11	machinist 69:12,15	Manchin's 24:6	member 22:22 26:6 30:18 50:19 63:3 81:7
local 20:15 25:13 28:5 29:3,9,18 35:18 44:11 45:5 46:15 48:15,18,19 49:22 50:16 51:19 53:1 74:3 75:23	machinists 48:2	manner 10:20	members 6:5 26:17 33:13 49:7,12,20 58:11 71:7 75:2,6,20
locally 35:14	Maddalena 50:18	March 7:18	memberships 69:9
located 66:11	made 4:16 6:5 11:20 25:7 27:14 28:10 40:9,12 43:7 68:21	Marganian 64:1, 2	memorandum 14:14
location 57:23	magic 81:4,9 82:4,8 83:3	Mark 36:16,18	men 22:9 32:23 55:17
locations 58:23	magical 80:15 83:23 85:22 87:15 88:19	market 45:5	mention 4:9 13:11 48:11,14 49:5,14
loft 62:15	mail 17:5,6	Marlinton 46:23 67:24 68:4,18 74:10	mentioned 12:10 15:7 28:2 33:17 48:11 50:5 85:7
logistics 4:8	main 12:9 50:3	Mars 50:13 69:21,23	mentor 55:21
long 8:14,22 22:13 52:8 61:18 63:23 77:12	maintain 26:12	Mars' 43:23	mentorships 63:3
looked 71:8 85:10	majestic 80:19	marvelous 87:15 88:11	merits 12:20
lose 19:10 52:23	major 34:19 61:16	Mason 18:13	met 37:1,3
losing 28:4 46:19	majority 49:19	mass 51:9	methodology 83:14
loss 29:15 45:11,13,21,23	make 14:16 16:20 18:19 21:3,10,12 22:9,20 26:2 41:10 44:14 47:11 52:7 53:7 64:23 71:8 84:21	Massanutten 55:4	methods 82:2
losses 44:13 46:18		math 57:24 69:17 70:3 82:23	Metropolitan 72:23
lost 46:16		mathematics 32:4 34:3	Michelle 5:16
		matter 75:5 81:3	
		matters 11:9	
		Maury 59:14,15	
		Mcdonough 5:16	
		Mcmurdo 85:20	
		means 14:20 38:20 47:1 50:1 56:21 58:2 71:14,16	
		measure 23:20	

microcosm 51:18	month 8:7 40:3	41:2,5 52:24	NRAO 8:2,3 25:5
microphone 17:22	monuments 39:15	57:4,5 62:21	49:10,20 50:2
mid-1980s 42:11	moon 59:21,22	63:10 75:22	51:5
middle 56:8	Moore 21:15	80:10 88:9	NSF 5:22 6:8
68:4,18 81:19	24:3	nationally	7:7,9 9:20,22
84:9 89:9	Moorefield	13:23 14:5,9,	10:11 11:20
midst 83:16	24:10	11 43:17	14:24 16:14
midterm 7:4	Morgantown	native 50:15	17:5 35:6
mile 63:18	84:16	nature 39:13	45:14 50:1,3
miles 24:9 44:3	mothball 39:17	79:16	56:9 77:1
49:16 72:7	mothballing	NBC 66:22	79:24 83:22
militia 63:21	10:19	nearby 60:5	NSF's 6:2
million 8:13,	mother 62:10	necessarily	NSF-FUNDED
16,24 9:4	mountain 43:4	30:8 46:10	10:16
20:15,17	mountainous	54:13	NSF.GOV/AST
25:12,16 28:2	19:15	needed 6:13	13:12 17:12
31:9 41:6	mountains 80:19	44:13	nuclei 55:10
56:20	move 45:3 51:4	negatively	nudist 40:16
mind 40:9 88:2	70:22	54:11	number 9:20
minds 40:12	moved 30:18	neighbor 74:18	10:14 16:4
81:10	movement 50:5	neighbors 59:16	32:5 44:18
Minnesota 73:8	moving 9:16	nephew 73:7	45:24 62:10
minority 77:23	15:11 50:5	nephews 73:4	66:14,21 87:12
81:21	68:19,22	network 50:7	numbers 46:2
Minter 72:20,21	multiple 82:18	news 4:11 9:11	62:16
88:23,24	municipality	nice 8:8 58:6,	
minute 67:18	46:7	10 86:9,10	
76:8	mystery 86:15	88:14	
minutes 18:2		nickname 24:18,	
36:7 37:13	N	19	
47:4 53:2		nieces 73:3	
72:16 74:5	NANOGRAV 9:13	night 88:11	O'NEIL 4:6
mispronounced	Nanoherzt 9:12	nights 87:16	observatories
48:6	Naomi 78:7 83:8	Nobel 55:14	32:13 61:22
mission 59:21	NASA 50:14 51:2	noise 66:17	observatory 4:6
61:5	nation 22:19	nominal 45:19	5:9 7:21 8:3,
missions 50:14	23:24 33:14	51:8	5,11,14,15,21,
Mississippi	52:11,21 54:4	nonprofit 61:5	22 9:5,7,9,24
52:16	64:8 87:14	70:19	10:2,3 11:24
mobile 42:16	nation's 33:14	North 9:12	14:4 18:21
moment 4:5	national 5:8,	Northern 65:12	19:3 20:4,16
12:12	20,22 6:3,16	note 17:1	21:5,24 22:11
money 29:2,5	7:2,16,19,21	noted 35:16	23:2 24:13,16
41:21 50:2	8:1,6,23 9:6,	notice 35:3	25:23 30:24
51:10 52:4	15 11:8,16	noticed 14:15	31:7,21 32:19
62:2,3 73:18	13:19 16:17	61:11	34:5 35:14,17,
Monroe 59:16	17:18 18:24	notify 14:18	21,23 36:12
60:2,5,19,21	21:22 23:10	90:24	37:7,16 38:2,
61:3,8,13,15	25:21 26:8,12	November 12:5	6,21,22,24
	28:8 30:22,24	15:9 17:5 18:6	39:6,7,9 40:5,
	31:3 40:9		15 41:16,22
			42:22 44:10,17
			46:17,19,21
			47:14 48:12,
			17,20,21 49:2,

<p>8,13 50:4 51:18,19 55:2, 6,8 57:1 61:18 62:13 63:5,11, 12,19 64:4,15 68:11 69:6,10, 15 71:4,23 74:14,17,22,24 75:7,22,23 77:2,4 78:8 79:3,24 80:11, 20 82:7,15,21 83:5,16 89:1</p> <p>Observatory's 4:16 20:14 77:7</p> <p>observe 33:22 observing 82:20 occasions 68:10 October 7:24 12:13 15:8 offer 54:15 58:1,3,8,19 offered 51:6 offers 45:17 office 5:13 13:22 21:9,15 24:6 35:4 officer 5:8 47:14 oftentimes 33:8 Ohio 43:4 85:19 older 60:1 on-line 32:22 59:12 one-half 63:18 one-third 42:12 ongoing 6:11 13:13 open 5:4 55:1 62:1 78:18 opened 32:2 55:21 opens 76:8 opera 46:24 74:9,10,13,21 75:8,21 76:3,7 operate 57:19 81:11 87:6 operating 9:2 65:13 81:8,16</p>	<p>87:4 88:18 operation 6:12 7:12 10:18 22:13 46:14 77:1 87:13 operational 11:23 62:1 operations 10:5,12,15,20, 21 44:13,20 74:9 operative 55:1 opportunities 6:19 20:2 36:13 58:4 62:22 76:2 77:9,15,19 89:14 opportunity 19:20,23 35:6 36:8 41:9,13 50:17 55:16 67:17 68:6 72:9,18 76:24 80:9 81:15,17, 24 82:8 84:22 90:18 opposed 30:7 optical 43:12, 13 73:23 87:14 option 54:18 56:5 76:12 77:2 options 21:3 36:14 40:24 41:1,3 47:12, 19 59:18 64:4, 21 65:7 73:13 oral 17:20 18:5 order 6:10 69:4 Oregon 82:10 organization 8:20 42:8,20 49:6 61:5 87:5 organizations 23:15 organize 75:10 ornament 68:15 out-of-state 62:17 out-of-the-way 83:17</p>	<p>outpouring 21:2 outreach 34:24 41:16 42:15,22 overlook 23:21 oversee 11:9 overview 32:23</p> <hr/> <p style="text-align: center;">P</p> <hr/> <p>p.m. 15:10 pages 17:3 38:7,8 paid 49:16 50:24 pales 37:6,8 paper 82:12 papers 42:13 paramedic 49:17 parents 56:13 61:19 park 10:18 39:10 Parkersburg 43:2 part 4:18 5:2 9:5,8 17:17 20:23 28:22 29:23 31:6,17 33:7 47:16,24 51:13 58:12,15 64:10 73:22 74:18 75:8 84:22 86:19 participant 70:3 participants 33:13 participate 19:19 36:8 47:21 75:19 77:12 81:21 82:1 90:19 participated 34:10 participating 14:21 16:19 75:4 81:7 participation 34:1 particulate 17:2</p>	<p>parties 10:15, 17 13:21 14:14 partner 23:10, 14 55:3 71:5, 10,22 partners 22:22 partnership 72:9 87:10 parts 76:4 party 14:20 87:6,14 past 6:3 7:13 49:14 path 7:24 32:3 pathway 71:19 pathways 72:6 patience 70:14 72:14 Paul 64:1,2 Paula 65:11 pay 58:5 PBS 57:7 peace 80:24 Peak 10:3 Pearce 5:14 Peggy 24:5,7 pennies 52:22 Pennsylvania 36:20,22 Pentecost 5:11 17:18 18:8 21:8 24:5 26:22 27:13 30:3 36:1,5, 10,16 39:24 41:8 42:24 44:8 47:6 48:5 50:9 51:23 53:5 54:20 56:6 59:14 61:1 62:5 64:1 65:9 67:21 70:10,13 72:12,18 73:19 74:7 76:16,20 80:2 83:24 86:23 88:23 people 5:18 9:3 17:23 20:10 22:15 25:6 27:9 28:5,13</p>
---	--	--	---

<p>29:9,16 36:2 37:2 38:3,5 39:21 43:16 44:4 45:21 46:2 47:8 49:3,7,9 51:5 53:1 58:13 60:13,19 62:18 63:14 66:14,21 67:9,16 68:20 69:5 70:21,22 71:20 72:15 74:12,24 75:14,15,17 76:3,13 78:4 84:2,18,19 85:3 87:8,12, 19 88:7 90:17</p> <p>percent 7:17 9:4 34:11,14, 15 45:19,23 53:18 56:14 66:1 71:14 72:2</p> <p>percentage 37:19 53:19</p> <p>perfectly 4:12 21:3</p> <p>performance 74:21 75:24</p> <p>performances 75:9</p> <p>performers 75:10</p> <p>performing 74:11,20 76:1</p> <p>period 12:3 13:9 15:24</p> <p>permanent 45:17 50:19</p> <p>person 21:8 22:4 24:5 26:22 36:18 38:20 39:16 72:20</p> <p>personal 51:3 67:4</p> <p>personally 51:18 64:5</p> <p>personnel 45:10 71:8</p>	<p>perspective 34:14</p> <p>Ph.d. 32:9,11 43:19 83:8</p> <p>Ph.d.s 78:9</p> <p>phenomenal 34:6</p> <p>Philadelphia 36:20</p> <p>philanthropic 28:6</p> <p>phones 57:13</p> <p>Physicists 77:22 81:22</p> <p>physics 30:16 31:1,4,6,12 32:6 34:19 36:21</p> <p>pick 63:16</p> <p>picking 29:16</p> <p>picture 69:21 89:5</p> <p>piece 27:2</p> <p>pilot 72:2</p> <p>pin 80:21</p> <p>PING 77:22</p> <p>pioneer 60:15</p> <p>pipeline 32:10</p> <p>PIRE 30:22</p> <p>place 19:3 37:17 42:21 43:7,8 52:12, 23 53:22 59:1 60:17 61:20,23 63:15 71:13 74:3 75:14,15, 16 76:11 80:15 81:16 85:5,20, 22 87:8</p> <p>places 44:1</p> <p>plan 23:4 34:15,16 39:6</p> <p>planet 79:9 89:5</p> <p>planetary 43:22 50:11 78:10 83:7</p> <p>planets 50:13</p> <p>planning 8:17</p> <p>plans 9:15 40:19</p>	<p>plant 52:15</p> <p>plate 62:16,17</p> <p>play 57:15 58:15</p> <p>playing 47:24 79:3</p> <p>plays 24:10</p> <p>pleasure 22:6</p> <p>Pluto 43:24</p> <p>Pocahontas 18:14,15 19:15 20:8 22:1 24:10 27:22 28:11,14 29:4, 14 30:1 35:15 50:15 51:4 52:1 53:23 61:10,14 62:24 63:16,20 65:11,12 68:3 70:5 74:9,13 75:1,21 76:11</p> <p>point 11:3 31:3 34:21 37:12 47:11 90:22</p> <p>poised 38:18</p> <p>policies 16:13</p> <p>policy 11:17 71:8</p> <p>pollution 60:11 66:17</p> <p>pool 58:9</p> <p>population 29:8 45:8,11,22,23 46:7 56:14</p> <p>porch 62:8</p> <p>portfolio 6:3, 16,17 7:5,9</p> <p>portion 17:15</p> <p>pose 62:19</p> <p>position 19:11 51:6,7,9</p> <p>positions 32:12,14 45:18</p> <p>positive 75:5</p> <p>post-secondary 34:16</p> <p>posted 13:14 17:11,13 59:12</p> <p>potential 11:19,22 13:22</p>	<p>14:3,6 27:21 31:12 33:6 35:8 45:11 86:19</p> <p>potentially 44:22,24</p> <p>Powerpoint 17:10</p> <p>preach 52:2</p> <p>preacher 52:4</p> <p>preaching 52:8</p> <p>predict 45:9</p> <p>preliminarily 13:1</p> <p>preliminary 4:24 10:4,7</p> <p>premiere 42:8</p> <p>prepare 11:21 13:7 15:14 16:1</p> <p>prepared 27:19 45:3</p> <p>preparing 90:21</p> <p>presence 4:20 62:21 63:23</p> <p>present 49:21 74:23</p> <p>presentation 11:3 17:10 69:21 82:13 90:13</p> <p>presentations 37:14</p> <p>presented 23:5</p> <p>presenting 76:1</p> <p>preservation 13:19,22 16:17 61:6,7</p> <p>preserve 56:4</p> <p>preserved 18:20</p> <p>president 30:5 61:4 87:1</p> <p>President's 8:12,15 9:1</p> <p>Prestage 77:14 82:11</p> <p>pretending 47:23</p> <p>previous 9:6,17 85:22</p>
---	--	---	---

previously 32:4	48:3 53:10,16	publicity 57:5	quickly 7:14
price 71:15	71:23 77:11	published 7:3	quiet 28:8,23
pride 25:3	84:8	8:1,18 15:22	62:12,14 66:22
34:21	programmers	84:19	80:19 83:17
priest 52:1,13	63:7	publishing 16:2	88:20
primarily 66:3	programming	pull 28:3 62:18	quietly 80:23
primary 65:16	63:8 84:11	pulling 56:16	quote 7:6
principal 40:17	programs 19:19,	pulpit 52:2	
56:7 68:2,4	22 47:15,17,20	pulsar 32:17,24	<hr/> R <hr/>
prior 33:9 68:3	58:4 71:13	33:1,9,21	radio 6:22 7:21
private 20:13	73:6 77:11,20	47:17 81:2,18	9:6 19:4,11
23:17 54:15	78:14 81:23	85:6	28:8,10 38:15
privilege 27:1	88:14,16 89:8,	pulsars 19:6,21	40:22 42:6,8,9
89:16 90:2,7	9,11,22	21:11 31:12	43:13 62:11
privileged	project 9:13	32:20 33:11	63:10 75:22
88:24	20:23 77:13	43:19 55:13	77:10,12
prize 55:14	projects 59:6	85:12	79:14,19 83:17
problem 82:2	68:20 78:8	punch-line 65:5	84:24 85:4
problems 29:21	promise 22:19	purchased 41:24	87:14 88:4,10,
31:5	promote 35:7	pure 39:9	20
proceed 7:7	promotion 11:7	purposes 8:17	radios 59:4,5
proceedings	properties	pursue 33:8	raise 51:11
42:6,7,12	13:24 14:5,11	34:16 77:16	raised 21:13
process 4:18,19	proposal 4:24	78:6,9,15	ran 88:10
5:4 9:23 10:10	8:20 35:11	82:14,22	range 11:2
11:5,12,13	proposed 10:5	pursuing 32:7	12:22
12:1,2,3,14,	11:14,20,23	put 25:1 47:18	reached 51:5
18,19 13:18,20	12:9,22 13:23	68:12 81:16	79:12
14:1,2,6,21,23	15:2,15 29:23	90:16	read 4:11 21:18
15:8,17 16:2,	38:12 46:6	PYTHON 84:8	38:7,9 44:16
6,10,19,20	protocol 82:13		59:17
17:4,14 23:3	proud 57:17	<hr/> Q <hr/>	readily 83:13
26:3,16 82:19	63:12 64:12	qualitatively	reads 44:18
processes 10:1	74:1,4 75:17	45:11 46:8	45:9 46:5
processing	provide 16:22	quality 13:3	ready 90:22,24
32:14	17:20,22 18:5	35:15,22	reaffirmed 7:5
produce 90:5	35:18,21 36:6	quantifiable	real 34:20 45:5
produced 86:9	50:1,3 80:10	23:18 46:18	75:4 81:12
product 46:11	83:23	quantified	85:9 86:4
profession 27:5	provided 7:17	45:14 46:8	realize 33:16
professional	31:11 34:24	quantifying	61:17 67:9
27:6 45:2	36:12 77:8	45:13	realized 53:22
48:1,2 54:6	providing 27:12	quantitatively	reason 19:4
71:19	71:6	46:5	28:12 35:10
professors	public 4:4,17	quest 32:20	47:19,20
84:15	5:5,14 9:24	33:1 73:22	reasons 9:16
profoundly 33:4	12:3,6 13:16	87:7,21	29:22 51:3
34:22 55:2	15:9,20,24	questions 57:9	79:21
program 5:8	16:1 17:15,17	quick 42:4	rec 58:10
7:11 32:10	21:12 39:11	45:16 86:4	
34:1,11 43:21	51:12 80:9		
	86:5		

recall 31:14	regional 24:8	requested 7:22	Restricted
receive 15:20	55:4 70:19	requests 42:15	55:24
65:3 79:24	regionally 35:1	required 15:1	result 11:16
87:9	register 13:10	requires 11:18	15:17,19 28:11
received 6:4	80:9	13:20	29:15,18 34:8
16:5 27:13	registered 27:6	rescue 49:21,22	resulting 7:15
50:22	regret 21:21	research 5:23	results 6:13
receiving 50:24	regular 17:6	6:6 19:13,24	52:17 81:13
81:6	regulations	22:12,14,18	resume 10:21
recent 20:21	40:11	30:5,8,23	retention 72:2
recently 35:5	related 34:17	31:2,10 32:24	retire 45:3
38:17 49:1	relationship	33:10 36:24	retired 41:12
recess 72:13	65:23	37:5 39:14	reveal 39:18
recipient 62:24	relatives 57:11	45:1 47:22	review 6:4,9,
recite 22:3	release 6:11	50:17 51:2,16	15,17,20 7:10
reclaim 19:12	relevant 12:16	54:3 55:3	8:19,20 15:12
recognize 23:5	relocate 45:10	64:12,16 65:3	26:15
26:17 35:8	56:17	74:2 78:1	reviewing
58:13	relocates	79:9,15 82:12	90:11,21
recognizing	44:22,24	83:14	reviews 7:5
23:11	rely 54:4	researcher	rewarding 78:19
recommend 32:21	remains 55:1	50:20	Richard 77:14
54:18	remember 33:17	researchers	82:11
recommendation	61:19 67:1	22:16,18 24:1	Ricky 56:6,7
7:5	90:20	40:4	59:11
recommendations	remove 29:2	resident 40:2	ride 70:16
7:9 9:18	removing 29:1	62:7 73:21	RII 35:6
recommended	renamed 8:3	residents 18:15	Riley 67:20,21,
6:15,20	30:15	resolution 9:3	22 68:2 70:13,
reconnecting	repairing 59:4	resolve 14:13	14,18
23:1	repairs 59:3	resource 5:1	River 43:4
record 16:8,9,	report 6:15 7:7	12:11,23 13:1	road 49:24
15 17:17 27:12	reporter 17:16	15:19 77:5	62:9,16 80:20
47:18 80:9	67:14	resources 13:3,	robbed 55:14
redone 38:23	reporters 57:7	4,6 14:7,8,12	Robert 41:2
reduce 9:20	reports 6:15	54:13 55:24	62:5,6
23:6	37:20 41:22	56:1 60:8,11	robust 22:14
reduced 10:16	represent 27:23	71:9 86:19	rocket 89:4
71:15	37:21	respectfully	Rocks 70:18
reduction 51:20	represented	66:4	Rodney 73:19,20
54:11	80:18	responded 49:15	role 5:19 6:2
refer 40:24	representing	26:7	50:3 53:9
reflect 79:5	49:9 81:20	responsible	64:24 79:3
80:21	represents 9:4	23:10	roles 35:18
reflective	49:6	rest 4:22	rolling 41:3,4
71:13	reputation	28:18,20 53:8,	Ron 50:18
regain 82:1	31:11	19 54:8,10	room 84:10
region 25:7,24	request 8:12,15	66:17 76:4	rooted 56:10
27:22 53:23	9:1 14:19	restoration	roughly 15:22
77:9	41:21 66:4	11:1	17:23 34:11,17

round 20:11	84:9 88:13	48:1 50:12	separated 7:20
Rousnyder 83:24	schools 33:19	51:16 55:3,19	8:2
84:1 86:18	50:16 51:13	65:20 66:13	sequences 68:16
Rouwe 5:16	56:16 58:3	78:12,19,24	series 74:21
rumors 40:15	74:20 89:9,10	79:1 81:21	75:24
run 30:8 68:13	science 5:8,20	83:4 90:5	serve 5:20 27:7
71:13	6:1,3,13,16,24	scope 10:16	32:12 35:4
runs 84:12	7:16,19 8:2,6,	12:7 56:14	39:11 71:11,
rural 33:5 35:2	23 9:15 11:8	scoping 4:4	14,15,16
54:24 56:4	12:20 17:18	12:3,14 15:8	service 15:4,5
58:21,22 72:4	18:24 19:23	scouting 84:4	35:19 49:17,
77:6 78:5	20:24 21:6,22	screen 58:8	19,23,24
83:17	22:18 23:10	search 32:17	services 46:19
Ryan 53:5,6	25:21 26:8,12	44:22 47:17	48:12 49:6
55:21	27:4,9,10	81:18 85:7	50:4
<hr/>	30:22,24 31:3	searching 79:10	servicing 58:17
s	32:3 33:3,8,16	season 20:11	set 4:8 12:1
<hr/>	34:2 35:4,8	seasonal 20:12	Seth 43:18
Sacramento 10:2	37:10 39:10,19	45:18	settled 65:15
sacrifices 25:7	40:9 41:2,5,15	seats 70:2	shake 28:16
safety 13:5	42:22 44:20	secondary 46:9	shaped 12:8
48:10 58:20	50:19 51:20	secret 81:2	share 26:4
59:4	52:14,15,16,24	section 9:23	shared 88:12
sale 45:6	55:5,20 56:4	13:19 14:8,21	sharing 46:20
SARA 42:17	57:5,24 58:17	16:18 44:16	71:9
43:12	60:1,2,4,23	45:8,12 46:3,	Sharp 56:6,7
Sarah 70:13,14,	64:12,16 65:1,	12	59:11
17	2,19 68:10,19,	secured 30:20	sheet 17:3,8
sat 62:7	21 69:1,5,12	seek 9:13	Sheets 39:24
satisfied 83:19	72:6 73:10,11,	sees 86:13	40:1,2 62:5,6
satisfying	12 75:3 77:7	select 16:10	Shelley 21:15
81:12	78:2,10 79:8	selected 35:5	24:2
Savannah 54:20,	80:10 81:6	selfie 62:19	shift 16:4
21 73:1	82:14,23 83:7	seminar 54:23	shining 20:19
save 52:22	84:14 87:24	senator 21:9,14	77:21
scenario 44:12	88:9,10 89:2,	22:22 24:2,6,	ship 89:4
schedules 26:2	6,12,13,14,20,	8,12,14 25:5,	shop 69:15
Scholars 77:11	21	19 26:1,6,11,	short 41:10
scholarships	science- 10:11,	22,24 27:8	shorter 6:23
50:24 63:1	15	35:16 56:23	shortsighted
school 29:7,9,	sciences 5:7,10	Senatorial	52:22
10 40:14,19,21	6:16 7:3 43:23	27:22	Shostak 43:18
50:17 54:23	scientific 7:8,	send 12:6 48:13	show 86:10
55:5 56:8,12,	10 16:13 22:12	72:18	shown 21:2
17,18 57:17,	26:15 27:3	senior 6:9	shows 8:16
22,23 58:22	33:7 50:22	seniors 69:10	Shrader 61:1,2,
59:5 62:24	79:4,23 83:18	sense 34:5	3
63:4,9 68:3,4,	scientist 44:6	64:23	shut 55:15
18,23 70:5	50:11 53:7	senses 80:16	shutting 88:3
73:5 78:8 79:2	scientists	sensitive 6:22	
81:17,20 83:15	19:12,13 20:7	66:16	
	23:24 31:15		
	40:4 47:23		

side 69:13	slide 16:16	speaks 62:20,21	starting 77:10
sides 25:2	slip 39:19	special 19:3	starts 12:2
sign 62:20 81:3	slowly 39:19	53:22	67:13
signal 32:14	small 44:1,2	species 14:24	state 13:21
signed 14:15,16	61:19 66:5	15:3 16:21	18:17 19:2,17
36:2 90:23	67:4	60:10	20:18 30:1
significance	smart 86:3	specific 6:1	31:9,11 34:22,
14:7 23:2	smile 28:16	specifically	24 35:3,7
significant	soccer 46:24	41:15 72:5	36:12,15 51:20
13:23 14:5,9,	social 35:17	spectrum 31:18	52:16 61:19
11 30:21 32:16	57:24 58:18	spend 34:4	62:3 68:21
45:4 61:13	society 27:9,11	spent 23:9	76:4 77:9
significantly	42:6 57:21	spiral 86:11	79:22
33:3	84:24 87:11	spoke 73:1	stated 6:8,21
signs 33:21	socioeconomic	sponsored 46:13	statement 4:4
silent 39:14	13:5 30:7	sponsors 75:23	5:2,3 9:23
similar 10:1	44:11 53:13	spouse 49:10	10:4 11:22
78:22	54:8 56:1	spouses 48:22	12:8,15 13:3,8
simple 62:13	63:10 71:3	49:20 50:2,6	15:14 19:9
simply 14:20	socioeconomically	spring 15:23	21:18 27:18
20:3 21:4	51:21	90:22	29:24 54:17
35:22 80:16	socioeconomics	squad 49:19	90:22
single 58:14	44:16	squads 49:10,	statements
73:4 79:17	software 33:20	15,18	27:19
single-dish	64:3	square 44:2,3	States 19:4,10
6:22	soil 52:15	staff 24:14	22:12 53:24
sister 62:15	solid 13:4	26:18 31:20	79:22
sit 57:17 62:15	solve 83:2	32:12 35:17,21	stationed 63:21
84:17,18	solving 82:2	37:2 38:5	statistical
site 8:3 10:24	son 82:5,17	50:19 51:21	82:12
39:10 42:15	86:6	53:6 58:11	statistics 22:5
50:1 58:23	sound 46:23	77:7 81:7 86:1	stats 22:2
59:8 62:1	52:7	staffed 51:16	status 25:2
63:19,22 64:19	source 61:16	stage 75:10	statute 11:18
83:7	62:2	stand 55:19	stay 45:21
site's 7:17	sources 9:14	standpoint	65:21 66:12,
sitting 5:17	South 38:3	68:23	13,14,19 70:6
64:17 70:2	Southern 29:15	stands 62:2	76:17
90:3	space 50:14	star 19:6 73:22	stayed 66:23,24
Sizemore 50:9,	spawning 79:13	87:6,7,14,21	staying 65:18
10,11 69:20	speak 11:12	staring 64:22	90:10
78:7 83:6	25:20 60:19	stars 23:22	steady 65:17
skies 20:24	71:7 76:24	89:4	steerable 79:17
skill 57:20	88:1,6	start 5:19	88:4
skills 32:13	speaker 36:16	15:24 29:1,13	STEM 34:16,23
33:12 35:9	47:9 67:18	80:15 90:11	48:3 54:6
82:13 83:14	76:18	started 4:10	55:1,16 69:4
skip 39:3 41:8,	speakers 43:17	15:8 29:12	72:1 77:17,18
9	87:16,17	48:18,19 78:4	78:6 81:7 84:4
Skynet 77:11	Speaking 39:6	90:13	89:7
	66:12		STEM- 34:16

STEM-TYPE 73:5	24 75:6 77:19,	23:6 29:5,22	40:4 43:19
step 23:4 67:22	23 78:9,19	30:1 31:9 38:4	49:3 56:20
steps 14:1 56:9 65:8	81:5,17,20,24	45:15 51:8	61:23
stewards 5:21	82:21 83:15,19	52:23 61:17	target 15:7
stewardship 6:2	85:8,9 88:12, 13,14	62:1 68:22	16:4
stick 72:16	studied 5:2	77:1 80:10	taught 48:23,24
stole 65:5	12:12,24	87:11	49:2 60:3
stood 61:20	studies 57:24	supporting	62:23 63:6
stop 39:20	58:18	22:14	tax 56:15,18
62:18 67:12	study 11:21	supposed 37:10	Taylor 35:3
stories 22:4	23:4,19,20	67:23	86:23,24
78:4	31:12,13 38:20	surprised	teach 36:21
stress 53:11	50:13 55:9	74:12,14	77:15
stroll 81:1	56:3 82:16	surrounding	teacher 52:14
strong 77:1	studying 69:22	25:24	60:2,3 88:8
80:9	stuff 43:13	survey 6:7,24	teachers 19:18
strongly 26:11	60:16 73:11	7:4 78:11	24:1 32:19
39:8 54:16	84:12 85:14	83:10	33:1 68:7 69:3
61:8	86:14	suspension	82:3
structure 22:4	submission	10:20	Teaches 60:2
79:17	16:14 47:3	sustaining 7:10	teaching 82:3
structures	submit 16:22,23	symbol 25:1	86:4
29:17,19	17:6 49:11	system 56:22	team 4:22 21:22
struggles 57:1	53:8 59:10	81:2	tear 62:9
struggling	76:20	systems 43:23	tearing 39:15
56:18 69:3	submitted 59:11	56:18	Tech 82:10
82:3	80:12		technical 75:9
stuck 57:12	succeed 55:16	T	76:5
student 31:22	successful	table 68:13	technicians
39:7 50:17	35:11 78:10	Taekwondo 46:23	48:2
53:10,16 54:22	sudden 28:4	takes 16:2 74:2	technological
55:12 56:14	Sue 47:6,11,13	taking 14:23	12:4 63:5
77:6 82:9	68:5 86:7	25:13 26:1	80:17
student's 58:15	suffer 29:8	80:19 90:20	technologies
students 19:17,	suffered 28:11	talented 77:13	57:2 79:14
18,19,22,24	suffering 28:18	talents 83:2	technology
20:1,5 22:17	suggest 12:11	talk 5:3 22:10,	10:18 27:4
23:23 26:19	summarize 7:14	11 27:2 28:13,	32:3 33:8
31:24 32:5,7,	53:8,15	16 30:6 37:10	34:2,23 35:4,
9,19 33:1,3,6	summarized 9:18	44:11 52:3	5,8 39:11 40:6
34:2,10,12,14,	summer 53:10,	56:15 57:13,22	55:5 57:19
18 35:2 40:18	15,16 54:2	58:11,20 60:7,	65:1,19 66:11
43:20 47:21	55:9 77:12	13 64:6,7 65:6	77:4 82:23
48:23 49:4,10	81:22	69:16 71:2	techs 63:5
53:17,20 54:2,	sun 80:21	73:2,13	telephones
3,12 56:1,12,	superintendent	talked 29:12	28:15
16,24 57:4,9,	67:24	56:23 63:14	telescope 6:20,
10,17 58:2,7	supplement 18:4	68:5 69:21	22 7:20 19:5
59:2 60:4 63:2	support 6:10	talking 5:19	24:19 25:1
68:6,20 71:17,	21:5,16 22:24	24:21 29:1,12	34:7,21 35:21,
			23 36:24 37:5

40:22 41:7,14, 23,24 54:14 59:24 66:10 73:9,10 81:8 84:14 86:5,8 87:20 88:4,10 telescopes 5:23 6:12 9:21 42:14 80:18, 22,23 89:11,13 Television 57:7 telling 69:24 ten 6:23 32:9 36:23 37:1 42:7 45:19 65:12 66:1,18 ten-minute 72:12 term 66:15 terms 30:10 34:11 35:18 40:4 testament 78:13 thereof 46:11 thing 4:9 24:20,22 26:21 49:14 58:10 59:24 66:20 68:23 70:1 73:3 85:6,8 things 4:10,11, 13,15 8:9 10:8 12:9,20 16:4, 14 28:17 29:14 30:8 40:7,17 44:18 48:8,19 58:21 60:18 69:13 73:1 84:13,21 85:18 86:2 89:19 thinking 23:14 72:4 thought 59:19 thoughts 12:22 thousand 49:16 thousands 22:16 81:24 threatened 15:2 three-and-a-half 43:3 three-year-old 89:3 90:3	threw 24:11 thrives 28:7 83:21 tidbit 63:13 tied 54:17 ties 49:12 time 10:22 13:18 18:3 19:14 20:12 24:4,20 26:1 30:21 32:6 34:4 36:2,7 40:16,20,21,23 41:21 42:10 44:22 47:4 48:16 52:8 54:14 57:6,10, 11 58:17 59:20 63:8,23 64:10, 14 65:14 68:11 70:24 75:8 76:1,6 78:3,18 80:14 85:23 86:13 89:18 90:10 Times 63:16 titled 6:7,18 today 4:13 9:14,17,19 10:3,13 16:23, 24 17:11 21:2, 17 24:13 40:12 52:2 55:4 56:5 60:20 61:11 63:16 75:13 76:24 90:14 today's 21:20 27:11 57:19,21 Tom 49:8 tomorrow 23:2 25:19 tonight 15:10 toothbrush 68:11 top 84:19 top-of-the-line 79:7 topic 52:3 topics 35:5 total 8:13 45:23	touched 77:19 tourism 20:16 61:16,18,24 62:2,3 65:16 66:3 tourists 65:18 66:13 trace 49:20 Tracie 61:1,2,3 tracking 19:6 traditional 82:2 traffic 13:6 trained 87:19 training 39:8 49:20 50:21 69:2,10 86:6 transcribe 17:16 translate 32:13 translated 4:12 transportation 58:5 travel 58:4 traveled 18:16 traveling 49:16 treasure 86:22 treated 78:20 tremendous 77:5 78:13 79:11 82:19 90:7 tripled 32:7 trouble 39:20 trucks 25:2 48:17 true 33:24 76:5,9 truth 37:19 turn 11:3 25:18 44:6 82:24 turns 25:16 80:23 type 11:13 typed 15:16 types 12:20 typical 81:9 typically 14:14	<hr/> U <hr/> U-HAUL 24:24 U.S. 7:11 15:4 39:19 ultimately 16:10 50:23 51:1 unable 21:20 unacceptable 21:4 underestimate 63:9 undergoing 38:17 undergrad 43:21 undergraduate 31:24 32:6 72:1 82:9 undergraduates 81:15 underprivileged 20:1 34:13 underrepresented 34:12 underserved 35:2 77:23 understand 4:23 19:8 24:18,23 26:18 71:20 72:15 90:17 understanding 39:12 understands 25:22 undertaken 20:22 undertaking 73:24 unfillable 38:15 UNIDENTIFIED 47:9 67:18 76:18 Unincorporated 62:20 unique 22:8 60:9 79:16 81:13,23
--	---	---	---

uniquely 79:8	30:2,5 31:9	walk 66:8 80:20	70:21 71:12,24
United 19:4,10	33:19 34:18,22	wanted 17:24	72:5 73:21
22:12 53:24	35:1,24 36:19	48:11,14 49:5	74:1,4,10 77:6
79:22	43:2,3,15	60:20 65:6	78:5 79:22
universities	48:15 53:21,24	74:16 80:5	86:22 87:2
8:4 32:12	54:24 61:15	85:21	88:19
42:16 54:3	62:7 64:7	wanting 22:17	whispering
university 9:12	70:21 71:12,24	68:24	80:21
23:15 26:18	72:5 73:21	Washington	White 80:2,3
30:6,9,12,14,	74:10 77:6	21:15 24:14	83:12
17 32:2,18	78:5 79:22	waste 13:4 23:6	wife 65:11
34:18 36:22	86:22 87:2	watch 68:12	Wildlife 15:4,5
83:10	88:19	watched 62:9	wireless 28:15
unpaid 51:7	Virginian 74:1	Watchman 60:21	57:2
unusual 11:13	Virginians	water 29:20	wires 68:12
78:22 79:17	21:19 22:15	61:6	wisdom 53:1,3
up-to-date	74:4	Watershed 61:7	wisely 23:9
79:11	visit 57:14	Waugh 73:19,20	woman 39:2
upgrades 38:16	61:9,12 65:18,	wave 9:13 31:2,	55:13,19
urge 54:16 87:3	21 80:14	15,18	women 22:9
USA 25:4	visited 22:7	wavelengths	53:19 55:1,16
usage 39:9	visitors 25:14	6:22	78:5,6 79:1
utter 82:8	39:17 65:17	waves 31:13	83:6
	66:6	ways 15:5 75:4	won 35:12 69:19
	visits 82:15	77:5 83:21	wonderful 18:22
	vital 87:4	website 13:12	19:2
	88:18	17:2,11,12,13	wonders 80:17
v	vitality 7:11	week 43:17 73:8	words 41:10
	voice 18:17	88:11	66:16
vacancies 44:21	26:2,9 76:24	weeklong 88:9	work 19:1
Valley 87:10	voices 18:19	weekly 69:6	21:14,16,23
valuable 78:1	74:19	weeks 22:6	22:9 31:6,10
variety 32:13	volunteer	59:21	33:17 35:20
vehicle 62:19	41:11,14,18,	Weirton 21:14	41:13,17,18
vein 78:22	20,21 42:5	welcoming 5:18	42:2,5,20
verbal 16:23	46:19,21 49:18	welding 69:13	51:10 55:9
verify 33:22	84:2	Wes 24:15	56:13 60:23
versatile 79:8	volunteered	west 9:11 18:13	63:8 65:21,24
vested 37:4	76:6	19:2,22 20:8,	75:1,14,15
viable 12:10,22	volunteering	17 21:6,14,19,	82:9 84:3 85:9
36:14 41:1	58:16 63:8	24 22:15	87:20 89:11
73:13,15	volunteers	23:14,23 25:1,	90:7
vice 30:5 87:1	41:16 42:1,21	3,24 26:17	worked 30:12
video 58:8	46:22 71:6	27:7 29:15	43:21,23 68:14
view 32:22 55:6	76:7	30:1,5 31:9	78:8
village 48:3	voted 37:17	33:19 34:18,	workforce 29:8
Virgil 40:17		22,24 35:24	30:10 33:14
Virginia 9:11		36:19 43:2,3,	34:13,23 44:22
19:2,22 20:9,		14 48:15	45:10
17 21:6,14,24		53:21,23 61:15	working 15:13
23:15,24 25:1,		62:7 64:7	22:22 27:7
3,24 26:17			30:18 31:16,23
27:7,8 29:15			
	wage 35:14		
	wait 16:7 67:18		
	w		

38:22 41:11 43:21,22,24 47:22 50:18 51:2 69:14 72:3 84:3,11 89:19		
works 35:24 39:13 83:7,9		
workshop 88:10		
world 19:12 21:24 24:21 27:10 28:18,20 37:24 38:9,13 39:22 42:9 44:4 52:21 54:1,4 55:6,22 60:4 64:24 66:17 76:15 78:24 79:15,18 84:15 85:3 88:4,20		
world's 6:21		
world-class 51:16 78:1 87:24 90:5		
world-leading 39:9		
worlds 6:7 23:23		
worldwide 27:4		
worth 22:4		
wow 86:12,14		
wrap 86:16		
wrapped 16:15		
write 23:3 62:16		
writing 53:8 90:16		
written 16:23, 24 18:6 36:6 37:15 42:13 47:3 59:10,12 80:12		
wrong 65:8		
wrongfully 55:14		
WVU 31:20 43:19,21		
	<hr/> X <hr/>	
	Xinxiang 64:18	
	<hr/> Y <hr/>	
	year 7:2,16,24 8:11,17,22,23, 24 19:17 25:15 30:24 42:10,17 49:15 64:14 66:3 68:14 69:18 73:8 77:21 85:2,9 87:7,21	
	year- 20:10	
	years 7:13 30:12 36:11,23 37:1 41:11 42:7 50:8 51:3 52:14 53:17,18 59:21 61:21 62:23 65:13 70:22,23 72:1, 22 73:23 75:24 79:24 80:6 87:11 88:8	
	yield 81:14,19	
	yoga 46:22	
	young 40:21 55:13,19 60:23 70:21,22 72:24 77:6 78:4,15 81:5,10 84:9	
	youngest 73:5	
	youngsters 89:20	
	<hr/> Z <hr/>	
	zone 28:8 62:12 66:22 83:17 88:20	
	Zumba 46:22	