NATIONAL RADIO ASTRONOMY OBSERVATORY

(GREEN BANK OBSERVATORY)

EIS PUBLIC SCOPING MEETING - NUMBER 1

HELD AT THE

GREEN BANK SCIENCE CENTER

155 Observatory Road

Arbovale, West Virginia 24915

Wednesday, November 9, 2016

3:30 p.m.

IN ATTENDANCE:

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I N D E X

P R O C E E D I N G S

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

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

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

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

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

specific science investigations.

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

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

higher-ranked facilities."

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

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

October 1st of this year following the path that was

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

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

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

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

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

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

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

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

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

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

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

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

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

restoration.

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

I want to thank the National Science Foundation for

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

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

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

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

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

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

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

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

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

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

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

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

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

Pocahontas County.

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

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

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

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

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

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

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

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

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

Thank you for your time.

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

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

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

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

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

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

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

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

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

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

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

ELIZABETH PENTECOST: The next person is Senator Greg Boso.

SENATOR GREG BOSO: Good afternoon. I am Senator Greg

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

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

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

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

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

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

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

When we get to looking at the environmental impact if

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

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

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

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

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

ELIZABETH PENTECOST: Mr. Fred King.

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

As West Virginia works --

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

DR. FRED KING: I will conclude.

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

DR. FRED KING: Thank you.

ELIZABETH PENTECOST: Thank you so much.

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

ELIZABETH PENTECOST: The next speaker is Mark Devlin.

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

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

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

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

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

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

expensive.

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

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

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

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

ELIZABETH PENTECOST: Mr. Charles Sheets.

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

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

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

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

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

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

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

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

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

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

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

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

ELIZABETH PENTECOST: Mr. John Dennis.

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

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

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

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

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

ELIZABETH PENTECOST: Carla Beaudet.

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

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

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

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

A quick hand-waving estimate for you. The GBO currently has 108 permanent full-time employees, offers an additional 40 seasonal positions which all account for giving us a nominal 118. Maybe ten percent of those employees would choose and be able to find a way to stay in the area. That's a loss of 106 people from the Green Bank Arbovale area whose combined population in 2014 was 303, a loss of 34 percent of the total population. This number is probably inflated because we don't all live

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

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

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

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

that by no means is an exhaustive list.

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

CARLA BEAUDET: Okay. Thanks.

ELIZABETH PENTECOST: Sue Ann Heatherly.

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

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

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

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

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

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

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

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

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

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

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

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

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

ELIZABETH PENTECOST: Hanna Sizemore.

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

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

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

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

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

ELIZABETH PENTECOST: Father Arthur Bufogle.

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

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

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

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

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

ELIZABETH PENTECOST: Mr. Ryan Lynch.

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

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

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

whole world.

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

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

ELIZABETH PENTECOST: Ms. Savannah Horton.

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

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

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

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

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

Restricted funding harms cultural resources and

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

ELIZABETH PENTECOST: Ricky Sharp.

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

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

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

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

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

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

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

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

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

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

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

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

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

ELIZABETH PENTECOST: Maury Johnson.

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

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

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

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

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

ELIZABETH PENTECOST: Tracie Shrader Flack.

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

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

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

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

ELIZABETH PENTECOST: Robert Sheets.

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

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

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

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

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

ELIZABETH PENTECOST: Paul Marganian.

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

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

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

leaders in science and technology.

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

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

ELIZABETH PENTECOST: Larry Garretson.

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

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

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

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

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

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

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

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

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

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

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

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

JOSEPH RILEY: Joseph Riley.

ELIZABETH PENTECOST: Joseph Riley.

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

leave.

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

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

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

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

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

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

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

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

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

ELIZABETH PENTECOST: One more before the break.

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

ELIZABETH PENTECOST: Sarah Riley.

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

establishing their career.

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

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

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

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

ELIZABETH PENTECOST: We will take a ten-minute break.

(Recess was had.)

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

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

The next person is Mali Minter.

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

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

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

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

ELIZABETH PENTECOST: Rodney Waugh.

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

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

ELIZABETH PENTECOST: Brynn Kusic.

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

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

Green Bank Observatory makes it possible for people of

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

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

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

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

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

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

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

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

Erica Engquist.

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

from now.

ELIZABETH PENTECOST: Deanna White.

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

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

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

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

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

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

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

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

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

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

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

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

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

CAROLINE BLANCO: Excuse me.

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

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

ELIZABETH PENTECOST: Grayg Rousnyder.

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

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

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

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

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

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

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

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

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

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

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

ELIZABETH PENTECOST: John Taylor.

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

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

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

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

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

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

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

ELIZABETH PENTECOST: Anthony Minter.

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

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

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

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

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

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

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

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

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

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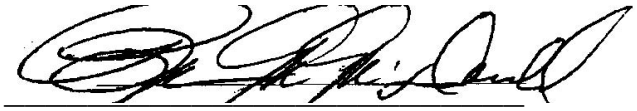
CERTIFICATION OF REPORTER

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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