

September 29, 2014

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re: Sequoyah License Extension, Docket ID NRC-2013-0037

Dear NRC Environmental Impact Analysts:

Both as a representative of the Bellefonte Efficiency & Sustainability Team / Mothers Against Tennessee River Radiation (BEST/MATRR), a local chapter of the Blue Ridge Environmental Defense League (BREDL), and as a concerned citizen living on the Tennessee River downstream of the Sequoyah Nuclear Power Plant, I hereby submit comments expressing our concerns about Tennessee Valley Authority's (TVA) requested 50% beyond-design-life-span license extension for their Sequoyah Nuclear Power Plant (SQN) and to specifically address issues with the Draft Environmental Impact Statement, which is the Nuclear Regulatory Commission (NRC) review of the TVA's last submission of an Environmental Impact Statement (EIS) for a license extension for operation of the Sequoyah Nuclear Power Plant (SQN) reactors 1 & 2 for 20 years beyond their 40 year design-basis life span.

First, I must formally request an extension for public comment before any further review of proposals for licensing extensions are granted to the Sequoyah Nuclear Plant. The basis of the request is the lack of current information being provided to the public, as well as the lack of response to issues previously presented; and also the vast quantity of material revision that was not made readily available to the public. I am fairly internet savvy, yet it took me hours to track down the newly revised 2014 version of the Draft Supplemental Environmental Impact Statement (DSEIS), which was not made available as a link in the announcement for the Sept. 17th meeting. In 2011, we reviewed the 500 page 2010 Final SEIS; then in 2013, we reviewed the 568 page 2011 Final SEIS and wrote comments about our concerns about issues with that version. Now in 2014, you have completed a 481 page Supplement 53 NRC review of that 568

page TVA document, the 2011 SEIS version. We need time to review this in order to make relevant comments.

This deeper analysis should have been something to be proud of, that the TVA, NRC and EPA could promote as truly providing the service to the public that our taxes pay you to do. You should have notified the public that you have been studying the issues further and were willing to expend the time and energy to ensure the safety of our Tennessee River Basin biosphere and our human health. Unfortunately, you have instead shown a complete disregard for the public from which you say you want to hear. Nowhere in any of your announcements for this meeting did the NRC refer to the ML number for the newly revised Draft SEIS. In fact, you appeared to bury the document, which appears to be a more and more standard procedure for the NRC. Anyone who has tried to find documents using the NRC site ADAMS search engine knows that it seems to be designed to divert researchers away from their topics of study, since one rarely sees in the results lists the actual document searched for, even with precise titles and/or ML numbers. After giving up on the dead-end search through ADAMS, I tried to reach the current DSEIS through a search of NRC's Reactor Unit specific pages for Sequoyah Units 1 & 2. This also lead to dead ends. Similar searches on the TVA website did not lead to the document, with no apparent posting of the Sequoyah DSEIS by the government corporation who operates the reactors and who conducted the EIS and SEIS studies.

Finally, I was able to find a link to the newly revised 2014 DSEIS (<http://pbadupws.nrc.gov/docs/ML1421/ML14211A454.pdf>) after going through 8 more pages on the NRC site to reach the proper license application documents page. This inaccessibility of information does not protect the environment and people of the United States or the Tennessee Valley, which is your job – despite what anyone you work with may say or what they may ask you to do. Go look at your Congressional Charters, look at your own Mission Statements. The job of each person working for the NRC, the EPA, and the TVA is first and foremost to protect U.S. citizens and the environment that sustains us all.

Formally, therefore, again we request an extension of the public comment period before any further meetings of the Petition Review Board or any other entity responsible for reviewing the appropriateness of extending the Sequoyah Nuclear Power Plant Operating Licenses for another 20 years, which is 50% beyond the two reactors' design-basis life span. And we alert the public and the NRC that all references herein referring to the DSEIS also refer to the Generic EIS Supplement 53, published in July 2014 for public comment.

That said, I will proceed to some new issues as well as reiterating the issues previously submitted, for which we have received no specific response. An irregular occurrence happened this year, in that the Sequoyah Annual Effluents Emissions Reports were not posted on the appropriate NRC website page until a few days ago, whereas the previous years annual report is normally posted in April or May of each year. As the Director of Nuclear Safety Project for the Union of Concerned Scientists, Dave Lochbaum, has reported, the total releases of Liquid Tritium from Sequoyah in 2013 were as follows:

B. Tritium

| | | | | | |
|--|--------|----------|----------|----------|----------|
| 1. Total Release | Ci | 1.67E+02 | 1.12E+02 | 9.76E+02 | 3.16E+02 |
| 2. Average Diluted Concentration During Period | μCi/ml | 8.94E-05 | 6.14E-05 | 5.08E-04 | 1.38E-04 |
| 3. Percent Of Applicable Limit | % | * | * | * | * |

1,571 curies (100% of total liquid release)

One overriding consideration which was not found in this Draft SEIS is the factor of accumulation of radionuclides in the environment and in human beings over time. We know there has been an actual fourfold annual increase in Tritium pollution since 2004 from the Production of Tritium for Nuclear Weapons at the Watts Bar Power Plant upstream (with the possibility still open for producing more Tritium for weapons at Sequoyah). Repeated tests of groundwater via well testing has also shown repeated leaks into the ground near Sequoyah, yet

Monitoring Wells

SQN started conducting an investigation of tritium releases to the groundwater in 2003 due to identification of tritium in one of the on-site monitoring wells. This study involved pressure testing of the radwaste discharge line, installation and sampling of groundwater wells, visual inspection under the refueling water storage tanks (RWSTs) and inspection of drain lines. In addition to the one on-site Radiological Environmental Monitoring Program (REMP) groundwater monitoring well, SQN also, has 18 non-REMP monitoring wells to support monitoring the onsite groundwater plume and for the presence or increase of radioactivity. These wells are sampled periodically for tritium. **The tritium concentrations obtained in 2013 from these non-REMP wells are listed below.** Initial and follow up analyses for the semi-annual sampling procedure indicated no gamma activity.

| Well ID | Date | Activity in pCi/L | Date | Activity in pCi/L |
|---------|------------|-------------------|------------|-------------------|
| Well-24 | 1/1/2013 | <233 | 10/30/2013 | <222 |
| Well-25 | 1/1/2013 | <233 | 10/30/2013 | <222 |
| Well-26 | 1/1/2013 | <233 | 10/30/2013 | <222 |
| Well-27 | 1/1/2013 | <233 | 10/30/2013 | <222 |
| Well-28 | 1/1/2013 | <233 | 10/30/2013 | <222 |
| Well-29 | 3/6/2013 | 418 | 4/16/2013 | 414 |
| Well-29 | 7/10/2013 | 263 | 10/30/2013 | 501 |
| Well-30 | 1/1/2013 | <233 | 4/16/2013 | <231 |
| Well-30 | 7/10/2013 | <219 | N/A | N/A |
| Well-31 | 3/6/2013 | 537 | 4/16/2013 | 1536 |
| Well-31 | 7/10/2013 | 1526 | 10/30/2013 | 1352 |
| Well-32 | 1/1/2013 | <233 | 10/30/2013 | <222 |
| Well-34 | 1/1/2013 | <233 | 10/30/2013 | 477 |
| Well-35 | 1/1/2013 | <233 | 10/30/13 | <222 |
| GP-7A | 1/1/2013 | 304 | 3/6/2013 | <219 |
| GP-7A | 4/16/2013 | 430 | 7/10/2013 | 464 |
| GP-10 | 3/6/2013 | <219 | 7/10/2013 | <219 |
| GP-10 | 10/30/2013 | <222 | N/A | N/A |
| GP-13 | 1/1/2013 | 5577 | 4/16/2013 | 5303 |
| GP-13 | 7/10/2013 | 3830 | 10/30/2013 | 4526 |
| W-9 | 1/1/2013 | <233 | 4/16/2013 | <231 |
| W-9 | 7/10/2013 | <219 | 10/30/2013 | <222 |
| WE-10 | 1/1/2013 | 22606 | 3/6/2013 | 27959 |
| WE-10 | 4/16/2013 | 29630 | 5/25/2013 | 26780 |
| WE-10 | 6/9/2013 | 26120 | 7/10/2013 | 25291 |
| WE-10 | 8/17/2013 | 23280 | 10/30/2013 | 19888 |

these leaks are not commented upon by TVA or by NRC oversight nor were they analyzed in the environmental impact studies. In the 2013 Effluents report for SQN (page E1-6) , you can see that Well #10 had contamination throughout the year, yet this continuing problem is not noted in this 2014 DEIS.

Tritium pollution is downplayed by the NRC, but the existing and forthcoming Tritium Production increase is alarming when one considers the fact that Tritium is a hydrogen isotope that bonds with oxygen and actually transforms fresh H₂O water into radioactive H₃O water. This ‘Tritiated’ radioactive water permeates throughout living organisms, emitting radiation throughout the entire body, and no matter how much or for how long it resides within the cells, organs and DNA, it is radioactive and

therefore causes cellular damage and can break DNA sequences, which can result in reproductive and hereditary damage.

Fission by-products are radioactive because they emit ionizing radiation, and one Curie emits radioactivity at 37 billion disintegrations per second. The Tritium Production SEIS proposes from 6,800 Curies up to 50,000 Curies per year of Tritium being added into our Tennessee River, in addition to the routine radioactive pollutants being released from TVA's nuclear power plants. It also should be noted that although Tritium has a fairly short half-life, relatively rapidly emitting half of its radioactivity in 12.5 years, Tritium still remains radioactive for over 120 years, piling up in our biosphere, and because Tritium bonds with water, it cannot be filtered or destroyed.

The likely DOE-TVA scenario will add 5,000 - 10,000 Curies of radioactive Tritium to the Tennessee River every year upstream of Chattanooga. No Environmental Impact Statement for Sequoyah relicensing can ignore this ongoing upstream Tritium production and the upcoming decisions to add such large quantities in addition to the ionizing radiation normally released by nuclear power plants.

Another issue that has not been adequately addressed by the 2014 DSEIS for Sequoyah is the new ruling for indefinite storage of all radioactive fuel waste at the plant site. The Sequoyah EISs equate the Decommissioning of the initial license with the Decommissioning of both the design-basis and the 50% beyond design-basis build-up of radioactive waste in addition to the cumulative build-up of 60 years of effluent releases in the environment of the Tennessee River Basin. (DSEIS 2.2.1 lines 20-21) We think that 60 years of highly toxic radionuclide waste and emissions buildup, in addition to the very large quantities of waste created by the DOE-TVA Production of Tritium for Nuclear Bombs, will have a cumulative effect that has not been adequately studied in any of the Sequoyah relicensing Environmental Impact Statements.

Again, it is this cumulative build-up of radionuclides in our environment that is not addressed in these Environmental Impact Statements. Has anyone calculated the density of ionizing radiation in the biosphere after 40, 50 and 60 years of build-up? Has the accumulation of specific radionuclides, and their radioactive progeny, been calculated? Has the biological and human health effect of exposures to these cumulative radionuclides and progeny been investigated and calculated? Has anyone even acknowledged that genetic mutations are known results of exposures to nuclear fission's radioactive wastes? Will there be any attempt to understand the environmental impact and the consequential impact on human beings living here of the genetic mutations which will continue transforming the biota of our environment for countless generations?

Anyone who has studied the toxic longevity of nuclear waste and who has studied the field of geology knows the probable impossibility that any geologic repository will be able to secure nuclear waste that remains hazardous for millions of years. The current NRC ruling to make TVA and other commercial nuclear operators responsible for isolating this radioactivity from U.S. citizens and our environment is unrealistic for a period beyond the limited 60 plan of this report. It is irresponsible because the NRC is simply ignoring the long-term problem by only

addressing the license period. Even the more secure dry cask storage systems currently proposed for eventual on-site storage are only designed for 60 to 100 years maximum, so the NRC is simply not holding themselves or the nuclear industry accountable for millions of years of radioactive waste.

In the more immediate future, affecting your children and grandchildren, what happens if there is not enough money to Decommission when the time comes? Are you just going to force another tax-payer bailout, costing at present around \$3 billion per reactor? If so, then every individual involved in this decision has no right to ever complain about higher taxes. TVA most certainly does not have the funds to accomplish this ever-more-costly Decommissioning task (\$21 billion and rising), and no one appears to be holding TVA responsible for their inadequate Decommissioning Fund – not the TVA Board of Directors, its CEO, nor its regulator, the NRC.

As noted in our previous Scoping comments, we challenge the Sequoyah relicensing EIS dismissal of truthfully “reasonable alternative energy sources,” in favor of old-school industries. We find it troubling that a report supposedly assessing the environmental impact of this nuclear power plant license extension does not favor environmentally sound alternatives, but instead advocates unhealthy pollution-producing energy choices. In this day and age, it shows an amazing lack of vision to not even include Energy Efficiency in your four viable alternatives. We have previously presented highly respected studies showing that Energy Efficiency can readily replace all of Sequoyah’s power production, while adding no toxic pollutants into the environment. In the 1970’s TVA led the nation in pioneering

Energy Efficiency, and now it is simply an embarrassment in that field of energy. Also, TVA’s power system provides an ideal infrastructure for developing Renewable Energy resources, with hydro-power and hydro-storage offering backup power for the Solar-Wind Combination or for Solar alone; however, you seem to ignore this Renewable combination in your Draft SEIS. TVA is supposed to lead the nation in energy innovation, not in clinging to toxic producing, internationally dependent forms of energy.

Figure 8: Average Annual Energy Efficiency Spending as a Percentage of Total Revenues, 2005 through 2009



Sources: GAO analysis of EIA and utility data.
 Note: "Regional utilities" are investor-owned.



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Compared to the previous EIS, commented upon during the Scoping phase, we are grateful for the brief acknowledgment that there are “reasonable alternative energy sources” other than nuclear and gas power plants; ¹ however, it seems unlikely that you will acknowledge the potential of this most effective alternative of all, Energy Efficiency. We assert that Energy Efficiency is a “reasonable alternative energy source” that needs to be more fully evaluated in this and in any Environmental Impact Statement (EIS). To support our claim, we have already entered into the record multiple studies showing that Energy Efficiency is a far more economically sustainable and environmentally “reasonable alternative energy source” than nuclear or gas power plants. Every year this becomes more apparent, and TVA is lagging behind the nation and certainly the world in recognizing the value of Energy Efficiency, and the value of using multiple Renewable Energy sources, including hydro power as backup energy storage for solar renewables. TVA is a non-profit government corporation, and should be leading the nation in developing environmentally sustainable non-polluting energy sources.

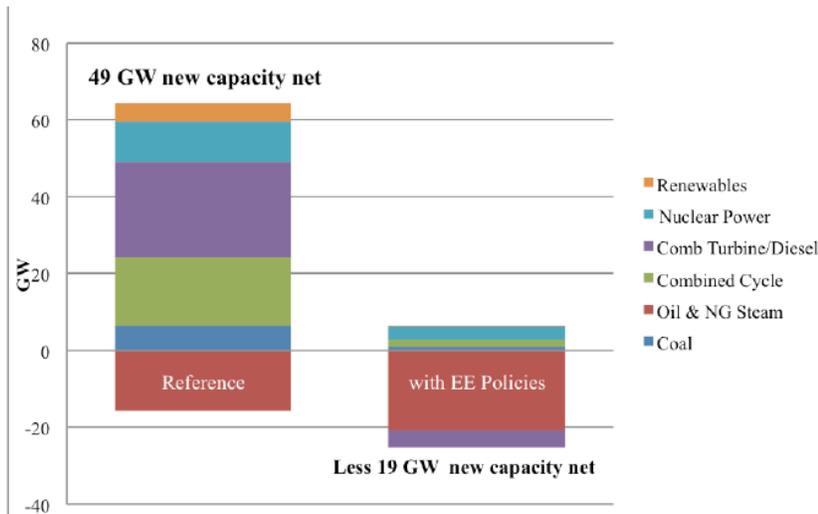


Figure ES.4 Incremental Generating Capacity in 2030 Beyond 2010 -- Southern NERC Regions

We must strongly urge you to reconsider your bias, in what is purportedly an environmental analysis. You list hydro-power (which has proven itself to be the long-term, solid, cost-effective, and non-polluting workhorse for TVA), as well as Solar and Wind Power, in addition to Energy Efficiency and Demand Response, as “Alternatives Considered but Dismissed.” We think you are dismissing the health of the people of this valley by dismissing these healthy energy choices.

We ask that the NRC License Extension be denied to the Sequoyah plant, and that Energy Efficiency (EE) be the first choice alternative for replacing Sequoyah, since all of the power generated by Sequoyah can be replaced by Energy Efficiency alone and any needed new power can be generated with renewable sources. It is highly likely that future policies will include regulations for a Carbon-Constrained Future (CCF), and EE is a highly effective means of achieving carbon reduction. As Figure ES-4 shows, in one decade EE can reduce future capacity needs in the south by 19 GW. Energy Efficiency Programs can also enhance the quality of life of TVA rate-payers by improving the efficiency of our homes, reducing monthly electric bills, and improving our environment by not emitting more toxic waste. This 2010 Georgia Tech and Duke University study, shows assertive Energy Efficiency programs in the south in one decade alone can eliminate the need for new power plants for two decades and save 8.6 billion gallons of fresh water – both extremely important environmental impacts. ²

As shown in the charts below, the 2012 federal NREL report on renewable energy states that rural Tennessee alone has the technical potential of generating well over 2.2 million GWhs of rural utility scale solar power, yet Tennessee actually consumes less than 104,000 GWhs.³ Why

don't the NRC and TVA reports mention this, even after the study reference and link were submitted to you during the scoping sessions? Your reports only talk about general capacity for the whole U.S., carefully avoiding specifics for generating options in TN.

Table 3. Total Estimated Technical Potential for Rural Utility-Scale Photovoltaics by State^a

| State | KM ² | GW | GWh | State | KM ² | GW | GWh |
|----------------------|-----------------|-------|------------|-------------------|------------------|----------------|--------------------|
| Alabama | 44,058 | 2,115 | 3,706,839 | Montana | 91,724 | 4,403 | 8,187,341 |
| Alaska | 187,608 | 9,005 | 8,282,976 | Nebraska | 101,457 | 4,870 | 9,266,757 |
| Arizona | 107,231 | 5,147 | 11,867,694 | Nevada | 77,751 | 3,732 | 8,614,454 |
| Arkansas | 57,239 | 2,747 | 4,986,389 | New Hampshire | 741 | 36 | 57,364 |
| California | 83,549 | 4,010 | 8,855,917 | New Jersey | 5,232 | 251 | 439,774 |
| Colorado | 94,046 | 4,514 | 10,238,084 | New Mexico | 147,652 | 7,087 | 16,318,543 |
| Connecticut | 256 | 12 | 19,628 | New York | 19,294 | 926 | 1,492,566 |
| Delaware | 3,483 | 167 | 272,333 | North Carolina | 48,892 | 2,347 | 4,232,790 |
| District of Columbia | 0 | 0 | 0 | North Dakota | 114,228 | 5,483 | 9,734,448 |
| Florida | 58,597 | 2,813 | 5,137,347 | Ohio | 49,908 | 2,396 | 3,626,182 |
| Georgia | 64,343 | 3,088 | 5,492,183 | Oklahoma | 99,641 | 4,783 | 9,341,920 |
| Hawaii | 431 | 21 | 38,033 | Oregon | 39,267 | 1,885 | 3,740,479 |
| Idaho | 42,613 | 2,045 | 3,936,848 | Pennsylvania | 7,430 | 357 | 553,356 |
| Illinois | 103,524 | 4,969 | 8,090,985 | Rhode Island | 184 | 9 | 13,636 |
| Indiana | 62,891 | 3,019 | 4,876,186 | South Carolina | 32,399 | 1,555 | 2,754,973 |
| Iowa | 83,763 | 4,021 | 6,994,159 | South Dakota | 111,850 | 5,345 | 10,008,873 |
| Kansas | 144,996 | 6,960 | 14,500,149 | Tennessee | 26,396 | 1,267 | 2,225,990 |
| Kentucky | 23,319 | 1,119 | 1,823,977 | Texas | 425,280 | 20,411 | 38,993,582 |
| Louisiana | 49,876 | 2,394 | 4,114,605 | Utah | 49,797 | 2,390 | 5,184,878 |
| Maine | 13,723 | 659 | 1,100,327 | Vermont | 739 | 35 | 54,728 |
| Maryland | 7,773 | 373 | 585,949 | Virginia | 22,378 | 1,074 | 1,882,467 |
| Massachusetts | 1,074 | 52 | 82,205 | Washington | 20,753 | 996 | 1,738,151 |
| Michigan | 71,741 | 3,444 | 5,215,640 | West Virginia | 729 | 35 | 52,694 |
| Minnesota | 135,627 | 6,510 | 10,792,814 | Wisconsin | 66,788 | 3,206 | 5,042,259 |
| Mississippi | 59,997 | 2,880 | 4,981,252 | Wyoming | 59,464 | 2,854 | 5,727,224 |
| Missouri | 65,767 | 3,157 | 5,335,269 | U.S. Total | 3,186,955 | 152,974 | 280,613,217 |

^a Non-excluded land was assumed to be available to support development of more than one technology.

Germany, that small and cold northern country. is now generating 20% of its electricity with solar power, and plans to end its dependence on nuclear power by 2025. It is doing this because the citizens (and its leader, Angela Merkel, who happens to be a trained physicist and chemist) carefully read the definitive study on childhood cancer near all 16 nuclear power plants in Germany and decided to end the man-made, and therefore preventable, cause of suffering in some of its children.

Why do your Environmental Impact Statements selectively reflect a biased perspective towards dirty, environmentally toxic energy choices? How are you protecting the environment and the safety of the people by jerry-rigging information to try and make unreasonable choices sound reasonable? Rather than protecting U.S. citizens by acting

Figure B-1. Electric retail sales in the United States in 2010 (EIA).

Table B-1. Electric Retail Sales by State, 2010^a

| State | GWh | State | GWh |
|----------------------|---------|-------------------|------------------|
| Alabama | 90,863 | Montana | 13,423 |
| Alaska | 6,247 | Nebraska | 29,849 |
| Arizona | 72,832 | Nevada | 33,773 |
| Arkansas | 48,194 | New Hampshire | 10,890 |
| California | 258,525 | New Jersey | 79,179 |
| Colorado | 52,918 | New Mexico | 22,428 |
| Connecticut | 30,392 | New York | 144,624 |
| Delaware | 11,606 | North Carolina | 136,415 |
| District of Columbia | 11,877 | North Dakota | 12,956 |
| Florida | 231,210 | Ohio | 154,345 |
| Georgia | 140,672 | Oklahoma | 57,846 |
| Hawaii | 10,017 | Oregon | 46,026 |
| Idaho | 22,798 | Pennsylvania | 148,964 |
| Illinois | 144,761 | Rhode Island | 7,799 |
| Indiana | 105,994 | South Carolina | 82,479 |
| Iowa | 45,445 | South Dakota | 11,356 |
| Kansas | 40,421 | Tennessee | 103,522 |
| Kentucky | 93,569 | Texas | 358,458 |
| Louisiana | 85,080 | Utah | 28,044 |
| Maine | 11,532 | Vermont | 5,595 |
| Maryland | 65,335 | Virginia | 113,806 |
| Massachusetts | 57,123 | Washington | 90,380 |
| Michigan | 103,649 | West Virginia | 32,032 |
| Minnesota | 67,800 | Wisconsin | 68,752 |
| Mississippi | 49,687 | Wyoming | 17,113 |
| Missouri | 86,085 | U.S. Total | 3,754,486 |

^a EIA

as regulators, why are you continuing to enable an industry that cannot survive without tax subsidies after 50 years of development? Why do you continue to allow operation of these nuclear plants with inadequate Decommissioning Funds in place? And most importantly, for the health and safety of our environment and people, why do you continue to provide licenses to companies that cannot safely secure their most toxic waste products from contaminating the environment for millenniums of generations to come?

Why, at the very least, aren't "reasonable alternative energy sources" being seriously evaluated? Solar panels covering the hot asphalt parking lots at TVA power plants across seven states should have been considered, especially using backup power from either hydro power at TVA dams and/or Combined Heat to Power (CHP) recycling of the heat generated by TVA's existing plants into heat generated electricity? And why isn't that one of the "reasonable alternative energy sources," recycling heat to help slow global warming and the impacts of climate change? Why isn't the recycling of waste heat generated by TVA power plants into electricity combined with solar as one of the alternatives? Why aren't Combined Heat to Power (CHP) units included in your analyses? Heat prevention and heat recycling are important steps to prevent further global warming, not just reducing carbon emissions. Heat prevention and heat recycling are both direct and reasonable alternatives to adding further pollution into our environment.

Rather than "reasonable alternative energy sources", we believe the false assumption of limited options in this DSEIS is biased toward environmentally unsound choices requiring the use of dirty nuclear and fossil fuels rather than the best replacement of existing power – which is first and foremost that of demand reduction through Energy Efficiency and heat recycling, and secondly through environmentally Sustainable Renewable Energy such as wind and solar, combined with heat recycling and dam power backups. This 2014 NRC version of the EIS has at least included a cursory analyses of some of these options, along with the previous nuclear and gas generation 'alternatives', but one wonders if this was only to keep up the appearance of listening to yet another GAO report admonishing the TVA once again for lagging in Energy Efficiency.⁴ The NRC appears to praise TVA for an "increase in focus on the EEDR program,"⁵ whereas in fact TVA is claiming to be working towards a paltry 2% to 5% reduction in energy consumption by 2015, and is shooting for a whopping 9% to 18% Energy Efficiency by 2030, while the U.S. average is around 30%.

NRC's blatant bias in favor of unhealthy energy choices is blaring in its tenacity. You are enabling TVA in not fulfilling its mission to the nation and to the people of this valley, and you are definitely not fulfilling your own mission to protect the health and safety of U.S. citizens by "dismissing" truthfully "reasonable alternative energy sources" – modern Energy Efficiency and Renewable Energy choices that are readily available, are far more cost-efficient, and are incalculably less harmful to the environment and the health and safety of the people. Something is terribly wrong with NRC's stubborn adherence to enabling an industry which the NRC is supposed to be regulating, an industry that is creating and discharging into our environment some of the most toxic substances known to man.

"Over 60 epidemiological studies world-wide have examined cancer incidences in children near nuclear power plants (NPPs): most of them indicate leukemia increases."⁶ Is there any more significant environmental impact than childhood leukemia?

Our next area of concern is the extended use of spent fuel cooling pools as storage tanks, rather than the circulating cooling pools they were designed to be. As originally designed, and as recommended by a National Academy of Sciences study commissioned for Congress and Homeland Security in 2005, radioactive trash (or spent fuel) should be moved from the cooling pools into dry cask storage after 5 years, not continually packed into the vulnerable cooling pools. As Robert Alvarez states in the 2012 submitted article, “Improving Spent-Fuel Storage at Nuclear Reactors” and nuclear safety studies for decades have said severe accidents can occur at spent fuel pools and the consequences could be catastrophic. “A severe pool fire could render about 188 square miles around the nuclear reactor uninhabitable, cause as many as 28,000 cancer fatalities, and cause \$59 billion in damage, according to a 1997 report for the NRC by Brookhaven National Laboratory.”⁷

Sequoyah has well over a thousand metric tons (about 2.5 million pounds) of highly radioactive waste with a history of improper storage.⁸ In 2010, for example, about 75% of 30 years of spent fuel was being stored in cooling pools. While this is better than the 100% pool storage record at Watts Bar and the 88% record at Browns Ferry, this clearly indicates the lack of attention by the corporate culture of TVA to the maintenance and security warranted by a nuclear power utility, which indicates a potential threat to our environment. The concentration of fuel, transfer and storage plans, and scheduled implementation of those plans needs to be identified and evaluated in the Safety Evaluation Report.

Other concerns are potential non-deliberate "beyond-design-basis events," such as floods and tornadoes. TVA's dams are aging and maintenance has been spotty at best. Many valley residents are concerned over the possibility of a catastrophic flood being caused by one or more dam failures. Dams were not built to the same earthquake safety standards as the power plants and one dam failure could trigger a domino effect upstream of nuclear power plants, possibly overwhelming the planned backup systems should 'all hell break loose'.⁹ Clearly, you have required some attention to the flood threat since our last comments, but we are still not convinced the domino-effect has been mitigated.

Responsible maintenance ties into this issue of concern. When tornadoes took out power to Browns Ferry for several days in 2011, two of the eight backup power generators were inoperable when the tornado hit and a third generator was shut down the next day. That is a 40% failure rate for critical backup power. If TVA maintenance is not keen for nuclear power plants, where NRC oversight is physically in effect daily, one wonders about the quality of maintenance at the many aging TVA dams upstream from Sequoyah. Multiple dam failure scenarios need to be identified and evaluated for the Safety Evaluation Report.¹⁰

We all know, from watching the Fukushima helicopters desperately dropping water on the reactors and cooling pools stranded without power backup generators, that nuclear power plants ironically must have a constant supply of power and of pumped water in order to prevent the environmental horror of reactor and/or cooling pool meltdowns.

Another lesson of Fukushima is the necessity of preparedness for multiple events or even compound disasters. In the Tennessee Valley, we have what many here call a tornado corridor,

and tornados often come with volumes of rain. Please note previous submission, of the map of TVA nuclear power plants 50 mile radii superimposed on the NOAA Tornado Track of the April 2011 outbreak in this area.¹¹ The Safety Evaluation Report for Sequoyah needs to identify and evaluate not only the dual dangers of floods and tornadoes, but also the potential consequences of combined and compound disasters on the environment of our valley.

National Severe Storms Forecast Center reported 29-31 tornadoes within a 35 mile radius of Sequoyah in the 37 year period between 1950 and 1986. Within the next 15 year period, ending in 2002, they reported 23 tornadoes in that same area,¹² nearly doubling the incidence of tornadoes in the 35 mile radius. Then in one day, about 15 tornadoes swept through that radius, with 3 touchdowns within 10 miles of Sequoyah.

According to the NOAA tornado track of the April 2011 outbreaks, there appeared to be about 15 tornadoes within that same radius,¹³ and according to the SEIS, three tornadoes touched down within 10 miles of Sequoyah (according to Kenneth Wastrack, TVA, personal communication).¹⁴ The increasing frequency, size, and severity of tornadoes due to climate change is a potential environmental hazard that needs to be identified and evaluated in the SEIS and Safety Evaluation Report.

Again we will state that the very volume of issues necessary to mitigate the hazards and Environmental Impact of extending the Sequoyah Nuclear Power Plant operating license another 50% beyond its design-basis life span, indicates the number of potential and known problems with this inherently dangerous radioactive technology – and its potential and already known deleterious impacts on the human environment.

We strongly urge you to hold off on consideration of extending this license until a permanent solution for the radioactive waste is found, and the people of this valley can be assured of long-term protection from this pile up of toxic nuclear waste.

Again, we remind you to look more deeply into your bias and seriously consider Energy Efficiency and Renewables as “reasonable alternative energy sources” according to studies and implementations around the world and across this country. Energy Efficiency programs can actually 'supply' the energy that Sequoyah supplies now at less cost for TVA and at greater benefit to the people of this valley, and certainly would help mitigate the Environmental Impact of Sequoyah's radioactive waste. We also know that solar electricity can be generated for less money and with significantly less risk to human habitat, and that TVA's own dams can store energy for an ideal solar backup system, especially if used in conjunction with heat recycling and storage using CHP and molten salt storage technologies.

What we do not know, again, is why the NRC continually enables an industry that is willing to gamble with human lives and habitats, despite the truly “reasonable alternative energy sources” of Energy Efficiency and Sustainable Energy. We ask that you reconsider whether you are truly accomplishing your mission in these reports, to re-examine whose mission you are fulfilling, the mission of the nuclear industry or the Nuclear Regulatory mission to protect the environment and people of the United States.

Thank you for your consideration of our concerns and for your service at the Nuclear Regulatory Commission, in the Reactor Regulations Department, and on the License Review Board.

BEST wishes,

Gretel Johnston, Vice President / Secretary

BEST/MATRR

Bellefonte Efficiency & Sustainability Team (BEST)

Mothers Against Tennessee River Radiation (MATRR)

- A Chapter of the Blue Ridge Environmental Defense League (BREDL)

References:

- ¹ Nuclear Regulatory Commission, “License Renewal Application for Sequoyah Nuclear Plant, Units 1 and 2, Tennessee Valley Authority,” *Federal Register*, March 8, 2012, [Docket Nos.: 50–327, 50–328; NRC–2013– 0037], <http://www.gpo.gov/fdsys/pkg/FR-2013-03-08/pdf/2013-05491.pdf>
- ² Marilyn Brown, Etan Gumerman, Oiaojing Sun, Youngsun Baek, Joy Wang, Rodrigo Cortes, and Diran Soumonni, “Energy Efficiency in the South,” Southeast Energy Efficiency Alliance, Atlanta, GA, April 12, 2010, pgs. 1, 2, 13, <http://www.aeec.arkansas.gov/Solutions/Documents/ReportEfficiencyInTheSouth.pdf>
- ³ Anthony Lopez, Billy Roberts, Donna Heimiller, Nate Bair, Gian Porro, “U.S. Renewable Energy Technical Potentials”, National Renewable Energy Laboratory, NREL/TP-6A20-51946, July 2012, Tables No. 2 and No. 3, www.nrel.gov/docs/fy12osti/51946.pdf
- ⁴ U.S. Government Accountability Office, “Tennessee Valley Authority: Full Consideration of Energy Efficiency and Better Capital Expenditures Planning Are Needed,” GAO report on TVA to Committee on Environment and Public Works, U.S. Senate, GAO-12-107, October 2011. <http://www.gao.gov/new.items/d12107.pdf>
- ⁵ Nuclear Regulatory Commission, “Generic Environmental Impact Statement for License Renewal of Nuclear Plants, Supplement 53, Regarding Sequoyah Nuclear Plant, Units 1 and 2,” 2-20, line 39. <http://www.nrc.gov/reading-rm/doc-collections/nuregs/staff/sr1437/supplement53/>
- ⁶ Ian Fairlie, “A Hypothesis to Explain Childhood Cancers Near Nuclear Power Plants,” *Journal of Environmental Radioactivity*, Vol. 133, July, 2014, pgs. 10-17. <http://www.sciencedirect.com/science/article/pii/S0265931X13001811>
- ⁷ Robert Alvarez, “Improving Spent-Fuel Storage at Nuclear Reactors,” *Issues in Science & Technology*, National Academy of Sciences, Winter 2012, <http://www.issues.org/28.2/alvarez.html>.
- ⁸ Pam Sohn, “Nuclear Waste Piling Up in Region,” *Chattanooga Times Free Press*, March 22, 2010, <http://www.timesfreepress.com/news/2010/mar/22/nuclear-waste-piling-up-in-region/?print>
- ⁹ Pam Sohn, “TVA Cited for Flood Prevention Violations”, *Chattanooga Times Free Press*, March 19, 2013, <http://www.timesfreepress.com/news/2013/mar/19/tva-cited-for-flood-prevention-violations/?print>
- ¹⁰ Huffington Post, “Leaked Report Suggests Long-Known Flood Threat To Nuclear Plants, Safety Advocates Say”, http://www.huffingtonpost.com/2012/10/19/nuclear-plant-flood-threat-leak_n_1983005.html?view=print&comm_ref=false
- ¹¹ BEST/MATRR, “Nuclear Tornadoes?” map, compiled from NOAA map and NRC & TVA data, May, 2011, <http://candel.net/TornadoMapFinal.pdf>
- ¹² TVA, “Final Supplemental Environmental Impact Statement: Sequoyah Nuclear Power Plant Units 1 & 2 License Renewal,” June 2011, Chapter 3, page 134, http://www.tva.com/environment/reports/sqn-renewal/seis/chapter_3.pdf
- ¹³ NOAA, “Tornado Tracks: April 27 through 29th, 2011,” <http://www.srh.noaa.gov/srh/ssd/mapping/>
- ¹⁴ TVA, “Final Supplemental Environmental Impact Statement: Sequoyah Nuclear Power Plant Units 1 & 2 License Renewal,” June 2011, Chapter 3, page 134, http://www.tva.com/environment/reports/sqn-renewal/seis/chapter_3.pdf