BEST/MATRR
MATRR.org - Because it Matters

BEST/MATRR
P.O. Box 241
Scottsboro, AL 35768

Sept. 21, 2014

DOE/NNSA (Department of Energy /
National Nuclear Security Administration)

Mr. Curtis Chambellan
CLWR SEIS Document Manager
P.O. Box 5400
Albuquerque, NM 87185-5400
Phone: (505) 845-5073
E-mail: tritium.readiness.seis@nnsa.doe.gov

Re: Comments on Draft Environmental Impact Statement (DSEIS) for Tritium Production in Tennessee

Dear Sirs:

First, I would like to say that it is disappointing at best that our United States is using civilian, commercial nuclear power reactors to produce weapons material. This is a direct contradiction of our international policy of discouraging proliferation of nuclear weapons and of opposing the process of deriving weapons material from power reactors in Iran, North Korea and other countries. By using nuclear power reactors for this purpose, we are being hypocritical and undermining the credibility of our foreign policy.

Secondly, the unnecessary production of power and of weapons material through nuclear fission is a violation of the rights of citizens living downwind and downstream of these commercial facilities. The radioactive pollutants released by TVA's nuclear power plants accumulate in the river and surrounding land, contaminating our property, our food supplies, and our water for thousands of generations. This is a terrible environmental debt to leave future generations, in addition to the financial debt of trying to isolate these cumulative toxins from the environment and the health debt to families. TVA began producing Tritium for weapons in 2004 at Watts Bar Reactor #1 (with Sequoyah Reactor Units #1 and #2 as backups), and according to the revised 2014 Draft Supplemental Environmental Impact Statement (SEIS), this Tritium production is releasing 3 to 4 times more Tritium into the Tennessee River than originally anticipated in the 1999 Final EIS.

We are grateful that the National Nuclear Security Administration (NNSA) is adhering to the science and the carefully formulated regulations in evaluating this revised estimate of annual environmental contamination, and we hope that this is more than an exercise and actually provides an opportunity to rethink the consequences of this program. We are leaving an horrendous environmental debt to future generations with nuclear waste, and are just presuming that they will be able to afford to deal with it. We ask that you adopt an exceptionally wise policy

of Native American elders who consider every decision that effects the people who entrust them with responsibility, every decision is made collectively with an awareness and responsibility for how their current decision will affect the Seventh Generation from that decision in their community.

The one overriding consideration which I did not find in this Draft SEIS is the factor of accumulation of radionuclides in the environment and in human beings over time, and the genetic damage to our species. This actual fourfold increase in Tritium pollution is alarming when one considers the fact that Tritium is a hydrogen isotope that bonds with oxygen and actually transforms fresh H_20 water into radioactive H_30 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. This is not natural radiation that leads to a slow process of evolutionary mutations, it is an unnatural and random alteration of the very substance, the DNA that makes us human, and that makes children like their parents and their grandparents. This is a serious legacy.

Another fact that needs stating is that one Curie releases radioactivity at 37 billion disintegrations per second. The DOE-NNSA is currently proposing a massive increase in Curies being released into the river with the Production of Tritium for Nuclear Weapons at the Watts Bar and Sequoyah Nuclear Power Plants, in addition to the routine radioactive pollutants being released from these two 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 120 years, piling up in our biosphere, and because Tritium completely bonds with water, it cannot be filtered or destroyed.

So, additional Tritium releases to our environment are proposed from 6,800 Curies up to 50,000 Curies of radioactivity each year, the vast majority of which will bond with the water in the Tennessee River, infecting biota, fish and wildlife with increasing concentrations up the food chain to humans, as well as directly contaminating public water supplies along the river, including Chattanooga's population, which depends on the river for drinking water. Again, we note the facts that radionuclide contaminations are cumulative, which is not addressed by this DSEIS, and the fact that Tritium is impossible to filter out of water.

This Draft SEIS is an impressive document, at 500 pages, and it seems the researchers and writers have attempted to cover all possible environmental consequences for the Tennessee River Basin biota and population caused by this commercial production of Tritium for nuclear weapons. As noted, however, important factors can be overlooked, and this is an example of the

value of peer reviews and public input. Years have gone into the production of this report, however, it should be noted the public is allowed only 45 days to respond. Given my own limitations in expertise and time, I will nevertheless attempt to contribute to the purpose of the Draft and point out possible shortcomings, asking questions in hopes they will lead to an even more thorough analysis of consequences before the Final SEIS recommendations are complete and certainly before any decisions are made regarding granting expansion of Tritium Production here.

In the DOE-NNSA Environmental Impact Statement published in 2014 on the impact of Tritium Production for Nuclear Weapons at the Watts Bar and Sequoyah Nuclear Power Plants, in section 2.3.22, it says the Tritium Production may increase the amount of spent nuclear fuel a reactor produces in each fuel cycle by 24% to 48% (for proposals of 2,500 Tritium Production absorption rods (TPBARS, replacing boron absorption rods) or the maximum proposed of 5,000 rods respectively), due to the absorption of neutrons reducing the power levels and requiring more fuel per cycle. Have the proposed scenarios presented in the DOE-NNSA's 2014 EIS regarding the environmental impact of Tritium Production at Sequoyah been addressed by this DSEIS for extending Sequoyah's operational period another 20 years?

Is TVA using High Burnup Fuel at Watts Bar in addition to these TPBARS? In addition to producing 24% to 48% more radioactive waste to be stored beside the Tennessee River, how do the TPBARS affect the radioactive composition of the nuclear waste in terms of the relative amounts of different radionuclides produced, compared to routine nuclear power? What is the effect on the cladding and assemblies of the other fuel rods? How does Tritium production's added nuclear waste affect the temperatures and radioactivity in the cooling pools? Hasn't Sequoyah practised using high burn-up fuel for a period of time? Have there been increased leakage and cladding and assembly failures since high burn-up fuel has been used at Sequoyah? How would Tritium Production for Weapons affect the necessary cooling pool storage time before the waste can be moved into dry storage? How is it different when combined with High Burnup Fuel? Are TVA's Holtec dry storage systems actually certified and approved for this altered radioactive waste storage and for how long?

Specifically, what is the planned schedule for managing the existing volume and the propsed Tritium Production's increased volume of spent nuclear fuel assemblies"? TVA has proven to be lax, at best, in moving radioactive fuel waste from vulnerable cooling pools to more secure hardened dry cask storage. As concerned citizens living downstream, we want to see an actual plan, a definitive schedule, for moving the radioactive fuel into dry cask storage. Are the NNSA or the NRC requiring fuel storage plan specifics, and will TVA be required to adhere to a submitted schedule? Where and when will this schedule for moving waste from fuel cooling pools into Hardened On-Site Storage (HOSS) dry-casks be published for public review?

With as much as 41 to 82 more fuel assemblies being added to the nuclear fuel pools per cycle, just how many assemblies are stored in the Watts Bar fuel storage pool now? With the design-basis capacity of 1,386 assemblies, will the TVA schedule be able to make room for the additional fuel assemblies by the time the pool reaches maximum capacity in 2017? What is the actual schedule for moving the radioactive fuel from the fuel storage pools to hardened dry cask storage systems?

Specifically, how will TVA accommodate an annual increase of 24% to 48% in radioactive waste from these nuclear power plants in our valley, in addition to the new Watts Bar 2 fuels, when TVA is already unable to safely contain the volume of fuel waste it has produced in the last 40 years – most of which is still sitting in cooling pools? Can we be assured that TVA will not accelerate procedures to meet deadlines, thereby risking safety, spillage or leakage?

Will Watts Bar or Sequoyah's cooling pools, fuel assemblies, and/or fuel rod claddings (which have suffered failures in the past) be exposed to beyond-design-basis heat or radioactivity? In the Draft SEIS section 3.1.10 it says, "When TVA irradiates nuclear reactor fuel to the point that it no longer contributes to the operation of the reactor, or if the fuel has cladding leaks that allow radioactive gaseous emissions, the fuel assembly becomes "spent nuclear fuel" and TVA removes it from the reactor core and stores it in the spent nuclear fuel storage pool or basin."

What are the fuel cladding failure leakage rates? Just how many leaking fuel rods are in each cooling pool and how does that effect the Tritium radioactivity of the water discharged into the river? Precisely how much has the rate of fuel cladding failures increased since tritium production began at Watts Bar in 2004? How much has leakage affected the radioactivity of core and fuel pool coolants? Are these leaking assemblies eventually stored in the doubled dry casks specifically designated for damaged fuel?

Also according to section 2.3 of the Draft SEIS, "A small amount of tritium permeates through the TPBARs during operation, which increases the quantity of tritium in the reactor coolant water system in comparison with a reactor that is not being used to produce tritium (DOE 1999a). Because tritium is an isotope, or type, of the hydrogen atom, it can combine with oxygen in the coolant water to become part of a water molecule (tritiated water). Tritiated water in the reactor coolant can reach the environment via several mechanisms, including (1) operations that refresh the reactor coolant to maintain the correct system parameters, (2) refueling operations, and (3) normal leakage and diffusion from the primary system into secondary systems. Tritium is released to the environment through the normal operations of the radioactive waste system or in steam system blowdown or condensing cooling water."

Will this increased tritium in the reactor coolant water system affect the longevity of components in the TVA nuclear power reactors, and has a revised schedule of inspection and replacement been incorporated into new regulations to ensure the safety of the nuclear units is maintained?

In conclusion, I would like to remind the folks preparing the Final SEIS for Tritium Production in Commercial Light Water Reactors in Tennessee, of the insidious nature of Tritium. It seems so easy to dismiss the impact of Tritium on our environment and human life because the Tritium will be diluted by the river, but it also seems a deliberate oversight for nuclear environmental impact studies to simply ignore the accumulation of toxic radionuclides in our environment. This Draft SEIS seems to address only annual effects, but does not address the cumulative build up in sediment, soil and living organisms from decades of Tritium production, and cannot address the random mutations over hundreds of generations.

Ionizing radionuclide by-products of nuclear fission are not found in nature, and should not be equated with naturally occurring radiation. Living organisms do not have the biological ability to categorize these unnatural isotopes, organisms try to make sense of what they are and to respond to them appropriately. The problem is, with no naturally evolved mechanism for recognizing the new and unnatural elements, our bodies cannot categorize unnatural elements as poison or nutrient. So, we mistakingly identify radionuclides as whatever they most closely resemble in nature, and absorb them as necessary nutritional elements rather than as actual toxic poisons. Cesium-137 resembles potassium, so it permeates our cellular structure and deposits in human muscles, where it irradiates muscle cells and nearby organs. Strontium-90 resembles calcium, and it is absorbed by our bones, where we make blood cells, and leukemia is a disease of our blood cells. When Strontium-90 is released from nuclear power plants, it lands on soil and is taken up by grass which is concentrated in cows and goats milk and in the breasts of lactating women. At least 19 quality, peer-reviewed studies around the world have shown childhood leukemia rates are doubled near nuclear power plants.

Tritium actually transforms water into radioactive water that permeates and irradiates the cellular structure all through our bodies. This is an invisible and insidious danger, because there is simply no safe dose of radiation. Some people are more resistant than others and their bodies can repair the damage, but radiation poisoning is cumulative and children are extremely vulnerable because their cells are dividing rapidly. Women and the unborn are also at high risk. Birth defects include downs syndrome, cleft palate or lip, congenital malformations, spinal defects, kidney, liver damage and more. Cancer is not the only risk. We ask that you think of the Seventh Generation and not leave this environmental debt of ionizing radionuclides to our future generations.

Thank you for your work to ensure the safety of our environment and our families.

Sincerely,

Gretel Johnston

BEST/MATRR
Bellefonte Efficiency & Sustainability Team (BEST)
Mothers Against Tennessee River Radiation (MATRR)
best@matrr.org