Environmental Impact Statement
Scoping Process
Summary Report
Clinch River Nuclear Site
Early Site Permit Application
Oak Ridge, Tennessee
October 2017

U.S. Nuclear Regulatory Commission
Rockville, Maryland

1.0 INTRODUCTION

On May 12, 2016, the Tennessee Valley Authority (TVA) submitted to the U.S. Nuclear Regulatory Commission (NRC) an application for an Early Site Permit (ESP) for the Clinch River Nuclear (CRN) Site in Oak Ridge, Tennessee. An ESP is an NRC document that states that the reviewed site is suitable for construction and operation of a nuclear power plant. The ESP application and review process make it possible for early evaluation and resolution of safety and environmental issues related to siting. An ESP application may refer to a reactor's (or reactors') characteristics, which is referred to as the plant parameter envelope (PPE), rather than a detailed reactor design. An additional application and NRC review is needed to approve reactor construction or operation.

As part of the application, TVA submitted an environmental report (ER) prepared in accordance with the requirements of Title 10 of the *Code of Federal Regulations* (CFR) Part 51 and 10 CFR Part 52. (See Package Accession No. ML16144A145 in NRC's Agency Document Access and Management System [ADAMS]. ADAMS is accessible in the NRC Public Electronic Reading Room: http://www.nrc.gov/reading-rm/adams/web-based.html [case-sensitive].) The ER focuses on potential environmental effects from the construction and operation of two or more small modular reactors (SMRs) with characteristics that fall within the PPE. The ER does not include an assessment of the benefits of the proposed action (e.g., the need for power), a benefit-cost balance, or a discussion of energy alternatives, in accordance with 10 CFR 51.50(b)(2). It does include an evaluation of alternative sites to determine whether there is an obviously superior alternative to the proposed site. NRC regulations implementing the National Environmental Policy Act (NEPA) are contained in 10 CFR Part 51, Subpart A. In addition, the NRC follows the Council on Environmental Quality regulations to the extent set forth in 10 CFR 51.10 and 10 CFR 51.14(b). NRC regulations related to the environmental review of ESP applications are contained in 10 CFR Part 51 and 10 CFR Part 52.

The U.S. Army Corps of Engineers (USACE), Nashville District, is participating in the NEPA process as a cooperating agency. The Memorandum of Understanding between the USACE and NRC on environmental reviews related to the issuance of ESPs can be found under ADAMS Accession No. ML082540354. The request for cooperation on the CRN Site ESP environmental review, dated April 12, 2017, can be found at ADAMS Accession No. ML17065A237. The USACE acceptance of NRC's invitation to serve as a cooperating agency, dated May 2, 2017, can be found at ADAMS Accession No. ML17205A413.

The NRC and USACE staff are preparing an environmental impact statement (EIS) in support of the TVA ESP application. The proposed federal action is the NRC issuance of an ESP to TVA approving the CRN Site as a suitable site for the future construction and operation of two or more SMRs with a maximum electrical output not to exceed 800 megawatts electric (MWe). The EIS will include an evaluation of the environmental impacts of the proposed action, the no-action alternative, alternatives related to the facility cooling and circulating water systems; and alternatives available for reducing or avoiding adverse environmental effects. Finally, the EIS will include an evaluation of alternative sites to determine whether there is an obviously superior alternative to the proposed site.

The NRC staff conducts its reviews of ESP applications in accordance with guidance set forth in review standard RS-002, *Processing Applications for Early Site Permits*. The review standard draws from the previously published NUREG–0800, *Standard Review Plan for the Review of Safety Analysis Reports for Nuclear Power Plants* and NUREG–1555, *Standard Review Plans for Environmental Reviews for Nuclear Power Plants: Environmental Standard Review Plan*. The safety review is a separate process from the environmental review, but the two reviews are conducted in parallel.

On April 13, 2017, in accordance with 10 CFR 51.26, the NRC initiated the scoping process by publishing a Notice of Intent to prepare an EIS and conduct the associated scoping process in the *Federal Register* (82 FR 17885) (ADAMS Accession No. ML17068A244). The Notice of Intent informed the public of the staff's intent to prepare an EIS and to conduct scoping for the CRN ESP application. Through the notice, the NRC also invited the applicant; Federal, Tribal, State, and local government agencies; local organizations; and individuals to participate in the scoping process by providing oral comments at NRC-scheduled public meetings and/or by submitting written suggestions and comments no later than June 12, 2017.

The scoping process provides an opportunity for public participation to identify issues to be addressed in the EIS and to highlight public concerns and issues. The Notice of Intent identified the following objectives of the scoping process:

- Define the proposed action that is to be the subject of the EIS;
- Determine the scope of the EIS and identify the significant issues to be analyzed in depth;
- Identify and eliminate from detailed study those issues that are peripheral or that are not significant;
- Identify any environmental assessments and other EISs that are being or will be prepared that are related to, but are not part of, the scope of the EIS being considered;
- Identify other environmental review and consultation requirements related to the proposed action;
- Identify parties consulting with the NRC under the National Historic Preservation Act (NHPA), as set forth in 36 CFR 800.8(c)(1)(i);
- Indicate the relationship between the timing of the preparation of the environmental analyses and the NRC's tentative planning and decision-making schedule;
- Identify any cooperating agencies and, as appropriate, allocate assignments for preparation and schedules for completing the EIS to the NRC and any cooperating agencies; and
- Describe how the EIS will be prepared, and including any contractor assistance to be used.

Two public scoping meetings were held at the Pollard Technology Conference Center Auditorium, 210 Badger Avenue, Oak Ridge, Tennessee, on May 15, 2017. The first meeting convened at 2:00 p.m. and the second meeting convened at 7:00 p.m. The NRC announced the meetings in local and regional newspapers (*The Oak Ridger, Roane County News, Knoxville Sentinel,* and *The Roane Reader*) and issued press releases locally. The scoping meetings began with NRC staff members providing a brief overview of NRC's review process for ESP

applications and the NEPA process. After the NRC's prepared statements, the meetings were opened for public comments.

Twelve (12) afternoon scoping meeting attendees and seven (7) evening scoping meeting attendees provided oral comments that were recorded and transcribed by a certified court reporter. Two (2) written statements were received during the meetings. In addition to the oral and written statements provided at the public scoping meeting, a total of 74 pieces of correspondence were received during the scoping period.

Transcripts for both afternoon and evening scoping meetings can be found under ADAMS Accession Nos. ML17151A407 and ML17151A408, respectively. A scoping meeting summary memorandum (ADAMS Accession No. ML17157B585) was issued on June 20, 2017.

At the conclusion of the scoping period, the NRC staff and its contractor, Pacific Northwest National Laboratory, reviewed the scoping meeting transcripts as well as all written material received and identified individual comments. These comments were organized according to topic within the proposed EIS or according to the general topic if outside the scope of the EIS. After comments were grouped according to subject area, the staff prepared responses to the comments, identifying which were within the scope of the EIS.

Table 1 identifies in alphabetical order the individuals who provided comments, their affiliations (if given), and the ADAMS accession number that can be used to locate the correspondence. All of these comments are publically available. The full comments are accessible in the NRC Public Electronic Reading Room.)

The comment categories are listed in Table 2 in the order that they are presented in this document. Table 3 lists the comment categories in alphabetical order and commenter names and numbers for comments that were binned into each category. The balance of this document presents the comments with NRC staff responses organized by topic category.

Table 1. Individuals Providing Comments during the Comment Period

Commenter	Affiliation (if stated)	Comment Source and Document ID	Correspondence ID
Abkowitz, Kendra	Tennessee Department of Environment and Conservation	Email (ML17163A443)	0043
Almond, Jake		Meeting Transcript (ML17151A407)	0001-8
Anderson, KC		Email (ML17163A439)	0039
Anonymous		Letter (ML17145A549)	0035
Anonymous		Letter (ML17158B348)	0036
Anonymous		Letter (ML17180A317)	0059
Anonymous		reg.gov (ML17163A077)	0047
Anthony, Kate		reg.gov (ML17164A179)	0051
Bates, Renee		Letter (ML17157B347)	0034
Beach, Tom		Meeting Transcript (ML17151A408)	0002-1
Boles, Dustin	U.S. Fish and Wildlife Service	Email (ML17145A505)	0003
Bothwell, Cecil		Email (ML17145A542)	0008

Commenter	Affiliation (if stated)	Comment Source and Document ID	Correspondence ID
Bryant, Harry		Email (ML17206A449)	0060
Burger, Carol		reg.gov (ML17163A081)	0050
Campbell, Jim	East Tennessee Economic Council	reg.gov (ML17166A207)	0053
Carter, Pat		Email (ML17157B743)	0027
Carter, Rick		Email (ML17157B745)	0028
Chinn, Jr., Rick	City of Oak Ridge	Email (ML17163A440)	0040
Chinn, Jr., Rick	City of Oak Ridge	Email (ML17180A318)	0040
Colclasure, Doug		Email (ML17163A442)	0042
Colton, Kara	Energy Communities Alliance	Email (ML17163A441)	0041
Cremer, Claudine		reg.gov (ML17163A080)	0049
Cumberland, Margaret		Meeting Transcript (ML17151A408)	0002-3
Curran, Diane	Southern Alliance for Clean Energy	Email (ML17166A206)	0052
DiMaria, Pamela		Email (ML17163A438)	0038
Ellis, Daniel		Email (ML17145A551)	0010
Emert, Steven	Anderson County Board of Commissioners	Letter (ML17177A090)	0058
Flagg, Tom		Email (ML17145A554)	0011
Frank, Terry	Anderson County Mayor	Letter (ML17151A788)	0062
Franklin, Doug	Hands On, Carpentry and Solar	reg.gov (ML17132A171)	0017
Gilmartin, Gary		Meeting Transcript (ML17151A407)	0001-2
Goins, Joe		reg.gov (ML17163A086)	0056
Goss, Sandra	Tennessee Citizens for Wilderness Planning	reg.gov (ML17166A208)	0054
Griffin, Tim	Energy, Technology and Environmental Business Association	Meeting Transcript (ML17151A407)	0001-9
Grimes, Patricia		Email (ML1715B722)	0023
Hardy, Parker	Oak Ridge Chamber of Commerce	Meeting Transcript (ML17151A407)	0001-3
Harland, Donald		reg.gov (ML17142A302)	0021
Hickman, Beth	City of Oak Ridge	Email (ML17163A440)	0040
Hickman, Beth	City of Oak Ridge	Email (ML17180A318)	0040
Holt, Cathy		Email (ML17145A565)	0014
Humphries, Leigha	Oak Ridge Chamber of Commerce	Email (ML17158C137)	0037
Hyche, Kenneth		reg.gov (ML17163A078)	0048
Jennings, Mary	U.S. Fish and Wildlife Service	Letter (ML17205A341)	0063
Johnston, Susan		reg.gov (ML17163A076)	0046
Jones, Sid		Email (ML17157B748)	0031
Jordan, Ben		Meeting Transcript (ML17151A407)	0001-1
Kirkman, Arden		Email (ML17157B741)	0025
Kohlhorst, Darrel		Meeting Transcript (ML17151A407)	0001-7

Commenter	Affiliation (if stated)	Comment Source and Document ID	Correspondence ID
Krushenski, Kenneth	City of Oak Ridge	Email (ML17163A440)	0040
Krushenski, Kenneth	City of Oak Ridge	Email (ML17180A318)	0040
Kurtz, Sandy		Meeting Transcript (ML17151A408)	0002-2
LeQuire, Alan		reg.gov (ML17163A085)	0044
Lloyd, AA		Email (ML17138A296)	0020
Long, Larry	EPA Region 4	Email (ML17157B742)	0026
Lyle, Marcia		Email (ML17157B750)	0033
Martin, Rodger		Meeting Transcript (ML17151A408)	0002-6
McBride, Geoff		Email (ML17145A560)	0005
McBride, Linda		Email (ML17145A557)	0005
McClendon, Linda		Email (ML17145A507)	0004
McClendon, Linda		Email (ML17157B746)	0029
McCoy, Lawrence		Email (ML17164A178)	0038
McFadden, Nancy		Email (ML17145A539)	0007
Michlink, Doug	Container Technologies	Meeting Transcript (ML17151A407)	0001-6
Mortenson, Julia		reg.gov (ML17163A074)	0045
Naegeli, Wolf	Foundation for Global Sustainability	Meeting Transcript (ML17151A407)	0001-11
Oehler, Susan		Email (ML17145A549)	0009
Packan, Nicolas		Email (ML17057B740)	0024
Paddock, Brian		Meeting Transcript (ML17151A408)	0002-4
Pittillo, Dan		Email (ML17145A567)	0015
Powell, Michelle	Southern Alliance for Clean Energy	Meeting Transcript (ML17151A407)	0001-4
Prins, Claire		reg.gov (ML17142A304)	0022
Pritchett, Karen	United Keetoowah Band of Cherokee Indians	Email (ML17206A450)	0061
Pusey, Caleb		reg.gov (ML17163A073)	0044
Rangle, Daniel	Choctaw Nation of Oklahoma	Email (ML17157B749)	0032
Robertson, Grace		reg.gov (ML17136A204)	0018
Safer, Don	Tennessee Environmental Council	Meeting Transcript (ML17151A407)	0001-5
Salzman, Alicia		Letter (ML17157B750)	0057
Sauer, Robert		Email (ML17145A559)	0012
Skutnik, Steve		Meeting Transcript (ML17151A407)	0001-10

Commenter	Affiliation (if stated)	Comment Source and Document ID	Correspondence ID
Skutnik, Steve		Meeting Transcript (ML17151A408)	0002-5
Smith, Brian		reg.gov (ML17138A295)	0019
Spencer, Martha		reg.gov (ML17163A084)	0044
Sprignoli, Damon		Email (ML17145A545)	0005
Sutlock, Dot		Email (ML17145A537)	0006
Sweeton, Beverly		Email (ML17157B747)	0030
Toombs, Elizabeth	Cherokee Nation	Email (ML17145A580)	0016
Turk, Lawrence "Butch"		Email (ML17145A535)	0005
Turk, Lawrence "Butch"		reg.gov (ML17163A082)	0044
Wallace, Beth		Email (ML17163A075)	0038
Wunderlich, Walt		Email (ML17145A564)	0013
Zeller, Lou	Blue Ridge Environmental Defense League	Meeting Transcript (ML17151A407)	0001-12
Zeller, Lou	Blue Ridge Environmental Defense League	Meeting Transcript (ML17151A408)	0002-7
Zeller, Lou	Blue Ridge Environmental Defense League	reg.gov (ML17151A409)	0055
Zeller, Lou	Blue Ridge Environmental Defense League	reg.gov (ML17166A379)	0055

Table 2. Comment Categories

2.1 Comments Concerning Process – ESP
2.2 Comments Concerning Process – NEPA
2.3 Comments Concerning Site Layout and Design
2.4 Comments Concerning Land Use – Site and Vicinity
2.5 Comments Concerning Geology
2.6 Comments Concerning Hydrology – Surface Water
2.7 Comments Concerning Hydrology – Groundwater
2.8 Comments Concerning Ecology – Terrestrial
2.9 Comments Concerning Ecology – Aquatic
2.10 Comments Concerning Socioeconomics
2.11 Comments Concerning Historic and Cultural Resources
2.12 Comments Concerning Meteorology and Air Quality
2.13 Comments Concerning Health – Nonradiological
2.14 Comments Concerning Health – Radiological
2.15 Comments Concerning Nonradiological Waste
2.16 Comments Concerning Accidents – Severe
2.17 Comments Concerning the Uranium Fuel Cycle
2.18 Comments Concerning the Need for Power

2.19 Comments Concerning Alternatives – No-Action
2.20 Comments Concerning Alternatives – Energy
2.21 Comments Concerning Alternatives – Sites
2.22 Comments Concerning Benefit-Cost Balance
2.23 General Comments in Support of the Licensing Action
2.24 General Comments in Support of the Licensing Process
2.25 General Comments in Support of Nuclear Power
2.26 General Comments in Opposition to the Licensing Action
2.27 General Comments in Opposition to Nuclear Power
2.28 Comments Concerning Issues Outside Scope – Safety
2.29 Comments Concerning Issues Outside Scope – Security and Terrorism

Table 3. Comment Categories

Comment Category	Commenter (Comment ID)
Accidents-Severe	• Curran, Diane (0052-1) (0052-3) (0052-4) (0052-5) (0052-7) (0052-8) (0052-9) • Martin, Rodger (0002-6-5) • Safer, Don (0001-5-7)
Alternatives-Energy	• Bates, Renee (0034-1) • Curran, Diane (0052-2) (0052-6) (0052-10) (0052-13) (0052-14) (0052-15) (0052-16) (0052-17) (0052-18) • Ellis, Daniel (0010-2) • Goins, Joe (0056-2) • Harland, Donald (0021-2) • Johnston, Susan (0046-1) • Kirkman, Arden (0025-4) • McBride, Geoff (0005-2) (0005-6) • McBride, Linda (0005-2) (0005-6) • McFadden, Nancy (0007-2) (0007-4) • Mortenson, Julia (0045-1) • Naegeli, Wolf (0001-11-1) • Powell, Michelle (0001-4-5) • Safer, Don (0001-5-3) • Sprignoli, Damon (0005-2) (0005-6) • Sweeton, Beverly (0030-1) • Turk, Lawrence "Butch" (0005-2) (0005-6) • Wunderlich, Walt (0013-4) (0013-5) • Zeller, Lou (0001-12-2) (0055-1)
Alternatives-No-Action	• Curran, Diane (0052-19) • Kurtz, Sandy (0002-2-14) • Skutnik, Steve (0001-10-5) (0002-5-4)
Alternatives-Sites	• Colclasure, Doug (0042-1) • Wunderlich, Walt (0013-1) (0013-2)
Benefit-Cost Balance	• Anonymous, Anonymous (0059-4)

Comment Category	Commenter (Comment ID)
	• Anthony, Kate (0051-3) (0051-9) • Powell, Michelle (0001-4-2) • Safer, Don (0001-5-2) (0001-5-4)
Ecology-Aquatic	• Kurtz, Sandy (0002-2-3) • Naegeli, Wolf (0001-11-3) • Safer, Don (0001-5-11)
Ecology-Terrestrial	• Boles, Dustin (0003-1) (0003-2) (0003-3) (0003-4) (0003-5) (0003-6) (0003-7) • Cumberland, Margaret (0002-3-1) • Jennings, Mary (0063-1) • Kurtz, Sandy (0002-2-5) (0002-2-6) • Naegeli, Wolf (0001-11-2)
Geology	• Safer, Don (0001-5-8)
Health-Nonradiological	• Abkowitz, Kendra (0043-9) • Almond, Jake (0001-8-1)
Health-Radiological	• Holt, Cathy (0014-3) • Kurtz, Sandy (0002-2-12) (0002-2-13) • Martin, Rodger (0002-6-1) • Paddock, Brian (0002-4-8) • Pittillo, Dan (0015-1) • Skutnik, Steve (0001-10-3)
Historic and Cultural Resources	• Abkowitz, Kendra (0043-11) • Pritchett, Karen (0061-1) • Rangle, Daniel (0032-1) • Toombs, Elizabeth (0016-1)
Hydrology-Groundwater	• Abkowitz, Kendra (0043-4) • Jones, Sid (0031-2) • Kurtz, Sandy (0002-2-2) • Paddock, Brian (0002-4-9) • Skutnik, Steve (0002-5-1)
Hydrology-Surface Water	• Abkowitz, Kendra (0043-2) (0043-3) • Anonymous, Anonymous (0059-3) • Anthony, Kate (0051-5) (0051-11) • Goss, Sandra (0054-2) • Grimes, Patricia (0023-2) • Kirkman, Arden (0025-3) • Kurtz, Sandy (0002-2-4) (0002-2-7) (0002-2-9) • Martin, Rodger (0002-6-2) • Skutnik, Steve (0001-10-2) (0002-5-2)
Land Use-Site and Vicinity	• Goss, Sandra (0054-1)
Meteorology and Air Quality	• Abkowitz, Kendra (0043-7) (0043-8) (0043-10) • Kurtz, Sandy (0002-2-8)
Need for Power	• Anthony, Kate (0051-6) (0051-12) • Powell, Michelle (0001-4-3)

Comment Category	Commenter (Comment ID)
	• Safer, Don (0001-5-6)
Nonradiological Waste	• Abkowitz, Kendra (0043-5) (0043-6)
Opposition-Licensing Action	• Anonymous, Anonymous (0035-1) (0036-1) • Anthony, Kate (0051-1) (0051-7) • Carter, Pat (0027-2) • DiMaria, Pamela (0038-1) • Ellis, Daniel (0010-1) • Flagg, Tom (0011-1) • Goins, Joe (0056-1) • Grimes, Patricia (0023-1) • Harland, Donald (0021-1) • Holt, Cathy (0014-4) • Hyche, Kenneth (0048-2) • Kirkman, Arden (0025-1) • Kurtz, Sandy (0002-2-1) • LeQuire, Alan (0044-1) • Lloyd, AA (0020-1) • McBride, Geoff (0005-1) (0005-4) (0005-5) • McBride, Linda (0005-1) (0005-4) (0005-5) • McClendon, Linda (0029-1) • McCoy, Lawrence (0038-1) • McFadden, Nancy (0007-1) • Oehler, Susan (0009-1) • Paddock, Brian (0002-4-10) • Pittillo, Dan (0015-2) • Powell, Michelle (0001-4-1) (0001-4-6) • Prins, Claire (0022-1) • Pusey, Caleb (0044-1) • Robertson, Grace (0018-1) • Safer, Don (0001-5-1) • Salzman, Alicia (0057-1) • Spencer, Martha (0044-1) • Sprignoli, Damon (0005-1) (0005-4) (0005-5) • Sutlock, Dot (0006-4) • Turk, Lawrence "Butch" (0005-1) (0005-4) (0005-5) (0044-1) • Wallace, Beth (0038-1) • Zeller, Lou (0001-12-1) (0002-7-2)
Opposition-Nuclear Power	• Anderson, KC (0039-1) • Anonymous, Anonymous (0047-1) (0059-1) • Anthony, Kate (0051-4) (0051-10) • Bothwell, Cecil (0008-1) • Burger, Carol (0050-1) • Carter, Pat (0027-1) • Carter, Rick (0028-1) • Cremer, Claudine (0049-1) • Franklin, Doug (0017-1)

Comment Category	Commenter (Comment ID)
	• Harland, Donald (0021-3) • Holt, Cathy (0014-1) • Lyle, Marcia (0033-1) • McClendon, Linda (0004-1) • Sauer, Robert (0012-1) • Smith, Brian (0019-1)
Outside Scope-Safety	• Anthony, Kate (0051-2) (0051-8) • Kurtz, Sandy (0002-2-11) • Martin, Rodger (0002-6-3) • Paddock, Brian (0002-4-2) (0002-4-7) • Safer, Don (0001-5-9) • Skutnik, Steve (0001-10-4) • Sutlock, Dot (0006-1) • Zeller, Lou (0002-7-1)
Outside Scope-Security and Terrorism	• Martin, Rodger (0002-6-4) • Sutlock, Dot (0006-3)
Process-ESP	• Kohlhorst, Darrel (0001-7-1) • Safer, Don (0001-5-5) • Zeller, Lou (0055-2)
Process-NEPA	• Abkowitz, Kendra (0043-1) (0043-12) • Curran, Diane (0052-11) (0052-12) • Long, Larry (0026-1) (0026-2) (0026-4) • Paddock, Brian (0002-4-6) • Skutnik, Steve (0002-5-3)
Site Layout and Design	• Anonymous, Anonymous (0059-2) • Kurtz, Sandy (0002-2-10) • Paddock, Brian (0002-4-1) (0002-4-3) (0002-4-4) (0002-4-5) • Powell, Michelle (0001-4-4) • Wunderlich, Walt (0013-3)
Socioeconomics	• Almond, Jake (0001-8-2) • Kohlhorst, Darrel (0001-7-2) • Naegeli, Wolf (0001-11-4)
Support-Licensing Action	• Beach, Tom (0002-1-1) • Bryant, Harry (0060-1) • Campbell, Jim (0053-1) (0053-3) (0053-4) (0053-6) • Chinn, Jr., Rick (0040-1) • Emert, Steven (0058-1) • Frank, Terry (0062-1) • Gilmartin, Gary (0001-2-1) • Griffin, Tim (0001-9-2) • Hardy, Parker (0001-3-1) • Hickman, Beth (0040-1) • Humphries, Leigha (0037-1) • Jordan, Ben (0001-1-2) • Kohlhorst, Darrel (0001-7-4)

Comment Category	Commenter (Comment ID)
	• Krushenski, Kenneth (0040-1) • Michlink, Doug (0001-6-1) (0001-6-3) • Packan, Nicolas (0024-1)
Support-Licensing Process	• Colton, Kara (0041-1) (0041-3) • Emert, Steven (0058-2) • Humphries, Leigha (0037-2) • Skutnik, Steve (0001-10-1)
Support-Nuclear Power	• Campbell, Jim (0053-2) (0053-5) • Colton, Kara (0041-2) • Griffin, Tim (0001-9-1) • Jordan, Ben (0001-1-1) • Kohlhorst, Darrel (0001-7-3) • Michlink, Doug (0001-6-2) • Skutnik, Steve (0001-10-6)
Uranium Fuel Cycle	• Harland, Donald (0021-4) • Holt, Cathy (0014-2) • Hyche, Kenneth (0048-1) • Jones, Sid (0031-1) • Kirkman, Arden (0025-2) • Long, Larry (0026-3) • McBride, Geoff (0005-3) (0005-7) • McBride, Linda (0005-3) (0005-7) • McFadden, Nancy (0007-3) • Safer, Don (0001-5-10) • Sprignoli, Damon (0005-3) (0005-7) • Sutlock, Dot (0006-2) • Turk, Lawrence "Butch" (0005-3) (0005-7)

2.0 SCOPING COMMENTS AND RESPONSES

The comments and suggestions received as part of the scoping process are summarized and responded to below. Parenthetical numbers after each comment refer to the comment ID number (document number-comment number). Comments are grouped by category.

The draft EIS will take into account the relevant issues raised during the scoping process, and will be made available for public comment.

The comment period for the draft EIS will offer the next opportunity for the applicant; interested Federal, Tribal, State, and local government agencies; local organizations; and members of the public to provide input to the NRC's environmental review process. The comments received on the draft EIS will be considered in the preparation of the final EIS. The final EIS, along with the staff's Safety Evaluation Report, will be considered in the NRC's decision on the ESP application.

2.1 Comments Concerning Process – ESP

Comment: On to the scoping comments. The ESP process at this stage of the game is highly speculative without knowing what the reactor design is going to be and without even having a certified reactor design. In the ESP application they talk about four possible reactors -- designs that could be considered -- well, three of the companies have -- have removed themselves from the business. That's an indication of their judgment of the market conditions that are highly unfavorable to small modular reactors. (**0001-5-5** [Safer, Don])

Comment: I know you're doing a lessons-learned study right now, and I know the NRC has long had a lesson from the program. Looking at the EIS statements you've done in the past, I hope you will also look at the timing factor. Taking long amounts of time to get through these things does not necessarily mean a complete review. So I would hope that you would look at that because I think anything we can do to push the process forward and still make it a complete and thorough process would help the industry. (**0001-7-1** [Kohlhorst, Darrel])

Comment:

Critical Infrastructure

Executive Order 13636, "Improving Critical Infrastructure Cybersecurity," was issued February 12, 2013.[6] The order cites "cyber intrusions into critical infrastructure" which "demonstrate the need for improved cybersecurity." The order states:

Sec. 9. Identification of Critical Infrastructure at Greatest Risk. (a) Within 150 days of the date of this order, the Secretary shall use a risk-based approach to identify critical infrastructure where a cybersecurity incident could reasonably result in catastrophic regional or national effects on public health or safety, economic security, or national security.

TVA's application states that "SMR deployment will demonstrate that the technology is capable of incrementally supplying ... power that is less vulnerable to disruption to facilities owned by

federal agencies."[7] The NRC cannot take lightly the prospect of another experimental nuclear reactor design's impact on electric power infrastructure in light of the evolving threats and the energy economics of the 21st Century. SMR passive cooling systems do not have active backup systems. The weaker containment of SMRs has a greater chance of damage from hydrogen explosions. Underground siting increases risk during flooding. And multiple SMRs present higher risk from reduced support staff or safety equipment. The risks from these reactors are precisely the catastrophic regional or national effects on public health or safety and economic security which EO 13636 seeks to prevent.

In conclusion, the Commission should reject TVA's proposal for modular nukes.
[footnotes:]
[6] Federal Register, Vol. 78, No. 33, February 19, 2013
[7] Clinch River Nuclear Site Early Site Permit Application, Part 3, Environmental Report, page 1-1 (**0055-2** [Zeller, Lou])

Response: *The action before the NRC is the issuance of an early site permit (ESP) to determine whether the Clinch River Nuclear (CRN) Site is suitable for placement of one or more small modular nuclear reactors with a maximum electrical output not to exceed 800 MWe. An ESP, if granted, does not authorize construction of any reactors; the applicant must obtain a construction permit (CP) or combined construction permit and operating license (combined license or COL) from the NRC and the CP or COL application would be the subject of an NRC review when the application for the CP or COL is submitted. An applicant is not required to specify a reactor design for an ESP; however, in the absence of a specified design, the applicant is expected to provide a plant parameter envelope (PPE), which TVA has done here. A PPE is a set of values of plant design parameters that an ESP applicant expects will bound the design characteristics of the reactor or reactors that might be constructed at a given site. The PPE values are a bounding surrogate for actual reactor design information, and should provide sufficient information about the reactor(s) and associated facilities, so that an assessment of site suitability can be made.*

The NRC is conducting its environmental review of TVA's ESP application and preparing an Environmental Impact Statement (EIS) in accordance with 10 CFR Part 51 and 10 CFR 52.18. The environmental review will focus on the effects of construction and operation of a nuclear power plant that is bounded by the PPE provided by the applicant. Accidents will be addressed in Section 5.11 of the EIS, but reactor safety systems and flooding risk are reviewed in the NRC's separate but parallel safety review. The outcome of the ESP safety review will be published in a Safety Evaluation Report.

2.2 Comments Concerning Process – NEPA

Comment: One of the things, the fundamental things, about an EIS is that it identifies what the project is and why it is needed. Because every project under an EIS has to have a no-action alternative. The law requires that.

So, the no-action alternative is we don't approve anything. And for this, obviously, it's we build these SMRs, whatever they may be at this site, but there has to be a reason. And that reason needs to be in the Environmental Impact Statement.

I know that TVA has asserted to the NRC that it doesn't need to talk about the need for power. And I know the TVA officials have said, "We're not buying any power, folks. Sorry. You know, go away. We haven't even made a contract for 3-cent-a-kilowatt-hour wind, like the west end of the State."

But, as we get closer to this, it seems to me that the EIS is going to be challenged and challengeable if it does not state the need, the projected need for power, and why that is going to be compared to the other sources that are already going and available, both from all the existing generation, particularly since TVA says it's not going to phase out its coal plants, and with things like free mining wind at the west end of the State. (**0002-4-6** [Paddock, Brian])

Comment: But, then, I think there are issues that are involved that in one place there are other issues, such as flooding and seismology risks that have not even been brought up that I think we all agree are valid.

Again, I think we should establish here the purpose of an early site permit should be to establish the viability of a site and to characterize, if a site is chosen for action, what a root cause is of potential risk factors would be. So, in other words, what is our baseline flooding risk? What is our baseline subsidence risk? What is our baseline seismological risk? These are valid.

Things I think, though, that should be not they're irrelevant to the scope and they are beyond the NRC's safety mandate include the following factors. I believe this is entirely the NRC is not an energy policy agency, nor should they be.

I believe it is valid if you want to take this to the TVA Rate Payers Board. Be my guest. You should. The same goes for electricity. These are ancillary to the site's suitability. I think the site suitability presentation should focus on the environmental suitability and environmental impacts.

A lot of talkers have brought up the absence of a specified design, which is somewhat puzzling since we're not at the construction licensing, construction/operating licensing phase.

What we question more here with this Environmental Impact Assessment is whether or not this site could suitably host a numeric nuclear facility. In this sense, then, I think discussions should be suitably restricted towards the issues which have the most pertinent influence on actual radiological safety issues of the plant. And these include the geology, hydrology, and seismology. Other issues that are more policy-oriented and such I think are not as germane. (**0002-5-3** [Skutnik, Steve])

Response: *Chapter 1 of the EIS will address the purpose of and need for the proposed action, and will present the range of alternatives considered in the EIS, including the no-action alternative. The ESP determination is primarily a siting decision; in accordance with 10 CFR 51.75, the EIS will not include an assessment of the need for power or an evaluation of alternative energy sources because these matters were not addressed in the applicant's environmental report (ER). Site safety, seismicity, and flooding risk are reviewed in the NRC's separate but parallel safety review; the outcome of the ESP safety review will be published in a Safety Evaluation Report.*

Comment: NRC and TVA may want to consider the advantages of early consultation with federal, state and tribal agencies for the purpose of streamlining the permitting process during the NEPA analysis. One advantage of an early consultation process could be TVA obtaining their environmental permits shortly after the NEPA Record of Decision (ROD) issuance. The inclusion of NRC's systematic approach (10 CFR Part 51) along with state and federal permitting issues into the NRC's pre-permitting process can provide a streamline NEPA analysis that helps to eliminate duplications in the permitting analysis. This will help to provide a more productive analytical process overall. (**0026-1** [Long, Larry])

Comment: NRC and TVA may also want to consider incorporating the Army Corps of Engineers into the early consultation process to include Clean Water Act (CWA) 404 permitting requirements, such as avoidance and minimization, along with mitigation requirements, if any. (**0026-2** [Long, Larry])

Comment: Please provide us [EPA Region 4, NEPA, Resource Conservation & Restoration Division] with a copy (electronic, CD with two hardcopies) of future NEPA documents when they become available. (**0026-4** [Long, Larry])

Comment: The Tennessee Department of Environment and Conservation (TDEC) appreciates the opportunity to provide comments on the Nuclear Regulatory Commission (NRC) Notice of Intent (NOI) to prepare an Environmental Impact Statement (EIS) related to the Tennessee Valley Authority (TVA) early site permit (ESP) for the Clinch River Nuclear (CRN) Site near Oak Ridge, Tennessee.[1] TDEC understands that the ESP application by TVA is an initial determination process for resolving safety and environmental siting issues for a potential future Small Modular Reactor (SMR) at the CRN Site, but does not authorize construction and operation of a nuclear power plant. Additionally, as a Federal agency, TVA is required to comply with the National Environmental Policy Act (NEPA) and the National Historic Preservation Act (NHPA) independently of NRC requirements. The NRC expects to publish a draft EIS in June 2018. The proposed CRN Site, is located in Roane County, Tennessee, along the Clinch River, approximately 25 miles west-southwest of downtown Knoxville, Tennessee. (**0043-1** [Abkowitz, Kendra])
[footnote:]
[1] For more information on the TVA CRN proposal, including the ESP Application (ML16144A086) please visit https://www.nrc.gov/reactors/new-reactors/esp/clinch-river.html. Specific information regarding the TVA CRN proposal as is discussed in TDEC's consolidated response is taken from the Part 3 – Environmental Report submitted as part of TVA's ESP to NRC. The Part 3 – Environmental Report can be found at https://www.nrc.gov/docs/ML1614/ML16144A145.html.

Comment: TDEC appreciates the opportunity to comment on this NOI from NRC to prepare an EIS for the TVA CRN Site. Please note that these comments are not indicative of approval or disapproval of the proposed action or its alternatives, nor should they be interpreted as an indication regarding future permitting decisions by TDEC. (**0043-12** [Abkowitz, Kendra])

Response: *The NRC is conducting its environmental review of TVA's ESP application and preparing an EIS in accordance with 10 CFR Part 51 and 10 CFR 52.18. The U.S. Army Corps of Engineers (USACE) is a cooperating agency on the environmental review and will be*

providing input relevant to Clean Water Act Section 404 permitting and mitigation requirements. The NRC has initiated consultation with Federal, State, and Tribal entities; a chronology of correspondence will be provided in Appendix C of the EIS, and key formal consultations (e.g., Section 7 of the Endangered Species Act) will be in Appendix F of the EIS.

Comment:

2. Brief Summary of Basis for the Contention:

a. Requirements of NEPA

NEPA implements a "broad national commitment to protecting and promoting environmental quality." Louisiana Energy Services, L.P. (Claiborne Enrichment Center), CLI98-3, 47 NRC 77, 87 (1998) (quoting Robertson, 490 U.S. at 348 and citing 42 U.S.C. § 4331). NEPA has two key purposes: to ensure that the agency "will have available, and will carefully consider, detailed information concerning significant environmental impacts" before it makes a decision; and to guarantee that "the relevant information will be made available to the larger audience that may also play a role in the decision-making process and implementation of that decision." Robertson, 490 U.S. at 349.

In fulfilling NEPA's first purpose of evaluating the environmental impacts of its decisions, requires a federal agency to take a "hard look" at potential environmental consequences by preparing an EIS prior to any "major Federal action[] significantly affecting the quality of the human environment." Robertson, 490 U.S. at 349; 42 U.S.C. § 4332(c). The "hallmarks of a 'hard look' are thorough investigation into environmental impacts and forthright acknowledgment of potential environmental harms." National Audubon Society, 422 F.3d at 185. In addition, the agency must "rigorously explore and objectively evaluate the projected environmental impacts of all reasonable alternatives for completing the proposed action." Van Ee v. EPA, 202 F.3d 296, 309 (D.C. Cir. 2000). In considering alternatives, the agency must examine the "alternative of no action." 40 C.F .R. § 1502.14.

In fulfilling NEPA's second purpose of public participation, the agency's environmental analysis must be published for public comment "to permit the public a role in the agency's decision-making process." Robertson, 490 U.S. at 349-50; Hughes River Watershed Conservancy v. Glickman, 81F.3d437, 443 (4th Cir. 1996). NRC's Part 51 regulations also allow interested members of the public to participate in the environmental decision-making process through the NRC's hearing process. 10 C.F.R. §51.104(a). (**0052-11** [Curran, Diane])

Comment:

b. Regulatory requirements for NEPA compliance in ESP proceedings

Because an ESP approves only the banking of a site and not construction or operation of any nuclear facility, the NRC limits the scope of an EIS to issues related to the siting of the facility. As explained in the preamble to the rule, the NRC intended to focus the environmental analysis for ESP applications on issues related to site suitability, such as environmental impacts of construction and operation and alternative sites:

The environmental report and EIS for an early site permit must address the benefits associated with issuance of the early site permit (e.g., early resolution of siting issues, early resolution of issues on the environmental impacts of construction and operation of a reactor(s) that fall within the site characteristics, and ability of potential nuclear power plant licensees to "bank" sites on which nuclear power plants could be located without obtaining a full construction permit or combined license). The benefits (and impacts) of issuing an early site permit must always be addressed in the environmental report and EIS for an early site permit, regardless of whether the early site permit applicant chooses to defer consideration of the benefits associated with the construction and operation of a nuclear power plant that may be located at the early site permit site. This is because the "benefits * * * of the proposed action" for which the discussion may be deferred are the benefits associated with the construction and operation of a nuclear power plant that may be located at the early site permit site; the benefits which may be deferred are entirely separate from the benefits of issuing an early site permit. The proposed action of issuing an early site permit is not the same as the "proposed action" of constructing and operating a nuclear power plant for which the discussion of benefits (including need for power) may be deferred under § 51.50(b).

Final Rule: Licenses, Certifications, and Approvals for Nuclear Power Plants, 72 Fed. Reg. 49,352, 49,430 (Aug. 28, 2007) (emphasis added). Accordingly, NRC regulation 10 C.F.R. §51.50(b)(2) provides that an environmental report for an ESP application "need not include an assessment of the economic, technical, or other benefits (for example, need for power) and costs of the proposed action or an evaluation of alternative energy sources." As explained in the preamble, the choice is up to the applicant:

Environmental reports must focus on the environmental effects of construction and operation of a nuclear reactor, or reactors, which have characteristics that fall within the design parameters postulated in the early site permit. Environmental reports must also include an evaluation of alternative sites to determine whether there is any obviously superior alternative to the site proposed. Environmental reports submitted in an early site permit application are not required to but may include an assessment of the economic, technical, and other benefits and costs of the proposed action or an analysis of other energy alternatives.

Id. at 49,434 (emphasis added). Thus, the NRC does not consider the energy alternative issue to be material to the issuance of an ESP, unless the applicant chooses to address the issue.

In a proceeding where the applicant decides not to address energy alternatives at the ESP stage, the NRC prohibits members of the public from raising contentions regarding those issues, because the NRC does not require those issues to be addressed in its ESP licensing decisions.

See, e.g., Dominion Nuclear North Anna, L.L.C. (Early Site Permit for North Anna ESP Site), LBP-04-18, 60 NRC 253, 264 (2004) (citing Florida Power & Light Co. (Turkey Point Nuclear Generating Plant, Units 3 and 4), LBP-01-06, 53 NRC 138, 159 (2001); Pacific Gas & Electric Co. (Diablo Canyon Nuclear Power Plant, Units 1 and 2), LBP-93-01, 37 NRC 5, 29-30 (2001); Public Service Co. of New Hampshire (Seabrook Station, Units 1 and 2), LBP-82-106, 26 NRC 1649, 1656 (1982); Yankee Atomic Electric Co. (Yankee Nuclear Power Station), CLI-96-7, 43 NRC 235, 251 (1996); Arizona Public Service Co. (Palo Verde Nuclear Generating Station, Units 1, 2, and 3), LBP-91-19, 33 NRC 397, 410, aff'd in part and rev'd in part on other grounds,

CLI-91-12, 34 NRC 149 (1991) (holding that a contention advocating stricter requirements than agency rules impose or that otherwise seek to litigate a generic NRC determination are inadmissible)). Accordingly, with the exception of the issue of site alternatives, NRC prohibits members of the public from seeking consideration of alternatives in an Environmental Report or EIS for an ESP, including comparisons of the proposed operational technology to other technologies for production of electricity.

In hearings on NEPA issues, the NRC also requires fairness to all parties. Hydro Resources, Inc. (P.O. Box 15910, Rio Rancho, NM 87174), CLI-01-04, 53 NRC 31, 38 (2001). As the Commission held in Hydro Resources, Inc., the NRC may not issue a license based on an EIS whose contents it has shielded from challenge in a hearing. (**0052-12** [Curran, Diane])

Response: *The commenter's scoping comments were submitted to the NRC as part of a separate hearing process. Please refer to ML17188A445 for the NRC staff's response to the comments. These comments describe the NEPA process as it relates to an ESP proceeding. The comments do not provide information relevant to the environmental effects of the proposed action and will not be evaluated in the EIS.*

2.3 Comments Concerning Site Layout and Design

Comment: In fact, SMRs don't even exist yet. There isn't a certified reactor design, therefore it is impossible to state now that SMRs can provide reliable energy for extended operation as TVA misleadingly stated in their ESP application. (**0001-4-4** [Powell, Michelle])

Comment: The design for the SMR is not there yet. And it seems to me that we can't really make a final determination that this site is even suitable when you don't know what you want to construct. So, I'm not quite sure why there's a scoping session ahead of even knowing about are we clear that the site would be applicable before you know that you want to build on it. (**0002-2-10** [Kurtz, Sandy])

Comment: It looks like to me that the proposal is that there's going to be 12 SMRs. It is the NuScale SMR design, which is still in discussion with the people at the NRC as well because, eventually, if it ever becomes the only approved SMR design.

I recently spent an entire afternoon listening to staff testimony to the Advisory Committee on Reactor Safeguards --and this was the other piece that the introductions mentioned --where the safety of an SMR is reviewed. It went from about one o'clock to five o'clock. It was quite extensive.

These are mostly academics and other nuclear engineers, specialists. One of the members, in fact, has been on the Advisory Committee so long that he sat on the discussion of the safety of the Clinch River breeder reactor, and he is about my age.

That Committee raised a number of questions which I think go to the point about how you decide the suitability of the site when you do not yet have an approved design. The last time the NRC approved another site approval several years ago --and this was called to our attention at a couple of earlier public meetings as this was beginning to gel. And we were told, "Go back and look at the most recent approval of the other site."

Well, I looked at it. It took about 10 years to approve the site. And that was based on the idea that they would build one of several existing designs that had already been designed and built and approved, and so forth. So, the envelope primarily for that was quite clear as to what kind of a nuclear reactor generation system might be built at a site. It seems to me that that makes the environmental assessment much, much easier. (**0002-4-1** [Paddock, Brian])

Comment: Another member of the Committee, the Advisory Committee on Reactor Safeguards, questioned, he said, "I am very uncomfortable with the assumption that, because these reactors are going to be underground, they're safe." There are a lot, tons of things we worry about with the above-ground full-scale reactors that simply can't happen. And there was not a lot of discussion about that assumption, but there was a certain amount of discomfort among several members of the Advisory Committee about the assumption that this somehow, putting small reactors underground, as is proposed here, wiped away a lot of the questions and problems that you might ordinarily think more about it. (**0002-4-3** [Paddock, Brian])

Comment: And the staff also brought up in their testimony to the Committee a very interesting question. They said, "Well, we're having quite a difficult time because there are no applicable, advanced reactor standards applicable to SMRs that are still working advanced reactors."

And by the way, there were handouts at the table there, new reactor plant designs, and referred to a 1988 Policy Statement and referred to several designs, only one of which I think, the AP1000, has seen tentative, partial construction in the United States. And this was called a "backgrounder," and it was from June 2008.

If we are still thinking, if we are still able to describe what our understanding is of advanced nuclear plant designs on a piece of paper that was put out in 2008, we obviously are not ready for new plant designs.

The same thing is true of the next-generation reactors. The factsheet talks about as of January 2004. It talks about the AP1000. And the radioactive waste sheet is dated April of 2007.

If we are where we were a decade ago on all of those issues --and I don't believe we are --in terms of both the challenges and our responses, then we're getting way ahead of ourselves.

Now, if you go back to the staff comments, one of the things they say is, "We don't have a place to go." It doesn't fit in with the advanced reactor design approval process or standards that are being worked on there. It doesn't fit in with the existing standards for full-scale reactors. These are supposed to be lightwater reactors.

But, for example, the chemical engineers have a huge, a large set of standards, very detailed standards for what goes into the kind of equipment and how it's installed, and so forth, for a full-scale reactor. And the staff said: we can't really use those. They don't apply. What we have to do with respect to every standard engineering function is to go back and figure out why that's in there. Why did we say the pipe should be this big? Why did we say it has to be done this way? And we have to figure out what that was to accomplish in terms of safety and reliability. And we have to do that with every one of the existing standards, and that is just for mechanical

engineering, which was the example used, but it would clearly apply for control, instrumentation, and a number of other factors.

Likewise, at other places, they simply say, "We cannot use, without reinventing to some extent all of the existing standards for reactor safety and for reactor standards." And that brought about a very interesting conversation at the end among the members of the Advisory Committee on Reactor Safeguard because one of them said, "Why don't we go back to basics? Why don't we just look at the things where you might release radiation to affect the public and skip all the rest of this?" All this stuff that we developed over the years that says what kind of stainless steel has to be used in what kind of a situation, and what the reliability is of pumps and switches and instruments, and so forth. And that led to a fairly interesting discussion about whether we were trying to be too detailed in developing these standards. (**0002-4-4** [Paddock, Brian])

Comment: But, to tell the people that are working on the EIS that they have some kind of a grasp on what the proper envelope is --and I think that is the word that is used in the application, the proper envelope to be examined of what the possible design for our numbers, and so forth, are. Are these SMRs, and particularly the multiple system of them --it seems to me we have gotten way ahead of ourselves. (**0002-4-5** [Paddock, Brian])

Comment: If it is an experimental design of national importance the TVA rate payers should not be used as test rabbits for footing the bill if they already shoulder the risks of possible failure. Given the unreliability of renewable energy at least as long as we don't have the necessary bridging capabilities, SMRs could fill a very necessary role in stabilizing electricity supply, especially near locations where electrical supply reliability is paramount. Hopefully these reactors can be made safe enough that they can be also located near these locations, i.e., by self-contained cooling as well as by self-contained emergency systems. Until this happens TVA should direct its attention to the urgently needed revamping of the legal environment that prevents it from continuing its role as a valley-wide resource development agency, as addressed in 4. (**0013-3** [Wunderlich, Walt])

Comment: No actual approved design (**0059-2** [Anonymous, Anonymous])

Response: *Most of these comments concern the lack of an approved Small Modular Reactor (SMR) design or the timeframe for the SMR design review process. An applicant is not required to specify a reactor design for an ESP; however, in the absence of a specified design, the applicant is expected to provide a plant parameter envelope (PPE) that provides sufficient information about a surrogate reactor(s) and associated facilities so that an assessment of site suitability can be made. SMR design development and certification are outside the scope of the ESP environmental review; information about NRC's SMR design certification status can be found on the NRC's website at https://www.nrc.gov/reactors/new-reactors/smr.html.*

An ESP, if granted, does not authorize construction of any reactors. The applicant must obtain a construction permit (CP) or combined construction permit and operating license (combined license or COL) from NRC, and an application for CP or COL is required to reference a specific reactor design. In its review of a CP or COL application referencing an ESP, the NRC would carefully consider any parameters that are outside the PPE that was evaluated for the ESP, any

new and significant information that could change the impact determined for the ESP, and any information relevant to resolving any issues left unresolved for the ESP.

2.4 Comments Concerning Land Use – Site and Vicinity

Comment: We recommend environmental zoning for the former Clinch River Breeder Reactor Site. We believe it is appropriate that all of the upland area on the northern half of this peninsula be designated as Zone 4 [Natural Resource Conservation]. Further, portions of the disturbed and level area at the southern end of the peninsula should be designated for Zone 5 [Industrial]. The portion of the site designated for small modular reactor installation would best be limited to the area previously disturbed by prior construction and the relatively level land immediately surrounding it to the north and away from the reservoir. Further, we ask that a strip between 75 m and 300 m wide be maintained along the edge of the Clinch River/Melton Hill Reservoir within this parcel. (**0054-1** [Goss, Sandra])

Response: *An assessment of site and regional land-use impacts from the proposed action of building and operating the CRN Site will be discussed in EIS Section 4.1 and 5.1. This assessment will address zoning issues and compatibility with nearby land uses. Cumulative land-use impacts will be addressed in Section 7.1.*

2.5 Comments Concerning Geology

Comment: In the geology -- that site is on karst terrain, and I was doing some reading last night on the EIS and we go into 140-something pages of geology, but the fact is, it is karst terrain. They found that when the Clinch River site was prepared. And it needs to be thoroughly considered and thoroughly vetted.

The risks of sinkholes and active sinkholes -- I mean, we've all seen the sites in Florida of huge apartment complexes ending up underground and people being buried in them. I understand there will be a lot of geology work done, but that needs to be seriously considered, especially in karst terrain. (**0001-5-8** [Safer, Don])

Response: *The geology of the site will be described in EIS Section 2.8. The effects of geologic features such as karst on the occurrence and movement of groundwater at the CRN Site will be discussed in EIS Section 2.3.1.2.*

2.6 Comments Concerning Hydrology – Surface Water

Comment: In particular, I've heard a number of comments at this forum which I feel are beyond the NRC's stated scope and mandate issues that are not germane to safety to -- particularly to the site suitability or safety. And I would remind the audience and the NRC that the mandate should properly be put on whether or not the site can be suitably host to a nuclear reactor design. So in this sense then I think it's perfectly appropriate to consider things like level effects on water quality (**0001-10-2** [Skutnik, Steve])

Comment: [the erosion and all the things associated with soil toxics and those kinds of things will eventually get to the river, the Clinch River. And that is not good for].... our drinking water, for that matter, as it goes downstream. (**0002-2-4** [Kurtz, Sandy])

Comment: [Then, we can talk about the climate change impacts, and I am hoping that in this scoping, do you include that and address] .....any water flow issues ... (**0002-2-7** [Kurtz, Sandy])

Comment: [When you are talking about climate change,].... You are talking temperature. And so, the temperature, water temperature is very important, especially when you're talking about nuclear plants. And so, not only the water flow, but the water quantity should be addressed if it is going to meet the needs of any nuclear plant work. (**0002-2-9** [Kurtz, Sandy])

Comment: The impacts on water quality are another valid consideration I've seen brought up that should be part of the NRC review, and we'll ultimately own that. (**0002-5-2** [Skutnik, Steve])

Comment: And there was a previous comment on water temperatures. A few years ago we had a summer where I think we hit 108 degrees. That's somewhat normal. So, severe droughts, water temperatures are a concern. I know they limited one reactor based on its operation. (**0002-6-2** [Martin, Rodger])

Comment: it [SMRs] uses too much water. we need to move in the direction of clean alternative solutions. there is so much unknown about this technology, and the clinch river is a clean river now. (**0023-2** [Grimes, Patricia])

Comment: [A reactor that produces long-lived and highly radioactive nuclear waste ....] and will most likely pollute the community's clean water supply is just not wise. (**0025-3** [Kirkman, Arden])

Comment: Given the expected activity associated with this proposed project, the following TDEC permitting requirements are likely to apply.[2] The construction of a Small Modular Reactor (SMR) at the TVA CRN Site will require a construction storm water permit based on the land disturbance at the site being more than one acre.[3] A National Pollutant Discharge Elimination Permit (NPDES) permit will be required for the discharge from the facility into the Clinch River.[4] An Aquatic Resource Alteration Permit (ARAP) will be required for the water withdrawal at the facility.[5] This facility will also be required to have a Tennessee Storm Water Multi-Sector General Permit, which will include the barge loading and offloading facility.[6]
[footnotes:]
[2] As this is a scoping document for a forthcoming EIS, there is not sufficient information to address the requirements for the permits in more detail. There have not been any public water supply intakes, wells or springs identified that would be impacted from the proposed facility, but as additional details are provided more permitting requirements may be necessary.
[3] For more information on NPDES Stormwater Construction Permitting please visit http://www.tn.gov/environment/article/permit-waternpdes-stormwater-construction-permit.
[4] For more information on NPDES Discharge Permitting please visit https://www.tn.gov/environment/article/permit-water-nationalpollutant-discharge-elimination-system-npdes-permit.
[5] For more information on the ARAP program please visit https://www.tn.gov/environment/article/permit-water-aquatic-resourcealteration-permit.
[6] For more information on the NPDES Industrial Stormwater General Permit program please visit http://www.tn.gov/environment/article/permit-water-npdes-industrial-stormwater-general-permit. (**0043-2** [Abkowitz, Kendra])

Comment: The TVA CRN Site Part 3 - Environmental Report submitted to the NRC as part of the ESP Application notes that due to the interactions of the Watts Bar Dam, Melton Hill Dam and Fort Loudon Dam, that the river flow "can be upstream, downstream or quiescent, depending on the modes of operation" within the vicinity of the site. This could mean that for short periods of time, the intake at the CRN facility would be downstream of the NPDES discharge point for the facility. It is not clear what impact if any this flow reversal would have, but TDEC recommends that the forthcoming EIS consider this variable. (**0043-3** [Abkowitz, Kendra])

Comment: SMR's are extremely water-intensive, especially when compared to clean energy choices such as wind, solar and energy efficiency and conservation. In these global warming times of drought, squandering water in this way is the last thing we should be doing. (**0051-11** [Anthony, Kate])(**0051-5** [Anthony, Kate])

Comment: Water use could be an environmental concern, but it is impossible to comment further on water consumption by the proposed reactors without more information about the cooling-system water requirements and other water intake needs. In principle, the adjacent river/reservoir could provide adequate water supply. (**0054-2** [Goss, Sandra])

Comment: More intensive water use than clean energy sources (**0059-3** [Anonymous, Anonymous])

Response: *Potential impacts on surface-water use and quality as a result of construction at the CRN Site will be discussed in EIS Sections 4.2.2.1 and 4.2.3.1. The potential impacts on surface-water use and quality as a result of plant operations at the CRN Site will be discussed in EIS Sections 5.2.2.1 and 5.2.3.1. The effects of the CRN Site discharge on water temperature in the Clinch River will be included in Section 5.2.3.1 and the resulting potential impacts on aquatic ecology will be discussed in EIS Section 5.3.2. Permits and approvals will be discussed in Chapter 1 and Appendix H of the EIS. Appendix L will discuss expected future changes in climate at the CRN Site and will evaluate the potential effects of future climate change on the assessed environmental impacts.*

2.7 Comments Concerning Hydrology – Groundwater

Comment: I am looking at the coarse terrain of that site, and it is right along the Clinch River, of course. So, I am hoping that the scoping will really take a look at more knowledge that we know since the breeder reactor was referred to was studied, that they will look more carefully at how this works, because this SMR will be in a hole in water.

And there are sinkholes around. I don't know who's responsible for dealing with the sinkholes, but I know in the past that those sinkholes are often treated by filling them with concrete. That doesn't seem like a good plan, in part because of the surface, and with the coarse terrain, you never quite know where the water is going to do. (**0002-2-2** [Kurtz, Sandy])

Comment: Let me say one final thing about this site. The site is, as has been mentioned, a coarse site. And TVA in its application did some extensive hydrogeological descriptive material, and as one gentleman mentioned, at a previous reactor site there was a good deal of work done.

But you have to understand in coarse [karst] that core drilling doesn't really tell you. You can drill down and you could be six inches from the edge of a gigantic cave and you will miss it, and you will not know it's there. And ground-penetrating radar only works for the first few feet. You cannot tell what's under there.

And there are two recent examples that I would offer you. One is that TVA created a new lime waste site for coal ash over at Kingston. And I don't know if you've followed that. But the darned thing blew a hole in the bottom and a sinkhole and dumped a lot of ash out into the river. And somebody came along in a boat and said, "What's all this gray stuff bubbling up in the water?" And it was coal ash.

And they spent a lot of money on re-engineering that to TVA's satisfaction because they simply could not tell. And to this day, none of the engineers who did the re-engineering can guarantee you that what they have done --you know, they cut it down and relined it, and did a lot of things --that there are not sinkholes fairly near the surface that could burst through where there is enough weight in that area. (**0002-4-9** [Paddock, Brian])

Comment: I think that with that they hydrogeology is an entirely valid concern to be brought up, no matter what reactor design should be put there. That is an entirely valid concern over siting a reactor. And this is part of every, by now, it is part of every NRC review, and it should be.(**0002-5-1** [Skutnik, Steve])

Comment: My second concern comes from participation in design of groundwater monitoring systems and groundwater tracing studies in East Tennessee over several decades. Because of the statistical nature of radioactive emissions and the counting techniques typically used for analysis of radionuclides, detection monitoring systems for releases of radioactive substances into groundwater may yield ambiguous results. The scoping document, which contains much general background information on geology and hydrogeology, indicates that the site hydrogeology will be complicated due to extensive fracturing and to dissolution (karst) processes. I have been on the site, and believe the scoping document presents a fair assessment of the geology and hydrogeology of the site. My experience has been that adequate groundwater monitoring for a release at such sites requires more sampling, both spatially and temporally, than at sites without such extensive altering of primary bedrock permeability. While TVA has reactors on karst sites, they were permitted before it was so well understood that, on these sites, it is very difficult to adequately predict either direction or velocity of groundwater flow.

At the proposed site, one monitoring well has already been contaminated with volatile organics. TVA and TDEC sampling of well 422L at the site indicated non-aqueous phase diesel range organics. This obviously adds a further complication to the question of site monitorability. Presumably, TVA would need to remediate or isolate this contamination before attempting to monitor groundwater on the site.

Finally, there are other potential sources of radioactive contamination nearby. The Clinch River has received significant discharges of radioisotopes during legacy operations at Department of Energy Oak Ridge facilities. River sediments retain significant concentrations of radionuclides,

and low levels of some radioactive isotopes persist in river water. Air emissions of radioactive substances occurred near the site, possibly increasing the levels of radioactivity in soils.

My third concern about the site is related to the potential for flooding of the buried portions of the planned reactor(s) should groundwater channeling through karst conduits increase the groundwater flux into the excavation made to contain the reactor(s) due to soil piping or bedrock collapse. While there is currently little indication that such channels are well developed on the site, quarry operations and construction projects in East Tennessee frequently change groundwater hydraulics in ways that negatively impact (or even stop) operations. (**0031-2** [Jones, Sid])

Comment: Investigations by DOE and TDEC's Division of Remediation (DoR) - Oak Ridge Office have shown that there is deep ground water flow that goes under the Clinch River from the Oak Ridge National Laboratory (ORNL).[7] Migration of chlorinated solvents within the Conasauga Group formation, under the Clinch River along strike to the southwest, has resulted in contaminated private wells at Hoods Ridge. There is also suspected contamination from Oak Ridge Reservation in the Jones Island area across the Clinch River from Oak Ridge Reservation as well. TDEC recommends that any private well or spring use occurring in the area be investigated as a part of the EIS to address the unique geology and hydraulic connectivity of the site. TDEC also recommends that the extent of the existing ground water contamination, including preexisting radiological constituents and volatile organic compounds in the groundwater, at the proposed CRN Site be determined by TVA and addressed in the forthcoming draft EIS.[8]
[footnotes:]
[7] The proposed CRN Site is located in complex folded/faulted karst geology of the Valley and Ridge Province. The Copper Creek Thrust Fault cuts southwest/northeast across the “toe" of the boot-shaped site. A lesser unnamed thrust fault cuts across the northern portion of the site. Karst ground water flow does not behave as laminar flow and does not follow Darcy's Law - interstitial porosity plays a very minor role but appears to be a significant focus in TVA's investigations. The beds of the Chickamauga Group formations in the area are dipping at 30 plus degrees to the southeast. Ground water flow is going to generally be along strike of the beds to the southwest, as is evidenced from the offsite contamination from the Department of Energy (DOE) ORNL.
[8] TVA notes in its CRN Site ESP Application Part 3 - Environmental Report that monitoring well OW-422L in the center of the CRN Site has petroleum-based contamination. This location is slightly more than ½ mile west of the area of Hoods Ridge where chlorinated solvent contamination has been identified from the DOE ORNL. The existence of pre-existing site contamination is an issue of concern for both TDEC Division of Remediation and Division of Water Resources. (**0043-4** [Abkowitz, Kendra])

Response: *The occurrence and movement of groundwater at the CRN Site will be described in EIS Section 2.3.1.2, including the effects of fractures, karst, and geologic unit bedding planes. Existing groundwater quality will be described in EIS Section 2.3.3.2. Potential impacts on groundwater use and quality as a result of construction at the CRN Site will be discussed in EIS Sections 4.2.2.2 and 4.2.3.2. The potential impacts on groundwater use and quality as a result of plant operations at the CRN Site will be discussed in EIS Sections 5.2.2.2 and 5.2.3.2.*

2.8 Comments Concerning Ecology – Terrestrial

Comment: And to close with dignity of the Oak Ridge Reservation which is the largest contiguous protected area. There's a lot of rare and endangered species and in terms of forest and the rich and valued products -- ecological products. That's a great asset and a very valuable natural resource and -- that is also endangered by this site -- this close proximity. (**0001-11-2** [Naegeli, Wolf])

Comment: We live in a temperate rainforest. This is an especially rare kind of area. And it seems to me that we would want to preserve that, that temperate rainforest. It is one of the few in the world. And the biodiversity here of our species is very, very rare, indeed, and we need to take responsibility to protect it, another reason perhaps that this site is not suitable. (**0002-2-5** [Kurtz, Sandy])

Comment: Then, we can talk about the climate change impacts, and I am hoping that in this scoping, do you include that and address the loss of forest, soil disturbance, and ...the biodiversity, indeed, of the forest itself. (**0002-2-6** [Kurtz, Sandy])

Response: *The staff will discuss potential impacts on terrestrial resources from construction and operation of the proposed project, including forests and other natural habitats and threatened and endangered species and critical habitats, in Sections 4.3 and 5.3 of the EIS, respectively. The staff will address cumulative impacts on terrestrial resources surrounding the project area, including on the Oak Ridge Reservation, in Section 7.3 of the EIS. Appendix L of the EIS will discuss the effect of climate change on the evaluation of environmental impacts.*

Comment: So, this Clinch River Site has two advantages by being there at Oak Ridge National Laboratory because ORNL's Environmental Sciences Division has done extensive long-term research on the environment very close to this site and has just many papers and species list, and information about this area.

Also, for the past three years the National Ecological Observatory Network, or NEON, project of Battelle has been doing a lot of ecological/environmental research on many different aspects. And it is within the same area. All this environmental data is provided as a public service. So, these may be two resources that we have here. (**0002-3-1** [Cumberland, Margaret])

Response: *The staff agrees that the Oak Ridge National Laboratory and the National Ecological Observatory Network are beneficial sources of information that may be used, among others, to describe and characterize in the EIS those ecological resources that may be affected by the proposed action or alternatives.*

Comment: The [U.S. Fish and Wildlife] Service [FWS] has reviewed recent and historical endangered species collection records within the locality of the proposed project site. Records indicate that several federally listed terrestrial and aquatic species occur within the vicinity of the site identified by NRC/TVA. Due to the presence of these species within the proposed project vicinity, we request that NRC, or a designated representative thereof, work closely with the Service when addressing threatened and endangered species within the action area to ensure that the appropriate species and federally designated critical habitats are included in an

assessment. While we realize that TVA has extensive records for federally listed and at-risk species in its Natural Heritage Database, we also suggest that NRC utilize the U.S. Fish and Wildlife Service Information for Planning and Conservation (IPaC) system located at: https://ecos.fws.gov/ipac/, in addition to TVA's Natural Heritage Database, to obtain the most comprehensive species information. The proposed action area can be input into IPaC and a current species list, appropriate for the proposed project, will immediately be produced. (**0003-1** [Boles, Dustin])

Comment: Furthermore, the Service [FWS] recommends the development of a Biological Assessment, as required by 50 CFR 402.12, which would analyze the potential effects of the action on listed and proposed species and designated and proposed critical habitat. The Biological Assessment will identify whether any such species or habitat are likely to be adversely affected by the action and is used in determining whether formal consultation or a conference is necessary. When evaluating potential impacts to species, both direct and indirect impacts should be considered. (**0003-2** [Boles, Dustin])

Comment: Additionally, we [FWS] recommend that NRC address and include known locations of wetlands during their analysis with determinations of potential future effects to the resource. (**0003-3** [Boles, Dustin])

Comment: We [FWS] also request that NRC coordinate frequently and early with the Service regarding the proposed action to remain in compliance with Section 7 of the Endangered Species Act of 1973 (87 Stat. 884, as amended; 16 U.S.C. 1531 et seq.). Additionally, the Service request that NRC coordinate in regards to any potential survey efforts for threatened and endangered species. (**0003-4** [Boles, Dustin])

Comment: We [FWS] further recommend that NRC address and include known locations of migratory birds, afforded certain levels of protection under the Migratory Bird Treaty Act of 1918 (16 U.S.C., Chapter 7, Subchapter II), and determine potential future effects to these resources. In addition, we request that NRC determine the potential for presence and effects to the bald eagle (*Haliaeetus leucocephalus*) in the action area. This species is currently afforded certain levels of protection under the Bald and Golden Eagle Protection Act (16 U.S.C. 668-668c), enacted in 1940, and the MBTA. (**0003-5** [Boles, Dustin])

Comment: NRC should also identify hibernacula utilized by at-risk or federally listed bat species in the vicinity of the action area and determine if the proposed action could affect any individuals. (**0003-6** [Boles, Dustin])

Comment: As NRC proceeds with its analysis, we [FWS] will provide additional comments specific to the action. We can also provide a comprehensive list of species which we feel could be affected by the proposed action at a later date, upon request (**0003-7** [Boles, Dustin])

Comment: We have included a species list as an enclosure to this letter [see ML17205A341 for the tables], which identifies a list of species that may occur near the identified action areas. The Service recommends that you evaluate the proposed project for potential direction and indirect impacts to these listed species or their habitats in compliance with Section 7 of the Endangered Species Act of 1973 (87 Stat. 884, as amended; 16 U.S.C. 1531 et seq.). While

evaluating potential impacts to these species, please also consider modification of any associated critical habitat for listed species.

While the project proponent is not required to consult on petitioned species, Section 7(a)(4) of the Endangered Species Act of 1973 does provide a mechanism for identifying and resolving potential conflicts between a proposed action and a proposed species during the early planning stages. Therefore, we take this opportunity to recommend that you consider impacts to the hellbender (*Cryptobranchus alleganiensis*), petitioned for listing in FY18. There are historic records of this species occurring near the proposed site of the CRN. Additionally, there are records of the Berry Cave salamander (*Gyrinophilus gulolineatus*), which is petitioned for listing in FY19.

The Service recommends that you coordinate with the Tennessee Wildlife Resource Agency and Tennessee Department of Environment and Conservation's Natural Heritage Program to address concerns regarding state listed species.

Response: *The NRC staff appreciates the U.S. Fish and Wildlife Service's request to work cooperatively on the Endangered Species Act (ESA) consultation for the proposed project. The staff will coordinate with the U.S. Fish and Wildlife Service on the Endangered Species Act (ESA) consultation for the proposed project and in its development of a Biological Assessment to ensure that it properly addresses all potentially affected listed and proposed species (and designated critical habitat), as well as habitats used by such species (e.g., hibernacula), and will also coordinate with other state agencies as suggested. The staff will summarize relevant information from the ESA consultation and will include it in Sections 2.4, 4.3, and 5.3 of the EIS. The staff will similarly include evaluations of migratory birds, including the bald eagle, and wetlands in the EIS.*

2.9 Comments Concerning Ecology – Aquatic

Comment: And further on, really, the Tennessee River ecology, it's already temperature stressed by the climate change -- the more extreme southern temperatures that we've been experiencing at longer duration of them in the past two decades. So -- and even before Watts Bar 2 came online, TVA had several times instructed their nuclear power plants to refrain from really stressing the ecology of the river more. And so I think it's really a stupid idea to put more nuclear plants upstream (**0001-11-3** [Naegeli, Wolf])

Comment: The effect of the reactors on the river need -- I'm sure will be studied carefully, but I hope it's given serious consideration. The downstream water quality and the aquatic life and the effect really on the water temperature all the way down stream -- because there's been issues by the time it gets to Browns Ferry (**0001-5-11** [Safer, Don])

Comment: And so, the erosion and all the things associated with soil toxics and those kinds of things will eventually get to the river, the Clinch River. And that is not good for aquatic biodiversity .... as it goes downstream. (**0002-2-3** [Kurtz, Sandy])

Response: *Potential impacts on aquatic ecosystems from water quality effects during construction and operation will be discussed in Sections 4.3.2 and 5.3.2. Thermal impacts on*

aquatic organisms and habitats as a result of plant operations will be discussed in Section 5.3.2 of the EIS. Potential cumulative impacts on aquatic life will be discussed in Section 7.3.

2.10 Comments Concerning Socioeconomics

Comment: Also what needs to be considered in terms of the location is population growth, at least over the next 20 years. And if local climate change goes on as it has, and has done for the last two decades at least, been always at the upper range of what the experts predicted it could be -- the change in temperatures. And so that could lead to a lot more population in this part of Tennessee because a lot of people living further south may find it unbearable and people who are north may find that extreme events which are precipitated by the climate change -- it's not so much the temperature alone that is of concern, it's really that this causes much more extreme conditions -- longer droughts, more floods, more severe storms and extended what used to be natural disasters seem to be taking longer and longer before they settle down anymore. And so that should be considered. There may be a quite populated area and a more -- that have established here in 20 years. (**0001-11-4** [Naegeli, Wolf])

Response: *Potential impacts from the proposed action on socioeconomic factors, such as the regional population, will be discussed in Section 4.4 and 5.4 of the EIS. These sections will include consideration of the demographic impacts for the proposed action. Cumulative socioeconomic impacts will be discussed in Section 7.4 of the EIS.*

Comment: Second of all, several people here have talked about the -- the workforce. I hope you will also take into consideration, Oak Ridge is very rich in nuclear workers. We understand nuclear operations. We understand the rigor and formality required with those kind of operations. We have a governor who supports education in the state. We have a drive-to-55 program. That 55-percent of our adult population certificate or -- or qualified in some field.

Locally we have the University of Tennessee involved with the operations of Oak Ridge National Lab. We have the Pellissippi Community College and Roane State Community College that all work very close with our nuclear providers and actually curtail their -- or -- or custom their -- their curriculum to make sure it matches us so that we have the workforce of the future that we need. And as you look at -- at the amount of time these reactors are going to be online and operating, that is a long time. And it is not just who we have today, it is what we want to also have in the future. (**0001-7-2** [Kohlhorst, Darrel])

Response: *Potential impacts on socioeconomic factors from construction and operation of the proposed action will be addressed in Sections 4.4 and 5.4 of the EIS. This impact assessment will include consideration of the workforce requirements for the proposed action in conjunction with the regional labor market outlook (e.g., skill sets and availability). Cumulative socioeconomic impacts will be discussed in Section 7.4 of the EIS.*

Comment: Another thing is the -- my -- I live on Dove Ridge and if you look at the aerial photographs of the site, there is a long linear green space of trees that lead that site. And my thinking is well, two reactors. Somebody said they could put 12 in if they need more power line right away, I would think I would know where it was going -- right behind my house on the only

long linear forested areas there is leading that site. So those are my concerns. My property value -- if it is built, I know it would go down. Will I be made whole? I'm concerned about that. (**0001-8-2** [Almond, Jake])

Response: *Potential impacts from the proposed action on socioeconomic factors, such as property values, will be addressed in Sections 4.4 and 5.4 of the EIS. Cumulative socioeconomic impacts will be discussed in Section 7.4 of the EIS.*

2.11 Comments Concerning Historic and Cultural Resources

Comment: TDEC concurs with the plan to conduct Phase I/II site evaluation of the property proposed for the TVA CRN Site. This archaeological evaluation will determined if prehistoric and/or historic sites eligible for the National Register of Historic Places (NRHP) are located within the proposed property. If an archaeological site is determined eligible for inclusion on the NRHP, additional archaeological considerations will be necessary for the project to move forward.[13]
[footnote:]
[13] For more information on the Tennessee Division of Archeology please visit https://www.tn.gov/environment/section/arch-archaeology. If there are site specific archaeological questions please contact Jennifer Barnett at (615) 687-4780 or Jennifer.Barnett@tn.gov. (**0043-11** [Abkowitz, Kendra])

Comment: The Cherokee Nation (CN) is in receipt of your correspondence about Clinch River Nuclear Site Early Site Permit Application, and appreciates the opportunity to provide comment upon this project. The CN maintains databases and records of cultural, historic, and pre-historic resources in this area. Our Tribal Historic Preservation Office (THPO) reviewed this project, cross referenced the project's legal description against our information, and found that this Area of Potential Effect (APE) lies within our historic homelands.

In accordance with the National Historic Preservation Act (NHPA) [16 U.S.C. 470 §§ 470-470w6] 1966, undertakings subject to the review process are referred to in S101(d)(6)(A), which clarifies that historic properties may have religious and cultural significance to Indian tribes. Additionally, Section 106 of NHPA requires federal agencies to consider the effects of their action on historic properties (36 CFR Part 800) as does the National Environmental Policy Act (43 U.S.C. 4321 and 4331-35 and 40 CFR 1501.7(a) of 1969).

The CN has a vital interest in protecting its historic and cultural resources. The CN is in concurrence that an Environmental Impact Statement (EIS) in compliance with NHPA should be conducted for the Clinch River Nuclear Site, and is requesting a copy of this report. This office looks forward to receiving and reviewing the EIS. Please contact the CN with response to this request.

Additionally, we would request Department of the Interior conduct appropriate inquiries with other pertinent Tribal and Historic Preservation Offices regarding historic and prehistoric resources not included in the CN databases or records. If items of cultural significance are discovered while developing this project report, the CN asks that activities halt immediately and our offices be contacted for further consultation. (**0016-1** [Toombs, Elizabeth])

Comment: Information on Native American use in the project vicinity shows that prehistoric, ethnographic, historic, and traditional sites of value to the UKB [United Keetoowah Band] surround the project area. We recommend that a cultural resources inventory be completed prior to project implementation. (**0061-1** [Pritchett, Karen])

Response: *Potential impacts on historic and cultural resources will be discussed in Chapters 4, 5, and 7, based on the affected environment described in Chapter 2. The NRC will also fulfill its responsibilities under Section 106 of the National Historic Preservation Act with regard to historic properties for the project. The results of the Section 106 review will also be presented in the EIS. Copies of the EIS will be sent to Tribal consulting parties (including Tribal Historic Preservation Officers [THPOs]), the Tennessee Historical Commission, and the Advisory Council on Historic Preservation for their review and comment in accordance with NHPA consultation requirements.*

Comment: Thank you for the correspondence regarding the above referenced project. This project lies outside of our area of historic interest. Therefore, the Choctaw Nation of Oklahoma respectfully defers to the other Tribes that have been contacted. If you have any questions, please contact me by email. (**0032-1** [Rangle, Daniel])

Response: *The NRC will remove the Choctaw Nation from the CRN ESP EIS mailing list. The NRC will continue to consult with other Tribes contacted for the proposed project under Section 106 of the National Historic Preservation Act.*

2.12 Comments Concerning Meteorology and Air Quality

Comment: When you are talking about climate change, you are talking catastrophic weather events that need to be followed up. (**0002-2-8** [Kurtz, Sandy])

Response: *Potential impacts on meteorology and air quality from construction and operation of the CNR Site will be discussed in Sections 4.7 and 5.7 of the EIS. Cumulative impacts will be discussed in Section 7.6. Climate change will be discussed in Appendix L.*

Comment: The site may have air contaminant emissions from other onsite air emission sources that are required to have an air contaminant permit from the Division of Air Pollution Control. TDEC recommends that appropriate entities involved in the project review potentially applicable air permits as well as work with the Division of Air Pollution Control to ensure all emission sources are properly identified and permitted.[12]
[footnote:]
[12] For more information on TDEC Air Pollution Control permits please visit https://www.tn.gov/environment/topic/permit-air. (**0043-10** [Abkowitz, Kendra])

Comment: Water cooling tower emissions are evaluated for permitting and have been permitted at other existing TVA nuclear plants. The water vapor itself is not a regulated emission, however the resultant particulates that arise from evaporation (minerals found in the local river water or streams) are considered to be potential emissions as are any algaecide or slime mold/fungus treatments added to the water to act as a biocide. (**0043-8** [Abkowitz, Kendra])

Response: *The EIS addresses emission from the construction and operation of the proposed facility, as well as the cumulative impacts from existing sources. These comments refer to permits the applicant should apply for prior to operation of the CRN Site. The action before the NRC is an ESP to determine whether the CRN Site is suitable for placement of one or more SMRs. An ESP, if granted, does not authorize construction, and the applicant must obtain a construction permit or a combined license from the NRC prior to building at the site. Any new and significant information regarding emissions will be addressed at that time with another NRC NEPA review. It is at that stage in the project that the applicant is likely to consider taking steps to apply for air contaminant emission permits from the state.*

Comment: Should any land clearing activities or disposal of brush or trees/tree limbs occur, TDEC prefers that wood waste be disposed of by chipping, grinding, or composting rather than open burning. However, if open burning does occur during site preparation and construction, open burning regulations should be followed. TDEC recommends that detailed clearing activities, total amount of areas where soils are to be disturbed, and associated impacts be addressed in the draft EIS.[11]
[footnote:]
[11] TDEC APC Rule 1200-3-4-.01 et seq., http://sos.tn.gov/effective-rules. Additional information on open burning in Tennessee is available at https://tn.gov/environment/article/apc-open-burning and http://www.burnsafetn.org/. (**0043-7** [Abkowitz, Kendra])

Response: *Environmental impacts associated with the construction of the CRN Site will be addressed in Chapter 4 of the EIS. The building-related air emissions and related impacts on air quality, as well as the emissions from any open burning of vegetation, will be addressed.*

2.13 Comments Concerning Health – Nonradiological

Comment: I am a neighbor to the site. I can -- from my house on my porch you can see this site. You can see the buildings that are out there already. I've always not wanted to be NIMBY about my backyard but I guess if I had to vote, I'd prefer it not be there. But my concerns are the noise. It -- how much noise this plant would make not only in the -- when it's running but in the building of it. When we moved there I had my family with me on my property, and I said can you guys hear that? And they said Dad, I don't hear anything. What are you talking about? I said that's it, I don't hear anything but the birds. So I am concerned about the noise. I'm concerned -- I -- when this thing first got announced I tried to get in touch with Lamar Alexander. He never returned my calls. But somebody finally did and I asked if there would be a cooling tower on this site, and they said yes. Talking to folks today, they don't know. But the cooling tower would be looming in my -- from my porch. And I don't think that will help the property values. (**0001-8-1** [Almond, Jake])

Comment: Cooling towers are also associated with certain other potential pathogenic airborne illnesses including Legionnaire's disease and some amoebae considered harmful. (**0043-9** Abkowitz, Kendra])

Response: *Potential impacts from nonradiological health factors, such as noise and etiological agents associated with cooling towers, due to construction and operation of the CRN Site, will*

be addressed in EIS Sections 4.8 and 5.8. Cumulative impacts from nonradiological health factors will be discussed in Section 7.7.

2.14 Comments Concerning Health – Radiological

Comment: [I would remind the audience and the NRC that the mandate should properly be put on whether or not the site can be suitably host to a nuclear reactor design. So in this sense then I think it's perfectly appropriate to consider things like] ... radiological safety. (**0001-10-3** [Skutnik, Steve])

Comment: And there is also much associated illness, cancers and such, both in children and with workers, employees, in the nuclear site. So, that would be, I think, that people, that scoping should address. (**0002-2-12** [Kurtz, Sandy])

Comment: What impact does radiation have on the soil, the air, and the water, and noise? Those are things that should be considered, it seems to me, in scoping. (**0002-2-13** [Kurtz, Sandy])

Comment: As a public health professional, I am worried about keeping these highly toxic [radioactive] materials out of the air and water for generations to come. (**0014-3** [Holt, Cathy])

Response: *Potential impacts on human health from radiological factors due to the construction and operation of the CRN Site, such as radiological safety for workers, illness, and radiation levels, will be addressed in EIS Sections 4.7 and 5.9. Cumulative impacts on human health from radiological factors will be addressed in Section 7.8.*

Comment: Just remember the background of that is that, right now, because of the development of nuclear weapons here, you really have about a million tons of low-level radioactive waste already in this area.

And the Canadians have been given permission to bring in 10,000 more metric tons from Canada, with no permit or anything required. And they've said in their application that, while they have to have an export permit, in fact, they are not sending anything back.

So, you folks are going to be host to another 10,000 tons of low-level radioactive waste. And it is sort of a question about how much cumulative radioactive you want.

You are also storing a lot of high-level enriched uranium. Because, don't forget, when the Soviet Union collapsed, there was a deal made to bring as much of that away and keep it safely until it could be turned into fuel for reactors. So, you've already got yours. (**0002-4-8** [Paddock, Brian])

Comment: My Ph.D. research back in the mid-1960's involved radionuclide fallout in two Piedmont Georgia ecosystems, granitic outcrops and adjacent woodlands. In my study, I analyzed the radioisotope fallout from nuclear weapons testing taking place in our West and Russia. The project sampled 9 radioisotopes using scintillation counting for gamma emissions from these elements, particular Cs-127 and Mn-54. My results demonstrated the presence of these radioisotopes in all parts of three tree species, Juniperus virginiana, Pinus taeda, and Quercus georgiana. I also tested the presence of radionuclides in the soils of these trees. I

found that those trees at the lower edges of rock outcrops accumulate more radionuclides than high on the outcrop and adjacent woodlands. Thus I am concerned with any potential release of radionuclides into our atmosphere and aquatic ecosystems.

This brings me to the point that development of additional sources of release or potential release will result in bioaccumulation of dangerous radionuclides. This is certainly a problem that can occur in the Clinch River watershed. It could also affect a broad area downwind of the proposed Small Modular Reactors on the Clinch. (**0015-1** [Pittillo, Dan])

Response: *A baseline preoperational radiological environmental monitoring program will be addressed on Section 2.11 of the EIS. Exposure pathways used to assess dose to construction workers is described in EIS Sections 4.9.1, 4.9.2 and 4.9.3. Exposure pathways used to assess dose to the public and biota other than humans are discussed in EIS Sections 5.9.1 and 5.9.5. Potential cumulative impacts of the radiological impacts of normal operations will be addressed in EIS Section 7.8.*

Comment: One thing, when you have that documentation in the Oak Ridge Library, you should also have I can recommend a copy of the previous settlement. There was an environmental statement I don't know how many decades ago for Clinch River. That would be useful to compare it to in terms of the subtleties that go to the safety assessment. I don't know what goes into the departmental [environmental] impact statements, but, you know, some things, if you are looking at potential radiological releases, you should look at things like weather. (**0002-6-1** [Martin, Rodger])

Response: *The staff agrees that the Final Environmental Statement related to the Construction and Operation of the Clinch River Breeder Reactor Plant, dated February1977, may be a useful document to support this review. Radiological impacts from construction and operation of the CRN Site will be addressed in EIS Sections 4.7 and 5.9, while cumulative impacts will be discussed in Section 7.8.*

2.15 Comments Concerning Nonradiological Waste

Comment: According to the TVA CRN ESP Application Part 3 - Environmental Report, the CRN Site SMR is expected to be a Small Quantity Generator (SQG) of Hazardous Waste and will also construct and operate an on-site landfill[9] for construction/demolition wastes. Any nonradioactive hazardous and nonhazardous wastes associated with the construction, operation, and decommissioning of the CRN facility as well as construction of an on-site landfill must be handled in accordance the state's Solid and Hazardous Waste Rules and Regulations.[10] Furthermore, mixed wastes (e.g. containing low-level radioactive waste) with a hazardous component must be handled in accordance with the NRC requirements but also with the aforementioned Rules and Regulations. TDEC recommends that waste management considerations as specifically regulated by the Rules and Regulations of the state of Tennessee be incorporated in the forthcoming NRC EIS.
[footnotes:]
[9] If TVA wishes to construct and operate a solid waste disposal facility (i.e., construction/demolition landfill) at the CRN Site they will be required to obtain a landfill permit from the TDEC Division of Solid Waste Management. Information about the permitting process

and required application materials can be found at http://www.tn.gov/environment/article/permit-waste-landfill-permit.
[10] Reference TDEC SWM Rule 0400 Chapter 11 for Solid Waste and Chapter 12 for Hazardous Waste http://sos.tn.gov/effective-rules. (**0043-5** [Abkowitz, Kendra])

Comment: Sections 3.6 and 5.5 of the Environmental Report describe the various hazardous and nonhazardous waste streams that are expected to be generated as well as their impacts and procedures for management (e.g. Spill/Discharge Response Program, TVA-approved vendors for transport and disposal, a Waste Minimization Plan). While this information is informative, TDEC recommends further discussion of specific hazardous and mixed waste management and monitoring practices, treatment methods, and storage areas for attaining compliance with the state and limiting adverse environmental impacts and irreversible environmental commitments during construction and operation of the facility and its offsite rail, barge terminal, and underground transmission line improvement projects in the forthcoming NRC EIS. (**0043-6** [Abkowitz, Kendra])

Response: *Nonradiological waste impacts due to the construction and operation of the CRN Site will be addressed in Sections 4.10 and 5.10 of the EIS. Cumulative impacts will be addressed in Section 7.9. Permits and authorizations for the CRN Site will be addressed in Appendix H.*

2.16 Comments Concerning Accidents – Severe

Comment: Contention 2 challenges TVA's failure to address the environmental impacts of accidents involving ignition of spent fuel in the spent fuel storage pool(s) at the proposed SMR. There is no question that the consequences of such accidents could be catastrophic, but TVA has failed to show or even assert that the likelihood of such an accident is remote and speculative. Therefore, the Environmental Report violates the National Environmental Policy Act ("NEPA") by failing to address the environmental impacts of a spent fuel storage pool fire. The NRC Staff should ensure that this deficiency is corrected in the EIS for the proposed Clinch River Site ESP. (**0052-1** [Curran, Diane])

Comment: Contention 1 raises safety issues under NRC regulations for the implementation of the Atomic Energy Act. (**0052-3** [Curran, Diane])

Comment: Contention 1 challenges TVA's application for an exemption from NRC's emergency planning requirements with respect to the establishment of ten-mile emergency planning zone ("EPZ"). As demonstrated in the contention, TVA has failed to justify its proposal to reduce the size of the EPZ to the site boundary, or in the alternative a two mile radius. (**0052-4** [Curran, Diane])

Comment: Contention 2 challenges TVA's failure to address the environmental impacts of accidents involving ignition of spent fuel in the spent fuel storage pool(s) at the proposed SMR. There is no question that the consequences of such accidents could be catastrophic, but TVA has failed to show or even assert that the likelihood of such an accident is remote and speculative. Therefore, the Environmental Report violates NEPA by failing to address the environmental impacts of a spent fuel storage pool fire. (**0052-5** [Curran, Diane])

Comment:

Contention 1: Inadequate Emergency Plan

1. Statement of the Contention: The Emergency Plan in the ESP application for the Clinch River SMR is inadequate to satisfy 10 C.F.R. §52. I 7(b)(2) because the size of the proposed plume exposure Emergency Planning Zone ("EPZ") is less than the minimum ten-mile radius required by 10 C.F.R. §50.47(c)(2) for most nuclear power reactors. While TVA claims to qualify for an exemption from 10 C.F.R. §50.47(c)(2) "due to the decreased potential consequences associated with such a facility" (ESP Application, Part 6 at 1), TVA has not demonstrated that it satisfies the NRC Staffs criterion for such an exemption with respect to the potential for a spent fuel storage pool fire. As provided in an NRC guidance document that has been consistently applied to exemption applications, the Staff will not approve an exemption to offsite emergency planning requirements unless the applicant can demonstrate that the time between uncovering of spent fuel and initiation of a zirconium fire in the spent fuel storage pool is ten hours or more. Preliminary Draft, Regulatory Improvements for Power Reactors Transitioning to Decommissioning at A-1 (RIN # 3150-AJ59, NRC Docket# NRC-2015-0070, 2015) ("Draft Guidance for Decommissioning Reactors") (NRC ADAMS Accession No. ML16309A332). [1]

Therefore, for consistency with this principle, in order for TVA to qualify for an exemption from the ten-mile EPZ, TVA should have to demonstrate for the spent fuel storage pool(s) to be located at the proposed site that in the event of a loss of cooling and adiabatic heating conditions (i.e., conditions in which a range of factors may prevent heat from leaving individual fuel assemblies or spent fuel racks), at least ten hours would elapse before a zirconium fire would be initiated. Such an analysis would depend on fuel design features, as well as operational factors that are not specified in the ESP application. If this information is not available or not sufficiently well-defined to enable a technically sound analysis that could plausibly demonstrate the condition is met with adequate margin, TVA's exemption request should be rejected without prejudice and TVA should be advised to re-submit it at the COL stage.
[footnote:]
[1] In reliance on the Draft Guidance for Decommissioning Reactors, the NRC has issued exemptions from emergency planning requirements for numerous reactors, including Kewaunee, Crystal River, San Onofre, and Vermont Yankee. See Memorandum from Stephen S. Koenick to William M. Dean re: Transition to Decommissioning Lessons Learned Report (Oct. 28, 2016) (ADAMS Accession No. ML16176A339). (**0052-7** [Curran, Diane])

Comment: 2. Brief Summary of Basis for the Contention: While detailed emergency plans are not required for ESP applications, NRC regulation 10 C.F .R. § 52.17(b)(2) provides ESP applicants with the option to submit emergency plans for approval by the NRC. As part of its ESP, TVA has submitted two alternative emergency plans -one with an EPZ that conforms to the site boundary (Part 5A of the ESP application) and the other with a two-mile EPZ (Part B of the ESP application). Part 6 of TVA's ESP application consists of a request for an exemption from the ten-mile EPZ requirement in 10 C.F.R. §§ 50.33(g), 50.47(b), and 50.47(c)(2).

As demonstrated in Draft Guidance for Decommissioning Reactors, the NRC considers pool fires to constitute contributors to the accident risk that must be protected against through the

emergency planning process. Id. at A-1. In Part 6, entitled "Exemptions and Departures," TVA asserts that an EPZ extending beyond the site boundary (or, alternatively, a two-mile radius) is not necessary to achieve the purpose of NRC's emergency planning regulations because "there are no offsite consequences from any credible event in excess of the [U.S. Environmental Protection Agency Protective Action Guidelines]." Id., Table 1-1. But TVA completely fails to discuss any SMR design features that would decrease the potential for spent fuel pool fires to result in significant off-site radiological releases.

The Draft Guidance for Decommissioning Reactors advocates the allowance of relaxation of the ten-mile EPZ requirement for decommissioning reactors on the ground that after a reactor has shut down and spent fuel has cooled for a period of years, the time between uncovering of spent fuel and ignition of spent fuel zirconium cladding (assumed to occur when the cladding temperature reaches 900°C) in a spent fuel storage pool increases to at least ten hours. Id. This guidance is based in tum on NUREG-1738, Technical Study of Spent Fuel Pool Accident Risk at Decommissioning Nuclear Power Plants (2001) (ADAMS Accession No. ML13251A342). For operating plants, the NRC has demonstrated that cladding temperatures can reach 900°C (1173 K) in less than 10 hours for certain accident scenarios. NUREG-2161, Consequence Study of a Beyond-Design-Basis Earthquake Affecting the Spent Fuel Pool for a US Mark I Boiling Water Reactor at 132-33 (2014) (ADAMS Accession No. ML13297070) ("Consequence Study").

In the case of an operating SMR or other type of reactor, recently discharged hot spent fuel is loaded periodically into the spent fuel pool. In the case of multiple modules that share one spent fuel pool, like the NuScale SMR design, this could happen as often as every two months or even more frequently, depending on the number of modules and the fuel management strategy. As a result, the time between uncovering of spent fuel and ignition could be significantly less than ten hours.

It is well established that significant radiological consequences of a pool fire could extend beyond the site boundary, and for that matter well beyond a ten-mile EPZ. Consequence Study at 169 (reporting that 4 million people could be displaced out to 500 miles). In the NRC's License Renewal Generic Environmental Impact Statement, the NRC also concluded that the environmental impacts of a pool fire are "comparable to those from the reactor accidents at full power." NUREG-1437, Generic Environmental Impact Statement for License Renewal of Nuclear Plants at 1-28 (2013). The potential for reactor accidents to have significant adverse public health effects within at least a ten-mile radius --including early and latent fatalities --is discussed in NRC's emergency planning guidance documents. See NUREG-0396, Planning Basis for the Development of State and Local Government Radiological Emergency Response Plans in Support of Light Water Nuclear Power Plants (1978) and NUREG-0654/FEMA-REP-l, Rev. 1, Criteria for Protective Action Recommendations for Radiological Emergency Response Plans and Preparedness in Support of Nuclear Power Plants (1980). Thus, before an exemption from the ten-mile EPZ requirement in NRC's emergency planning regulations may be approved, TVA should be required to demonstrate that the time between uncovering of spent fuel and ignition of spent fuel is comparable to a spent fuel pool at a decommissioning reactor, i.e., greater than ten hours.

The information provided by TVA should be sufficiently detailed to allow the NRC Staff, the parties and the Atomic Safety and Licensing Board ("ASLB") to independently verify TVA's representations. It appears doubtful that TVA will be able to supply the NRC with that information, given that (a) TVA has not yet chosen a design for the proposed SMR, (b) only one design (NuScale) has been submitted to the NRC, and (c) even the NuScale design has not been reviewed or approved by the NRC, and is still in the early stages of review. If that is the case, the NRC should reject TVA's exemption application without prejudice, and allow it to be resubmitted at the COL stage.

3. Demonstration that the Contention is Within the Scope of the Proceeding: This contention is within the scope of this ESP proceeding because it raises an issue of compliance with NRC safety regulations for issuance of an ESP.

4. Demonstration that the Contention is Material to the Findings NRC Must Make to issue an ESP for the proposed TVA SMR: The contention is material to the findings that NRC must make in order to issue an ESP for the proposed TVA SMR because it seeks to ensure that TVA fulfills NRC's emergency planning regulations with respect to the size of the EPZ. (**0052-8** [Curran, Diane])

Comment:

Contention 2: Failure to Address Consequences of Pool Fires

1. Statement of the Contention: The Environmental Report fails to satisfy NEPA because it does not address the consequences of a fire in the spent fuel storage pool, nor does it demonstrate that a pool fire is remote and speculative.

2. Brief Summary of Basis for the Contention: The consequences of spent fuel pool fires must be considered in any environmental analysis of the impacts of reactor operation, because the NRC has not ruled out their likelihood as remote and speculative. State of New York v. NRC, 681F.3d471, 483 (D.C. Cir. 2012). See also NUREG-1437, Generic Environmental Impact Statement for License Renewal of Nuclear Plants at 1-28 (2013) ("License Renewal GEIS") (concluding the environmental impacts of pool fires are "comparable to those from the reactor accidents at full power."). TVA claims that the design of the spent fuel storage pool(s) for the proposed SMR has "spent fuel pool cooling without the need for active heat removal." Environmental Report at 9.3-2. But the Environmental Report does not state that the cooling system renders pool fires remote and speculative.

As discussed in Contention 1, it is well established that the radiological consequences of a pool fire are potentially catastrophic. For instance, radioactive fallout from a pool fire could displace as many as 4 million people out to 500 miles. Consequence Study at 169. The potential for reactor accidents to have significant adverse public health effects within at least a ten-mile radius --including early and latent fatalities --is also discussed in NRC's emergency planning guidance documents. See NUREG-0396, NUREG-0654. In the License Renewal GEIS, the NRC also concluded that the environmental impacts of a pool fire are "comparable to those from the reactor accidents at full power." Id. at 1-28 (2013).

Therefore, in the absence of a documented and supported assertion that the potential for a pool fire is remote and speculative, TVA must address the consequences of a pool fire in its Environmental Report.

3. Demonstration that the Contention is Within the Scope of the Proceeding: This contention is within the scope of this ESP proceeding because it seeks consideration of the consequences of a type of severe accident that NRC views as reasonably foreseeable and therefore must address in the EIS for the proposed ESP.

4. Demonstration that the Contention is Material to the Findings NRC Must Make to issue an ESP for the proposed TVA SMR: The contention is material to the findings that NRC must make in order to issue an ESP for the proposed TVA SMR because it relates to the question of whether TVA has addressed all reasonably foreseeable impacts of operating an SMR in its Environmental Report, as required by NEPA. State of New York, 681 F.3d at 483. (**0052-9** [Curran, Diane])

Response: *The commenter's scoping comments were submitted to the NRC as part of a separate hearing process. Please refer to ML17188A445 for the NRC staff's response to the comments.*

Comment: The EIS should go in detail with beyond design basis accidents. That's major accidents where loss of coolant creates situations where massive amounts of radiation can be released. The industry is wanting to say that these -- that can never happen. That was said back in the '70s and '80s. I was there -- a critic then. And they said you could never have a major loss of coolant accident and a major release of radiation. That was before Fukushima, of course, and Fukushima proved that to be tragically wrong. And it almost happened at Three Mile Island, but that containment held for the most part. Although people that live there say -- many people have stories of -- of tragedies after Three Mile Island because of radiation exposure. So usually these environmental impact statements do not go into the details about the beyond-design basis accident because they wouldn't build them if they really went into those details. But I think it's a -- a travesty that these things aren't considered -- those types of accidents. It's my understanding that the EIS is going to go into the problems. If you have one of these reactors goes bad, well, the NuScale design, which is the only one that is on the books now as being considered, can have up to 12 50-megawatt reactors. And in the same pool with the spent fuel, all of that underground in a pool of water. If you start having one reactor go seriously bad -- and you know, the industry will say, well, these are going to have passive design where you can't have a -- a major meltdown, blah, blah, blah. Well, that was told us 30 years ago, 40 years ago when the GE Mark 1s, on the -- on the ice condenser designs. This is all theoretical and the industry try and put their best face on it, but we need -- we've learned, I hope, with nuclear energy we have to be prepared for the worst consequences because they can happen even if they are unthinkable, they are happening now. Fukushima is still happening now. So the effects of multiple cascading reactor failures and spent fuel burning due to the emptying of that pool need to be considered in the environmental impact statement. (**0001-5-7** [Safer, Don])

Comment: And I don't know what goes into a radiological release under accident conditions when they do the site assessment. That would be good to look at..... One newspaper report

indicated that the Fukushima accident could never happen; that scenario could never happen. So, we need to be practical. I'm not afraid of any of this stuff. I'm a nuclear engineer. But sometimes we don't always look at things we should. (**0002-6-5** [Martin, Rodger])

Response: *EIS Chapter 5 will include an evaluation of the risks associated with potential severe accidents. The evaluation will also include estimates of health and economic risk to a distance of 50 miles from exposure to the plume and from exposure to contaminated land and water.*

2.17 Comments Concerning the Uranium Fuel Cycle

Comment: The spent fuel -- the impact of long-term storage needs to be considered in the EIS. The failure of the planning -- the zirconium planning is being studied right now in Oak Ridge, just now, for high burnup fuel. It's never been studied before. What's been studied is the low burnup fuel. That's not what we're dealing with in this industry anymore. The burnup of -- of -- the -- I don't know how they can know this, because they don't know the reactors of design, but in the -- the documents there was a talk of somewhere around 40 to 50 gigawatt days per metric ton. The -- the crazy number they have for burnup, but -- measure for burnup. But the high burnup fuel and the storage of that needs to be taken into account, and the possible impacts of that fuel breaking containment through either the failure of the cladding, the failure of the pool, the failure of the canisters over time -- the canisters are just thin-walled, half-inch stainless steel. And there's been some indications recently that they are not -- they may not last as long as any of us wants to -- think that they're going to last. That needs to be put into the environmental impact statement. (**0001-5-10** [Safer, Don])

Comment: And just like existing nuclear power plants, they produce long-lived, highly radioactive nuclear waste for which no safe management and permanent storage exists. (**0005-3** [McBride, Geoff] [McBride, Linda] [Sprignoli, Damon] [Turk, Lawrence "Butch"]) (**0005-7** [McBride, Geoff] [McBride, Linda] [Sprignoli, Damon] [Turk, Lawrence "Butch"])

Comment: They are expensive. They generate high-level waste which we do not know what to do with in the US. (**0006-2** [Sutlock, Dot])

Comment: It [nuclear power] also produces highly radioactive nuclear waste. SMRs need disposal sites to contain this highly radioactive waste, but there is no safe management and no safe permanent storage for this waste. (**0007-3** [McFadden, Nancy])

Comment: I am concerned about not only the cost, but mainly the long-lived radioactive nuclear waste, which there is no known way to store safely. (**0014-2** [Holt, Cathy])

Comment: Also, I understand that this site will employ small modular reactors SMR). There are no well tested and proven designs for SMR's. SMRs produce extremely toxic, highly radioactive and long-lived nuclear waste for which no safe, long term management exists. SMRs could greatly complicate the disposal of nuclear waste. The use of SMRs would increase the number of designated locations for radioactive nuclear waste in the world, making it harder to control, track and manage. (**0021-4** [Harland, Donald])

Comment: A reactor that produces long-lived and highly radioactive nuclear waste that threatens its down-wind neighbors....is just not wise. (**0025-2** [Kirkman, Arden])

Comment: I do not live near the site or own property near the site, but I have worked intermittently on problems with radioactive waste management and groundwater monitoring in the Oak Ridge area for many years. My first concern comes both from my involvement with attempts to resolve a number of issues with on-site management of low level radioactive waste in Oak Ridge and an awareness of the difficulties encountered in attempts made to date to manage transuranic waste, high level radioactive waste, and spent nuclear fuel. There have been decades of work toward establishing an adequate disposal facility for high level radioactive waste and spent nuclear fuel in the United States, yet little progress has been made toward consensus of how and where this material can be safely disposed for the duration of the hazard. Until some significant steps toward resolution of the waste disposal issues have been made, expansion of nuclear power seems unwise. (**0031-1** [Jones, Sid])

Comment: We do not need to be using money for a risky venture into unproven nuclear power when we have no way to safely dispose of the waste which will remain dangerous for thousands of years. We do not need to pollute the plane[t] and endanger ourselves and future generations. (**0048-1** [Hyche, Kenneth])

Response: *These comments are concerned with continued storage and long-term disposal of high-level waste. While a repository for final disposal of spent nuclear fuel has yet to be constructed, the Commission has, through rulemaking, considered the environmental impacts of spent fuel disposal in light of the current national policy regarding spent fuel. As directed by 10 CFR 51.23(b), the impacts assessed in NUREG-2157 are deemed incorporated into this EIS in Section 6.1.6. Section 6.1.6 also explains that current national policy mandates that high-level and transuranic wastes are to be buried at deep geologic repositories and that no release to the environment is expected to be associated with deep geologic disposal.*

Comment: A major issue with nuclear facilities is the disposal of radioactive waste products. NRC may want to consider an economic feasibility comparison study for vitrification of waste products verses current storage and disposal practices as part of the EIS. (**0026-3** [Long, Larry])

Response: *An economic feasibility comparison study for vitrification of waste products versus current storage and disposal practices is outside the scope of this EIS, and this comment does not provide specific information related to the environmental effects of the proposed action.*

2.18 Comments Concerning the Need for Power

Comment: TVA's 2015 Integrated Resource Plan for a 20-year long term energy plan that the Southern Alliance for Clean Energy is closely working on showed that the utility did not succeed any new base load generation beyond Watts Bar 2, and possible -- and the possible extended power up rate at the three Browns Ferry Reactors. TVA did not include a need for power analysis that is typically part of the environmental report in the ESP application. We are concerned that was not included because it has been based on the outcome of the 2015 IRP, TVA would not be able to demonstrate to the NRC a need for SMRs even 20 years from now. Why spend tens of millions of dollars on a licensing process for something that is not even

needed? The NRC needs to conduct a full need-for-power analysis for this draft EIS, not punt the essential review to the combined operating license stage. The NRC must not hide behind the purported need as stated in TVA's ESP application to provide secure power to the DOE facilities such as Oak Ridge National Lab. TVA repair money is being wasted on something that is not needed. (**0001-4-3** [Powell, Michelle])

Comment: The -- I second what's been said about having a need for power. That really needs to be considered now. It's -- it's -- inexcusable to push that -- to spend the $70 million of taxpayer money and TVA money when the power -- the technology -- TVA will not build the power. And with the renewables coming online, it's likely they will never need power from these SMRs. (**0001-5-6** [Safer, Don])

Comment: AND they are not needed. We are not facing any energy shortage and if we continue to make progress in conservation and clean, renewable energy, there is no reason to expect that we will be.

This is a dangerous, expensive, wasteful boondoggle, using tax payer money to profit the companies that manufacture these reactors and allowing them to test an experimental product at our expense and risk. (**0051-12** [Anthony, Kate])(**0051-6** [Anthony, Kate])

Response: *The action before NRC is the issuance of an ESP to determine whether the CRN Site is environmentally suitable for placement of one or more SMRs. The ESP determination is primarily a siting decision; in accordance with 10 CFR 51.50, the applicant's ER need not include an assessment of the need for power or of alternative energy sources. In accordance with 10 CFR 51.75, the ESP EIS will not include an assessment of the need for power or an evaluation of alternative energy sources because these matters were not addressed in the applicant's ER.*

If TVA were to apply for a construction permit or combined license at some time in the future, the environmental review of that application would include an assessment of the need for power. The review of that application would include the development of another EIS and the opportunity to participate in another hearing.

2.19 Comments Concerning Alternatives – No-Action

Comment: I believe that if you are going to bring in considerations of the environmental impact, the NRC should likewise consider the impacts of the alternative sources that would likely be built in the event the site is not built. I would point out that while TVA recently completed Watts Bar Unit 2, the predominant share of TVA's new electricity generation has not been renewables. It has been natural gas.

The TVA in the last 15 years has replaced hundreds of megawatts of coal capacity almost exclusively with natural gas. In that sense, then, I believe the avoided emissions from a nuclear unit should be considered a bounding part of the scope. That this is -- this would inherently result in a -- a net void emissions even with a substantial share of renewable capacity given the

requirements for natural gas back up. In as much, I believe, that the early site permit should consider the countervailing environmental effects of pursuing this project. (**0001-10-5** [Skutnik, Steve])

Comment: And finally, perhaps I'm hoping that the scoping will list some alternative uses because there are many other things that that forest --and it is a forested area --could be used for. And probably the best thing would be no action at all because the climate change issues that we need to address, then the forest. But it's hard to see the forestation action that it provides free of charge would be perhaps the best use of all. (**0002-2-14** [Kurtz, Sandy])

Comment: But I want to bring up, a lot of people brought up the issue of a no-action scenario. And I think this is actually really important to go back to this. I agree that the no-action scenario should be considered. I want to present some statistics.

TVA's generating portfolio generation capacity, 2012, was about 34 percent nuclear, 32 percent coal, 9 percent hydro, 11 percent natural gas. Today it is about 37 percent nuclear, 24 percent coal, 20 percent natural gas, 9 percent hydro, 3 percent wind and solar, and 7 percent of what is termed "energy-efficiency".

There is something I want to highlight in these numbers; that while we have a moderate increase in the nuclear generation capacity from the completion of Watts Bar Unit 2, the largest and most substantial growth in TVA's electricity-generating portfolio has not been nuclear energy; it has not been renewables; it has not been hydroelectric power. It is the natural gas.

The no-action scenario inherently will mean, with the growth in electricity demand, this means displacing zero carbon-emitting sources for carbon-emitting sources. There is no way around this. So, therefore, then, a no-action scenario should consider the environmental impacts of likely alternative sources of generation that will be constructed in the absence of this source. (**0002-5-4** [Skutnik, Steve])

Comment: In considering alternatives, the agency must examine the “alternative of no action.” 10 C.F.R. §51.104(a). (0052-19 [Curran, Diane])

Response: *The no-action alternative will be evaluated in Section 9.1 of the EIS with respect to the purpose and need as it is defined in Section 1.3 of the EIS. Energy alternatives are not required to be evaluated for an ESP. Because TVA has chosen not to evaluate energy alternatives in its ER, the NRC staff will not evaluate energy alternatives in its EIS. If TVA were to apply for a construction permit or combined license at some time in the future, the environmental review of that application would include an assessment of energy alternatives.*

2.20 Comments Concerning Alternatives – Energy

Comment: Contention 3 -Impermissible Discussion of Energy Alternatives and Technical Advantages

1. Statement of Contention: The ESP application violates the National Environmental Policy Act ("NEPA"), 42 U.S.C. § 4321-4370f, and NRC implementing regulations because it contains impermissible language comparing the proposed SMR to other energy alternatives and

discussing the economic and technical advantages of the facility. The language is impermissible because TVA has explicitly invoked 10 C.F.R. §5 l.50(b)(2), which excuses it from discussing the economic, technical, or other benefits of the proposed facility such as need for power. See Environmental Report, Chapter 8 (postponing need for power discussion), Environmental Report Section 9.2 (postponing energy alternatives discussion).[2] By formally choosing to exclude consideration of alternatives from its Environmental Report, TVA has effectively precluded Petitioners from submitting contentions on those subjects.

Under the circumstances, TVA must restrict the content of the Environmental Report to the impacts of construction and operation and a limited evaluation of alternatives related solely to the selection of the site. Any language comparing the proposed SMR to other energy alternatives, or purporting to justify the need for the SMR, should be stricken from the Environmental Report.

Furthermore, such language should not be included in the NRC's Environmental Impact Statement ("EIS") for the proposed ESP. Such an EIS would end up becoming an advertisement for SMRs rather than the rigorous, unbiased and independent scientific study required by NEPA. Robertson v. Methow Valley Citizens Council, 490 U.S. 332, 348 (1989); National Audubon Society v. Dep't of Navy, 422 F.3d 174, 185 (4th Cir. 2005); 40C.F.R.§1500. l(b).

In the alternative TVA may elect to address energy alternatives and need for power in the Environmental Report. In that case, fairness requires that Petitioners must be provided a reasonable opportunity to submit contentions on the new alternatives analysis.

Title 10 of the Code of Federal Regulations 51.50(b)(2) does not require a need for power discussion be included in an early site permit application. The need for power discussion is to be included in the combined license application.

See also Environmental Report, Section 9.2, "Energy Alternatives." The "Energy Alternatives" section is a blank page because "[t]his section is not required for an Early Site Permit Application." Id. at 9.2-1.
[footnote:]
[2] See Environmental Report at 8-1 (**0052-10** [Curran, Diane])

Comment: b. Comparison of alternatives in TVA's ESP application

In its ESP application, TVA has chosen not to address the issues of energy alternatives or need for the proposed SMR, and has instead postponed those issues to the Combined Operating Licensing ("COL") stage. See Environmental Report, Chapter 8 (postponing need for power discussion), Environmental Report Section 9.2 (postponing energy alternatives discussion).

Although the first paragraph of the "Purpose and Need" statement (Section 1.1.1) appropriately defines the purpose and need for issuance of the ESP in the limited manner prescribed by NRC regulations (i.e., "to provide for resolution of site safety and environmental issues, which provides stability in the licensing process"), Chapter 1 of the Environmental Report is brimming with claims that SMR technology is preferable to other energy technology on a host of issues,

including safety, security, reliability, carbon reduction, water use, and economies of scale. And in Chapter 9, TVA's discussion of the "no action" alternative, TVA laments that all of these asserted advantages of SMRs would be lost if TVA did not receive an ESP.

For instance, TVA promotes "SMR technology" as preferable for serving federal facilities: The SMR technology is designed with inherent enhanced safety and security features. SMR deployment will demonstrate that the technology is capable of incrementally supplying clean, secure, reliable power that is less vulnerable to disruption to facilities owned by federal agencies (e.g., U.S. Department of Energy (DOE), U.S. Department of Defense (DoD), TVA, etc.). Environmental Report at 1-1. TVA asserts that building an SMR "near federal facilities" could provide "enhanced reliability and other benefits, by providing continued operation during a widespread and extended loss of the electrical power grid, meeting reliability needs with clean energy that supports carbon reduction directives." Id. at 1-2. TVA also compares SMRs favorably to coal, to "assist federal facilities with meeting carbon reduction objectives." Id. at 1-3.

To support its claims regarding the special suitability of SMRs to supply electricity to federal facilities, TVA invokes the imprimatur of DOE:

DOE expressed its support to TVA for the development and licensing of SMRs as a means to meet DOE goals of improving the environmental, economic, and energy security outlook for the United States (Reference 1-5). DOE believes that SMR deployment near federal facilities could provide enhanced reliability and other benefits, by providing continued operation during a widespread and extended loss of the electrical power grid, meeting reliability needs with clean energy that supports carbon reduction directives. DOE specifically requested TVA to assess, as a part of the deployment project planning and licensing process, the ability of SMRs to continue to supply electricity to nearby offsite customers during a disruption to offsite power supplies. This includes electricity transmission to those customers in a manner less vulnerable to intentional destructive acts and natural phenomena that could disrupt the power supply.

Environmental Report at 1-2.

TVA also asserts that SMRs have certain benefits in relation to light water reactors ("LWRs"):

SMRs provide the benefits of nuclear-generated power in situations where large nuclear units, with an approximate electrical output exceeding 1000 MWe, are not practical, because of transmission system constraints, limited space or water availability, or constraints on the availability of capital for construction and operation. Environmental Report at 1-l. See also id at 1-4 ("SMRs may provide the benefits of nuclear-generated power in situations where large nuclear units are not practical ...").

Further, TVA claims that an SMR would serve national security needs: Power generated by SMRs could be used for addressing critical energy security issues. Their use on or immediately adjacent to DoD or DOE facilities, using robust transmission (e.g., armored transformers, underground transmission), could address national security needs by providing reliable electric power in the event of a major grid disruption. A more reliable electric power supply could be accomplished by the SMR operation in "power island" mode with robust transmission to critical facilities. In addition, intentional destructive acts (e.g., terrorist attacks) and natural phenomena

(e.g., tornadoes, floods, etc.) could disrupt the grid and the ability to restore most generation sources." Id. at 1-2.

In addition, TVA favorably compares the reliability SMRs to renewable energy sources, asserting that SMRS: can provide reliable energy for extended operation. Because nuclear reactors require fuel replenishment less frequently than other power generation sources (coal, gas, wind and solar), SMRs are less vulnerable to interruptions of fuel supply and delivery systems.

TVA could demonstrate this "power islanding" and secure supply concept as part of the [Clinch River] SMR project by utilizing controls, .switching, and transmission capabilities to disconnect the SMR power plant from the electrical grid while maintaining power from the SMR power plant to a specified DOE power need. Such a demonstration would show that SMR technology is capable of supplying reliable power that is less vulnerable to disruption from intentional destructive acts and natural phenomena. Id. at 1-2. Finally, TVA asserts that SMRs are preferable to other reactor designs for their safety features: SMR design features include underground containment and inherent safe-shutdown features, longer station blackout coping time without external intervention, and core and spent fuel pool cooling without the need for active heat removal. These key features advance safety by eliminating several design basis accident scenarios. Development of a security-informed design efficiently provides the same or better protection against the threats large reactors must consider. Physical security is designed into the SMR plant architecture, incorporating lessons learned from significant shifts in security posture since 2001, and the opportunity to build more inherently secure features into the initial design.

In Chapter 7, TVA also compares SMRs favorably to other reactors with respect to accident risks.

In Section 9.1, TVA once again introduces impermissible energy alternative considerations by describing the disadvantages of the "no-action alternative" as the lack of the supposed benefits described above, as well as the failure to create "new jobs" or to realize the "technological and financial benefits to the local, community Tennessee Valley, and the nation that would result from the construction of the fist-of-its-kind SMRs." Id. at 9.1-1-9.1-2. Similarly, TVA includes the same set of inappropriate energy-related alternatives in its discussion of alternative sites in Section 9.3. Id. at 9.3-2-9.3-3. (**0052-13** [Curran, Diane])

Comment: c. TVA's comparisons of SMRs with other technologies are unlawful

TVA's claims regarding the favorable comparison of SMRs with other energy alternatives must be stricken from the Environmental Report, and may not be included in the EIS for the ESP, because TVA has waived the right to make them by choosing not to address energy alternatives or the need for power in the Environmental Report. Id., Chapter 8 and page 9-2. In addition, TVA's claims regarding energy-related alternatives should be stricken in fairness to Petitioners, because Petitioners are precluded from raising issues related to energy alternatives and need for power by virtue of TVA's decision not to formally address those alternatives.

TVA's claims regarding energy alternatives are not only impermissible, but they are unsupported; some are even nonsensical. Thus, to allow them to remain, unchallenged, would reduce the Environmental Report to an advertisement for SMRs, without support or verification, and without providing the context of a comprehensive environmental analysis. For instance:

- The Environmental Report lacks a thorough comparison of SMRs with other energy technologies. TVA makes selective comparisons of SMRs with other energy technologies, but does not provide a comprehensive comparison. For instance, TVA compares SMRs with coal, gas, wind and solar on the factor of reliability. Environmental Report at 1-2. But it does not make a comprehensive analysis that addresses all relevant factors, such as carbon reduction, water use, air and water impacts, generation of waste products, and costs.
- The Environmental Report fails to acknowledge that solar and wind energy sources can meet all the other objectives listed by TVA (carbon reduction, safety, and incremental deployment), and have less deleterious environmental impacts, in particular water use. In fact, the magnitude of impact on water use is listed in Table 3.1-2 of the Environmental Report, which states that: "The expected (and maximum) rate of removal of water from a natural source to replace water losses from closed cooling water system" are "17,078 gpm (expected) [and] 25,608 gpm (maximum)." Assuming that TVA used a reactor capacity of 800 MW, that expected rate translates to 1,281 gallons/MW/hour. That rate of water withdrawal is higher than almost any other form of electricity generation. A combined cycle natural gas plant will be about a factor of four lower.[3] Solar photovoltaics (PV) and wind use negligible amounts of water; PV plants, for example, use about I gallon/MW/hour.

[footnote:]
[3] J. Macknick et al., Operational water consumption and withdrawal factors for electricity generating technologies: a review of existing literature, 7 ENVIRON. RES. LETT. 45802 (2012).
(**0052-14** [Curran, Diane])

Comment: To the extent that the Environmental Report compares SMRs with other energy sources on the factor of reliability, the comparison makes only partial sense. TVA asserts that: "Because nuclear reactors require fuel replenishment less frequently than other power generation sources (coal, gas, wind and solar), SMRs are less vulnerable to interruptions of fuel supply and delivery systems." While the statement is true for coal and gas, it is irrational in the case of wind and solar because they need no fuel replenishment. Renewable sources of power like solar and wind are, therefore, not vulnerable to fuel disruption. Although these are intermittent in nature, that concern can be addressed in a number of ways, in particular by incorporating on-site energy storage technologies.

TVA asserts that SMR technology provides "a way to supply federal mission-critical loads with reliable power from generation and transmission that is less vulnerable to supply disruption from intentional destructive acts and natural phenomenon than typical commercial power generation facilities and transmission systems." Environmental Report at 9.3-1. But TVA lumps generation and transmission together, without justification. Reliance on SMR technology has nothing to do with the security of transmission systems. In addition, TVA fails to address the United State's history of unsuccessful experimentation with small reactors, which suggests that SMRs are quite unlikely to be reliable sources of generating power in the first place. Prior experience that is particularly important to take note of is the Army's Nuclear Power Program, which was started

in the 1950s, and resulted in the construction of eight small reactors. The experiences with these reactors reveal the potential for failure implicit with SMRs. The PM-3A reactor at McMurdo Sound in Antarctica, for example, "developed several malfunctions, including leaks in its primary system [and] cracks in the containment vessel that had to be welded."[5] The leaks from the plant resulted in significant contamination and nearly 14,000 tons of contaminated soil was physically removed and shipped to Port Hueneme, a naval base north of Los Angeles, for disposal. The Army eventually cancelled the program in 1976, due to poor economics as well as the realization that diesel generators were a superior option for supplying power to remote areas. The official history of the Army's Nuclear Power Program termed the development of small reactors "expensive and time consuming."[6]
[footnotes]
[4] M.V. Ramana, The Forgotten History of Small Nuclear Reactors, IEEE SPECTRUM, 2015, http://spectrum.ieee.org/energy/nuclear/the-forgotten-history-of-small-nuclear-reactors (last visited May 24, 2015); M. V. Ramana, The checkered operational history of high temperature gas cooled reactors, 72 BULLETIN OF THE ATOMIC SCIENTISTS 171-79 (2016).
[5] LAWRENCE H. Sum, THE ARMY'S NUCLEAR POWER PROGRAM: THE EVOLUTION OF ASUPPORT AGENCY 111 (1990).
[6] Suid, supra, at 93. (**0052-15** [Curran, Diane])

Comment: In both Chapter 1 and Chapter 9, the Environmental Report asserts:

SMR technology can assist federal facilities with meeting carbon reduction objectives. Energy-related carbon dioxide (C02) emissions account for more than 80 percent of greenhouse gas (OHO) emissions in the United States. Studies show that on average coal combustion generates approximately 894-975 grams of C02 per kilowatt-hour (g/kWh) of electricity generated. Natural gas generates an estimated 450-519 g/kWh. Nuclear power emission rates have been calculated to range from 6 -26 g/kWh.

Id. at 1-3, 9.3-2. TVA's unsupported assertion that nuclear power emission rates have been calculated to range from 6 to 26 grams per kilowatt hour is erroneous in two key respects. First, independent studies suggest that there is much uncertainty about the level of emissions associated with the generation of nuclear energy. A widely cited academic study shows that estimates of lifecycle emissions from nuclear power plants vary by over two orders of magnitude, from 1.4 to 288 g/kWh of C02, with a mean value of 66 g/kWh.[7] Second, and more important, SMRs require more uranium fuel for each kWh of electricity generated.[8] Because of their smaller size and higher area to volume ratio, SMRs will necessarily leak more neutrons from the core when compared to larger reactors. As a result, SMRs need more fuel for each kWh of electricity generated in comparison to the large LWRs that are most common around the world, and that are the basis for the emission estimates made so far (either the 6-26 g/kWh or the 1.4-288 g/kWh). Emissions of C02 associated with uranium mining, processing, and enrichment are the dominant contributions to the lifecycle emissions associated with nuclear power. Therefore, this increased need for fuel would result in a corresponding increase in the C02 emissions per kWh.
[footnote:]
[7] Benjamin K. Sovacool, Valuing the greenhouse gas emissions from nuclear power: A critical survey, 36 ENERGY POLICY 2950-63 (2008).

[8] Alexander Glaser, Laura Berzak Hopkins & M.V. Ramana, Resource Requirements and Proliferation Risks Associated with Small Modular Reactors, 184 NUCLEAR TECHNOLOGY 12129 (2013). (**0052-16** [Curran, Diane])

Comment: TVA claims that its SMR design improves on spent fuel pool safety by providing for "spent fuel pool cooling without the need for active heat removal." Environmental Report at 1-3, 9.3-2. But this assertion does not mention other relevant information demonstrating that SMRs may require greater spent fuel storage capacity than LWRs, because they could generate a larger quantity of spent fuel for each kWh of electricity generated -additional impacts that should be compared with the safety benefits claimed by TVA. [See, e.g., Glaser et al., cited in note 8 above. For instance, TVA's calculations appear to use a burnup value of 51 gigawatt-days per metric ton: of uranium ("GWD/tU"). This value is much higher than some of the reported burnups of the designs of the four potential SMRs under consideration by TVA. For example, the International Atomic Energy Agency lists the burnup of the Holtec SMR design as 32 GWD/tU.[9] At this relatively low burnup, the Holtec SMR will generate more spent fuel than an SMR design that has a burnup of 51 GWD/tU. In turn, this would mean that the fuel pool capacity and, possibly, dry storage capacity, will have to be increased.

This is only a partial list of deficiencies in TVA's discussion of energy alternatives, provided for purposes of illustrating the bias and lack of rigor in TVA's discussion, as further grounds for Petitioners' argument that the discussion should be stricken from the Environmental Report. If and when TVA decides to formally address the issue of energy alternatives in a revised Environmental Report, Petitioners will review it and may submit a contention that challenges its contents with a more comprehensive list of deficiencies.
[footnote:][9] IAEA, ADVANCES IN SMALL MODULAR REACTOR TECHNOLOGY DEVELOPMENTS 89 (2014). (**0052-17** [Curran, Diane])

Comment:

3. Demonstration that the Contention is Within the Scope of the Proceeding: This contention is within the scope of this ESP proceeding because it seeks compliance with NEPA and NRC regulations for the implementation of NEPA in ESP applications.

4. Demonstration that the Contention is Material to the Findings NRC Must Make to issue an ESP for the proposed TVA SMR: The contention is material to the findings that NRC must make in order to issue an ESP for the proposed TVA SMR because it relates to the question of whether TVA's Environmental Report improperly addresses issues that TVA has determined should be excluded from this ESP proceeding and therefore may not be addressed by TVA or NRC and also may not be challenged by Petitioners in contentions. (**0052-18** [Curran, Diane])

Comment: Contention 3 asserts that the Environmental Report for the proposed Clinch River Site ESP is biased and unfair, because it advocates the technical advantages of SMRs as an energy alternative, even though TVA formally elected not to address energy alternatives or the need for power in the Environmental Report for the ESP.[3] As discussed in Contention 3, when an applicant elects not to address energy alternatives, the NRC follows a policy of not addressing those issues, and does not take comments on those issues. Under the circumstances, the NRC should not repeat or expand upon the discussion of energy alternatives

in the Environmental Report. To discuss energy alternatives would reduce the EIS to an advertisement for SMRs instead of the rigorous, unbiased and independent scientific study required by NEPA. (**0052-2** [Curran, Diane])
[footnote:]
[3] Contention 3 is supported by the expert declaration of Dr. M.V. Ramana, Professor and the Simons Chair in Disarmament, Global and Human Security at the Liu Institute for Global Issues, University of British Columbia, Vancouver, Canada.

Comment: Contention 3 asserts that the Environmental Report is biased and unfair, because it advocates the technical advantages of SMRs as an energy alternative, even though TVA formally elected not to address energy alternatives or the need for power in the Environmental Report for the ESP. (**0052-6** [Curran, Diane])

Response: *The commenter's scoping comments were submitted to the NRC as part of a separate hearing process. Please refer to ML17188A445 for the NRC staff's response to the comments. Energy alternatives are not required to be evaluated for an ESP. Because TVA has chosen not to evaluate energy alternatives in its ER, the NRC staff will not evaluate energy alternatives in its EIS. If TVA were to apply for a construction permit or combined license at some time in the future, the environmental review of that application would include an assessment energy alternatives.*

Comment: Regarding the fuel cost that has been mentioned earlier -- of natural gas, suppose there are quite a lot of uncertainties in there. But there's also a lot of uncertainty about nuclear fuel costs will work out in the future and -- in terms of climate and other impacts. Then the workforce requirements will -- potential workforce benefits -- economic benefits from technology -- it's certainly much less than what renewable resources for electricity could bring in the future. This is a very accelerating economic sector now, and will be for the foreseeable future. At a -- much more affect the number of jobs that will be created, and it will be all dependent on the -- mostly on the wind and solar energy, which is very productive now -- predictable in terms of the cost because, I don't know, but it can't really be easily changed.

Then regarding the safety -- safety is obviously a relative term particularly when one can predict in advance. But it's certainly safer not to use nuclear power. And the long term management of the waste -- the spent fuel -- is also not very well determined what the risks are for future generations and for the ecology of the future. That's also very unpredictable (**0001-11-1** [Naegeli, Wolf])

Comment: I will talk briefly about some of the issues we plan to bring up in our intervention on this reactor, which we plan to do in June by the deadline to intervene in the early site permit.

There is -- needs to be a basis for the plant and -- for the site permit. And that is something I have looked at and read the documents for, for example, the -- TVA's application submitted and on the record to the Commission's website. The basis -- part of the basis for the plant from TVA is Executive Order 13514, which is Federal Leadership in Energy, Environment, Economic Performance issued in 2009. It was to do this through an increased energy efficiency, reduction of greenhouse gasses, elimination of waste, new designs, construction maintenance and operating high performance, sustainable buildings in sustainable locations.

United States is the world's largest energy consumer. The Federal Government is the nation's single largest energy user. The Department of Defense is the biggest energy user in the federal system. And the leading use of -- leading in use of energy in the Defense Department is jet fuel. In other words, energy used in the most energy intensive federal agency is used principally to fly or to drive heavy equipment over long distances. A modular nuke at Clinch River would not have any impact here.

Moreover, the general trend in energy use by the Federal Government has been downward for the last four decades and is now in steep decline. According to the Federal Energy Management Program this accomplishment is directly attributed to federal employees making choices for efficiency and striving to reduce operating costs. Tools employed by federal agencies are training, technical assistance, energy performance, contracts. Not nuclear power.

A subsequent executive order, Executive Order 13693 entitled Planning for Federal Sustainability in the Next Decade was issued in 2015. It revokes 13514, but reiterated overall policy to -- to increase energy efficiency and improve environmental performance. Executive Order 13693 also sent specific targets for cleaner energy sources with interim goals and endpoints to be achieved by 2025, rebuilding electric energy and thermal energy. Two broad energy categories are defined by EO 13693, renewable and alternative. They are not the same.

According to the order -- the executive order, alternative energy includes small modular nuclear reactors. The order -- the order's definition of renewable energy does not include small modular reactors. The differences are significant when applied to the 10-year sustainability goals in section three of the executive order. Section 3b of the order specific to building electric energy, that is heating and lighting, and thermal energy which shall be provided by renewable energy and alternative energy not less than 25 percent by fiscal year 2025.

However, section 3c states that the percentage of building electric energy not thermal energy -- building electric energy -- keeping the lights on -- could be provided by renewable electric energy. Renewable electric energy, not alternative energy, which would be the small modular reactors -- is to be not less than 30 percent by fiscal year 2025. Clearly the executive order contemplates alternative energy sources to be heat sources such as nuclear and other thermal electric power plants. Renewable sources directed to be used solely for electrical generation are largely solar, wind, wave, heat pumps and hydro-electric. The order provides TVA will the bill of justification for so-called small modular reactors, particularly within the eight-year window remaining between now and 2025.

I mentioned that we [Blue Ridge Environmental Defense League] plan to intervene in this permit. We plan to do that. (**0001-12-2** [Zeller, Lou])

Comment: In terms of our water resources, SMRs are even more water-intensive than traditional nuclear reactors, which are already a water-hogging technology that strains water resources. The NRC needs to analyze the fact that SMRs use more water per unit of electricity produced in a plethora of actual clean, safe energy options. As climate change impacts such as prolonged droughts potentially becoming more frequent, we must pursue water saving not water-squandering energy choices. (**0001-4-5** [Powell, Michelle])

Comment:

Global Warming

Executive Order 13514, titled "Federal Leadership in Environmental, Energy, and Economic Performance," was issued on October 5, 2009. The public policy advanced by the President's Order was:

[I]ncrease energy efficiency; measure, report, and reduce their greenhouse gas emissions from direct and indirect activities; conserve and protect water resources through efficiency, reuse, and stormwater management; eliminate waste, recycle, and prevent pollution; leverage agency acquisitions to foster markets for sustainable technologies and environmentally preferable materials, products, and services; design, construct, maintain, and operate high performance sustainable buildings in sustainable locations; strengthen the vitality and livability of the communities in which Federal facilities are located; and inform Federal employees about and involve them in the achievement of these goals. [2]

The United States is the world's largest energy consumer; the federal government is the nation's single largest energy user; the Department of Defense is the biggest energy user in the federal government; and the leading use of energy in the Defense Department is...jet fuel. In other words, energy use in the most energy-intensive federal agency is used principally to fly or drive heavy equipment over long distances. A modular nuke at Clinch River would not have any impact here.

Moreover, the general trend in energy use by the federal government has been downward for the last four decades, and is now in steep decline. According to the Federal Energy Management Program, "this accomplishment is directly attributed federal employees making the choice for efficiency and striving to reduce operating costs." The tools employed by federal agencies are: training, technical assistance and energy performance contracts. Not nuclear power.

A subsequent executive order, EO 13693-"Planning for Federal Sustainability in the Next Decade," was issued on March 19, 2015. This order revoked EO 13514 but reiterated the overall policy: "It therefore continues to be the policy of the United States that agencies shall increase efficiency and improve their environmental performance." EO 13693 also set specific targets for cleaner energy sources with interim goals, the end points to be achieved by 2025 for building electric energy and thermal energy.

Two broad energy categories are defined in EO 13693: Renewable and alternative. They are not the same. According to the order, alternative energy includes small modular nuclear reactors. The order's definition of renewable energy does not include small modular reactors. The differences are significant when applied to the ten-year sustainability goals set by Section 3 of the order.[5] Section 3(b) of the order is specific to building electric energy and thermal energy which shall be provided by renewable electric energy and alternative energy, "not less than 25 percent by fiscal year 2025." However, Section 3(c) states that the percentage of building electric energy to be provided by renewable electric energy is to be "not less than 30 percent by fiscal year 2025."

Clearly, the Executive Order contemplates alternative energy sources to be heat sources, such as nuclear and other thermoelectric power plants. The renewable sources, directed to be used solely for electrical generation, are largely solar, wind, wave, heat pumps and hydroelectric. The order provides TVA with little justification for so-called small modular reactors, particularly within the eight-year window remaining between now and 2025;
[footnotes:]
[2] Federal Register Vol. 74, No. 194, Page 52117, October 8, 2009
[3] '"alternative energy' means energy generated from technologies and approaches that advance renewable heat sources, including biomass, solar thermal, geothermal, waste heat, and renewable combined heat and power processes; combined heat and power; small modular nuclear reactor technologies; fuel cell energy systems; and energy generation, where active capture and storage of carbon dioxide emissions associated with that energy generation is verified." EO 13693, Section 19(c)
[4] '"renewable electric energy' means energy produced by solar, wind, biomass, landfill gas, ocean (including tidal, wave, current, and thermal), geothermal, geothermal heat pumps, microturbines, municipal solid waste, or new hydroelectric generation capacity achieved from increased efficiency or additions of new capacity at an existing hydroelectric project." EO 13693, Section I 9(v)
[5] Sec. 3. Sustainability Goals for Agencies, In implementing the policy set forth in section I of this order and to achieve the goals of section 2 of this order, the head of each agency shall, where life-cycle cost-effective, beginning in fiscal year 2016, unless otherwise specified (**0055-1** [Zeller, Lou])

Response: *The action before NRC is whether to issue an ESP and to determine whether the CRN Site is suitable under the NRC's regulations for placement of one or more SMRs. The ESP determination is primarily a siting decision; in accordance with 10 CFR 51.50, the applicant's ER need not include an evaluation of alternative energy sources. In accordance with 10 CFR 51.75, the ESP EIS will not include an evaluation of alternative energy sources because these matters were not addressed in the applicant's ER. If TVA were to apply for a construction permit or combined license at some time in the future, the impacts of energy alternatives would be assessed at that time. The review of that application would include the development of another EIS and the opportunity to participate in another hearing.*

The scope of the present ESP environmental review includes water use impacts, socioeconomic impacts, and uranium fuel cycle impacts; the review team will use the plant parameter envelope values provided by the applicant to assess these impacts. In the EIS, water-related impacts will be discussed in Sections 4.2 and 5.2; socioeconomic impacts will be discussed in Sections 4.4 and 5.4, and the uranium fuel cycle will be discussed in Section 6.1. Estimated greenhouse gas emissions (GHG) emissions will be presented in Appendix K and an assessment of project impacts given predicted regional climate change will be presented in Appendix L of the EIS.

Comment: Small modular reactors are too costly, too slow to bring online, too uncertain and have a high environmental impact and risk. Current national high level radioactive waste disposal practices would leave this dangerous waste on-site for decades, or much longer, after final reactor shut down. The future belongs to renewable energy. All trends point in that direction. The global increase in renewables in 2015 was 63 gigawatts of wind, 50 gigawatts of solar, 28 of hydroelectric. Total nuclear capacity worldwide is going down, even France is

moving away from nuclear power. TVA should embrace the future and aggressively add renewable generation to speed up the retirement of coal, nuclear and gas facilities. TVA should partner with the Clean Line Project to lock in two cents per kilowatt hour of electricity now. TVA should embrace all forms of solar energy and energy efficiency. The sooner TVA starts changing course to put renewables first, the smoother the transition will be. (**0001-5-3** [Safer, Don])

Comment: SMRs are significantly more water-intensive than clean energy choices such as wind, solar and energy efficiency and conservation. (**0005-2** [McBride, Geoff] [McBride, Linda] [Sprignoli, Damon] [Turk, Lawrence "Butch"]) (**0005-6** [McBride, Geoff] [McBride, Linda] [Sprignoli, Damon] [Turk, Lawrence "Butch"])

Comment: Nuclear power is more water intensive than wind, solar and energy efficiency and conservation. (**0007-2** [McFadden, Nancy])

Comment: Why choose such dangerous waste from SMRs, when wind, solar, energy efficiency and conservation measures already exist and are effective. (**0007-4** [McFadden, Nancy])

Comment: Solar based renewable energy resources will provide more jobs and a higher return on investment. In addition, the negative environmental impacts of nuclear energy (mining, disposal, etc.) far outweigh any possible short-tern benefits. Support the future, support solar (**0010-2** [Ellis, Daniel])

Comment: The TVA would do better addressing its responsibility of making the region a solar powered residential region of world class status. I recently became aware that the TVA is a hindrance, or more specifically, some obsolete law is a hindrance in completely solar powering residential needs just because it makes TVA the sole legal supplier of energy to local distributors, who are thus not allowed to buy solar power produced by residents. I think this is outrageous obsolescence in this age of distributed solar power production capability (see Knoxville Mercury, March 2017: Tale of the Two Meters). TVA was not a power company to start with. Now it is time to remember its roots and promote residential solar power instead of being a hindrance to solar energizing the Tennessee Valley Region. Many individuals in this region have installed solar and it would turn into a tsunami if the thumb screws would not be kept on people's initiative to produce their own power, but by far not enough. In countries which are much less endowed with solar energy many more people have gone solar than here, where a so-called regional development agency denies solar power to its residents just due to some obsolete law. Actually, TVA and the region should be a world leader in residential solar energy supply. How long have we still to wait for this to happen? (**0013-4** [Wunderlich, Walt])

Comment: Thinking about TVA's wind power import project and also about the solar energizing of the Tennessee Valley Region, the East Tennessee area that could be spoiled by a nuclear mishap lends itself much more for cooperating in the renewable energy system by pumped storage energy than for nuclear power experiments. We have the Cumberland rim with hundreds of meters of head for any number of such plants that have relatively high efficiency, are of proven technology and can be run totally automatic and totally pollution free. (**0013-5** [Wunderlich, Walt])

Comment: Every nuclear power plant built in the United States has been plagued by budget overruns and multiple delays. There are better alternatives for additional electrical power generation including solar and wind energy. Solar is now less expensive than fossil fuel power and vastly less expensive than nuclear power (**0021-2** [Harland, Donald])

Comment: Plus it is not needed when there are better choices that are less expensive and less highly water intensive, such as wind and solar.

The Clinch River site was previously abandoned, and should remain that way. Clean energy is the way to go, if energy is needed. (**0025-4** [Kirkman, Arden])

Comment: I am opposed to this expensive nuclear experiment. We cannot dispose of the nuclear waste we have accumulated. Why do we persist in creating more? We need to put our expertise on wind and solar, something we don't have to be concerned about polluting water, air and soil with devastating health effects. These sources of power are on the rise world wide and are much safer. They have provided many, safer jobs. Tennessee does not need to lag behind and put us in nuclear jeopardy. (**0030-1** [Sweeton, Beverly])

Comment: Thank you for your time in working for the good of our country, and its energy needs. I am writing to express my deep concern about the Clinch River Small Modular Reactor Project. These reactors are not needed and are prohibitively expensive when compared to clean, renewable solar and wind power. What's more, the Tennessee Valley Authority is seeking site approval before reactor designs have been studied, much less approved. SMRs are significantly more water-intensive than clean energy choices such as wind, solar and energy efficiency and conservation. And just like existing nuclear power plants, they produce long-lived, highly radioactive nuclear waste for which no safe management and permanent storage exists. I implore you to deny the permit. It does not make sense that we would allow them to go in this direction when good, safe alternatives exist. My hope is that you and other earnest, environmentally aware government administrators and leaders will encourage TVA to look at the long-term implications, not just their present bottom line, and seek clean and safe energy choices. (**0034-1** [Bates, Renee])

Comment: Roane County, TN, is close to major populations centers: Knoxville, Chattanooga, Nashville and Lexington, KY, as well as to many ecologically sensitive areas. Pollution of the Clinch River and Watts Bar would be increased. I lived in East Tennessee for 15 years and I know for a fact that nuclear reactors should not be built in this area.

This is an unproven, experimental technology which is not needed. We should instead be emphasizing Solar and Wind Energy, which are much kinder to our precious fresh water. Solar and Wind energy do not endanger residents and guests in the United States, unlike nuclear energy. Small modular reactors are extremely expensive. Thank you for denying TVA the ESP to build such a nuclear device. (**0045-1** [Mortenson, Julia])

Comment: Small Modular Reactors have not been proven safe, and there’s no reason to try such an uncertain and expensive source of energy. I would love to see TVA take a leading role in forward-thinking, sustainable energy resources instead of wasting needed funds on this uncertain and experimental method. (**0046-1** [Johnston, Susan])

Comment: Build a solar installation. Tennessee needs renewable energies, not more pollution! (**0056-2** [Goins, Joe])

Response: *These comments express opposition to nuclear power or to building SMRs at the CRN Site, and express support for alternative sources of power generation. Because an ESP is primarily a siting decision, and analysis of energy sources is not required, energy alternatives will not be evaluated in the ESP EIS. If TVA were to apply for a construction permit or combined license at some time in the future, the environmental impacts of energy alternatives relative to those of the proposed project would be assessed at that time. The review of that application would include the development of another EIS.*

2.21 Comments Concerning Alternatives – Sites

Comment: The exposure of freshwater resources to nuclear contamination is more or less critical depending on what this SMR really is. Sometimes it is presented as if it were just the size of a Truck trailer, sometimes one has the impression it is a huge structure. How much output does it provide? Is it relevant to the TVA system? Probably not, but as a small self-contained power source it could well be of national importance. Still the question remains: Do these experiments have to be conducted in a river bend of the Clinch River, in a relatively densely populated area of a very scenic part of the country, that has many other potentials. Putting nuclear weapons facilities there is bad enough, but this was a war time decision and was made at a time when the ramification of nuclear contamination were either not recognized or belittled. (**0013-2** [Wunderlich, Walt])

Response: *The EIS will include an evaluation of the construction and operation impacts of a SMR at the CRN Site in Chapters 4 and 5. The EIS will also include an evaluation of the construction and operation impacts of a SMR facility at alternative sites, such as other property within the Oak Ridge Reservation, in Chapter 9 of the EIS, and will include an evaluation of alternative sites to determine whether there is an obviously superior alternative to the proposed site.*

Comment: I find the site very precarious. It should never have been chosen for any nuclear experiments. It is surrounded on three sides by the Clinch River, a major waterway that feeds into the Tennessee river which feeds into the Mississippi River, the short stretch of Ohio River discounted. The recent experience with the Japanese Daiichi plant makes one to think about it. What if this thing explodes, what if its containment cracks? What is the geology around the site? Is it rocky, is it shaly, is it loamy? seismicity? One would assume that these elementary questions have been asked and answered satisfactorily by now. (**0013-1** [Wunderlich, Walt])

Comment: The plan to site the proposed TVA SMR at the former CRBR location in Oak Ridge, TN is in essence using a greenfield returned to its natural landscape over the intervening 35 years since the CRBR was canceled. This fully recovered natural environment is habitat to diverse and extensive numbers of wildlife species and wildlife habitat. The Federal Government is spending billions of dollars cleaning and rehabilitating legacy nuclear sites in Oak Ridge and across the US. Before another greenfield becomes a new legacy nuclear site every consideration should be given to using a recently or soon to be deactivated nuclear power plant site, closed coal fired power plant, or other nuclear era legacy site. One such nuclear era

legacy brownfield site is the S-50 -- K-25 Power House site barely 3 miles from the proposed site. It has all the attributes of the proposed location, even more so -- including a railroad, barge terminal, high voltage power line infrastructure, water supply, security (water on three sides and a single entry point) no nearby public/private land owners, and it is owned by the Federal Government (DOE). In addition, using it for a nuclear reactor site would save the $100's of millions in cleanup costs faced with making it acceptable for private industrial use. https://en.wikipedia.org/wiki/S-50_(Manhattan_Project).

Are you aware of the S-50 - K-25 Power House Area and it close proximity?

Have your toured the area and been briefed on its attributes and been made aware of it as a viable location?

Why can't it be transferred to TVA from DOE in exchange for the CRBR site which can then be returned as part of the DOE Reservation Environmental Research landscape?

What are the life cycle costs savings using it as compared to a greenfield site?

These are a few of the questions that when fully and independently addressed will conclude that the SMR project located on a brownfield can go forward at a major savings in cost and environmental impact. The last thing a new nuclear project should result in is creating another nuclear liability for our Nation. Especially when so many alternatives exist, (**0042-1** [Colclasure, Doug])

Response: *Chapter 9 will describe the TVA's site selection process and the NRC staff's evaluation of that process. In Chapter 9, the NRC staff will also independently compare the alternative sites to the proposed site to determine if any of the alternative sites are environmentally preferable to the proposed site.*

2.22 Comments Concerning Benefit-Cost Balance

Comment: Billions of dollars could be spent on the nuclear reactor technology that is unproven, untested and significantly more expensive than other types of energy technologies that are actually available today including renewables, such as solar, wind, energy efficiency and demand site management measures.

The economics of new nuclear have only worsened since 2010 while the economics for renewables and energy efficiency have improved. The NRC must include updated economic cost analysis of the actual costs of many nuclear reactors. This can be done by looking into nearby Georgia and South Carolina where the under-construction Toshiba/Westinghouse AP 1000 reactors are years delayed and billions of dollars over budget. In fact, Westinghouse has filed for bankruptcy and is out of the construction business and parent company, Toshiba may be next in line. These projects may never be finished. The reality is that new nuclear power is losing the bet and draft environmental impact statement must consider accurate cost statement estimates as compared to other energy technologies that have only seen cost drop as new nuclear power costs sour. (**0001-4-2** [Powell, Michelle])

Comment: The economics of small modular reactors do not make sense, even with optimistic pre-construction cost projections. It is impossible to say how much actual spending would exceed these estimates, but it is almost certain to be substantial. Watts Bar 1 and 2 were originally projected to cost under $700 million. They were completed decades later at an acknowledged cost of over $13 billion. Watts Bar 2 is currently inoperable due to a structural failure in a 40-year old steam condenser. It is unknown when repairs will be completed, but not for months. The once hyped U.S. SMR business is down to one manufacturer with two possible customers, TVA and UAMPS, the Utah Associated Municipal Power Systems. In 2009, TVA made a great decision when it withdrew from plans to be the first in the US to build a Westinghouse AP1000 reactors. Construction delays from cost overruns have forced Westinghouse into bankruptcy and the VC Summer and Vogtle reactors may never be finished after billions have been spent. (**0001-5-2** [Safer, Don])

Comment: And just a footnote, the total estimated cost for TVA to develop SMRs to the point of getting this application -- early site permit -- is $72 million. Half of that will be given to TVA by the DOE. So -- so far TVA has spent around $23 million on SMR activities through fiscal year 2015, and estimates are about $5 million in the fiscal year 2016. And it will be at least five years before TVA will decide whether to build these or not. That's from Bill Johnson and Joe Hoagland, CEO and vice president at TVA. It's very uncertain whether they'll do these. (**0001-5-4** [Safer, Don])

Comment: They are not cost effective. They may cost less per reactor, but the cost per kilowatt-hour of the electricity produced by a small reactor will be higher than that of a large reactor. Perhaps eventually costs per kwh will be reduced as SMR's are mass produced, but we are decades away from that. Wind, solar and other clean renewable sources are continually reducing in price. And that is even before external costs are included. All fossil fuel energy sources are heavily subsidized in that society bears much of the actual cost of environmental destruction through mining, pollution of air and water, and impacts of global warming.(**0051-3** [Anthony, Kate])(**0051-9** [Anthony, Kate])

Comment: 4. [illegible] and most renewables are already cheaper

5. Obviously, its not about science but the money

6. Time it takes to certify SMR's will do little to help with global warming (**0059-4** [Anonymous, Anonymous])

Response: *The cost of the proposed action need not be considered in an ESP ER or in the NRC's EIS (10 CFR 51.50(b)(2); NUREG-1555). If TVA were to apply for a construction permit or combined license at some time in the future, the environmental review of that application would include an assessment of the proposed project's benefit-cost balance. Therefore, this issue will not be assessed further during the ESP review or in the ESP EIS.*

2.23 General Comments in Support of the Licensing Action

Comment: Certainly the Clinch River site, I think the country has invested a tremendous amount in it through the years. It's a well understood site. I think it is uniquely well suited to potentially host a small modular reactor. And you know I just hope that this ESP process will

allow us to move as quickly as possible through to providing an asset back to the -- to the -- to the energy grid and the -- and the nation that we can all be proud of. (**0001-1-2** [Jordan, Ben])

Comment: I just finished reading a book called Underway on Nuclear Power which is a history of Dennis Wilkinson. He was the first CO of the Nautilus submarine. He was also the first CEO of the Institute of Nuclear Power Operations. It reminded me that there are parallels between -- that can be drawn between the early evolution of nuclear power to the development of right sized grid reactor.

The importance of having the United States to deploy a small modular reactor in -- in its modular infrastructure and focused on the fuel life cycle as appropriate is, in my opinion, a key milestone, as was the first deployed nuclear submarine. And then the enhanced nuclear operation of the commercial nuclear fleet that the Institute of Nuclear Power provided.

TVA can bring both of those to the Clinch River site. There is nowhere better to permit and build the industry-changing small modular reactor than the Oak Ridge area. With the uncertainty of gas pricing and the uncertainty of its environmental impact -- which you haven't truly realized yet -- the need for a nationally secured source of power with on-site fuel storage is -- is important and probably of the utmost importance for national security. The SMR offers your viable option for our future.

East Tennessee provides the necessary infrastructure to make this project successful. A pool of talented individuals in the region that have training and understand nuclear operations, finally we have a contractor infrastructure that's unmatched across the nation. And then the needed research and development capability with the recognized national lab right in our backyard, along with the experts in nuclear fuel storage and nuclear waste processing make this a -- a very viable option.

The early site permit and the construction of the small modular reactor requires some need for labor, which will be provided through the permitting process -- updating safety environmental emergency plans, preparedness plans, will reduce the future licensing burden. And then addressing some of the regulatory issues that small modular reactors need to address like emergency planning size and -- and the emergency planning zones.

So I fully support the approval of the TVA's request for the early site permit, (**0001-2-1** [Gilmartin, Gary])

Comment: We [Oak Ridge Chamber of Commerce] believe the construction of the small modular reactor on the Clinch River site is clearly aligned with that vision and we are supportive of an expedited environmental review associated with the early site permit application.

Small modular reactors by virtue of their contact [compact] nature and potential for design and safety system standardizations are clearly environmentally responsible and refers to the merit of this next generation of -- of power plant technologies. In addition, TVA already owns and has meticulously characterized the proposed site, its proximity to water resources and existing power transmission lines also merit further positive consideration.

Oak Ridge is -- Oak Ridge workforce's familiarity with nuclear energy and with nuclear reactors also represents a safeguard of significant importance. The Oak Ridge Chamber encourages prompt action on the environmental review and the EIS and early approval of the -- and quick approval of the early site permit application. (**0001-3-1** [Hardy, Parker])

Comment: I'm currently involved with a small company, vice president of sales with Container Technologies and we build engineered metal containers for nuclear waste. So I am still involved in the industry. I've lived in Chattanooga, lived in Knoxville, lived in Nashville. And I am a proponent of what TVA is trying to do here. (**0001-6-1** [Michlink, Doug])

Comment: So I am a proponent and I hope they succeed in what they are trying to do here and -- and make the right decisions as they move forward with selecting the best design for this -- for this site. (**0001-6-3** [Michlink, Doug])

Comment: Oak Ridge has a tremendous list of firsts when it comes to nuclear. And the SMR would be just another one in the long line of successful missions here. (**0001-7-4** [Kohlhorst, Darrel])

Comment: The Clinch River nuclear site and the partnership between TVA and DOE provide an exceptional opportunity for East Tennessee to be at the forefront of SMR development. The East Tennessee region, Oak Ridge National Laboratory and the businesses that reside here have the expertise to support that environment. And they have the experience that help ensure that it occurs in an environmentally sound manner. In turn, SMR development is good for reaching businesses and the regional economy as a whole.

I and the ETEBA [Energy, Technology and Environmental Business Association] commend TVA for their vision in pursuing SMR technology for East Tennessee. If this can be accomplished and in an environmentally safe manner -- and we are confident it can be -- then we fully support taking the next step with the early site permit application process. (**0001-9-2** [Griffin, Tim])

Comment: I have been involved in the nuclear industry since 1974. I started through uranium enrichment at the Oak Ridge Gaseous Diffusion Plant, 11 years; 3 years at Paducah Gaseous Diffusion Plant, and 22 years at Oak Ridge National Lab involved with research reactor, providing siting and assistance there. And HAZMAT work as well; I retired there in 2010. Since that time, I've been involved with the nuclear power generation at Comanche Peak, six outages; two at Fermi in Michigan; one at Duane Arnold in Iowa, and one at Oak Creek, New Jersey.

And I would like to say that, based on my experience, the nuclear industry as a whole is the safest industry in the world. The records speak for themselves.

And based on what I know about the Clinch River Site, there's been a lot of work done prior because a breeder reactor was intended to be built there years ago. That did not come to pass. So, we have volumes of information regarding the site and the safety of a reactor being built there. I think at this time I am sure that the NRC is going to look heavily at that information.

As far as the situation is concerned, we need to look far beyond today for our power demands. This modular effort I think, as far as a financial phase is concerned, the long-range production is

going to help with cost for production because the more parts you build exactly the same, the cheaper the price. Henry Ford proved that well over 100 years ago.

And so, in saying that, I would strongly urge a positive reaction from the NRC as far as permits are concerned. (**0002-1-1** [Beach, Tom])

Comment: I would like to register my support for the building of a Small Modular Reactor at the old TVA CRBR site in southwest Oak Ridge. I have some familiarity with the small-scale, underground-vessel design of modular reactors, having spent the final years of my research career at ORNL studying the postirradiation condition of TRISO fuel particles for the MHTGR program. I do not think a similarly-emplaced SMR would present a risk to either the Clinch River [a cold and constant-level river] environment or to public safety. On the latter point, our home at 113 Westwind Drive near the top of Black Oak Ridge, ten air miles from the CRBR site, makes us among the nearest city residents, but I nontheless do not feel endangered. To the contrary, I see concrete steps, like this one, toward introducing new nuclear reactor technology (base-load and carbon-free) as enhancing long-term environmental and public health locally and nationally. It is outside my expertise to comment on the geology of the proposed site, but I presume that it was investigated in detail before the enormous excavation for the CRBR was conducted.(**0024-1** [Packan, Nicolas])

Comment: Whereas, the Tennessee Valley Authority (TVA) is the electric power provider and an economic driver for Tennessee and the Southeastern United States; and

Whereas, TVA's Integrated Resource Plan (IRP) is a roadmap to 2033 that identifies market-driven scenarios and strategies to address changing energy demands, while continuing to provide reliable power at the lowest possible cost; and

Whereas, energy resources options outlined by TVA in the IRP include new nuclear options; and

Whereas, one of the nuclear options included in the IRP is Small Modular Reactors (SMRs); and

Whereas, SMRs have the potential to create jobs, encourage economic growth while providing clean, safe and cost-effective energy; and

Whereas, TVA has indicated interest in locating a SMR on the Clinch River Nuclear (CRN) Site located in Oak Ridge, Tennessee; and

Whereas, the United States Nuclear Regulatory Commission is preparing the Environmental Impact Statement as part of the review of TVA's early site permit to construct a SRM on the CRN Site;

NOW, THEREFORE BE IT RESOLVED THAT:

The Oak Ridge Chamber of Commerce Board of Directors encourages and supports TVA's efforts to construct a Small Modular Reactor on the Clinch River Nuclear Site in Oak Ridge, Tennessee, thereby enhancing Oak Ridge's role in next generation nuclear energy.(**0037-1** [Humphries, Leigha])

Comment: On June 5, 2017, the Oak Ridge City Council adopted Resolution No. 5-41-2017, which expressed support for the U.S. Nuclear Regulatory Commission's preparation of an environmental impact statement as part of the review of the Tennessee Valley Authority's early site permit application for the Clinch River Nuclear Site. The aforementioned resolution also directed that the resolution be transmitted to the U.S. Nuclear Regulatory Commission as the official comments from the City of Oak Ridge, Tennessee. Enclosed please find a copy of the resolution for your review.

NUMBER 5-41-2017 RESOLUTION

A RESOLUTION SUPPORTING THE UNITED STATES NUCLEAR REGULATORY COMMISSION'S PREPARATION OF AN ENVIRONMENTAL IMPACT STATEMENT AS PART OF THE REVIEW OF THE TENNESSEE VALLEY AUTHORITY'S EARLY SITE PERMIT FOR THE CLINCH RIVER NUCLEAR SITE

WHEREAS, the Tennessee Valley Authority (TVA) is a corporate agency of the United States that provides electricity for business customers and local power distributors serving 9 million people in parts of seven southeastern states; and

WHEREAS, the TVA has a significant economic impact on Tennessee, including the Oak Ridge region, with thousands of employees and subcontractors, procurements worth millions of dollars annually, as well as other spin-off activities; and

WHEREAS, TVA supports the social and economic well-being of Oak Ridge and other communities in the Tennessee Valley region through its efforts in education, human services and community enrichment; and

WHEREAS, TVA's Integrated Resource Plan (IRP) is a power planning roadmap to 2033 examining a variety of economic, regulatory and market-driven scenarios and strategies to help TVA respond to changing energy demands while continuing to provide reliable power at the lowest possible cost; and

WHEREAS, the energy resource options identified in the IRP include new nuclear options, including the possible construction of one or more Small Modular Reactors (SMRs); and

WHEREAS, SMRs have the potential to provide the United States with clean, safe, cost-effective energy and create jobs and spur economic development;

WHEREAS, TVA has expressed an interest to use the Clinch River Nuclear (CRN) Site, which was previously designated for the construction of a breeder reactor project, for the possible

construction of one or more SMRs that would be licensed by the U.S. Nuclear Regulatory Commission (NRC); and

WHEREAS, the TVA's CRN Site is located in the City of Oak Ridge in Roane County; and

WHEREAS, the TVA submitted an Early Site Permit (ESP) application for the CRN Site to the NRC in May 2016, using technical information from various plant designs to assess the suitability of the CRN Site for any future construction and operation of a nuclear power plant; and

WHEREAS, on April 13, 2017, the NRC published a notice in the Federal Register of the agency's intent to prepare an EIS as part of the review of the TVA's ESP application; and

WHEREAS, the NRC held two public "scoping" meetings in Oak Ridge on May 15th to accept public comments on the agency's intent to prepare an EIS; and

WHEREAS, the City of Oak Ridge desires to comment on the NRC's intent to prepare an EIS.

NOW, THEREFORE, BE IT RESOLVED BY THE COUNCIL OF THE CITY OF OAK RIDGE, TENNESSEE:

That the City of Oak Ridge encourages and supports TVA's efforts to develop and deploy a new generation of nuclear reactors, including the possible construction of Small Modular Reactors, to reduce environmental emissions, and to eventually serve as potential power source for the Tennessee Valley Region, including Oak Ridge.

BE IT FURTHER RESOLVED that the City of Oak Ridge supports the U.S. Nuclear Regulatory Commission's preparation of an environmental impact statement as part of the review of the Tennessee Valley Authority's early site permit application for the Clinch River Nuclear Site.

BE IT FURTHER RESOLVED that this resolution be transmitted to the United States Nuclear Regulatory Commission as the official comments from the City of Oak Ridge, Tennessee.(**0040-1** [Chinn, Jr., Rick] [Hickman, Beth] [Krushenski, Kenneth])

Comment: On behalf of the Council, we would like to express our support for the Nuclear Regulatory Commission's preparation of an environmental impact statement as part of the review of the Tennessee Valley Authority's Early Site Permit and potential Small Modular Reactor (SMR) project at the Clinch River Site. (**0053-1** [Campbell, Jim]) (**0053-4** [Campbell, Jim])

Comment: East Tennessee provides a pool of talented individuals in the region that have training and understanding of nuclear operations.

The Clinch River Site provides access to the research and development capability and collaboration with some of the world's experts relative to nuclear fuel and nuclear waste characterization, treatment, and storage.

SMRs on the Clinch River site will create jobs and have a positive economic impact on our region.

The East Tennessee Economic Council supports TVA's efforts to diversify its energy portfolio and ensure a safe, reliable supply of energy for the Tennessee Valley. We look forward to working with the NRC as it evaluates the Clinch River Site.(**0053-3** [Campbell, Jim]) (**0053-6** [Campbell, Jim])

Comment: I'm writing to you on behalf of the Anderson County Board of Commissioners to express our strong support for the proposed Tennessee Valley Authority - Clinch River Nuclear Reactor site.

Anderson County has a well-established history and proven track record of partnering with the Federal Government on a variety of beneficial nuclear projects from weapons manufacturing, scientific research and energy production. We believe that no other community in the nation can duplicate our success record in the nuclear sciences or the variety of resources available to the nuclear energy community.

The Oak Ridge nuclear facilities are located in both Anderson and Roane counties and provide a uniquely suited location for this project by supplying a highly trained nuclear energy workforce, needed natural resources and associated support facilities, such as the Oak Ridge National Laboratories and Y-12 complex. Furthermore, the Tennessee Valley Authority headquarters is located just twenty miles away in Knoxville.

The Anderson County Board of Commissioners has gone on record publicly supporting this project and variety of other nuclear projects since the birth of the nuclear energy age. We have been blessed with a highly educated community, strong and beneficial natural resources, along with a low cost of living index that provides the perfect location for placement of this worthy project. (**0058-1** [Emert, Steven])

Comment: I want to go on record as favoring the SMR project, with some reservations. As an environmentalist I feel the most important thing for us to do is end our dependence on fossil fuels. While wind and solar are wonderful I don't feel they can practically supply our needs in the future given ever increasing demand. Modern nuclear is probably the answer. I'm especially interested in LFTR and SMR. For that reason I applaud TVA for taking leadership in this energy endeavor. Education I feel is a key that needs to be emphasized. Many people justifiably fear nuclear given the history, but new technology virtually eliminates the safety concerns. (**0060-1** [Bryant, Harry])

Comment: As County Mayors of Anderson and Roane Counties, the two counties contiguous to the Clinch River site, we are pleased to see this progress and fully support the project. SMRs have the potential to provide the United States clean, safe, cost-effective energy. If the project is constructed at the Clinch River site it will also create jobs and have a positive economic impact on our region...Another positive factor for the proposed SMR site is the fact that it is in a region which has citizens who have supported and worked in the nuclear industry for many decades. Our region has the employee workforce and skill set to successfully support this project. Combining these factors with TVA's strong track record for nuclear operations gives us great assurance for supporting the SMR...We are in support of the ESP application as a logical and positive step in making the SMR a reality. (**0062-1** [Frank, Terry])

Response: *These comments provide general information in support of the ESP application or TVA's future plans to build one or more SMRs at the CRN Site. They do not provide any specific information related to the environmental effects of the proposed action and will not be discussed further in the EIS.*

2.24 General Comments in Support of the Licensing Process

Comment: I am here to both speak up in support of the early site permit process as well as express my concerns regarding the scope of the proposed early site permit. (**0001-10-1** [Skutnik, Steve])

Comment: BE IT FURTHER RESOLVED THAT:

The Oak Ridge Chamber of Commerce Board of Directors supports the United States Nuclear Regulatory Commission in their preparation of the environmental impact statement as the next step in TVA's early site permit application to construct a Small Modular Reactor on the Clinch River Nuclear Site. (**0037-2** [Humphries, Leigha])

Comment: ECA [Energy Communities Alliance] believes that by undertaking the review of TVA's early site permit, the NRC is taking a critical and important first step forward towards realizing the development and construction of advanced nuclear production technologies which will increase U.S. energy independence, improve reliability, reduce carbon emissions, and create economic opportunities and well-paid clean energy jobs in our communities. (**0041-1** [Colton, Kara])

Comment: ECA [Energy Communities Alliance] supports the NRC proceeding with preparation of the environmental impact statement and conducting the scoping process. We believe this effort can help create a model for siting new advanced nuclear facilities and lead to better understanding of how the federal government, local governments, regulators and industry can work together to help these projects come to fruition. (**0041-3** [Colton, Kara])

Comment: In closing, Anderson County is dedicated to this project and sincerely urges the NRC to grant the Early Site Permit Application and allow this project to move forward in the best interests of our community and nation. (**0058-2** [Emert, Steven])

Response: *These comments provide general information in support of NRC's early site permit process and will not be discussed further.*

2.25 General Comments in Support of Nuclear Power

Comment: I just wanted to express my opinion that SMRs have the potential to provide some clean, cost-effective energy and certainly I am a little uneasy with some of the natural gas bought. Whether it will be around for as long as folks are hoping, certainly at the price folks are hoping.

And so I support TVA in exploring some of the potential SMR technologies as a way of expanding the diverse portfolio that they currently buy. And you know, I certainly, as a lifetime East Tennessean, you know think that this is a uniquely well suited area for such an endeavor.

Both with just the area itself and also the pool of personnel and talented resources that exist here that understand nuclear energy and are interested in -- in being a part of it.

I think probably the best estimate that I can give to my belief about that would be that I would tell you that I would encourage my two young children to participate in the nuclear energy and the nuclear fuel cycle as they grow up and are exploring different things. I want to keep them in east Tennessee, and it is one of the major industries here. So supporting it is important to me. (**0001-1-1** [Jordan, Ben])

Comment: I believe this project is important for the future of the United States' clean energy portfolio. I went into nuclear engineering because I believe that energy security and clean energy are paramount to the importance -- of paramount importance to the security of our country and the future of our planet. I believe that success in establishing and demonstrating a small modular reactor at the Clinch River site will open the doors for us to develop a next generation of safer, more reliable and more cost-effective sources of nuclear power that can complement a portfolio of other clean energy sources.

I do not believe that nuclear energy should necessarily displace renewables. I believe we need all the clean energy we can get. We cannot afford to exclude categorically any source -- particularly prudent sources of clean electricity that we can get. Ultimately, I believe that it's too important and too critical to develop these clean energy sources to throw anything out the door. (**0001-10-6** [Skutnik, Steve])

Comment: One of my last jobs was to get involved with the Japanese and the French on modular reactors -- find out what they were doing.....this isn't the first time that they've thought about modular reactors. They have been looking at them for a long time, so has the industry.

And we were involved in looking at the Clinch River site. So I'm a proponent. I've lived through it. Decisions made to cut back and cancel reactors was done for a unusual reason, but we lived through it and we adapted to it and conservation became the word of the day, as well as managing the reactors that we had to construct. But all of us are enjoying the quality and the integrity of the reactors that I was involved with building.

I was not on the production -- on the main -- on the operation's side, but I was an OEDC and built them. That involved an lot of interesting and -- and difficult decisions that were made. But I am proud to say that Browns Ferry, Watts Bar, Sequoyah are providing some very good, reliable energy. And that's -- that's a good thing for all of us. (**0001-6-2** [Michlink, Doug])

Comment: As far as the SMR design goes, I congratulate TVA for being willing to step out and look at this. I mean, I -- I've always considered similarities between the reactors that the Navy operates, which I consider small modular reactors, and log millions of hours every day -- every year keeping those -- those boats at sea. Whether they're subs, escorts or aircraft carriers -- operating safely and providing this country the defense that we need. (**0001-7-3** [Kohlhorst, Darrel])

Comment: Given the current state of renewable energy resources, and in particular energy sourced technologies, nuclear power is the one technology that can provide sufficient and reliable base load capacity while at the same time reducing greenhouse gas emissions. If you

are concerned about climate change, as you should be, nuclear power is the closest thing we have to its solution.

Likewise, for the foreseeable future, SMRs are the source of nuclear power that will most likely be built. They are more affordable. They are more flexible in their application and they are as safe if not safer than standard nuclear power plants. SMRs are going to be designed and built. There is competition now for designs and for the sites where this important technology will be developed. (**0001-9-1** [Griffin, Tim])

Comment: In 2014, ECA [Energy Communities Alliance] formally adopted a policy position[1] supporting the development of new nuclear power generation facilities, such as a small modular reactor (SMR) at the Clinch River Nuclear Site. Since that time, ECA has been working with DOE and industry to understand their priorities and ensure there is a robust, local workforce with the capabilities necessary to support new nuclear missions. We are also considering the role for local governments in hosting manufacturing industries associated with advanced nuclear technologies, and public-private partnership opportunities for financing and power purchase agreements.

Individually, several ECA members are already taking steps to support SMR and advanced nuclear technology development. In 2012, the County Commission in Roane County, TN - the community that hosts TVA's Clinch River Site - unanimously passed a resolution[2] supporting TVA in its SMR application. The neighboring City of Oak Ridge, Tennessee, also recently passed a resolution in favor of moving forward with NRC's review of TVA's early site permit for an SMR on the Clinch River Site. Los Alamos County, New Mexico, and the City of Idaho Falls, Idaho, both part of Utah Associated Municipal Power Systems (UAMPS), are engaged with NuScale and efforts to build an SMR on DOE's Idaho National Laboratory reservation near Idaho Falls. The communities around the Hanford Site in Washington State are similarly interested, with a 2014 study completed by the Tri-City Development Council concluding, “siting an SMR generating station at Hanford is technically feasible and many benefits come from using the existing infrastructure, local nuclear workforce, and other regional assets.”[3]
[footnotes:]
[1] See: Energy Communities Alliance Policy Book: Nuclear Energy and Waste Management Policy, p.13.
[2] See: Roane County Resolution #05-12-24
[3] See: “Small Modular Reactor Hanford Site Analysis Final Report,” Tri-City Development Council, December 2014. (**0041-2** [Colton, Kara])

Comment: SMRs have the potential to provide the United States clean, safe, carbon-free, cost-effective energy.

TVA is exploring SMR technology as a way of expanding its diverse portfolio to ensure a safe, reliable supply of energy.

East Tennessee understands and appreciates the need for industries that utilize nuclear resources to produce beneficial products. (**0053-2** [Campbell, Jim]) (**0053-5** [Campbell, Jim])

Response: *These comments provide general information in support of nuclear power or SMRs. They do not provide any specific information related to the environmental effects of the proposed action and will not be discussed further in the EIS.*

2.26 General Comments in Opposition to the Licensing Action

Comment: I'm here to speak against the proposal for small modular reactors at Clinch River. But first, before I get into the technical details, I just want to say this. Some people think that Blue Ridge Environmental Defense League is against TVA. This is not true. We honor the tradition and the good things that Tennessee Valley Authority has done over the decades. What we don't like is TVA's nuclear program. I guess -- I guess -- I agree with David Freeman about this.

I would go so far as to say that TVA perhaps should thank Blue Ridge Environmental Defense League for challenging the licensing of Bellefonte Units 3 and 4 in Jackson County, Alabama. In 2008, we went to Chattanooga. We organized residents living around the proposed site at Bellefonte and we intervened in 2008. This ended in TVA withdrawing its application just about two years -- almost two years ago.

Westinghouse is withdraw -- a financial meltdown which is now creating a $6.5 billion crater in Georgia and South Carolina could have been TVA's instead of Southern Company's. (**0001-12-1** [Zeller, Lou])

Comment: I'm a long-time resident of Oak Ridge, Tennessee and I also work for the Southern Alliance for Clean Energy, or SACE. We have staff here in Knoxville as well as in Memphis and board members in Nashville and Chattanooga. We are a non-profit that the most responsible energy choices in the southeast. So we have a long history of both watch-dogging the TVA and working with the TVA to transform the region's electricity production to a cleaner, safer and more affordable for valley residents and businesses. Unfortunately we are here today to voice our serious concerns about the highly speculative and risky proposal to pursue expensive, untested small modular reactor technology at the Clinch River site. We have several requests for what the NRC must include in the draft environmental impact statement and will submit written comments. For those unaware, the Clinch River site being discussed today has a very long, troubled and expensive history. Some experts in the nuclear power field have said that it's possibly only behind the Shoreham Nuclear Power Reactor for the most-expensive-electricity-never-generated record. It is, we are very concerned that history is once again repeating itself. In a more recent, July 2015 GAO report and SMRs confirmed this. (**0001-4-1** [Powell, Michelle])

Comment: In conclusion after all the money and all the years wasted toward the first round of evaluating Clinch River for a breed reactor, it's time to stop throwing good money after bad and repeating the mistakes of past history. TVA leadership has to free itself from the clutches of the nuclear industry, including its proponents within the Department of Energy. SMRs do not make any sense, not today and not tomorrow (**0001-4-6** [Powell, Michelle])

Comment: I urge TVA to abandon its unnecessary small modular reactor project immediately. Nuclear power is neither clean nor green. Stop squandering money and resources on this -- this latest false hope of the DOE and the nuclear industry. The current early site permit

application process will likely prove to be an exercise in futility as renewable energy generation growth will make SMRs unnecessary long before any are built. It will be at least 2025 to 2026 and beyond before any SMRs even by the industry are thought to be possible to be finished. TVA has abandoned at least 13 nuclear reactors, many after billions were wasted. Much of TVA's $25 billion worth of debt is from these dead-end projects. Please stop wasting rate payers' money on nuclear energy. (**0001-5-1** [Safer, Don])

Comment: This is a scoping meeting. And so, I know that other people have talked about the SMRs and they're, I guess from our point of view, not viable kind of thinking to move forward into our future. But I am going to talk more about the site itself. Because whether you are for SMRs or you're not for SMRs, this is not a suitable site. (**0002-2-1** [Kurtz, Sandy])

Comment: So, you need to remember that this site, of all the sites that TVA may have control of or be able to acquire for an SMR, this is probably one of the worse possible sites, given its proximity to the city and given its proximity to the water and its coarse hydrogeology. And I urge that the EIS carefully evaluate this idea that this is a minimally-acceptable site. (**0002-4-10** [Paddock, Brian])

Comment: TVA has no basis for their contention and no basis for this application. We will bring this up again and during in June when we will intervene in this reactor design announced earlier.

In conclusion, the Commission should reject TVA's proposal for a so-called modular nuclear power station. (**0002-7-2** [Zeller, Lou])

Comment: TVA is pursuing an undeveloped, expensive, risky technology known as Small Modular Reactors (SMRs) at their previously abandoned Clinch River Site, near Kingston, TN. These reactors are not needed and are extremely expensive, with no actual approved reactor designs. (**0005-1** [McBride, Geoff] [McBride, Linda] [Sprignoli, Damon] [Turk, Lawrence "Butch"]) (**0005-4** [McBride, Geoff] [McBride, Linda] [Sprignoli, Damon] [Turk, Lawrence "Butch"])

Comment: These reactors are not needed and are extremely expensive, with no actual approved reactor designs. (**0005-5** [McBride, Geoff] [McBride, Linda] [Sprignoli, Damon] [Turk, Lawrence "Butch"])

Comment: They should not be built. (**0006-4** [Sutlock, Dot])

Comment: SMRs are not good for TVA and for Citizens of Tennessee (**0007-1** [McFadden, Nancy])

Comment: I have read reports of a Small Modular Reactor that is going to be installed at the Clinch River Site near Kingston, TN. I heard about this from Southern Alliance for Clean Energy. I agree with their position - this reactor is not needed and is certainly not "clean" energy for our area or our country. This small reactor will still produce long-lived and highly radioactive nuclear waste. Since there is no safe way to store nuclear waste and no safe way to clean it up if a nuclear waste spill happens (see Fukushima) it is highly irresponsible to create more of it. It is also quite stupid to do that. Extremely stupid, in fact. I do not want a reactor,

small or not, built in Tennessee or anywhere else. It is time to stop building any nuclear plants and it is time to stop making nuclear waste. Please do not approve this plan from the TVA. (**0009-1** [Oehler, Susan])

Comment: I oppose the construction and funding of a nuclear power plant of any size in Tennessee. (**0010-1** [Ellis, Daniel])

Comment: NO NUKES near Knoxville!!!! Please, do not do this. (**0011-1** [Flagg, Tom])

Comment: The TVA is seeking approval even before the reactor designs have been studied, and this is unconscionable to me. Please turn down this proposal to build SMRs. (**0014-4** [Holt, Cathy])

Comment: I propose this project does not proceed in development. (**0015-2** [Pittillo, Dan])

Comment: I am writing today to encourage the NRC to prohibit the SMR plans proposed for the Clinch River Site.

The facts show that these reactors are extremely expensive and are not necessary to meet TVA's existing or projected electricity demands. Just like existing nuclear power plants, they produce long-lived, highly radioactive nuclear waste for which no safe management or permanent storage exists. Plutonium-239 has a half-life of 24,000 years! Frankly, there will never be a safe storage solution for this waste since no one can guarantee what will happen thousands of years into the future. When something is too expensive, too dangerous and not necessary, why do it?

Moreover, SMRs are significantly more water-intensive than clean energy choices such as wind, solar and energy efficiency and conservation.

And, as I understand it, SMRs have no actual approved reactor designs. Please stop this plan from wasting anymore taxpayer dollars. As the NRC website states, the mission of the NRC is to protect people and the environment. This would extend from protecting people and the environment from the waste, as well as protecting people from extremely expensive expensive projects that only benefit special interests. Please consider these concerns, and I encourage your agency to stop this SMR plan. (**0018-1** [Robertson, Grace])

Comment: I am opposed to the construction of a nuclear reactor in the Knoxville TN area on the grounds of safety. Living in western NC as I do, I realize that we are "downwind" of that site and could be negatively impacted in the case of a breakdown of any sort at the site which releases radioactive material to the wind, water, or ground. I would prefer to see funds route~ instead to the building up of solar and wind power. Plus, the issue of disposing of nuclear waste has never been satisfactorily addressed. I would appreciate your taking my concerns under consideration in the deliberations. (**0020-1** [Lloyd, AA])

Comment: I oppose the Tennessee Valley Authority application for a early site permit for the Clinch River Nuclear Site in Roane County, Tennessee. I believe this new nuclear power site is unnecessary and too expensive (**0021-1** [Harland, Donald])

Comment: I am writing to voice my OPPOSITION to the building of a nuclear power plant on the Clinch River. We know that the country needs to transition away from fossil fuels but that certainly doesn't mean we have to replace it with an energy source that is just, if not more, dangerous to the people who live in and around such a facility, or along the highways needed to transport the waste. I do not think this is the correct solution. (**0022-1** [Prins, Claire])

Comment: I wish to speak against the idea of building small modular reactors on the clinch. it is expensive and unfamiliar technology. (**0023-1** [Grimes, Patricia])

Comment: Concerning the TVA's proposed Small Modular Reactors (SMRs) plan for the previously abandoned Clinch River Site near Kingston, TN? - it sounds like a real bad idea to me. (**0025-1** [Kirkman, Arden])

Comment: Please do the right thing and reject this. (**0027-2** [Carter, Pat])

Comment: I oppose TVA's Proposed Clinch River Small Modular Reactors. Renewable, safe energy is the way to go. (**0029-1** [McClendon, Linda])

Comment: I'm writing my concern about the proposed building of an SMR on the Clinch River. The technology is expensive, undeveloped and risky. There is no approved design. There is no safe measure to store or dispose of waste. It has no value as an alternative to fossil fuels because we will have run out of time by the time it comes on line. Continue to encourage solar and wind development. (**0035-1** [Anonymous, Anonymous])

Comment: We understand that there are plans to build a small modular reactor on the Clinch River. We believe that the answer to America's energy needs lies in th expansion of solar and wind sources. The reactor will certainly be expensive to build, take a long time to be permitted and constructed. There appear to be no actual approved designs for this reactor. (**0036-1** [Anonymous, Anonymous])

Comment: I strongly encourage you to abandon the plan to build the Clinch River Nuclear Reactor. SMRs are not needed and would be more accurately coined as an experimental technology that would be Squandering More Resources. SMRs are extremely expensive, with no actual approved reactor designs. SMRs are extremely water-intensive, especially when compared to clean energy choices such as wind, solar and energy efficiency and conservation. SMRs are polluting just like existing nuclear plants, SMRs produce long-lived, highly radioactive nuclear waste for which no safe management and permanent storage exists. Building this reactor would endanger lives. I want TVA to focus on clean green renewable energy production. (**0038-1** [DiMaria, Pamela] [McCoy, Lawrence] [Wallace, Beth])

Comment: I am writing to voice my OPPOSITION to the building of a nuclear power plant on the Clinch River. In my opinion Small Modular Reactors are:

-not needed and would be more accurately coined as an experimental technology that would be Squandering More Resources.

-extremely expensive, with no actual approved reactor designs.

-extremely water-intensive, especially when compared to clean energy choices such as wind, solar and energy efficiency and conservation.

-polluting just like existing nuclear plants, SMRs produce long-lived, highly radioactive nuclear waste for which no safe management and permanent storage exists. (**0044-1** [LeQuire, Alan] [Pusey, Caleb] [Spencer, Martha] [Turk, Lawrence "Butch"])

Comment: Please do not approve the dangerous experiment. (**0048-2** [Hyche, Kenneth])

Comment: I am writing to urge as strongly as I can that this should not be done. (**0051-1** [Anthony, Kate]) (**0051-7** [Anthony, Kate])

Comment: PLEASE, do not do this! (**0056-1** [Goins, Joe])

Comment: don't understand why a SMR is necessary

It is expensive to build and will take a long time to finish when renewable technologies will provide jobs are cheaper and not produce nuclear waste

Please do not build a SMR (**0057-1** [Salzman, Alicia])

Response: *These comments provide general information in opposition to the applicant's early site permit or to TVA's future plan to build and operate one or more SMR(s) at the CRN Site, and will not be discussed further in the EIS. The NRC is carefully reviewing the application against its regulations that are intended to protect public health and safety and the environment. If TVA were to apply for a CP or COL at some time in the future, the NRC would conduct another environmental review that addresses the need for power, cost-benefit and energy alternatives at that time.*

2.27 General Comments in Opposition to Nuclear Power

Comment: No to Nuclear; Yes to Renewable (**0004-1** [McClendon, Linda])

Comment: When I was a child (1950s) we were promised that nuclear powered electricity would soon be too cheap to meter. What we've learned is that it is too expensive to afford. We have not solved the waste storage problem and possibly never will. Nuclear energy is safe when it is in the interior of the sun. Period. (**0008-1** [Bothwell, Cecil])

Comment: I am writing to express my opposition to the proposed Clinch River nuclear power site. As a resident of Western North Carolina, I am affected by the weather patterns that frequently move into WNC form the west. A plant near Knoxville places us in greater possible danger from a nuclear accident. Examples of accidents around the world and in the USA can be given that show human and/or technological errors will happen at these sites, or during transportation of materials. Please consider other sources of energy that aren't associated with devastating accidents! (**0012-1** [Sauer, Robert])

Comment: I am a little surprised that a nuclear plant is even being considered, since they are prohibitively expensive especially compared to renewables such as solar and wind. (**0014-1** [Holt, Cathy])

Comment: We don't need any more stupid nukes. Wake up and look around the world. Even backward China is going full tilt to solar power and hot water, on new buildings and old. England requires all new houses to be carbon neutral. Even in the US many builders are including solar as standard on new houses. Even with massive subsidies nuclear has never been cost competitive. Absolutely no one has any idea what to do with nuclear waste, except to let it pile up in corners. Coal, oil and nuclear are dead, just haven't been buried. Show me where I am wrong. (**0017-1** [Franklin, Doug])

Comment: I am very concerned that there is a proposal for a TVA nuclear power plant on the Clinch River. I watched a recent documentary on the extraordinarily expensive but still risky containment building needed to attempt to protect us all from continued radiation poisoning still coming out of Chernobyl. Bottom line: we will NEVER be able to afford power plants that create a legacy of radioactive waste that requires tens of thousands of years of continued and expensive maintenance. For that reason alone, its absurd to even contemplate building new nukes. The cost of renewable energy sources such as solar, wind, tidal, etc. are falling rapidly and do not endanger life on earth for thousands of years after implemented. Please redirect your energies towards the goal of installing solar on the thousands of acres of warehouse roofs across the country. (**0019-1** [Smith, Brian])

Comment: This proposed site is 25 miles from Knoxville, Tennessee which puts this city at risk if a nuclear accident were to occur. I live in Western North Carolina which is down wind to this proposed site and would be vulnerable to radioactive contamination in the event of a nuclear accident. In addition, the highways of Western North Carolina could experience traffic transporting nuclear fuel and waste. This is an unnecessary public health hazard. (**0021-3** [Harland, Donald])

Comment: "Small level reactors" is just ridiculous. Everyone in the nation (but SC and Georgia republicans) have realized the needlessness, horrid expense and danger of nuclear. It is on to the industry and investors profit you all persist....AND, Please see New Zealand's policies on energy to be sane on his issue. (**0027-1** [Carter, Pat])

Comment: I think it is a big mistake to start new nuclear reactors. I live in Georgia and the public has already paid a fortune for the Vogtle plant expansion and there is no guarantee it will ever come on line.

http://www.myajc.com/business/kempner-how-georgia-officials-pantsed-you-over-the-holidays/kKdADfa9OhQqqcscxu5CQK/

Even before the bankruptcy filing, the Vogtle project has slipped more than three years behind schedule and more than $3 billion over budget.

If the project is abandoned, customers' rates could still go up to reimburse Georgia Power and other project partners for the roughly $8 billion in construction costs spent so far, including $3.9 billion by Georgia Power.

http://www.ajc.com/business/every-option-being-looked-for-plant-vogtle-after-contractor-bankruptcy/NFf8wnrT4yRY5XphpEC9XI/

Renewable energy is now more affordable, less polluting and has less on-going costs.

http://news.stanford.edu/news/2014/february/fifty-states-renewables-022414.html

You should consult Dr. Mark Jacobson of Stanford University http://web.stanford.edu/group/efmh/jacobson/ before making an $8 billion mistake like Georgia made!! (**0028-1** [Carter, Rick])

Comment: No SMR"s. I am totally against any more nuclear anything. Clean energy, not dangerous untried energy sources. NO NO NO to SMR's (**0033-1** [Lyle, Marcia])

Comment: Simply NO! To do this is an act of terror! No more fossil fuels, NO more reactors! (**0039-1** [Anderson, KC])

Comment: I oppose any nuclear energy with it's deadly waste. With solar and wind, it is simply not sensible to keep using nuclear. (**0047-1** [Anonymous, Anonymous])

Comment: We absolutely do not need to continue on the disastrous course of the past by generating energy from nuclear power. Have we learned nothing from Three Mile Island, Chernobyl and (most significantly) Fukushima?

It is shameless and ignorant that we should pursue this destructive path when so many non-polluting and less expensive and proven renewable options are available to us.

Get with the program, NRC. Wake up and smell the proverbial coffee. Abandon your archaic and short sited vision of harnessing the power from the splitting atom. Join the rest of the natural cycles of the planet and focus on utilizing solar, wind, hydro, wave, magnetic and other more visionary forms of energy production. (**0049-1** [Cremer, Claudine])

Comment: I have read all the information I could find on what are called Small Modular Reactors, or SMA's, and have concluded that it build any of these would be irresponsible. Since there is no approved reactor design for these, they would actually be "experimental" nuclear reactors. Those two words should never go together. These reactors use a great deal of water, which we need to start to conserve, not squander. These SMA's will produce nuclear waste, which takes thousands of years to disappear, and we have no safe place on earth to store it. The cost of solar energy has dropped a great deal in recent years, and that would be a much better alternative to SMA's. We also can build wind turbines, and use solar energy. Anything would be better than any kind of nuclear facility, especially one that we don't know is safe. (**0050-1** [Burger, Carol])

Comment: Nuclear is not clean energy. Uranium mining is extremely destructive. It is often open pit. There tends to be one part uranium per 1000 parts pitchblende ore or less. The remaining 999 parts are left behind as mine tailings, which still contain low level radioactive and are in the form of dust, which readily becomes airborne and spreads through the air. And the nuclear reactor process leaves behind spent nuclear fuel which is also radioactive and needs safe storage for centuries, which still have not figured out how to do. (**0051-10** [Anthony, Kate]) (**0051-4** [Anthony, Kate])

Comment: Very expensive and risky technology (**0059-1** [Anonymous, Anonymous])

Response: *These comments provide only general information in opposition to nuclear power. They do not provide any specific information related to the environmental effects of the proposed action and will not be discussed further in the EIS.*

2.28 Comments Concerning Issues Outside Scope – Safety

Comment: The other issue I'd like to bring up is I would like the NRC to consider both from the perspective of when to consider the site suitability -- I would like to consider this from a risk-informed perspective. In particular if we're talking about for example a 10 megawatt electric unit, it is obvious that the source term and the failure modes will be inherently different than a gigawatt class machine. And the NRC's early site permit process should inherently consider this. (**0001-10-4** [Skutnik, Steve])

Comment: And it was very interesting because one of the [Advisory Committee on Reactor Safeguards] members questioned the entire fundamental assumption of the safety. I think this goes to the environmental risks and results, the questions of safety and risk of this. Because, basically, what the staff is going is saying, "We're going to look at one Small Modular Reactor and, then, later on, we may multiply that by 12." Well, obviously, if you get a very small risk and you multiply it by 12, you may still get a very small risk.

But the whole question of the interaction, multiple failures or cascading failures, centralized failures of controls, which this is all coming out of one control room, is a very real issue. You've got to think about it, as the Advisory Committee questioned that.

And by the way, the application for the SMR here requests that it have fewer operators. In other words, you're not going to have a system of a full control room with several operators and backup operators the way you do for a full-scale reactor. You may have far fewer people. In fact, you may have even less than one per reactor if you have a dozen reactors going on at the same time. And this makes the issue of control in an emergency seem to be quite difficult. (**0002-4-2** [Paddock, Brian])

Comment: A few other things. I noted with the probabilistic risk assessments I don't know if anyone has ever taken into account the earthquake of 1812 and what impact that would have on the East Coast. The water comes. They sweep that under the rug, which isn't a good thing. So, they should be practical about that. (**0002-6-3** [Martin, Rodger])

Comment: These reactors have not been proven safe. (**0006-1** [Sutlock, Dot])

Comment: It is basically making all of us citizens of the region guinea pigs for testing an un-tried new technology. Claims are being made for their safety, but claims are also being made for their low cost and these claims are rather mutually exclusive. To make them cost effective, the assumption is made that the Nuclear Regulatory Commission (NRC) can be convinced to grant SMRs regulatory relief in safety and security areas. Thus, what-ever intrinsic safety advantages are unique to SMRs could be lost if the NRC allows safety margins to be reduced in other respects. The risks are higher because this has never been done before, because they are proposed to be located within 50 miles of a major city (Knoxville), and because proposals for the future is that these can be located in dense urban centers. (**0051-2** [Anthony, Kate])(**0051-8** [Anthony, Kate])

Response: *The environmental impacts of postulated accidents resulting in radioactive releases to the environment will be addressed in Chapter 5 of the EIS. Seismic hazards and emergency planning and preparedness are safety issues that are outside the scope of the environmental review and will not be addressed in the EIS. However, those topics will be addressed in the safety review that is conducted in parallel with the environmental review of the CRN project; the staff's safety review will be documented in a Safety Evaluation Report. The NRC will only issue a license or permit if it can conclude that there is reasonable assurance (1) that the activities authorized by the license or permit can be conducted without endangering the health and safety of the public, and (2) that such activities will be conducted in compliance with the rules and regulations of the Commission. If TVA were to apply for a construction permit or combined license for the CRN site at some time in the future, the actual design of the reactor(s) would be addressed during review of that application. The issue of SMR safety would also be addressed during NRC's review of any SMR design certification application.*

Comment: The emergency planning zone -- currently the industry is trying to -- proponents are trying to get the EPZ to be lessened in size. And the EIS should take into account the possible shrinkage of the emergency planning zones and what effect that would have on the populations. Same is true of security at the site, which in order to cut costs -- and there's always this dynamic tension between cost and safety -- and it seems like cost always wins -- that there's an effort to relax security.

There is an effort to relax staffing, have less people working the reactors, even though you could have up to 12 there. And I understand TVA's just talking about two. But these complexes are designed to have up to 12. So it might start with two but it could end up with 12. And at that point there's nothing small about this except the word small. (**0001-5-9** [Safer, Don])

Comment: The evacuation zones are of concern. Where will people go? Where does the wind blow? How do people get away in case there is an accident? And despite people believing that there's no accidents in nuclear, with nuclear power, that is not, indeed, the case. (**0002-2-11** [Kurtz, Sandy])

Comment: Another thing folks at Oak Ridge should know, by the way, is that the application for the SMR has requested that the safety zone is actually the defense line. None of this let's have a system where people 10 miles away in the impact zone matter and how to evacuate them,

and so forth, gets considered. This whole thing is going to be underground, and if it has a big problem, we'll just flood the whole thing and let it sit there, and nobody in town needs to know about it. (**0002-4-7** [Paddock, Brian])

Comment: I'm here to pick up where I left off on an earlier comment period this afternoon, to talk about the basis for the early site permit submitted, the application submitted by TVA. Referring to the application, Part 3, the Environmental Report for this hearing, TVA in their application cites Executive Order 13-636, which involves critical infrastructure as a basis for their request. Executive Order 13-636, entitled, "Improving the Critical Infrastructure of Cybersecurity," was issued February 12, 2013. The Order cites cyber intrusions into critical infrastructure which demonstrated a need for improved cybersecurity. The Order states that "The Secretary shall use a risk-based approach to identify critical infrastructure where a cybersecurity incident could reasonably result in catastrophic, regional, or national effects on public health or safety, economic security, or national security."

In fact, TVA's application states that "small amounts of reactor plume will demonstrate that technology is capable of incrementally supplying power that is less vulnerable to disruption to facilities owned by Federal agencies."

However, we see at the same time in Federal Register notice published on April 13th of this year the exact opposite is underway. In Federal Register notice of April 13th, there is a proposed rulemaking, the docket for which is open now.

What the notice says is that, "Under current regulations for large lightwater reactor designs, plume exposure, pathway emergency planning zone size is 10 miles. However, Small Modular Reactors may have comparatively smaller reactor core size and also include passive design safety features which result in potential accident increased releases and offsite radiation dose consequences that are smaller."

In fact, the note goes so far as to say, "The potential exists for this emergency planning zone to be contained within the site boundary." What this means is there is no emergency planning zone.

If the Clinch River Site was to become a site for a so-called Small Modular Reactor, the city of Oak Ridge would be left to fend for itself. There would be no emergency planning zone, no signs pointing the way out of town.

And what the rulemaking initiates is shrinking evacuation zones. Reducing current emergency planning zones from 10 miles to 1,000 feet is based on a false assumption. The proposed 70 percent reduction in security forces with modular reactors exposes them to risks from terrorist attack.

Small Modular Reactor cooling system do not have active backup systems. Less robust containment of so-called Small Modular Reactors have a greater chance of damage and hydrogen explosions. And underground siting increases the risk during flooding and evacuation. Multiple Small Modular Reactors, two or more, present a higher risk if operator reduced support staff or safety equipment.

The NRC cannot take lightly the prospect of another experimental nuclear reactor's design impact on electric power infrastructure in light of the evolving threats and the energy economics of the 21st century.

The risks from these reactors are precisely the catastrophic, regional, or national effects on public health or safety and economic security which Executive Order 13-636 seeks to present [prevent]. (**0002-7-1** [Zeller, Lou])

Response: *NRC is currently evaluating the Emergency Planning Zone (EPZ) size exemption requests. As part of the environmental impact evaluation, the size of the EPZ is one of the assessment values considered in the severe accident analysis that will be presented in Section 5.11 of the EIS. However, the appropriate EPZ size for a given set of potential accidents (including those involving spent fuel) will be carefully considered in the overall licensing process under different regulations than those involving environmental protection.*

2.29 Comments Concerning Issues Outside Scope – Security and Terrorism

Comment: One thing that worries me is cyberattacks. We are reputed to have taken out some of the radium centrifuges. Soon there will be some payback if there were a war scenario. So, I'm not comfortable sitting where it is going to take the coal, especially with the older reactors, the computer, the control systems, and something bad happened. So, really, people need to look at realistic scenarios. (**0002-6-4** [Martin, Rodger])

Comment: High level waste is a dirty bomb waiting to happen. They are not needed. They diminish the security of the region. (**0006-3** [Sutlock, Dot])

Response: *Security and terrorism are safety issues that are outside the scope of the environmental review and will not be addressed in the EIS. However, those topics are regulated under 10 CFR Part 73, "Physical Protection of Plants and Materials." Radioactive waste management will be addressed in Chapter 6 of the EIS.*