Comment Messages

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UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

FEB 12 1999

ASSISTANT ADMINISTRATOR
FOR ENFORCEMENT AND
COMPLIANCE ASSURANCE

Ms. Carol M. Borgstrom, Director
Office of NEPA Policy and Assistance (EH-42)
U.S. Department of Energy
1000 Independence Avenue, S.W.
Washington, D.C. 20585

Dear Ms. Borgstrom:

The Environmental Protection Agency has reviewed the Draft Environmental Impact Statement (DEIS) for the proposed Department of Energy's Construction and Operation of the Spallation Neutron Source (SNS). The proposed SNS facility will provide a next-generation accelerator-based neutron scattering facility that would support the needs of the scientific community. EPA is providing comment in accordance with Section 309 of the Clean Air Act, as amended (42 U.S.C., PL 91-604 12(a), 84 Stat. 1709), and the National Environmental Policy Act (NEPA).

The DEIS evaluates and compares four proposed alternative locations for the SNS. DOE's preferred alternative site is Oakridge National Laboratory (ORNL) in Oak Ridge, TN. The remaining alternative sites outlined in the DEIS, and the order of selection are the Los Alamos National Laboratory (LANL), located in Los Alamos, NM; Argonne National Laboratory (ANL), located in Argonne, ILL; and Brookhaven National Laboratory (BNL), located in Upton, NY. In addition to the "No Action" alternative, three other alternative methods were considered, but were later found to be technically inferior and therefore were eliminated by DOE.

The proposed action will involve the construction and operation of a short-pulse spallation neutron source comprising an ion source, a linear accelerator, a proton accumulator ring, a liquid mercury ring, a liquid mercury target, and a set of neutron scattering instrumentation. This facility would be designed to operate at a proton beam power of one Mega Watts (MW) and could be upgraded in the future to four MW. The one MW SNS would occupy real property approximately 110 acres. Supporting

Recycled/Recyclable

facilities would be located in 15 structures occupying an additional six acres. An increase in the power level to four MW would expand the footprint size of the SNS by approximately 15 acres.

EPA's general and regional specific comments are attached. Our overarching comments fall into two basic categories. These categories are programmatic authorities under the Clean Air Act, Radionuclide National Emission Standards for Hazardous Air Pollutants (Radionuclide NESHAPS), and the approval of accepted methodologies for calculating the effective dose equivalent (ede) exposures for members of the public.

EPA has rated this document EC-2 (Environmental Concerns-Insufficient Information). For additional information concerning our rating system, please refer to the attached rating summary. This rating reflects EPA's environmental concerns based on insufficient information described in our attached comments. Information requested includes a more detailed analysis of the preferred alternative, more detailed analysis of one of the non-preferred alternatives, additional mitigations for wetlands impacted areas, and the exposure dose factors used by DOE.

Please contact me (202-564-7148) or Marguerite Duffy of my staff (at 202-564-7148) if you have questions regarding these comments.

Sincerely,

for Richard E. Sanderson,
Director
Office of Federal Activities

Enclosure

SUMMARY OF RATING DEFINITIONS AND FOLLOW-UP ACTION

Environmental Impact of the Action

LO--Lack of Objections
The EPA review has not identified any potential impacts requiring substantive changes to the proposal. The review may have disclosed opportunities for application of mitigation measures that could be accomplished with no more than minor changes to the proposal.

EC--Environmental Concerns
The EPA review has identified environmental impacts that should be avoided in order to fully protect the environment. Corrective measures may require changes to the preferred alternative or application of mitigation measures that can reduce the environmental impact. EPA would like to work with the lead agency to reduce these impacts.

EO--Environmental Objections
The EPA review has identified significant environmental impacts that must be avoided in order to provide adequate protection for the environment. Corrective measures may require substantial changes to the preferred alternative or consideration of some other project alternative (including the no action alternative or a new alternative). EPA intends to work with the lead agency to reduce these impacts.

EU--Environmentally Unsatisfactory
The EPA review has identified adverse environmental impacts that are of sufficient magnitude that they are unsatisfactory from the standpoint of public health or welfare or environmental quality. EPA intends to work with the lead agency to reduce these impacts. If the potential unsatisfactory impacts are not corrected at the final EIS stage, this proposal will be recommended for referral to the CEQ.

Adequacy of the Impact Statement

Category 1--Adequate
EPA believes that draft EIS adequately sets forth the environmental impact(s) of the preferred alternative and those of the alternatives reasonably available to the project or action. No further analysis ,or data collection is necessary, but the reviewer may suggest the addition of clarifying language or information.

Category 2--Insufficient Information
The draft EIS does not contain sufficient information for EPA to fully assess environmental impacts that should be avoided in order to fully protect the environment, or the EPA reviewer has identified new reasonably available alternatives that are within the spectrum of alternatives analyzed in the draft EIS, which could reduce the environmental impacts of the action. The identified additional information, data, analyses, or discussion should be included in the final EIS.

Category 3--Inadequate
EPA does not believe that the draft EIS adequately assesses potentially significant environmental impacts of the action, or the EPA reviewer has identified new, reasonably available alternatives that are outside of the spectrum of alternatives analysed in the draft EIS, which should be analyzed in order to reduce the potentially significant environmental impacts. EPA believes that the identified additional information, data, analyses, or discussions are of such a magnitude that they should have full public review at a draft stage. EPA does not believe that the draft EIS is adequate for the purposes of the NEPA and/or Section 309 review, and thus should be formally revised and made available for public comment in a supplemental or revised draft EIS. On the basis of the potential significant impacts involved, this proposal could be a candidate for referral to the CEQ.

USEPA Comments on the Draft Environmental Impact Statement Spallation Neutron Source

Site Specific Information

1 We recommend that the final document include more site specific information relating to water resources, ecological resources, cultural resources, human health, support facilities and infrastructure, long-term productivity of the environment, and lastly, cumulative impacts resulting from construction and operation. The DEIS assesses these impacts at a general level. We recommend including site specific NEPA analysis or information so that each of the identified potential impacts for each facility are fully assessed.

Radiation

The DEIS is unclear on the programmatic authorities under the Clean Air Act, Radionuclide National Emission Standards for Hazardous Air Pollutants (Radionuclide NESHAPs), and the approval of accepted methodologies for calculating the effective dose equivalent (ede) exposures for members of the public.

Radionuclide Methodology

2 We were unable to find anywhere in the DEIS a request for an alternate methodology for demonstration of compliance with the Radionuclide NESHAPs. It is unclear whether DOE intends to seek such approval for the values provided within the DEIS. The values DOE has provided for ede, with the pathways of exposure chosen, are presented as having to meet the 10 millirem per year ede dose standard for all public exposures. Prior US EPA approval must be obtained for any alteration of Clean Air Act Assessment Package 1988 (CAPP88-PC). This includes other radionuclides of concern. If this prior approval is not sought and obtained, the calculated ede exposures cannot be accepted as being adequately protective of public health and safety. We recommend that if this is not the case, then that the request, along with the approval letter be provided in the EIS.

Radionuclide State Delegation

3 We recommend that DOE clarify the state authorities for each alternate site. For example, the State of Illinois Environmental Protection Agency has no authorities delegated to it with regards to the Radionuclide NESHAPs, or radiation in any form. Radiation issues for the State of Illinois is dealt with by the Illinois

3 Department of Nuclear Safety, which also has no delegated authority for the Radionuclide NESHAPs. All enforcement authority resides with the United States Environmental Protection Agency, Region 5 office for Radionuclide NESHAPs issues. The DEIS needs to be changed to reflect this confusion.

NESHAP Reports

4 The DEIS should address how operation of the facility would contribute to radionuclide emissions in the atmosphere and how it would contribute to the existing NESHAP reports.

Air Quality

5 While the EIS contains tables which provide monitoring data for all of the criteria pollutants for 1996, it does not state whether or not ANL and BNL are in areas classified as non-attainment or maintenance of the National Ambient Air Quality Standards (NAAQS). If they are in non-attainment or maintenance status they would be subject to the general conformity rules (40 CFR Part 93: "Determining Conformity of General Federal Actions to State or Federal Implementation Plans"). The final EIS should address both the status of all of the alternatives and the applicability of the general conformity rule.

Groundwater

6 The DEIS states that the Till formation at Argonne is classified as having low permeability which renders this formation unusable. EPA believes this groundwater information is inaccurate. It has been well documented that the Wadsworth Till formation possess extensively high yielding sand and gravel scams. Although several municipalities in the Chicago land area have recently switched to using Lake Michigan water as a potable source, several private residences in northeastern Illinois are still dependent on shallow groundwater as a potable supply source. EPA recommends that further consideration must be given to potential impacts to shallow ground water resources in the area.

DOE Preferred Alternative, ORNL Site Specific

Contaminated Site

7 The document references several conflicts surrounding the siting of the SNS at the preferred alternative, ORNL. As noted, an Oak Ridge citizens advisory organization, the End-Use Working Group, has drafted land use guidelines and recommendations for the DOE - Oak Ridge Operations. One of the draft guidelines

recommends the siting of additional DOE facilities at ORNL on brownfield sites instead of greenfield sites (Page S-17). EPA has an initiative - the Brownfields Economic Redevelopment Initiative - designed to empower stakeholders in economic redevelopment of abandoned industrial areas to clean up and reuse brownfields. We note that DOE is currently participating in the Interagency Working Group on Brownfield development [DOE contacts are Martha Crosland 202-568-5793 and Chris Camillo 202-401-3819, April 1997 data]. We recommend that the Final EIS examine the potential for using brownfield sites for the SNS project. Instead of committing 110 acres of hardwood and pine forest habitat for this project, EPA Region IV supports the examination of brownfield sites within ORNL to determine what sites might serve DOE's needs in this regard. 7

Conflicts With Existing Land Use

A potential conflict at the ORNL site stems from on-going environmental monitoring and ecological research projects in the proposed project area (Page S-17) being conducted by National Oceanic and Atmospheric Administration/Atmospheric Turbulence and Diffusion Division (NOAA/ADD). The proposed site is situated within a buffer zone designed to protect an ecological monitoring project from carbon dioxide and other pollutant emissions. The Final EIS needs to include: a) how long the NOAA/ADD monitoring project are expected to continue; b) what is the projected building schedule of the SNS project, including the proposed upgrade to peak operation to the proposed build-out to 4 MW beam; and c) indicate if there are any of the NOAA/ADD ecological monitoring projects that can be completed prior to addition to the atmosphere of combustion products from the natural gas-fired boilers at the proposed SNS site. 8

Wetlands

EPA requests that the final EIS includes discussion on avoidance and reduction of wetland impact, as well as, mitigation necessary to offset unavoidable wetland impacts. 9

Other Alternatives

Our limited review indicates that based upon population, health impacts, and groundwater issues, that the best site for the facility would be LANL. We would suggest that additional information be provided explaining why Oak Ridge is the preferred alternative. 10

Illinois Department of Agriculture

Bureau of Land and Water Resources • State Fairgrounds • P.O. Box 19281 • Springfield, IL 62794-9281
217/782-6297 • TDD 217/524-6858 • Fax 217/524-4882

January 7, 1999

Mr. David Wilfert
U.S. Department of Energy
Oak Ridge Operations Office
200 Administration Road, 146/SNS
Oak Ridge, TN 37831

Re: Proposed Spallation Neutron Source Project
Draft Environmental Impact Statement
DOE/EIS-0247

Dear Mr. Wilfert:

The Illinois Department of Agriculture (IDOA) has reviewed the Draft Environmental Impact Statement (DEIS) prepared for the proposed Spallation Neutron Source (SNS) project. We submit the following comments.

The primary site chosen for the SNS is Oak Ridge, Tennessee. Three other sites considered include Argonne National Laboratory in Illinois; Las Alamos, New Mexico; and Upton (Brookhaven), New York.

The Illinois site has no significant agricultural impacts since it is located on the grounds of the Argonne National Laboratory. The site consists of support service buildings, open space, and undeveloped ecological plots. If any agricultural land remains on the site, its viability for long-term agricultural use would be very low given the development that has occurred around it. Land use plans designate the area for nonagricultural uses. The IDOA would have no objection to the project if the Argonne National Laboratory was eventually chosen for the site of the SNS. 1

The IDOA would have two other comments to make on the DEIS.

1. It is the responsibility of the USDA Natural Resources Conservation Service (NRCS) to determine whether a site is subject to the provisions of the federal Farmland Protection Policy Act. Section 4.3.1.3 (Soils), page 4-117 of the DEIS indicates that the preparer of the DEIS has made this decision rather than the NRCS. 2

2. Numerous references to "open space" were made in the DEIS. The term need to be defined in the glossary. If the term includes farmland, then farmland needs to be broken out and assessed separately. Farmland is a natural resource and a land use just like wetlands, woodlands, and prairies, etc. Impacts to this natural resource must be properly evaluated in NEPA documents. 3

Mr. Wilfert
Page 2
January 7, 1999

If you have any questions concerning our review, please contact me.

Sincerely,

James R. Hartwig, Supervisor
Office of Farmland Protection and Mined Land Reclamation

JRH:drs

cc: Robert L. McLeese, NRCS
Kane-DuPage County SWCD

TENNESSEE HISTORICAL COMMISSION
DEPARTMENT OF ENVIRONMENT AND CONSERVATION
2941 LEBANON ROAD
NASHVILLE, TN 37243-0442
(615) 532-1550

January 11, 1999

Mr. A. Lee Watkins
Oak Ridge Operations
Post Office Box 2001
Oak Ridge, Tennessee 37831-8218

RE: DOE, ENVIRONMENTAL IMPACT STATEMENT, SPALLATION NEUTRON SOURCE/ORNL, OAK RIDGE, ANDERSON COUNTY

Dear Mr. Watkins,

1 At your request, our office has reviewed the above-referenced document in accordance with regulations codified at 36 CFR 800 (51 FR 31115, September 2, 1986). Considering the information provided, we find that the area of potential effect for this undertaking contains no cultural resources eligible for listing in the National Register of Historic Places. You should notify interested persons and make the documentation associated with this finding available to the public.

2 If your agency proposes any modifications in current project plans or discovers any archaeological remains during the ground disturbance or construction phase, please contact this office to determine what further action, if any, will be necessary to comply with Section 106 of the National Historic Preservation Act.

This office appreciates your cooperation.

Sincerely,

Herbert L. Harper
Executive Director and
Deputy State Historic
Preservation Officer

HLH/jyg

Illinois Historic Preservation Agency

1 Old State Capitol Plaza • Springfield, Illinois 62701-1507 • (217) 782-4836 • TTY (217) 524-7128

DuPage County
Argonne National Laboratory
DOE-Spallation Neutron Source Project; Draft Environmental Impact Statement; 800 Area
DOE/EIS-0247; IHPA Log #01122198

January 11, 1999

David Wilfert
U.S. Department of Energy
Oak Ridge Operations Office
200 Administration Road, 146/SNS
Oak Ridge, TN 37831

Dear Mr. Wilfert:

Thank you for requesting comments from our office concerning the possible effects of your project on cultural resources. Our comments are required by Section 106 of the National Historic Preservation Act of 1966, as amended, and its implementing regulations, 36 CFR 800: "Protection of Historic Properties".

1 Our staff has reviewed the "Draft Environmental Impact Statement for the Construction and Operation of the Spallation Neutron Source" dated December 1998. We understand from the draft EIS that the proposed location for the project is the 800 Area at Argonne Naitonal Laboratory-East. Recently Building 829 was determined as not eligible for listing on the National Register of Historic Places. At this time, our office is not sure if there are any other buildings located in the 800 Area. Even though these buildings may be less than fifty years old, if they are located in the 800 Area they should be assessed for National Register eligibility.

2 The process set forth in Table S 1.5.2-1 (page S-36) of the EIS for addressing possible impacts to prehistoric site 11DU207, if Argonee National Laboratory were selected for construction of the Spallation Neutron Source, is acceptable to our office. If you have any further questions, please contact Tracey A. Sculle, Cultural Resource Manager, at 217/785-3977 or Joseph S. Phillippe, Staff Archaeologist, at 217/785-1279.

Sincerely,

Anne E. Haaker
Deputy State Historic Preservation Officer

AEH:TAS

ILLINOIS DEPARTMENT OF NATURAL RESOURCES

524 South Second Street, Springfield 62701-1787 — Brent Manning, Director

January 29, 1999

David Wilfert
US Department of Energy
Oak Ridge Operations Office
200 Administration Road, 146/SNS
Oak Ridge, Tennessee 37831

Re: Spallation Neutron Source EIS
Argonne National Laboratory, DuPage County

Dear Mr. Wilfert:

Thank you for contacting the Illinois Department of Natural Resources for comments on the Draft EIS for the proposed Spallation Neutron Source (SNS). The Argonne National Laboratory (ANL) study was distributed to appropriate Department staff for review. The following need to be addressed if ANL is chosen to house the SNS:

1 • Threatened and Endangered Species. While no listed species are known to occur on the exact site for the SNS, several have been observed within the limits of ANL and the adjacent Waterfall Glen Forest Preserve. Surveys for the Kirtland's snake, red-shouldered hawk, and their respective habitats should be performed if ANL is chosen for the SNS.

2 • Waterfall Glen Forest Preserve District. The DuPage County Forest Preserve District should be consulted for impacts to Waterfall Glen, one of the county's largest preserves.

3 • Stream Resources. While the Department does not have authority over the floodways on the two small tributaries on the ANL site (because they both drain less than one square mile), a permit may be needed from the Department's Office of Water Resources if an impoundment is proposed. Additionally, any proposal to alter the streams on site should have a thorough macroinvertebrate and fish survey.

4 • Wetlands. Before a permit is sought from the Department of Environmental Concerns and the US Army Corps of Engineers to fill or alter any wetland, a thorough floristic survey should be performed to determine appropriate mitigation strategies.

[printed on recycled and recyclable paper]

Page 2 January 29, 1999

Please contact me if the ANL alternative is selected for the SNS. The Department can then provide further guidance and more detailed comments regarding the anticipated impacts. If you have any questions or need additional information, please do not hesitate to contact me at (217) 785-5500.

Sincerely,

Kim M. Roman
Project Manager
Endangered Species Consultation Program

cc: Bob Rung, IDNR
Bill Boyd, IDNR
JoEllen Siddens, DuPage Co. FPD

STATE OF TENNESSEE

Don Sundquist
Governor

February 8, 1999

Mr. David Wilfert, EIS Document Manager
U.S. Department of Energy
Oak Ridge Operations Office
200 Administration Road, 146/FEDC
Oak Ridge, TN 37831

Dear Mr. Wilfert:

As the Governor's Lead Contact for State of Tennessee National Environmental Policy Act (NEPA) reviews, I am providing comments in response to the **Draft Environmental Impact Statement (DEIS) for the Construction and Operation of the Spallation Neutron Source, (SNS) DOE/EIS-0247.** The attached comments from state agencies represent the complete and official response of the State of Tennessee. These comments are limited to the scope of study appropriate for the aforementioned document. Please give these comments your full consideration.

A spallation neutron source as proposed shall provide opportunities for scientific inquiry that may result in significant advances in human knowledge. This state-of-the-art facility will certainly produce improvements in education, engineering, technology, and both basic and applied research. The State of Tennessee fully supports such intellectual activity and firmly believes that Oak Ridge is best suited to host the facility

Because of its size and complexity, the project presents issues that warrant further evaluation. The State has identified some of these in the attached comments. None of these comments appear to present difficulties which cannot be satisfactorily resolved and none justify any halt of progress on the project. In general, the State requests a more complete explanation of the operating and safety systems of the proposed facility.

State Capitol, Nashville, Tennessee 37243-0001
Telephone No. (615) 741-2001

Mr. Wilfert
Page 2
February 8, 1998

The State of Tennessee welcomes the Spallation Neutron Source at Oak Ridge. We appreciate the opportunity to comment and will be pleased to consult with DOE on any concerns. If you have any questions, please contact me or our staff policy analyst at 615/532-4968 (fax 615/532-0740).

Sincerely,

Justin P. Wilson
Deputy Governor for Policy

JPW/emw

cc: Mr. Milton H. Hamilton, Jr., Commissioner
NEPA coordination file/Mr. Dodd Galbreath
State NEPA Contacts

STATE OF TENNESSEE
DEPARTMENT OF ENVIRONMENT AND CONSERVATION
DOE OVERSIGHT DIVISION
761 EMORY VALLEY ROAD
OAK RIDGE, TENNESSEE 37830-7072

February 1, 1999

David Wilfert, EIS Document Manager
U.S. Department of Energy
Oak Ridge Operations Office
200 Administration Road, 146/FEDC
Oak Ridge, TN 37831

Dear Mr. Wilfert

DOCUMENT REVIEW: Draft Environmental Impact Statement (DEIS) for the Construction and Operations of the Spallation Neutron Source, (SNS) DOE/EIS-0247, December 1998

The Tennessee Department of Environment and Conservation, DOE Oversight Division (TDEC/DOE-O) has reviewed the subject DEIS in accordance with the requirements of the National Environmental Policy Act (NEPA) and associative regulations of 40 CFR 1500-1508 and 10 CFR 1021 as implemented and offers the attached comments for consideration.

The State of Tennessee supports the overall mission of the Oak Ridge National Laboratory and the construction of the Spallation Neutron Source. The DEIS has addressed most of the information requested in our letter of August 29, 1997. It did not provided sufficient information on (1) **the design life and decontamination and decommissioning (D&D) plans for the facility** and (2) **health and safety, including radiologically activated and contaminated materials.**

1
2

It is the State of Tennessee's understanding that the SNS will be designed, constructed, and operated in a manner that is compliant with applicable laws, regulations and DOE Orders. The DEIS needs additional information to clearly demonstrate groundwater protection requirements, radioactive wastewater treatment capacity to support ORNL's active waste management, environmental restoration waste and SNS waste needs.

3

The State will expect best available technology in design and construction for pollution prevention, emission controls, and monitoring. It will also expect adequate funding for compliant treatment, storage and disposal of waste.

4

David Wilfert, EIS Document Manager
February 1, 1999
Page Two

If you have any questions regarding the Division's comments, please contact John Owsley or me at (423) 481-0995.

Sincerely

Earl C. Leming
Director

xc: Justin Wilson – Govenor's Policy Office
Mike Mobley – TDEC
Elgan Usrey - TEMA
Dodd Galbreath – TDEC, Environmental Policy Office

El451.99

GENERAL COMMENTS

5 Several environmental health and safety issues, including radiologically activated and/or contaminated materials, need to be addressed. Possible release of radiological materials to the environment during future upgrades to the facility should be addressed in the Final EIS. According to page A-15 of the Draft EIS, it may be ten years after initial operation before the power is upgraded to 4 megawatts. Significant radioactivity levels may have been reached in various facility locations and equipment by that time subjecting the public and environment to undue risks unless proper precautions are taken. In addition, a more thorough examination of

6 transport of radiological components through the soil and groundwater is required. Design criteria should include protection of groundwater from any contamination including leaching of radionuclides from neutron activated soil.

7 The Department commented on the SNS Notice of Intent by a letter from Mr. Earl C. Leming to Mr. David Wilfert dated August 29, 1997. It was requested in those comments that selection of a "green field" site over a "brown-field" site be addressed and justified in the EIS. It appears this has been done; however, the information is scattered over several sections of the document. Please consolidate the "green field" versus "brown-field" site information under a specific section and list some of the Oak Ridge brownfield sites that were initially considered and explain why those sites were rejected.

8 From a groundwater perspective, if this facility were located in Melton Valley over the relatively tight clastic formations such as the Pumpkin Shale, rather than over the Knox Aquifer (the Knox Aquifer is the best source of usable groundwater in E. Tennessee), there would be less risk of groundwater contamination. Further the relatively tight shales under Melton Valley, would offer an advantage from a standpoint of contaminant travel times, absorption, and matrix diffusion compared to the conduit flow that exists beneath Chestnut Ridge.

9 If Chestnut Ridge remains the preferred site, every effort should be made to reduce impact to the area.
10 In addition, DOE should respond to citizens' concerns about loss of data quality for the long-term ORNL ecological research projects at Walker Branch Watershed by exploring mitigation opportunities.

11 The draft EIS does not acknowledge that there is currently no outlet for Oak Ridge Reservation Low Level Waste.

12 Several topics that were not covered in the Draft EIS should be included in the final document. These include disposal of Cooling Tower Basin Sludge, handling and disposal of the sediments in the Retention Basin, and processing of activated cooling water from the target areas. Also discuss the expected residence lifetime (in the system) of the cooling water.

13 Include detailed facility maps in the final document. These maps should show expected locations of the facility, retention basins, cooling towers, etc.

SPECIFIC COMMENTS
Volume 1

14 **Page S-53, Table S 1.5.2-1. Comparison of impacts among alternatives, ORNL Alternative, Low-Level Radioactive Wastes**
Although "contracts are in place", there is currently (Jan. 19, 1999) no outlet for Oak Ridge Reservation Low level Waste.

15 **Page 3-47, Table 3.5-1, Comparison of impacts among alternatives, ORNL Alternatives**
What does "(4%) in radionuclide flux over White Oak Dam" mean? Describe this in terms of an increase in radiological activity in addition to a percentage increase.

16 **Page 4-1, Section 4.1.1. Geology and Soils**
This section of the Draft EIS does not discuss the transport of radiological contamination through the soils. Page 9-3 of the Conceptual Design Report NSNS/CDR-2/V2 states in the third paragraph: "A study of soil groundwater transport and migration of various radionuclides at the preferred NSNS (SNS) site must be performed as part of the EIS in order to determine if the indicated soil concentrations are capable of imparting a radiologically significant component to the groundwater." Please include this study in the Final SNS EIS.

17 **Page 4-7, Section 4.1.1.4, Site Stability**
The discussion of soils states that the soils "are not susceptible to liquefaction or mass movement." This section does not discuss karst sinkhole development which is an active process on Chestnut Ridge. There is a small depression within the footprint of the facility. Please discuss the implications on groundwater, surface water and structural stability following the discovery of karst landforms and how will karst be dealt with during design, construction, and operation of the facility.

18 **Page 5-17, 5.2.1.1, Site Stability**
Consideration should be made to the active doline formation encountered in the two barrow areas that exits along strike with the proposed SNS site. The two barrow areas suggest that anthropogenic factors can drastically increase the rate of sinkhole formation on Chestnut Ridge. Please discuss the implications of the above in the final document.

19 **Page 5-18, Section 5.2.1.2, Seismic Risk, 5.2.1.2-1 Seismic design criteria for ORR**
The discussion says Table 5.2.1.2-1 will present "estimated peak ground acceleration (PGA) at locations with greater than 30 ft (10m) of soil cover..," but the table presents "soil >10 ft (3m)."

20 **Page 5-22 Section 5.2.2.3.1 Resources**
Describe the "appropriate measures" if a karst formation is encountered during site characterization at the location of the retention pond.

21 **Page 5-22 through 5-245.2.2.3, Groundwater**
There is a closed depression shown on the S-19-A Oak Ridge Area Map, located within the map south and east area shown as the footprint of the proposed SNS facility. There is also a closed depression shown on the above referenced map to the east of the proposed facility. In all probability these closed depressions represent dolines. The East End barrow area, opened up with numerous swallets, suggests that the West End barrow area may have similar sinkhole development. These two areas are on strike with the proposed SNS facility. This suggests that the Knox Group beneath the site is an active karst aquifer with conduit flow. Dye traces conducted by TDEC demonstrates travel times in the order of 2 cm/sec, not the 2.9 m/yr. ground water velocity provided in this document.

22 A large karst spring SS-5 emerges at the base of Chestnut Ridge just to the map north of the proposed SNS site SS-5 is one of a series of large karst springs located in similar geologic situations at the base of Chestnut Ridge. A tracer study to determine travel times from this site utilizing potential karst features on or near the site to various receptors cross strike (SS-5) and along strike should be referenced in the final EIS.

23 **Page 5-24, Table 5.2.2.3.2-1 Estimates of radionuclide concentrations in soils and water surrounding the proposed SNS**
Please explain how the list of radionuclides and the quantities in this table were generated. Free release criteria should apply when there are uncontrolled releases to the environment. The quantities shown exceed the NRC Limits.

24 **Page 5-24, Section 5.2.2.3.2, Contamination, Last Paragraph**
The concept of a barrier to isolate the soil below the tunnel should be added to the design as a matter of course. This will help mitigate most chances of groundwater being affected by percolating surface water. A rainwater cover or protection of some type over all or selected portions merit consideration.

25 **Page 5-31, Section 5.2.5.3, Aquatic Resources**
Large volumes of water containing biocides and antiscaling agents are to be discharged from the retention basin into a relatively small creek. There should be further consideration of the effects of the chemicals and flow increase to White Oak Creek. Alternatives should be evaluated.

26 **Page 5-207, Section 5.9, Short-Term Use and Long-Term Productivity**
The Draft EIS mentions design life and decontamination and decommissioning (D&D) plans for the facility but contains insufficient detail. The EIS should also include the estimated costs associated with D&D and a plan for accumulating the finances required for D&D purposes.

27 **Page 6-1 through 6-18, Chapter 6, Permits and Consultations**
The Permitting and licensing requirements' section of the Draft EIS does not mention the Nuclear Regulatory Commission (NRC). The EIS should discuss the possibility of a NRC or State of Tennessee radiological permit/license being required for facility startup and /or operation.

28 **Page 6-3, Section 6.1.1, AIR QUALITY**
Tennessee has jurisdiction over radiological NESHAPS. Please correct the statement and Table 6.1-1.

Volume II

29 **Page D-11, Table 2-1, Protected vertebrate species with potential habitat on the NSNS site, their preferred habitats, and federal or state protection status.**
The first and fourth entries under the "Preferred Habitat" column are incomplete.

30 **Page D-12, Figure 2-1, Potential habitat areas for T & E animal species within the proposed NSNS site.**
The map would be more useful with the inclusion of the approximate locations of pools and sinkholes where threatened and endangered species and species in need of management might occur.

31 **Page D-25, Section 3.4.2, Functional Assessment, Wildlife Diversity**
There is no mention of fish being a possible inhabitant of wetlands on this site.

32 **Page D-26, Section 4.0, Summary**
The second paragraph states "...no habitat suitable for any fish species that have been previously documented on the ORR..." Should this read "Threatened and Endangered fish species" instead?

STATE OF TENNESSEE
DEPARTMENT OF ENVIRONMENT AND CONSERVATION
DOE OVERSIGHT DIVISION
761 EMORY VALLEY ROAD
OAK RIDGE, TENNESSEE 37830-7072

March 10, 1999

Mr. David Wilfert, EIS Document Manager
U.S. Department of Energy
Oak Ridge Operations Office
200 Administration Road, 146/FEDC
Oak Ridge, TN 37831

Dear Mr. Wilfert

DOE's response to Tennessee Department of Environment and Conservation, DOE-Oversight Division's (TDEC/DOE-O) comments on the *Draft Environmental Impact Statement (EIS), Construction and Operation of the Spallation Neutron Source (SNS)*, DOE/EIS-0247

We have further reviewed the responses, both written an oral, to the State's comment letter of February 9, 1999. The DOE provided these responses at the meeting on February 24, 1999, at the DOE-Oversight office. The following are the Division's comments on the DOE responses.

As addressed in our original comment letter, the current draft EIS fails to provide specific information on health and safety issues, potential radiological releases, proposed mitigation for protection of groundwater, and the location or occurrence of protected and endangered species within the proposed sites. In addition, specific locations of structures including roads, retention basins, cooling towers and the facility are not provided.

33 DOE has responded that requested information will be provided in studies and other documents after the Record of Decision (ROD) is issued. Because these items are necessary to fully evaluate the Environmental Impact of this project, we agree, after concurrence with your office, that it would be appropriate for DOE to issue a supplemental EIS in order to reference those studies and documents. This would formalize the commitments the DOE has made in their responses to comments on the Draft EIS. A supplemental EIS should be issued after the ROD but before construction is begun on the SNS project. The supplemental EIS should also include other appropriate environmental information that will not be available until that time.

The Division also offers the following specific comments for your consideration.

Comment Code S-5-1

34 Although the scope of the EIS is construction and operation of the SNS, decommissioning is an inevitable end result. It would seem prudent to have some type of funding assurance for D&D after the project life has been exceeded.

Comment Code S-5-9 & S-5-12

35 Based upon our current understanding of the processes associated with the SNS, it is highly unlikely that all radiological waste generated by operation of the Facility can be treated or disposed on site. What commitment will the Department make with regard to management of waste which will not meet an Oak Ridge Waste Acceptance Criteria or will in fact be characterized Special Case Waste (meaning it has no disposition alternative)?

It should be noted that commercial Low-Level Waste disposal contracts are for very low concentrations of radionuclides and certainly could not be utilized for disposition of all LLW generated by this proposed facility.

If you have questions regarding the Division's comments, please contact Bill Childres or me at (423) 481-0995.

Sincerely

Earl C. Lensing
Director

xc: Justin Wilson – Governor's Policy Office
Mike Mobley – TDEC
Elgan Usrey - TEMA
Dodd Galbreath – TDEC, Environmental Policy Office

el453.99

TENNESSEE COMMISSION OF INDIAN AFFAIRS
7th Floor, L & C Annex, 401 Church Street
Nashville, Tennessee 37243-0459
(615) 532-0745

February 9, 1999

David Wilfert
U.S. Department of Energy
Oak Ridge Operations Office
200 Administration Road, 146/SNS
Oak Ridge, TN 37831

Dear Mr. Wilfert:

Thank you for giving me the opportunity to comment on the Draft EIS for the Spallation Neutron Source (DOE/EIS-0247). I reviewed the Draft EIS when I received it, and I originally intended to make no comments.

1 However, I believe that I may have misunderstood statements in the document pertaining to avoidance of cultural resources in areas on the ORNL site that had not been surveyed yet (page 4-38 and page 5-37, for example). I took these statements to mean that all cultural resources identified during the survey would be avoided, but in reviewing the Draft EIS again, I am not sure I understood this correctly.

My specific concern is with the site identified as 40RE488, a multicomponent site located in an area that will be affected by road improvements. I understand that the survey does not indicate that this site is eligible for listing on the National Register of Historic Places, even though prehistoric artifacts were found. My concern is that 10 shovel tests in an area covering 262 feet by 67 feet could have missed Native American graves in this area.

2 If site 40RE488 will not be avoided during road construction, I would request that more extensive tests be done to determine if burials are present in this area. I realize that DOE has fulfilled the requirement to determine if this site contains resources eligible for the NRHP, but I feel that under the circumstances, more tests are warranted. If Indian burials were found before construction began, it would be easier to avoid them, thus saving time and money.

2 Please let me know if it will be possible for more tests to be done on 40RE488, and please keep me informed of the progress of the SNS project. Thank you for your time.

Sincerely,

Toye Heape

Toye Heape
Executive Director

State of New Mexico
ENVIRONMENT DEPARTMENT
Harold Runnels Building
1190 St. Francis Drive, P.O. Box 26110
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GARY E. JOHNSON
Governor

PETER MAGGIORE
Secretary

February 5, 1999

David Willert
U.S. Department of Energy
Oak Ridge Operations Office
200 Administration Road, 146/SNS
Oak Ridge, Tennessee 37831

Dear Mr. Willert :

RE: CONSTRUCTION AND OPERATION OF SPALLATION NEUTRON SOURCE PROJECT DRAFT ENVIRONMENTAL IMPACT STATEMENT, DOE/EIS-0247; U.S. DEPARTMENT OF ENERGY, OFFICE OF SCIENCE; DECEMBER 1998

This transmits New Mexico Environment Department (NMED) staff comments concerning the above-referenced Draft Environmental Impact Statement (DEIS).

A. BACKGROUND:

The U.S. Department of Energy (DOE) has proposed siting, constructing and operating a new Spallation Neutron Source (SNS) at one of four DOE facilities. Design will begin in 1999, construction is planned to begin in 2000, and operation will begin at the end of 2005. Los Alamos National Laboratory (LANL) in New Mexico is one of the potential candidates. Oak Ridge National Laboratory (ORNL) in Tennessee is the preferred site. This DEIS addresses the consequences of the SNS at each facility and a no action alternative.

The DOE selection criteria for the SNS required an area approximately 1,100 ft by 4000 ft. The proposed site at LANL is located in its southwest portion, at Technical Area-70 (TA-70). The area is on an undeveloped mesa top, flanked by Ancho Canyon to the southwest and a small unnamed canyon to the northeast. Other primary selection requirements by DOE were: a one mile buffer zone to insulate the public from accidents, proximity to a 62 to 90 MW power source, and presence of existing facilities and programs using neutron scattering techniques.

B. GENERAL COMMENTS:

1 1. LANL has the rights to approximately 1.8 billion gallons of water per year. They currently use 0.5 billion gallons, the surrounding communities use approximately 0.9 billion gallons, and the proposed SNS could use up to 0.7 billion gallons of water per year. Ground

1 water pumping may lower the water table in nearby wells, reduce long term main aquifer productivity, and directly compete with surrounding communities for water. The DEIS did not describe measures to mitigate this impact.

2 **2.** The proposed site at TA-70 is an undeveloped area at LANL within 1 to 2 miles of Bandelier National Monument. Large scale development would eliminate existing public use, be highly visible during the day and night, and increase traffic congestion. Over 330,000 people visit the Monument each year. We expect a greater negative impact to monument visitors and local residents than described.

3 **3.** White Rock was described to be 3 miles from the SNS. Pajarito Acres is a subdivision of
2 White Rock and appears to be within 1.5 miles of the facility. If the Maximum Exposed Individual (MEI) is based on exposure to individuals in White Rock, we expect it to be greater for residents of Pajarito Acres. We also expect noise levels and traffic congestion to be greater than described.

4 **4.** Siting the SNS at TA-70 would require development of extensive utility infrastructures, such as a 60 to 90 MW power source, natural gas lines, steam lines, a water delivery system and access to sanitary waste facilities. The DEIS did not adequately describe the expense or environmental impacts that would occur from these actions.

5 **5.** This document described cooling-tower blowdown discharge of 250 to 350 gpm into TA-70 drainage. It also stated that the water would infiltrate before reaching the Rio Grande. We believe the shallow alluvium, the short distance to the Rio Grande, and existence of Ancho Spring make it possible for water to flow to the Rio Grande. Surface water flows should meet New Mexico Cold Water Fishery Standards.

6 **6.** This document states that waste management facilities at LANL have sufficient capacity to handle the waste volume projected for the period 1998-2030. Therefore, construction and operation of the SNS would have a minimal contribution to cumulative impacts on waste management facilities. However, it also concludes that the existing treatment facilities do not have the capacity to treat all of the Low Level Waste (LLW) from the proposed SNS. It correctly states that the LLW (with accelerator-produced tritium) would not meet the waste acceptance criteria for the existing treatment facility at TA-50. Therefore, additional facilities that will accept these wastes are required. A new facility at TA-53 is under construction and expansion at TA-54 would be required. These expansions would be for treatment of waste with accelerator-produced tritium and LLW disposal. They do not appear to be minimal impacts.

7 **7. Air Quality:** a) The project is in an area that is currently in attainment for all National Ambient Air Quality Standards (NAACS). (Incidentally, the reference on Page 5-69 to Table 5.2.3.2-1 should probably be changed to Table 5.3.3.2-1.) Should LANL be chosen as the preferred site, LANL personnel should meet with the Department's Air Quality Bureau permitting personnel prior to construction of the proposed project to determine the appropriate level of air quality permitting for it.

8 b) The DEIS states that the MEI would receive a radiation dose from this project of approximately 2.9 mrem/year. The DEIS does not provide the location of this individual. Currently, LANSCE (a linear accelerator) at LANL provides between 2.9 and 5.0 mrem per year

8 to the current MEI. The report does not state whether the contributions from LANSCE have been considered in the 2.9 mrem present in this report. Communication with LANL personnel indicates that none of the staff responsible for the calculation of dose from airborne radiation were consulted in the development of the report. LANL is a very unique site due to its topography and climate (as opposed to Oak Ridge). If these considerations were not taken into account, the number reported in the DEIS could be significantly off. Concern about this possibility increases when noting the statement in the DEIS that the MEI reported in 1997 by LANL personnel is too large and should be reduced.

9 c) The DEIS does not address the Tribal Authority Rule (TAR) which is a vague EPA document that may empower the tribes to receive regulatory authority over LANL instead of the state. The new Neutron Source may place the MEI on tribal land, which would give the tribe excellent leverage to receive authority. However, since the location of the MEI was not adequately described nor were data provided showing that proper meteorological and topographical considerations were taken into account, it is not possible to reach any specific conclusion.

10 **8.** If the SNS is located at LANL, locations other than TA-70 should be considered. For example, there is an existing accelerator facility at TA-53. This location appears to have many of the features described as necessary for the SNS.

C. SPECIFIC COMMENTS

11 **1. 4.2 Los Alamos National LANL, Page 4-63, paragraph 1, line 11**
The Rio Grande is the only permanently flowing river near the project area.

This statement is incorrect. Ancho Canyon contains a perennial reach, which is supplied by Ancho Spring, that normally extends to the Rio Grande from a position about 0.5 miles southeast of the proposed SNS facility site.

2. 4.2.2.1 Surface Water, Page 4-70, paragraph 2, line 1
There are no permanent surface water resources within 0.25 miles (0.44 km) of the proposed SNS facility site.

The statement is true; however, the document should note that approximately 0.5 miles downstream of the proposed facility, a perennial reach exists in Ancho Canyon.

12 **3. 4.2.2.1 Surface Water, Page 4-72, paragraph 2, line 13**
Los Alamos, Water, and Pajarito canyons/streams originate upstream of LANL facilities.

This statement is not entirely correct. Several perennial streams exist onsite, and they include: 1) a 2-3 mile reach in Sandia Canyon exists as a result of the discharge of treated sanitary-sewage effluent, and heads at Technical Area 3, 2) a 1.5-2.0 mile reach in Canon de Valle that heads at Technical Area 16, and 3) 2-3 mile reach in Pajarito Canyon that heads near Technical Area 22 (Dale, 1998). A more accurate description of the hydrologic setting should be incorporated into the document.

4. 4.2.2.1 Surface Water, Page 4-72, paragraph 2, line 15

Perennial streams in the lower portions of Ancho and Chaquehui Canyons extend to the Rio Grande without being depleted by recharge to the ground.

12 A more accurate description of the flow conditions in the referenced canyons should be included in the document. Field observations and documentation during 1995, 1997 and 1998 showed that perennial flow in Chaquehui Canyon extended for approximately 300 ft from Spring 9A, and did not reach the Rio Grande. On September 29, 1998, field observations showed that perennial flow Ancho Canyon extended from Ancho Spring to within about 600 ft of the Rio Grande. In other words, these perennial reaches do not always reach the Rio Grande.

5. 4.2.2.2. Flood Potential, Page 4-72, paragraph 1, line 10
The overall flood risk to LANL and facilities at TA-70 is small because of the position of this site on a mesa top.

13 We agree that the flood risk on the mesa top is minimal. However, the flood risk downstream in Ancho Canyon and the unnamed canyon may be increased due to the additional outfall and runoff from parking lots, roofs, etc., at the site. The increase in runoff may affect the physical conditions and biological communities downstream from the proposed facility.

6. 4.2.2.3 Groundwater, Page 4-73, paragraph 2, line 9
Depth to groundwater, 840 ft (256 m), at TA-70 is inferred from a monitoring well adjacent to the site.

To the best of our knowledge there is no regional monitoring well adjacent to the TA-70. DT-9 is the closest well, and it is located approximately 4 miles northwest of the proposed SNS site.

14 **7,. 4.2.2.3 Groundwater, Page 4-73, paragraph 2, line 11**
The depth to groundwater at the bottom of Ancho Canyon along the southern edge of TA-70 is 600 ft.

This statement may not be correct considering the fact that Ancho Spring discharges within the canyon bottom.

8. 4.2.2.3 Groundwater, Page 4-75, paragraph 4, line 14
Background concentrations of radionuclides and trace metals are shown in the Ancho Spring results.

15 o The text should explain what "background concentrations" were used. To the best of our knowledge, background concentrations for ground water at LANL have not been agreed upon.

o It should be noted that in 1995, the high explosive compounds HMX (4.9 ppb), RDX (23 ppb) and 2,4-DNT (0.18 ppb) were detected in Ancho Spring waters (data from LANL Report: Environmental Surveillance at Los Alamos during 1995), which may indicate that Ancho Spring is not an appropriate background station.

o Contaminants were also found in Ancho Spring at earlier times. From 1951 through 1955 some contaminants were found: nitrate as nitrate (NO3), 0.2 to 30.0 ppm;

15 phosphate (NO3), 3.0 to 30 ppm; chloride (Cl), 2.8 to 93 ppm; and Fluoride (F), 0.2 to 3.2 ppm (data from Weir, et al., 1963, USGS report titled "The hydrology and the chemical and radiochemical quality of surface and ground water at Los Alamos, New Mexico, 1949-55").

9. 4.2.2.3 Groundwater, Page 4-75, paragraph 5, line 1
Long-term trends of the water quality in the main aquifer beneath LANL have shown little impact resulting from operations (LANL, 1997d).

16 The regional-aquifer monitoring system at LANL is probably inadequate to monitor long-term trends (e.g., long-screened intervals, spacing, casing degradation, possible borehole leakage, etc.). Recent data show that the regional aquifer beneath several historical release sites has been impacted by LANL activities.

10. 4.2.5.3 Aquatic Resources, Page 4-85, paragraph 1, line 2
These habitats currently receive NPDES-permitted wastewater discharges from LANL.

17 This statement is incorrect. A total of three perennial reaches or aquatic habitats at LANL do not receive wastewater effluent: 1) lower Ancho Canyon, 2) Canon de Valle near TA-16, and 3) Pajarito Canyon from TA-9/22 to approximately the mouth of Two-mile Canyon.

11. 4.2.9.1.2 Water, Page 4-108, paragraph 1, line 21
Surface and runoff water results from Ancho Canyon (TA-70) indicate all radionuclides well below the DOE DCGs for public dose, with many reported values below analytical detection limits (Table 4.2.9.1.2-1).

18 Surface-water data should be compared to more applicable standards such as New Mexico Water Quality Act or the federal Clean Water Act.

We appreciate the opportunity to comment on this DEIS. Please let us know if you have any questions.

Sincerely,

Gedi Cibas, Ph.D.
Environmental Impact Review Coordinator

NMED File No. 1229ER

New York State Department of Environmental Conservation
Division of Solid & Hazardous Materials, Room 488
50 Wolf Road, Albany, New York 12233-7250
Phone: (518) 457-6934 **FAX:** (518) 457-0629
Website: www.dec.state.ny.us

John P. Cahill
Commissioner

MAR 25 1999

Mr. David Wilfert
U. S. Department of Energy
Oak Ridge Operations Office
200 Administration Road
146/SNS
Oak Ridge, TN 37831

Dear Mr. Wilfert:

The New York State Department of Environmental Conservation has reviewed the Draft Environmental Impact Statement (DEIS) for the construction and operation of the Spallation Neutron Source (DOE/EIS-0247). The Department is not commenting on the preferred alternative, siting the Spallation Neutron Source at the Oak Ridge National Laboratory, because this is outside of New York State. Since Brookhaven National Laboratory is an alternative site, our comments will focus on the impacts of this alternative. Enclosed are the Division of Solid and Hazardous Materials' comments on the DEIS.

Thank you for the opportunity to comment on this document. If you have any questions, please contact Dr. Paul Merges, of my staff, at (518) 457-9253.

Sincerely,

Stephen Hammond, P.E.
Director
Division of Solid & Hazardous Materials

Enclosure

Division of Solid & Hazardous Materials
Department of Environmental Conservation
Comments on the Spallation Neutron Source
Draft Environmental Impact Statement (DOE/EIS-0247)

March 1999

1 In general, the Division of Solid & Hazardous Materials found the Draft Environmental Impact Statement (DEIS) to be technically rigorous, thoroughly researched, and conscientiously presented. There are no subjects related to the radioactivity involved that we believe should be addressed in greater detail, and we were pleased to see the level of attention paid to radioactive emissions, their environmental impacts, and potential accident scenarios involving radioactive materials.

2 A comparison using Table S 1.5.2-1 starting on page S-27 shows several reasons why Brookhaven National Laboratory (BNL) should not be the preferred alternative. The BNL alternative has the highest potential for increasing the radionuclide concentrations in groundwater due to soil activation by the linear accelerator (linac). The estimated radiation dose to the maximally exposed individual (page S-45) and the estimated latent cancer fatalities (page S-46) due to the presented accidents scenarios are greater than those for the Oak Ridge National Laboratory (ORNL) and Los Alamos National Laboratory (LANL) alternatives. This leads to the conclusion on page S-62 of Table S1.5.2-1 that the BNL alternative has the "potential for adverse radiological impacts on human health from normal BNL and SNS operations." In addition, the projected annual amount of low-level radioactive wastes (page S-53) generated by the SNS (16,400 m^3/yr) exceeds BNL's total annual capacity (300 m^3/yr), which would require additional low-level waste treatment capacity be provided. For all of these reasons, we agree that BNL should not be the preferred alternative.

3 Section 5.8.4 on page 5-205 lists the unavoidable adverse environmental impacts, should the SNS be constructed and operated at BNL. The first impact listed, neutron activation of soils in the berm used to shield the linac tunnel, is our primary concern. Activation of the soil berm, which is approximately 20 feet above the groundwater table, and the high permeability of the soils in which the SNS would be built, will lead to the rapid contamination of groundwater in much greater concentrations than will be experienced at ORNL or LANL. The intentional contamination of groundwater in the Upper Glacial Aquifer on Long Island without any mitigating measures is unacceptable.

4 Under the measures described to mitigate the adverse environmental impacts within section 5.11.4 on page 5-217, the only measure that BNL has not committed to implementing is a multi-layer shielding design to minimize the activation of the berm soils and the subsequent spread of contamination through subsurface soils and groundwater. If the SNS were to be constructed at BNL, the Department of Environmental Conservation would expect BNL's commitment to construction of the additional shielding, or some equivalent measures, in order to offer the greatest protection of the Upper Glacial Aquifer. Without such measures, this Department opposes the siting of the SNS at BNL.

CITY OF
OAK RIDGE

ENVIRONMENTAL QUALITY ADVISORY BOARD

POST OFFICE BOX 1 • OAK RIDGE, TENNESSEE 37831-001

February 5, 1999

Mr. David Wilfert, EIS Document Manager
U.S. Department of Energy
Oak Ridge Operations Office
200 Administration Road, 146/FEDC
Oak Ridge, TN 37831

RE: DRAFT ENVIRONMENTAL IMPACT STATEMENT, CONSTRUCTION AND OPERATION OF THE SPALLATION NEUTRON SOURCE, DOE/EIS-0247

Dear Mr. Wilfert:

The City of Oak Ridge Environmental Quality Advisory Board (EQAB) appreciates the opportunity provided to the public to review and comment on the Draft EIS on Construction and Operation of the Spallation Neutron Source (SNS).

The Oak Ridge City Council has passed a resolution expressing the City's support for the SNS project. The enclosed comments by EQAB are intended to assist DOE in assuring the quality and accuracy of the final EIS.

Sincerely,
For the Board

Ellen D. Smith by JH

Ellen D. Smith, Chairperson

cc: Mayor and Members, Oak Ridge City Council

Oak Ridge EQAB Comments on SNS Draft EIS

1 1. **Site maps.** Different maps in the EIS show different shapes and boundaries for the proposed facility site on the Oak Ridge Reservation (for example, compare the figures on pages 4-20 and 4-27). This is confusing. Please give an explanation for the different site configurations shown on the different maps.

2 2. **Section 4.1:** There is a puzzling absence of reference citations in some subsections of this chapter. For example, the discussions of the bedrock geology and geologic structure of the Oak Ridge Reservation (pages 4-1 to 4-6) surely are not original to this EIS, but there are no citations to the actual source or sources. Among the other sections where supporting references are absent or incomplete are Section 4.1.2.2 (pages 4-12 to 4-13), which cites no references; Section 4.1.5 (pages 4-18 to 4-27), which directs the reader to "the references compiled for this section" for more detail, but cites only two references that are related to only two of the several topics covered; and the discussion of the End-Use Working Group recommendations (page 4-56), which describes the Working Group's draft recommendations but does not include a reference citation.

In other instances, sources are identified informally, without full citations. For example, the discussion of emissions from non-DOE facilities (beginning at the bottom right on page 4-57) states that information about airborne emissions was "supplied by the facilities," but it does not name the facilities, give the dates for which the supplied information was valid, give the dates of the communications by which this information was supplied, nor identify the basis or source for the conclusion about the effective cumulative annual dose equivalent from these facilities. Similarly, Section 4.1.5.3 (page 4-18) names "the Forest Compartment Maps for the ORR" as a source, but gives no citation.

In these cited locations and throughout the EIS, please make sure that the final EIS identifies the sources of information relied upon, both to give appropriate credit to the sources and to help readers investigate the various subjects further, if they wish to do so.

3 3. Page 4-7, last paragraph in first column. It appears that the second sentence should say "The soils tested ranged from clayey sandy silt *with* gravel-sized chert (Unified Soil Classification System-"GC") to ..." (emphasis added to show insertion).

4 4. Page 4-30, Table 4.1.6.1-2. The entry for "Lenoir" should be "Lenoir City."

5 5. Page 4-31, Section 4.1.6.3.1. No source is identified for the information in the second paragraph of this section. However, data from the State Department of Education at http://www.k-12.state.tn.us/arc/fa_asr/table19.htm (essentially the same source that is cited elsewhere in the Education section) disagree with the numbers presented here. The lowest local funding percentage (30%) is in Loudon County (not Roane County) and the highest local funding percentage is in Oak Ridge (55%), not Knox County. State funding ranges from 38% in Oak Ridge (lower than Knox County's 43% figure) to 62% in Loudon (not Roane) County.

6 6. Page 4-32, Table 4.1.6.3.1-1. This table of public school statistics sometimes omits city-operated school systems and sometimes lumps them in with the counties. Cities in the region that operate separate school systems are Oak Ridge, Clinton, Harriman, and Lenoir City. Based on

6 comparison with the cited source (which gives data for the city and county systems separately), it appears that the table includes data for Oak Ridge and Clinton in some of the measures for Anderson County (e.g., the number of schools) but not others (e.g., student enrollment and per-pupil expenditures), while data for Lenoir City and Harriman seem to be completely missing. Please revise this table to include data for the city school systems. It is misleading to combine the data for city and county systems, since measures such as per-pupil expenditures can differ significantly between different systems in the same county (for example, Oak Ridge spent $6,794 per pupil, while Anderson County spent $4,900). Also, please check all the figures in the table for accuracy (some of them do not match any of the data in the source).

7 7. Page 4-32, first paragraph. The City of Oak Ridge Fire Department does serve the Oak Ridge community, but it is not the primary source of fire protection for ORNL. ORNL operates its own separate fire department, although there is a mutual aid agreement with the City. Please obtain the correct information from ORNL or from DOE Oak Ridge Operations and revise this passage accordingly.

8 8. Pages 4-35 to 4-40, Section 4.1.7. This Cultural Resources section mentions several properties on the Oak Ridge Reservation as being "eligible" for National Register listing, but does not mention the properties that are listed on the National Register of Historic Places, nor indicate that the Oak Ridge Graphite Reactor is a National Historic Landmark. Please include this information.

9 9. Page 4-41, first paragraph in second column. The north corner of the original reservation was never "politically separated from the reservation and incorporated as the City of Oak Ridge." From the City's inception, the corporate boundaries of the City of Oak Ridge have included the entire reservation area.

10 10. Page 5-22, Section 5.2.2.3.1. Regional construction experience indicates that infiltration from retention basins built over the Knox Group can sometimes accelerate karst processes and lead to formation of sinkholes, even when no preexisting sinkhole features have been identified. Therefore, DOE should consider constructing the retention basin in a manner that prevents or minimizes infiltration of collected runoff.

11 11. Page 5-22, last paragraph. It is not conservative to assume that the hydraulic conductivity of the vadose zone is equal to the saturated hydraulic conductivity of the soil matrix in the saturated zone. There is an extensive body of evidence (including research observations on the Walker Branch Watershed, published in ORNL reports and the open literature by researchers including Robert Luxmoore, Glenn Wilson, and Philip Jardine) demonstrating that most vadose zone flow is in "macropores," including fractures and root channels, not in the soil matrix. As a result, transit time through a 10-m distance in the vadose zone could be measured in minutes or hours, not years. Please use Walker Branch research results as a basis for revising the analysis of groundwater contamination impacts to include a more realistic assessment of radionuclide transport in the vadose zone.

12 12. B-34, Table. This table indicates that the Clinch River Breeder Reactor Site is currently used for waste management. As we understand it, the site is vacant and available for industrial

12 development. Please check the information and correct the table.

CITY OF
OAK RIDGE

OFFICE OF THE MAYOR

POST OFFICE BOX 1 • OAK RIDGE, TENNESSEE 37831-0001

February 5, 1999

(DISTRIBUTION AS INDICATED IN ATTACHED RESOLUTION)

You may recall that in April of 1997, you received a copy of a resolution adopted by the Oak Ridge City Council (Resolution No. 4-61-97) supporting and endorsing the National Spallation Neutron Source (SNS) and the companion Joint Institute for Neutron Science (JINS). The resolution was accompanied by a letter enlisting your support for these projects. I am once again enlisting your support as a fellow Tennessean.

Enclosed is a copy of Resolution No. 2-14-99 which was unanimously adopted by the Oak Ridge City Council during its regular meeting on Monday, February 1, 1999. This resolution reinforces our strong support for the Spallation Neutron Source (SNS) and urges its construction and operation at the preferred site in Oak Ridge. As explained in the resolution, the Department of Energy (DOE) has identified four alternative sites for the SNS: Oak Ridge National Laboratory (ORNL), Argonne National Laboratory in Illinois, Brookhaven National Laboratory in New York, and Los Alamos National Laboratory in New Mexico. We want to ensure that this project which will benefit not only Oak Ridge but our entire state, both economically and prestigiously, is located on the ORNL site. I am enclosing a publication titled, "Spallation Neutron Source, the Next-Generation Neutron Scattering Facility for the United States," that I believe you will find helpful in understanding the scope of this project and the opportunities it offers for future scientific and industrial research and development.

Any action you may take at this time to demonstrate your support for the location of the SNS at ORNL will be helpful. I cannot state too strongly that the completion of this project, and the companion JINS, will be in the long-term best interests of our state and our country. Please feel free to call me if you have questions or would like additional information about these projects.

Sincerely yours,

Walter K. Brown
Mayor

Enclosures

NUMBER 2-14-99

RESOLUTION

WHEREAS, the U.S. needs a neutron source to provide the scientific and industrial research communities with a much more intense source than is currently available, and to assure the availability of a state-of-the-art facility in the decades ahead; and

WHEREAS, this next-generation neutron source would create new scientific and engineering opportunities, and would help replace the capacity that will be lost by the eventual shutdown of existing sources as they reach the end of their useful operating lives; and

WHEREAS, the U.S Department of Energy (DOE) has worked with the scientific community since the early 1970s to provide a new neutron source; and

WHEREAS, the DOE has proposed to construct and operate a state-of-the-art, short-pulsed spallation neutron source (SNS) facility comprised of an ion source, a linear accelerator, a proton accumulater ring, and an experiment building containing a liquid mercury target and a suite of neutron scattering instrumentation; and

WHEREAS, the DOE has used a systematic process to select suitable alternative sites for the proposed facility that included criteria such as availability of land, adequacy of electric power source, presence of existing neutron science expertise and experience to meet mission goals, and existence of major facilities and programs using neutron scattering techniques; and

WHEREAS, the DOE has identified four siting alternatives for the proposed SNS: Oak Ridge National Laboratory (ORNL), Los Alamos National Laboratory in New Mexico, Argonne National Laboratory in Illinois, and Brookhaven National Laboratory in New York; and

WHEREAS, the DOE has prepared an Environmental Impact Statement (EIS) to examine the potential impacts associated with construction and operation of the proposed SNS at the four sites, and which names the ORNL location as the DOE preferred alternative; and

WHEREAS, the EIS describes the beneficial economic impacts of the proposed project on the Region of Impact (ROI), which includes Anderson, Knox, Loudon, and Roane Counties and the City of Oak Ridge; and

WHEREAS, the EIS states that economic benefits to the ROI in the form of jobs, wages, business taxes, and income would begin to accrue during the first year of the project in FY 1999, and would increase as construction and other associated project activities increase; and

WHEREAS, the DOE estimates that design and construction employment would be highest in FY 2002, and there would be an estimated 1,499 total (direct, indirect, and induced) new jobs created at ORNL; and

WHEREAS, the DOE further estimates that facility operation would continue to support up to 1,704 direct, indirect, and induced jobs for the first year of full operation (FY 2006), and for each of the following years of operation; and

WHEREAS, the DOE further estimates the economic benefits of annual operation, which would accrue to the ROI, to be: $ 68.7 million in local wages, $ 7.5 million in business taxes, $ 75.9 million in personal income; and $ 176.3 million in total output; and

WHEREAS, the preferred alternative for the SNS is located at the Oak Ridge National Laboratory, which is within the corporate limits of the City of Oak Ridge; and

WHEREAS, the City of Oak Ridge strongly supports the Department of Energy's objectives to ensure the vitality of the national scientific community by providing a neutron source that would satisfy current and future demand for research neutrons, lead to new scientific and technological discoveries, and meet international technological and economic challenges in an environmentally sound and safe facility; and

WHEREAS, the City of Oak Ridge commends the DOE Oak Ridge Operations office and the Oak Ridge National Laboratory for organizing a collaborative effort to achieve these objectives with Argonne, Brookhaven, Berkeley, and Los Alamos National Labs, and other U.S. industrial firms and universities that will be involved as the project matures; and

WHEREAS, the City of Oak Ridge commends the State of Tennessee for committing $ 8 million for ORNL and the University of Tennessee to construct a Joint Institute for Neutron Science (JINS), which will enhance the utility of the SNS by providing support facilities to scientists and engineers from universities, industries, and the international community; and

WHEREAS, an overwhelming majority of Oak Ridge citizens responding to a recent community survey stated strong support for the construction and operation of the proposed SNS at the preferred site at ORNL; and

WHEREAS, construction and operation of the SNS at the preferred site at ORNL will greatly assist the City of Oak Ridge as it continues to address the negative social and economic impacts associated with DOE downsizing.

NOW, THEREFORE, BE IT RESOLVED BY THE MAYOR AND COUNCILMEN OF THE CITY OF OAK RIDGE, TENNESSEE:

That the City of Oak Ridge supports and endorses the Department of Energy's preferred alternative to construct and operate the Spallation Neutron Source at the Oak Ridge National Laboratory.

BE IT FURTHER RESOLVED that this resolution shall be sent to the Secretary of Energy, the Governor of the State of Tennessee, the Tennessee Congressional Delegation, the City's representatives in the Tennessee General Assembly, the Tennessee Municipal League, and the Mayors of the cities throughout Tennessee urging their continued support for the SNS and JINS projects.

This the 1st day of February 1999.

APPROVED AS TO FORM AND LEGALITY:

City Attorney

Mayor

City Clerk

LOC INC
Oak Ridge Reservation
Local Oversight Committee

February 10, 1999

Mr. David Wilfert,
EIS Document Manager
U.S. Department of Energy
Oak Ridge Operations
200 Administration Road, 146/FEDC
Oak Ridge, TN 37830

Fax 576-4542

Subject: Comments on the Draft Environmental Impact Statement for Construction and Operation of the Spallation Neutron Source (DOE/EIS-0247, December 1998)

Dear Mr. Wilfert:

The Citizens' Advisory Panel (CAP) of the Oak Ridge Reservation (ORR) Local Oversight Committee, Inc. (LOC) has unanimously endorsed the following comments on the Draft Environmental Impact Statement (EIS) for Construction and Operation of the Spallation Neutron Source (SNS) (DOE/EIS-0247, December 1998). The LOC Board has not had the opportunity to review and approve the comments, and thus these comments should be considered submitted by the CAP only.

The LOC is a non-profit regional organization funded by the State of Tennessee and established to provide local government and citizen input into the environmental management and operation of the DOE ORR. The Board of Directors of the LOC is composed of the County Executives of Anderson, Knox, Loudon, Meigs, Morgan, Rhea, and Roane Counties; the Mayor of the City of Oak Ridge; and the Chairs of the Roane County Environmental Review Board, the City of Oak Ridge Environmental Quality Review Board, and the LOC CAP. The CAP has up to 20 volunteer members with diverse backgrounds who represent the greater ORR region.

1 The CAP strongly supports the selection of the Preferred Alternative to locate the SNS in Oak Ridge and have it be operated by ORNL. We recognize the importance of the research enabled by the SNS. The following comments are given for the purpose of strengthening the document and support for SNS.

2 The draft EIS documents most of the concerns and issues raised at the scoping meeting except for one--the lack of public involvement in selecting the actual, physical site. The draft EIS and associated public meetings are the first opportunity to comment on the proposed physical site. Allowing public involvement earlier in the site screening process for the ORR would have been desirable.

Anderson • Meigs • Rhea • Roane • City of Oak Ridge • Knox • Loudon • Morgan

136 S. Illinois Ave., Suite 208 • Oak Ridge, TN 37830 • Phone (423) 483-1333 • Fax (423) 482-6572 • E-mail: locinc@aol.com

The Draft EIS does not consider all of the potential environmental impacts. Two such potential impacts are:

3 1. The site plan shown on page 3-12 and elsewhere does not show the retention basin for site runoff, sediment settling, and cooling tower blowdown. This basin is discussed on pages 5-20, 5-21, 5-30, and elsewhere, but its size and location are never given. The retention basin could significantly increase the footprint of the SNS on the ridgetop.

4 2. Page 5-37, last paragraph mentions construction or improvement of utility corridors and a southwest access road not assessed at the time of the Draft EIS. Mitigation measures should be planned and implemented for impacts in addition to those on cultural resources, for example if any of the corridors run through the buffer zone for Walker Branch watershed.

5 The Draft EIS does not effectively show the intrusion of the SNS into environmentally sensitive areas. In contrast, the CERCLA Waste Disposal RI/FS (DOE/OR/02-1637&D2 in Figures 7.2, 7.3 and 7.4) shows in detail the sensitive areas. The CAP referred to these figures in studying the proposed SNS site, as they better show the sensitive areas' proximity to the SNS preferred location. For example, a copy of Figure 7.4 is enclosed; 6 the inclusion of a similar figure in Section 4.1.5 or 5.2.5.4 along with the figure found on page B-43 is recommended. In addition, an outline of the SNS footprint should be shown on Figures 4.1.5.4-1 and 4.1.5.4-2. Figures 4.1.8.3-1 and 4.1.8.3-2, found on pages 4-54 7 and 4-55 respectively, are not readable; these maps would be improved by expanding the view of the affected area and choosing lighter shading patterns.

8 The Draft EIS does a good job of stating the potential impact of the Chestnut Ridge SNS site on the climatic research being done in the Walker Branch watershed in support of the Nations Global Change Program. If this proves to be the chosen site, the CAP would like to see a commitment to mitigation measures before construction begins. Mitigation of the SNS impact on this research is extremely important to protect the value of 30 years of climate data. In addition to replacement of natural gas boilers with electric heat pumps (page 5-41), use of an electric shuttle bus to transport people to the site during the operations period is another potential mitigation mechanism. An electric shuttle would not only reduce carbon dioxide emissions from conventional vehicles but would also reduce runoff by eliminating the need for large parking lots, consequently allowing reduction of the volume of the retention basin and of the overall footprint of the SNS complex.

9 A better decommissioning plan is needed. Page 5-43 (second paragraph) states: "Current plans call for in-situ decommissioning of the SNS when its operational life cycle is completed." This is unacceptable to the CAP. Such approaches typically have resulted in excessive releases of contaminants to the environment as well as disproportionate surveillance and maintenance costs. Additionally, 30-years of continuous operations 10 (page 5-19) seems unrealistically short for this type of facility with the likely strong demand for linac time by neutron researchers. In practice, even "temporary" buildings on the ORR are still in use more than 50 years after construction.

Errors found in the document are listed below:

11 1. On page 4-5 the figure is mislabeled; it should be 4.1.1.1-3 (as referenced on page 4-7). In addition, the four borings discussed should be identified.

12 2. Page 4-19 (second paragraph of second column) states that one wetland area near Bear Creek south tributary 4 (BCST4) will be affected. However Table 4.1.5.2-1 and Figure 4.1.5.2-1 show BCST2.

13 3. On page 5-38 in the first column, 40RE488 is discussed in both the prehistoric and historic resource section, it is not clear whether there are two components to this location or if this is an error.

14 4. On page 5-48 in the second paragraph of the second column the figures for annual dose to members of the public appear to be reversed for inside and outside the controlled area.

15 5. Table 2.1 in Appendix B should be inverted, currently much of the information is upside down.

16 6. Figures 1 and 2, respectively on pages B-27 and B-29, are unreadable.

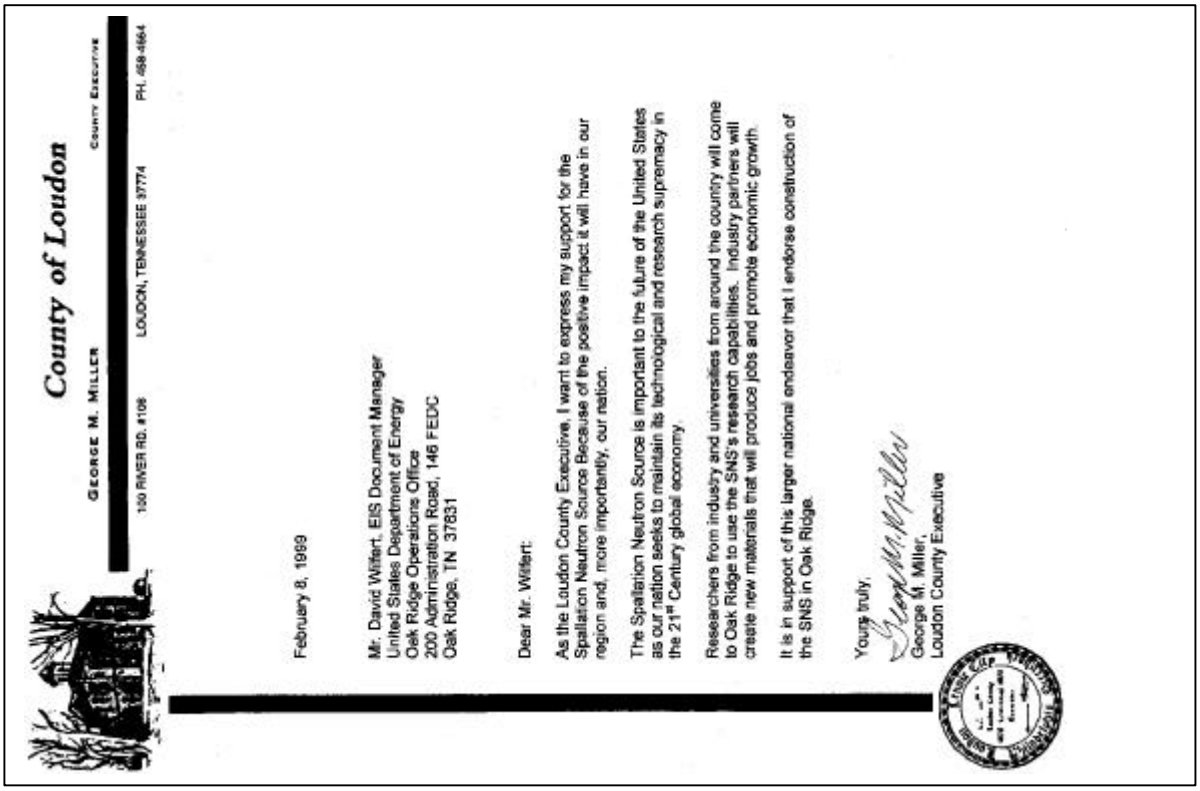
1 The CAP reiterates its strong support for locating the SNS at the Oak Ridge Reservation. We also appreciate the two-day extension of the comment period, enabling consideration of these comments by the full CAP at its regular meeting of February 9, 1999. The CAP believes that with proper mitigation measures, the facility can be sited in the proposed physical site and not cause a detrimental impact on research within the Walker Branch watershed. If you have any questions regarding these comments, please call me at 483-1333.

Sincerely,

Susan L. Gawarecki, Ph.D., P.G.
Executive Director

Enclosure

cc: LOC Citizens' Advisory Panel
LOC Board of Directors
Bill Pardue, Chair, ORREMSSAB
Jeff How, SNS Program Manager, DOE ER-10
Earl Leming, Director, TDEC DOE-O
Steve Richardson, Acting Manager DOE ORO



County of Loudon

GEORGE M. MILLER — COUNTY EXECUTIVE

100 RIVER RD. #108 — LOUDON, TENNESSEE 37774 — PH. 458-4664

February 8, 1999

Mr. David Wilfert, EIS Document Manager
United States Department of Energy
Oak Ridge Operations Office
200 Administration Road, 146 FEDC
Oak Ridge, TN 37831

Dear Mr. Wilfert:

As the Loudon County Executive, I want to express my support for the Spallation Neutron Source Because of the positive impact it will have in our region and, more importantly, our nation.

The Spallation Neutron Source is important to the future of the United States as our nation seeks to maintain its technological and research supremacy in the 21st Century global economy.

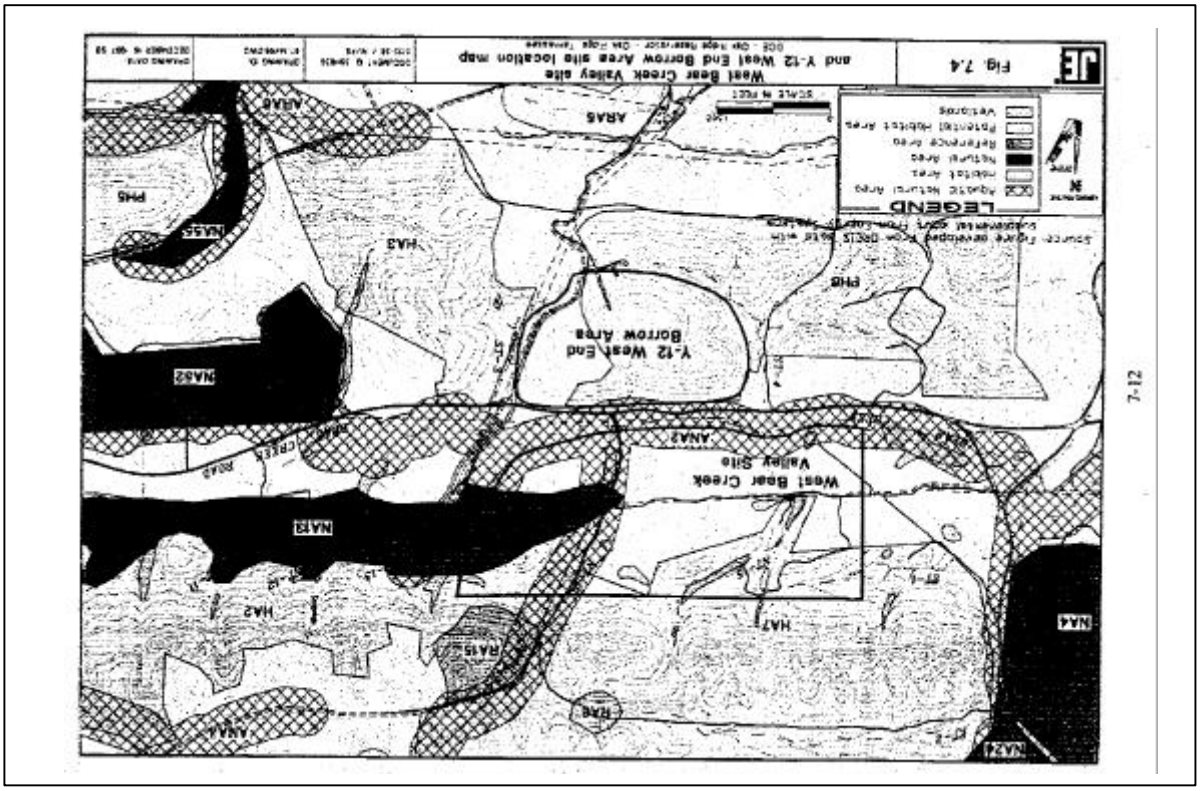
Researchers from industry and universities from around the country will come to Oak Ridge to use the SNS's research capabilities. Industry partners will create new materials that will produce jobs and promote economic growth.

It is in support of this larger national endeavor that I endorse construction of the SNS in Oak Ridge.

Yours truly,

George M. Miller,
Loudon County Executive

1



5

County Executive
Thomas Schumpert

Knox County

February 8, 1999

Mr. David Wilfert, EIS Document Manager
United States Department of Energy
Oak Ridge Operations Office
200 Administration Road, 146 FEDC
Oak Ridge, Tennessee 37831

Dear Mr. Wilfert:

1 As Knox County Executive, I am pleased to take this opportunity to express my support for the Spallation Neutron Source. It will have a positive impact in our region, and more importantly, our nation.

The Spallation Neutron Source is important to the future of the United States as our nation seeks to maintain its technological and research supremacy in the 21st Century global economy.

Researchers from industry and universities from around the country will come to Oak Ridge to use the SNS's research capabilities. Industry partners will create new materials that will produce jobs and promote economic growth.

It is in support of this larger national endeavor that I endorse construction of the SNS in Oak Ridge.

Sincerely,

Tom Schumpert
Knox County Executive

Room 615 • City-County Building • 400 Main Street • Knoxville, TN 37902-2405 • (423) 215-2005 • Fax (423) 215-2002

THE CITY OF KNOXVILLE, TENNESSEE
VICTOR ASHE
MAYOR

February 8, 1999

Mr. David Wilfert
EIS Document Manager
Department of Energy
200 Administration Road, 146 FEDC
Oak Ridge, TN 37831

Dear Mr. Wilfert:

1 As Mayor of Knoxville, I want to express my support for the Spallation Neutron Source because of the positive impact it will have in our region and, more importantly, our nation.

The Spallation Neutron Source is important to the future of the United States as our nation seeks to maintain its technological and research supremacy in the 21st century global economy.

Researchers from industry and universities from around the country will come to Oak Ridge to use the SNS's research capabilities. Industry partners will create new materials that will produce jobs and promote economic growth.

It is in support of this larger national endeavor that I endorse construction of the SNS in Oak Ridge.

Sincerely yours,

Victor Ashe

OFFICE OF THE MAYOR • 400 MAIN STREET • P.O. BOX 1631 • KNOXVILLE, TENNESSEE 37901
PHONE 423-215-2040 • FAX 423-215-2050 • E-MAIL mayor@ci.knoxville.tn.us

Executive Office
376-5578
FAX (423) 376-4518

Accounting Department
376-5553

Office of the County Executive
Roane County Courthouse
Kingston, Tennessee 37763

FAXED
2-8-99 @ 2:55 pm

February 8, 1999

Mr. David Wilfert, EIS Document Manager
United States Department of Energy
Oak Ridge Operations Office
200 Administration Road, 146 FEDC
Oak Ridge TN 37831

Dear Mr. Wilfert:

1 As the Roane County Executive, I want to express my support for the Spallation Neutron Source because of the positive impact it will have in our region and, more importantly, our nation.

The Spallation Neutron Source is important to the future of the United States as our nation seeks to maintain its technological and research supremacy in the 21st Century global economy.

Researchers from industry and universities from around the country will come to Oak Ridge to use the SNS's research capabilities. Industry partners will create new materials that will produce jobs and promote economic growth.

It is in support of this larger national endeavor that I endorse construction of the SNS in Oak Ridge.

Yours truly,

Ken Yager
Roane County Executive

KY:sl

341 Court Street
Maryville, TN 37804-5906
Phone (423) 982-1302
Fax (423) 977-1276

BLOUNT COUNTY GOVERNMENT
William A. Crisp
County Executive

February 8, 1999

Mr. David Eilfert, EIS Document Manager
United States Department of Energy
Oak Ridge Operations Office
200 Administration Road, 146 FEDC
Oak Ridge, TN 37831

Dear Mr. Eilfert:

1 As the Blount County Executive, I want to express my support for the Spallation Neutron Source because of the positive impact it will have in our region and, more importantly, our nation.

The Spallation Neutron Source is important to the future of the United States as our nation seeks to maintain its technological and research supremacy in the 21st Century global economy.

Researchers from industry and universities from around the country will come to Oak Ridge to use the SNS's research capabilities. Industry partners will create new materials that will produce jobs and promote economic growth.

1 It is in support of this larger national endeavor that I endorse construction of the SNS in Oak Ridge.

Sincerely,

Bill

William A. Crisp
Blount County Executive

WAC/rjp

Spallation Neutron Source Program

Comment Form

The U.S. Department of Energy is interested in your comments on the *Construction and Operation of the Spallation Neutron Source Facility: Draft Environmental Impact Statement*.

There are several ways to provide comments on this document, and these include:

- Attending public meetings and giving your comments directly to DOE officials.
- Returning this comment form to the registration desk at the public meetings.
- Returning this comment form or other written comments to the address on the back of this form.
- Faxing your comments to (423) 576-4542.
- Calling toll-free (1-800-927-9964) and leaving your comments via voice mail.
- Commenting via electronic mail to this address: nsnseis@ornl.gov.

Comments:

I fully support the SNS at the Oak Ridge Reservation.

1. I disagree with the decision to select the site without public involvement. The preferred site may actually be the best one, but the location being in the buffer area of Walker Branch does raise some questions. This long term research area will be impacted.

2. Better maps are required in the Final EIS. Figure S 1.3.1-1 showing the proposed SNS site on the ORR is cursory to say the least. A similar overview is fine, but a more detailed map of the site showing Walker Branch, the buffer area, relationship to EM areas in Bear Creek Valley, and any other ORR features (roads, utilities,etc.)is necessary.

3. The sense of the noun mitigation is "to act in such a way as to cause an offense to seem less serious." It is used in monitoring,

(continued)

Thank you for your input. Please use additional sheets if necessary and attach them to this form.

Name NORMAN A. MULVENON (optional)
Organization CAP/LOC
Address 118 CONCORD RD (optional)
City OAK RIDGE State TN Zip 37830-7126
Phone number 423.482.3153 (optional)
E-mail address mulvenon@juno.com (optional)

☒ Please add my name to the SNS EIS mailing list.
☐ Please take my name off the SNS EIS mailing list.

SNS SPALLATION NEUTRON SOURCE

Spallation Neutron Source Program
U.S. Department of Energy • Oak Ridge Operations Office
200 Administration Road, 146 SNS Building • Oak Ridge, TN 37831 • (800) 927-9964 Fax (423) 576-4542

Comment Form — Continuation Sheet

(continued from page 1)

wetlands, and maybe other places. As Ms. Barbara Walton pointed out, there is no commitment to mitigation measures. Please consider this very seriously. We do not want the more colloquial definition to be used: "If the good lord is willing and the creeks dont't rise."

4. I listened very carefully to the explanation of why the retention pond (s) is not shown on the site plan (Figure 3.2.1.5-1), but I suggest you make an educated guess. I think we deserve to know how the footprint will be affected. I would also be surprised if a heated discussion did not take place over increased flow to WOC to White Oak Lake to White Oak Dam along with the attendant subjects of velocity, erosion, sediment transport, etc., and increase in radionuclide releases. In 5.2.2.1.2 it is stated in the last paragraph that "actual flow over White Oak Dam would be lost in the noise of monthly,..." and "Accordingly, the effect of the proposed SNS on radionuclide releases from ORNL is considered minimal." One does not necessarily follow the other and more precise language is in order.

The remainder of the Draft EIS is acceptable, but I will wait for the Final version.

Norman A. Mulvenon

Name NORMAN A. MULVENON
Organization CAP/LOC
Address 118 CONCORD RD
City OAK RIDGE State TN Zip 37830-7126

SNS SPALLATION NEUTRON SOURCE

Spallation Neutron Source Program

Comment Form

The U.S. Department of Energy is interested in your comments on the *Construction and Operation of the Spallation Neutron Source Facility: Draft Environmental Impact Statement.*

There are several ways to provide comments on this document, and these include:

- Attending public meetings and giving your comments directly to DOE officials.
- Returning this comment form to the registration desk at the public meetings.
- Returning this comment form or other written comments to the address on the back of this form.
- Faxing your comments to (423) 576-4542.
- Calling toll-free (1-800-927-9964) and leaving your comments via voice mail.
- Commenting via electronic mail to this address: tonsris@ornl.gov.

Comments:

On page 4-111, vol. II, there is a minor mistake on the map (Fig. 4.7.10.1-1). The 4-lane highway between Santa Fe & Espanola is listed incorrectly. Signage shows an Interstate Icon with 285 inside. Road is US-84 / US-285. Signage should show a simple [illegible] instead of [illegible] the Interstate symbol.

Otherwise, the draft E.I.S. looks good.

Thank you for your input. Please use additional sheets if necessary and attach them to this form.

Name TOM SWITLIK (optional)
Organization Rio Arriba Env. Health Partnership
Address P.O. Box 4949 (optional)
City Fairview State NM Zip 87533
Phone number 505-747-9079 (optional)
E-mail address acequia@gte.net (optional)

☒ Please add my name to the SNS EIS mailing list.
☐ Please take my name off the SNS EIS mailing list.

SNS SPALLATION NEUTRON SOURCE

Spallation Neutron Source Program
U.S. Department of Energy • Oak Ridge Operations Office
200 Administration Road, 146 SNS Building • Oak Ridge, TN 37831 • (800) 927-9964 Fax (423) 576-4542

KNOXVILLE AREA CHAMBER PARTNERSHIP

CHAMBER OF COMMERCE
THE DEVELOPMENT CORPORATION OF KNOX COUNTY
KNOX COUNTY TOURIST COMMISSION
CENTRAL BUSINESS IMPROVEMENT DISTRICT
TENNESSEE SMALL BUSINESS DEVELOPMENT CENTER
U.S. DEPARTMENT OF COMMERCE EXPORT ASSISTANCE CENTER

February 8, 1999

Mr. David Wilfert, EIS Document Manager
United States Department of Energy
Oak Ridge Operations Office
200 Administration Road, 146 FEDC
Oak Ridge, Tennessee 37831

Dear Mr. Wilfert,

As Chairman of the Knoxville Area Chamber Partnership, I want to express my support for the Spallation Neutron Source because of the positive impact it will have in our region and, more importantly, our nation.

The Spallation Neutron Source is important to the future of the United States as our nation seeks to maintain its technological and research supremacy in the 21st Century global economy.

Researchers from industry and universities from around the country will come to Oak Ridge to use the SNS's research capabilities. Industry partners will create new materials that will produce jobs and promote economic growth.

It is in support of this larger national endeavor that I endorse construction of the SNS in Oak Ridge.

Sincerely,

Sharon J. Miller

Sharon J. Miller, Chairman
Knoxville Area Chamber Partnership

601 W. SUMMIT HILL DRIVE, SUITE 300
KNOXVILLE, TN 37902-2011
TELEPHONE: 423 637 4550
FACSIMILE: 423 559 5071
E-MAIL: PARTNERSHIP@KACP.COM
WEBSITE: WWW.KNOXVILLE.ORG

Chamber of Commerce
Blount Partnership

201 S. Washington St., Maryville, TN 37804-5728
423-983-2241 • Fax: 423-984-1386
http://chamber.blount.tn.us
E-Mail Address: chamb.com@chamber.blount.tn.us

February 8, 1999

Mr. David Wilfert, EIS Document Manager
United States Department of Energy
Oak Ridge Operations Office
200 Administration Road, 146 FEDC
Oak Ridge, TN 37831

RE: Spallation Neutron Source

Dear Mr. Wilfert:

As Chairman of the Blount County Chamber of Commerce, I want to express my support for the Spallation Neutron Source because of the positive impact it will have in our region and, more importantly, our nation.

The Spallation Neutron Source is important to the future of the United States as our nation seeks to maintain technological and research supremacy in the 21st Century global economy.

1 Researchers from industry and universities from around the country will come to Oak Ridge to use the SNS's research capabilities. Industry partners will create new materials that will produce jobs and promote economic growth.

It is in support of this larger national endeavor that I endorse construction of the SNS in Oak Ridge.

Sincerely,

George Williams
Chairman, Blount County Chamber of Commerce

GW/bsf

Blount Partnership

Tom Wood
PO Box 3069
Littleton, CO 80161

January 5, 1999

Mr. David Wilfert
USDOE, ORO
200 Administration Road
146/SNS
Oak Ridge, TN 37831

NSNSEIS@ornl.gov

Subject: Comments on the Draft EIS for the Spallation Neutron Source Facility

David:

I appreciate the opportunity to review the SNS EIS draft documents. As a recently relocated Oak Ridger, I enjoy keeping up with the events in town.

Comments:

I am very much in favor of the Oak Ridge site for the SNS. It is clearly the preferred alternative. However, there are some issues that might be considered in specific site selection decisions within the Oak Ridge Reservation.

1 On page S-39, Table S 1.5.2-1 there is a discussion of land use impacts and a statement that "… no brownfield sites … are available." This implies that no suitable sites were considered within the immediate area. I would like to suggest that at least one brownfield site, and perhaps others, are indeed available in the Oak Ridge Reservation and should be considered for the SNS site.

1 As discussed in the section on land use impacts, Section 5.7.1.8, page 5-168, the White Wing Scrap Yard site is being considered as a CERCLA disposal area. This site might also be an ideal "brownfield" site for the SNS.

1 The site is adjacent to ED-1 and a positive land use interaction of this "brownfield" site would be the added development for ED-1 in terms of a future hotel and potential private "spinoff" development at ED-1 that is supported by scientific work at the SNS. This location also makes the SNS more accessible to the private sector. Siting the SNS at this location can help to improve or accelerate the economic redevelopment of the City of Oak Ridge and the surrounding four county region.

1 Other benefits would include easier road way access and a reduction in the cost of remediation for the site, as it can be left as a "brownfield" with more relaxed cleanup or

1 risk assessment criteria. This is clearly a better land use for this location than as a future disposal site.

2 Another area of concern that is not clearly addressed in the EIS is the topic of karst formations associated with the siting of the SNS.

2 The region is noted for its karst formations, which have the potential to dramatically impact the construction of new facilities. The Copper Ridge area has been known to contain sink-holes and caves. Perhaps the White Wing Scrap Yard site is better suited from a karst standpoint and is less likely to have these impacts.

Again, I appreciate the opportunity to comment on this draft EIS. Please feel free to contact me at the above address if any clarification or additional comments are needed.

Sincerely,

Thomas R. Wood

T. R. Wood

---

130 Clemson Drive
Oak Ridge, Tennessee 37830-7664
E-mail: mosesa@aol.com
January 31, 1999

Mr. David Wilfert
SNS EIS Manager
U.S. Department of Energy
Oak Ridge Operations Office
200 Administration Road, 146/SNS
Oak Ridge, TN 37831
E-Mail: NSNSEIS@ornl.gov

Dear Mr. Wilfert:

Comments and Recommendations on the Draft Environmental Impact Statement (EIS) for the Spallation Neutron Source (SNS)

The following comments and recommendations are submitted based on my review of copies of the Draft EIS for the SNS (DOE/EIS-0247 Draft, December 1998) and related sections of the SNS Conceptual Design Report (CDR) (NSNS/CDR-1 and NSNS/CDR-2, May 1997) as they appear in electronic files on the Internet. I note that each comment is rather long while each recommendation is very short and to the point. The length of each comment is unfortunately necessitated by the importance and complexity of the issue involved coupled with the shortcoming of the draft EIS in failing either to address the issue at all or to address the issue in a direct and understandable fashion.

1 Before documenting my comments, I want to make it clear that I fully support the mission of the SNS and its siting in Oak Ridge. My comments are made not to disparage or negate the importance of the SNS to the future of neutron-based research in the U.S. or at Oak Ridge but to assure that all-important issues potentially affecting public welfare are adequately and sufficiently addressed. The issues raised in the comments and recommendations that are provided below are just as valid for public consideration and for DOE or other official resolution no matter where the SNS is sited. I strongly recommend that Oak Ridge be the selected site for SNS.

1. Radioactive Waste Classification and Management:

2 Comment: SNS EIS Sects. 6.1.3, 6.1.4, 6.1.10, and 6.1.11 and SNS CDR Sects. 8.8 and 9.1 fail to define the legal bases for how the SNS radioactive wastes are to be classified and regulated for disposal. Both sets of cited sections fail to indicate under which statutes or laws and under which regulatory authorities the SNS radioactive wastes are to be regulated, and both sets use terminology (specifically, "mixed waste") without further clarifying why the statutory definition of the term does not apply to SNS-generated radioactive wastes. Lack of clarity and specificity is unacceptable because the disposal of radioactive wastes from the SNS involves complex and conflicting statutory and regulatory matters that have not been resolved by the government

previously (see U.S. Nuclear Regulatory Commission, NRC, documents NUREG-1310 and SECY-92-325). If DOE at this juncture does not properly address this situation, there is confusion as to who is the legally empowered regulator for such wastes and what are the proper regulatory requirements. The fact is that the replaceable metallic components in the SNS target will under proton-neutron irradiation become as highly radioactive as any power reactor component irradiated in the core where such reactor-irradiated material would be classified as Greater-than-Class-C Low-Level Radioactive Waste (GTCC LLRW) under NRC regulations at 10 CFR Part 61 and would require ultimate permanent disposal in a geologic repository unless the NRC approves an alternative disposal. In the DOE system, however, appropriate regulatory requirements for disposal of these wastes have never been defined. The authors of both the EIS and the CDR do the public a disservice by failing to present this problem in a clear and straightforward manner. Although SNS EIS Sect. 6.1.2 alludes to one key aspect of the problem in the context of radioactive materials affecting water quality in site effluents, the issue is never detailed in the context of radioactive waste management and classification.

2 The reason that an issue exists is because SNS-generated radioactive materials do no meet the statutory definitions of source material, special nuclear material (SNM), or by-product material as defined in the *Atomic Energy Act of 1954* (AEA), as amended, and codified at 42 *U.S.C.* 2014. Thus, in a strict legal sense, SNS-generated radioactive wastes appear to fall solely under the *Resource Conservation and Recovery Act* (RCRA) as meeting the definition for "solid waste" codified at 42 *U.S.C.* 6903(27), are tehreby excluded both from the definition of "mixed waste" codified at 42 *U.S.C.* 6903(41) and from the DOE mixed waste reporting requirements at 42 *U.S.C.* 6939c, and should be regulated only as "hazardous waste" under the definition at 42 *U.S.C.* 6903(5) by the Environmental Protection Agency (EPA) and by the states under the *Federal Facilities Compliance Act* (FFCA). Therefore, SNS-generated highly radio-toxic or high-hazard radioactive wastes are subject to listing as hazardous waste under 42 *U.S.C.* 6921 and subject to all the standards and permitting requirements at 42 *U.S.C.* 6922, 6924, and 6925. Since EPA and the states (except perhaps for Illinois) have not promulgated land disposal restrictions previously for this type waste, it is expected that new EPA and/or state rulemaking, additional Federal EISs, and public meetings are required to bring closure by defining proper statute-based regulatory controls for the handling and disposal of SNS radioactive wastes. The draft EIS addresses none of this. There is no mention in the draft EIS that the SNS radioactive wastes fall into a category of wastes that NRC indicates in NUREG-1310 that Congress refers to as "orphan wastes," that DOE has itself called "unregulated wastes" (*Federal Register, 60*, pp. 13424-13425, March 13, 1995), and for which EPA has failed to take regulatory ownership in spite of the law.

DOE has previously acknowledged EPA authority over accelerator-generated (non-by-product) radioactive materials. This previous DOE acknowledgment of EPA authority has been (1) implicit both in 10 CFR Part 962 and in Definitions 3.a and 27 of DOE 5820.2A that respectively delineate the demarcation of authority between the AEA and RCRA and (2) explicit in Chapter IV of DOE 5820.2A that specifies that accelerator-generated radioactive materials are to be regulated under RCRA and/or as "residual radioactive material" under 40 CFR Part 192, where the latter EPA regulation is not really applicable. It is noted that the recent draft DOE O435.1 attempts to redefine DOE authority under the AEA-based oversight of radioactive wastes to include accelerator-generated radioactive wastes, but I have noted to DOE in separate

2 correspondence that this proposed revision to DOE 5820.2A requirements is not advisable because (1) there is an absence of clear statutory authority and (2) DOE needs to issue regulations not directives to manage radioactive wastes in an acceptable and enforceable manner. Thus, notwithstanding the broad regulatory authority granted both DOE and NRC at 42 *U.S.C.* 2201(i)(3) and (p) and with due consideration to the DOE General Counsel's interpretation of this authority with regard to the regulation of radiological hazards (Sect. B.1, *Federal Register, 61*, pp. 4209-4910, February 5, 1996), the AEA and RCRA appear to be very clear when considered in combination that the types of waste to be generated in SNS are not subject to DOE regulatory authority. It is also noted that DOE has used the terms "unregulated waste" and "special case waste" (*Federal Register, 60*, pp. 13424-13425, March 13, 1995) to refer to certain types of non-AEA radioactive wastes, that is, "unregulated" wastes that pose the same hazards as GTCC LLRW are to be treated as "special cases" under Sect. III.3.i(4) of DOE 5820.2A. However, DOE is understood to be dropping the "special case waste" terminology. This change in terminology is presumably due to the criticism stemming from the multiple findings of DOE activities involving the production or storage of special case waste with no clear path forward to disposal. These findings are documented in the DOE report, "Complex-Wide Review of DOE's Low-Level Waste Management ES&H Vulnerabilities," May 1996, submitted in response to Defense Nuclear Facilities Safety Board Recommendation 94-2. Finally, in the context of possibly considering DOE regulatory oversight of radioactive wastes, it is noted that DOE's issuance of regulations to implement the *Price-Anderson Amendments Act of 1988* is way behind schedule, is in abeyance, and has never proposed nor attempted to implement consistent rulemaking for radioactive waste classification and management analogous with and equivalent to that of the NRC regulations at 10 CFR Parts 60 and 61 for AEA-regulated materials. Thus DOE appears to have neither the statutory authority nor the regulatory track record to provide the regulatory structure needed to control the classification, treatment and disposal of SNS hazardous radioactive wastes.

It is noted that the statutory issue could be resolved if Congress would amend the definition of by-product material as it appears in 42 *U.S.C.* 2014(e)(1) from reading "any radioactive material (except special nuclear material) yielded in or made radioactive by exposure to the radiation incident to the process of producing or utilizing special nuclear material" to read instead "any radioactive material (except special nuclear material) yielded in or made radioactive by exposure to the radiation incident to the process of producing or utilizing *atomic energy or* special nuclear material." This wording change would adapt the intent of the words used in 42 *U.S.C.* 2013(c) regarding the purpose of the AEA and make by-product material consistent with the definitions both of "atomic energy" in 42 *U.S.C.* 2014(e) as being "all forms of energy released in the course of nuclear fission or nuclear transformation" and of "utilization facility" in 42 *U.S.C.* 2014(cc)(1) as being "any equipment or device, except an atomic weapon, determined by rule of the Commission to be...peculiarly adapted for making use of atomic energy in such quantity as to be of significance to the common defense and security, or in such manner as to affect the health and safety of the public." The recommended amendment would permit radioactive materials produced by particle accelerators and nuclear fusion devices to be classified as by-product material and thus subject to regulation by DOE and NRC but would exclude naturally-occurring radioactive materials except those covered under 42 *U.S.C.* 2014(e)(2). This change would permit NRC to license the use of such materials under 42 *U.S.C.* 2111 and thereby obviate the NRC's reluctance to assert licensing and regulatory authority, including waste classification,

over this type of radioactive waste by meeting the "consistent with existing law" provisions at 42 *U.S.C.* 2021b(9)(B) and 10101(12)(B) and (16)(B). Therefore, if this amendment were enacted, the regulation of the radio-toxicity of SNS-generated radioactive wastes and the safe disposal of these wastes would fall under the statutory provisions of the AEA, the *Nuclear Waste Policy Act* and the *Low-Level Radioactive Waste Policy Act* as opposed to RCRA only as is the case without the amendment. However, the proposed amendment would place the production and use of all radioactive medical therapy and diagnostic isotopes that are produced in small accelerators in hospitals under NRC regulations, but this control would in most cases simply be delegated back to the states, which already regulate such isotopes by default, by the NRC under 42 U.S.C. 2021(b)(1). The states would thus have enhanced authority under Federal law since litigation of contested violations could be referred to Federal courts if needed.

Finally, SNS EIS Sect. 6.1.11 states: "The Toxic Substances Control Act (TSCA) regulates the manufacture, use, treatment, storage, and disposal of certain toxic substances not regulated by RCRA or other statutes." While this statement is true with respect to the AEA as provided at 15 *U.S.C.* 2602(2)(B)(iv), this statement implies incorrectly that the treatment, storage, and disposal of certain hazardous materials are not subject to RCRA. Please note that the treatment, storage, and disposal of all hazardous materials except AEA-defined materials are covered under RCRA; that TSCA provides the statutory basis for implementing by regulation additional treatment, storage, and disposal requirements as may be appropriate for certain toxic substances generated for commercial purposes and regulated under TSCA; but that, as provided at 15 *U.S.C.* 2608(b) and 42 *U.S.C.* 6905(b), TSCA and RCRA are fully coordinated as the statutory bases for regulating the treatment, storage, and disposal of hazardous materials including toxic substances regulated under TSCA. Obviously, if this were not the case, TSCA regulations at 40 CFR Subchapter R would contain treatment, storage, and disposal requirements that are instead given in 40 CFR Subchapter I. It is also noted in this regard that the NRC has taken the position in SECY-92-325 that accelerator-generated radioactive materials that are produced for commercial purposes without using source material, special nuclear material, or by-product material are not subject to the AEA but are subject to regulation by the states and by the EPA under TSCA. This basis for the NRC's position applies to any radionuclides produced for commercial purposes in the SNS. This will not change unless Congress changes the AEA such as by redefining by-product material as noted above or makes some other set of changes to TSCA.

Recommendations:

1-1 The above-cited sections in the SNS EIS and CDR should be revised to indicate that all SNS radioactive wastes are subject to regulation by EPA and the state of siting under RCRA and FFCA. The inapplicability of the AEA to the regulation of SNS radioactive wastes should be clarified and explained. The use of the term "mixed wastes" should be deleted. The planned path forward should be outlined as to how DOE intends to obtain EPA and state rulemaking to define appropriate land disposal restrictions for SNS radioactive wastes.

1-2 The SNS EIS should clarify that any radionuclides produced for commercial purposes in SNS without using source material, special nuclear material, or by-product material will be regulated by the state of siting or by the EPA under

TSCA and that disposal of such commercial products when no longer used will be in accordance with TSCA/RCRA regulations or appropriate state regulations. The SNS EIS should commit that DOE will obtain TSCA permits for the production of any radionuclides in SNS for commercial purposes consistent with the NRC's position given in SECY-92-325.

1-3 SNS EIS Sect. 6.1.11 should be revised to correct the implication that TSCA and RCRA are not coordinated laws.

1-4 As an alternative to Recommendations 1-1 and 1-2 above, the SNS EIS could indicate the steps planned (1) to obtain an amendment to the AEA by Congress that will redefine by-product material to include SNS-generated radioactive materials and (2) for DOE and NRC to work together with the NRC agreement states to implement appropriate regulations under the amended AEA and related legislation.

2. Environmental and Public Health Hazards from Accidents:

Comment: In reviewing the draft EIS and the CDR, I have attempted to understand the bounding or worst case accidents so as to understand the degree of need for active prevention and mitigation features and the reliance if any that can be placed on inherent and passive features to prevent accidents and to mitigate the consequences of accidents. Although Sect. 3.1.2 of Appendix A to the draft EIS acknowledges the importance of the beam trip, I find that the "structured" process for defining the accident source terms, as given in Appendix A to the draft EIS, obscures key assumptions about the human factors in the assumed operability of safety systems and the high dependence of success paths both upon a safety culture that is yet to be created and upon institutional controls that have yet to be defined or specified. This situation is also obscured in CDR Chapters 7 and 8 so that safety-system top-level requirements are never well defined.

I do readily acknowledge that the total radioactive source term in SNS is very, very small in comparison to a large research or power reactor and that, during normal operation, the thermal margins in terms of temperature appear quite substantial to conditions that would fail the target vessel and the vessel confinement. However, unlike an NRC-licensed nuclear research reactor that would be designed and regulated under 10 CFR Part 50 Appendix A to meet NRC General Design Criterion (GDC) 11, "Reactor inherent protection," the SNS accelerator and target apparently lack any inherent protective or mitigative feedback mechanism to control the rate at which thermal energy is deposited in the target mercury by the proton beam. The singular importance of this fact is significant but has not been emphasized in the limited safety analysis presented in the EIS.

Thus, in SNS, the control of target heating during normal operation or upset conditions relies totally upon either the human operator or automatic detection and actuation systems that are designed, fabricated, constructed, configured, maintained, and tested by humans. The structures around the target provide the only inherent features that can passively prevent or mitigate a release of radioactive materials in the event of a worst case accident in which the target is

vaporized. However, the functional integrity of the confinement structures to prevent or mitigate a release of radioactive materials will be maintained and not bypassed only if conditions in the confinement, including the effects of an untripped beam, do not present a serious challenge to the confinement structure and particularly to the less massive barriers that would be in place if active mitigation features fail to operate during an upset to secure experimental access to the target as needed during operations to extract the neutron beams.

The fragility of relying solely on human operators and automatic prevention and mitigation systems, which can be bypassed by human operators, in a nuclear system that lacks inherent protective or mitigative feedbacks was illustrated most dramatically and notoriously in the accident at Chernobyl Unit 4. While the possible consequences and therefore the risk of a worst case accident in SNS is in no way comparable to what happened at Chernobyl, it must be remembered that the SNS mercury target is not merely a jar of radioactive liquid sitting in a hot cell where the standard practice is not to load hot cells containing radioactive materials with large quantities of highly flammable or explosive materials nor to place the jar in the path of an explosive or incendiary projectile. Instead the SNS target might better be characterized as an actively-cooled jar of radioactive liquid sitting in a hot cell with access ports more similar to those of a glove box and where the jar is heated by a device that is technically similar to the directed energy weapons regulated in international trade by the U.S. Department of State on the United States Munitions List at 22 CFR 121.1, Article XIII(h). An extended failure to trip the beam in an accident that is initiated by target under-cooling can lead to the vaporization of the target and adjacent target structures and potentially lead to energetic interactions with confinement structures and barriers contributing to loss of confinement integrity. The presence of cooling water systems nearby the target could lead to steam explosion or confinement over-pressurization. 3

The SNS accelerator beam may also be potentially classifiable as the energizing or effecting mechanism in a large "utilization facility" that effects "nuclear transformations" and satisfies the portion of the definition for utilization facility in the AEA at 42 *U.S.C.* 2014(cc)(1) as being "any equipment or device, except an atomic weapon, determined by rule of the Commission to be...peculiarly adapted for making use of atomic energy...in such manner as to affect the health and safety of the public." Although NRC has elected to classify even the smallest nuclear reactor as a utilization facility subject to a "minimum" set of health and safety regulations at 10 CFR Part 50, no such equivalent determination has ever been made by the NRC with respect to the utilization of atomic energy through the nuclear transformations that are induced by the accelerator beam in the target of an accelerator facility. Perhaps this is because the radioactive materials produced in an accelerator target are not AEA-regulated materials or perhaps because to date most commercial particle accelerators have been very small and with very low-power beams compared to what is envisioned for SNS. The historical safety and health physics performance of small accelerators is summarized only in the DOE report SLAC-327, *Health Physics Manual of Good Practices for Accelerator Facilities*, April 1988. In Sect. 2.6, "Beam Containment," pp. 28-30 of this report, examples are given of how failures to control the beam in small accelerators can lead to melting or vaporization of that portion of the target or other structures exposed to the uncontrolled beam. The substantial radiation hazard posed by the irradiated non-fissionable, heavy-metal targets in the larger DOE accelerators is also a matter of record (See Occurrence Report Number ALO-LA-LANL-RADCHEM-1996-0010, "Unposted

High Radiation Area on the Rooftop above TA-49-1 Hot Cells," 10/11/1996).

As implied in Sect. 3.1.2 of Appendix A to the EIS, the bounding accident for the SNS would be the failure of target cooling with simultaneous failure to trip the beam for an extended period of time. However, Sect. 3.17 Table 3.7 and Exhibit F Table F.1 of Appendix A to the draft SNS EIS indicate that one of the two bounding "beyond design basis accidents" analyzed in the draft EIS is the failure of target cooling with the failure of two out of three beam trip mechanisms such that there is a slightly delayed beam trip but the delay causes beam window failure leading to a mercury spill. The so-called bounding accident addressed in the draft EIS assumes that both the Target Protection System (TPS) and the Beam Permit (BP) fail but that the Personnel Protection System (PPS) operates quickly either automatically or in response to an operator action. This accident is indicated in the EIS to be beyond design basis because the estimated combined frequencies of component failures produces an event sequence frequency that is greater than 10^{-6} /year but less than 10^{-5} /year. The assumption of a simultaneous failure of the PPS is indicated in a footnote in Table 3.7 of Appendix A to have a frequency of occurrence that is less than 10^{-6} /year. 3

However, the accident failure frequencies used in the draft EIS are, according to Sect. 1.2 (P. A-14) of Appendix A, "based on experience and on engineering judgement considerations." In other words at this stage of the conceptualization of an as yet unbuilt and non-prototyped facility, the failure frequencies are based on unreviewed and non-validated guesses. It is highly likely that these guesses were developed by nuclear engineers with the tacit assumption that the typical regulated institutional controls of NRC-licensed nuclear systems will apply to SNS (that is, a continuously updated safety analysis report, technical specifications, a quality assurance program, configuration management and the associated procedural controls that are regulated by NRC against commitments made in the safety analysis report).

Although I am a proponent of the usefulness of risk-based regulation for nuclear systems when used as a guide to better understand the margins and conservatism in deterministic accident analyses and to address risk cliffs that may lurk beyond the design basis, it is noted that SNS lacks a key defense-in-depth component available in nuclear reactors by not meeting NRC GDC 11 and that there is no guarantee that SNS will be subject to equivalent institutional controls since, historically within DOE, accelerator facilities have received a much reduced level of regulation and external oversight compared to reactors. In general, copies of the safety assessment documents for DOE accelerators are not available to persons outside the facility and are not maintained available for outside review either by the public or by DOE safety oversight organizations.

Thus, I find fault with the underlying assumptions of the risk assessment in the EIS at this early stage of SNS design and with the failure to address a deterministic worst case scenario for assessing defense-in-depth. One cannot rely on hand-waving risk analyses for non-existent systems for which there is no data base for making integral estimates of system reliability that account for as-built configurations and the impacts of institutional controls. In this case, you must be deterministic and bounding in any accident or health-risk analysis.

Consistent with the NRC's requirements for deterministic safety analyses of anticipated

transients without scram (ATWS) for reactors, which have inherent feedbacks to mitigate such accidents, and consistent with NRC's treatment of operator actions wherein it is typically assumed that the operator takes no action or the wrong action for the first 10 minutes of a transient, it would appear to be more prudent and bounding if the SNS EIS addressed loss of target cooling with failure to trip the beam for a period of time up to 10 minutes. Since water-cooled systems are nearby, the potential for steam explosion or over-pressurization of the confinement should also be assessed under the worst case assumptions. More simply, it may be best to assume that all radioactive materials in the target environs are vaporized and released to the atmosphere similar to the conservative and bounding assumptions in NRC report NUREG-0396 that was used to establish the bases for 10 CFR Part 50, Appendix E, "Emergency Planning and Preparedness for Production and Utilization Facilities." It should be sufficient to determine for the most adverse weather conditions the boundaries of the zone around the SNS site where such an accident would lead to doses that exceed the EPA minimum guidelines for sheltering and evacuation (that is, 1 Rem whole body and 5 Rem thyroid). Beyond that boundary, which would hopefully be shown not to pass beyond the one-mile exclusion zone for the site, the SNS can be considered to be passively safe no matter what mistakes the operators might make. This is analogous to the approach proposed for the Modular High-Temperature Gas-Cooled Reactor that was being designed to incorporate numerous diverse and redundant, inherent and passive safety features that have no equivalent in the SNS.

3 Since my home in Oak Ridge is located on a hill about 10 miles Northeast of the proposed site for SNS, as a professional nuclear engineer, I am most interested in knowing the results of such a bounding accident analysis in which no optimistic assumptions are made about the performance of systems and operators. I prefer knowing that no matter what mistakes are made by the operators on site I have no need to be concerned off-site; I assume that my fellow residents of Oak Ridge and surrounding areas feel the same way. Of course, my requirements stem from treating SNS as a nuclear facility. Since the radio-toxic substances in the SNS target are not AEA-regulated materials, other bounding accident scenarios may be posed more analogous to the types of accident and emergency response situations that can occur in industries regulated by EPA and the states. However, whether one draws upon historical worst-case precedents at Chernobyl or Bhopal, the fragility of relying on the human operator and the importance of institutional controls must be addressed in setting the bounding case for public risk. My assumption is that it can be shown that no substantive risk exists; I expect that the final EIS will provide the substantive documentation to validate this assumption and not confuse the issue with hand-waving discussions about reliabilities for untried and nonexistent systems, operators, and procedural controls. While this approach will establish the hazard or bounding consequences for public health off-site, a similar approach is recommended for establishing the hazard or bounding consequences for both occupational safety and health and environmental insult on-site. It appears that the SNS approach used to date to evaluate hazards under DOE 5480.23 and DOE-STD-1027-92 always gets shortcut by the assumption that the target is never vaporized so the assumed release fractions for non-volatile radioactive materials are always much less than 1.0. Thus the strict requirements of Sect. 8.c of DOE 5480.23 and Sects. 3.1.2 and 4.1.1 of DOE-STD-1027-92 seem to be violated by the fatal logic flaw of assuming that which you want to prove.. Such logic may unfortunately be taken as further proof by some persons that DOE is inherently incapable of honest self-regulation. I hope that this is not the case.

Recommendations:

1-1 The SNS draft EIS and CDR should be revised to indicate that equipment relied upon to perform safety functions will be classified as safety-related and that DOE is committed to assuring that all safety-related equipment is subject to both technical safety requirements and configuration management controls as required for the DOE research reactors. This includes the TPS, BP and PPS.

3 2-2 The accident scenario for the beyond-design-basis event to be provided in the final EIS should address the consequences of the untripped beam (up to 10 minutes) as it affects the target and confinement. Consistent with NRC's treatment of ATWS, the failure to trip the beam should be applied to all events in which cooling is lost to the target both loss of coolant and loss of flow. The treatment of the accident upon which emergency planning is to be based should be as conservative as the NRC assumption underlying 10 CFR Part 50, Appendix E (namely, total loss of target integrity and total loss of confinement integrity).

3. Recommendations based on Other Considerations:

Comment: Sect. 1.2 (p. 1-7) of the draft SNS EIS indicates that the construction of SNS is a "global concern" from the standpoint of filling a "neutron gap" in research capabilities. The SNS is proposed to be a U.S. research facility, but it is inferred that SNS will be open to international research collaborations. The significance of SNS in the context of international collaborations and the sharing of its technology advances and advantages is not addressed in the draft EIS.

4 In particular, an issue that is not addressed in the SNS draft EIS is that which is addressed briefly in Sect. 1.6, "Nonproliferation," of DOE/EIS-0270D, December 1997, which is the draft EIS for locating the Accelerator Production of Tritium (APT) at the Savannah River Site. Sect. 1.6 of DOE/EIS-0270D asserts that "accelerator technology has been in use for more than 75 years," that "the possibility of producing special nuclear material (i.e., plutonium) using an accelerator was recognized several decades ago," and that the "APT is the first known accelerator proposed for a mission to produce weapons materials in a sustained production operating mode." The latter statement is simply not true since the formerly-classified Materials Test Accelerator pursued by the Atomic Energy Commission in the late 1940s and early 1950s was a project dedicated to developing an accelerator-driven system to produce weapons plutonium as an alternative to constructing large production reactors. Sect. 1.6 of DOE/EIS-0270D also indicates that using "an accelerator to produce special nuclear materials in quantities which could be a proliferation concern requires a particle beam power of approximately 1 megawatt or greater" and that "research accelerators with beam powers in the 1 megawatt range have been viable for at least 20 years." As noted in the SNS draft EIS, SNS is to use a 1 MW beam initially and upgraded to 4 MW later.

Article III of the *Treaty on the Non-Proliferation of Nuclear Weapons* stipulates that "Each State Party to the Treaty undertakes not to provide:...(b) equipment...especially designed or prepared for the...production of special fissionable material, to any non-nuclear-weapon State for peaceful

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purposes, unless the source or special fissionable material shall be subject to the safeguards required by this Article." However, there are currently no U.S. safeguards requirements or export controls placed on particle accelerators that DOE/EIS-0270D acknowledges are a potential proliferation risk at the beam power levels of the SNS. It is noted that the U.S. is a member of an international body called the Nuclear Suppliers Group (NSG) composed of signatories of the Nonproliferation Treaty. The guidance formulated by the NSG on issues of export controls includes the "Trigger List," which triggers safeguards, and the "Dual Use List." Based on an earlier international agreement on safeguards, the Trigger Lists starts with export controls for reactor equipment for a facility that can produce as little as 100 grams of plutonium annually. This international standard has implications for accelerators operating with beam powers much, much less than 1 megawatt. These agreements, guidelines and lists are published in the International Atomic Energy Agency (IAEA) Information Circulars. A logical question that arises is that, in the absence of clear controls to prevent the diversion of accelerator technologies for purposes of nuclear weapons proliferation, how can one be sure that any international collaboration on SNS will not lead to the uncontrolled transfer of technology that can be used to promote the illegal production of special nuclear materials for nuclear explosive purposes. What pro-active measures does DOE intend to take to prevent or mitigate the risk of nuclear proliferation arising from the construction and operation of SNS? Sect. 1.6 of DOE/EIS-0270D indicates only that DOE is considering changes to its regulations at 10 CFR Part 810 that implement its authority under 42 *U.S.C.* 2077(b) although it is now one year since these words were published for public consumption and no such rulemaking has been proposed to the public. However, how does DOE intend to coordinate its actions on SNS effectively with the NRC and the Department of Commerce that have the primary responsibility for nuclear-related export controls under 42 *U.S.C.* 2139 and 2139a? How does DOE intend to coordinate its activities on SNS effectively with the Department of Commerce under its authority provided in Sect. 3(d) of Presidential Executive Order 12938 of November 14, 1994, "Proliferation of Weapons of Mass Destruction," "to regulate the activities of United States persons in order to prevent their participation in activities that could contribute to the proliferation of weapons of mass destruction?"

Also, 22 CFR 121.1(a) stipulates that "The following articles, services and related technical data are designated as defense articles and defense services pursuant to sections 38 and 47(7) of the Arms Export Control Act (22 U.S.C. 2778 and 2794(7))." Further, 22 CFR 121.1, Article XIII(h) lists "Devices embodying particle beam and electromagnetic pulse technology and associated components and subassemblies (e.g., ion beam current injectors, particle accelerators for neutral or charged particles, beam handling and projection equipment, beam steering, fire control, and pointing equipment, test and diagnostic instruments, and targets) which are specifically designed or modified for directed energy weapon applications." While the SNS accelerator is not "specifically designed or modified for directed energy weapon applications," how can one be sure that any international collaboration on SNS will not be used to promote the illegal transfer of "services and related technical data" that could be diverted for purposes of developing directed energy weapon applications? What pro-active measures does DOE intend to take to prevent or mitigate the risk of the proliferation of enabling technology for directed energy weapon applications arising from the construction and operation of SNS? How does DOE intend to coordinate its activities on SNS effectively with the Department of State to preclude inadvertently violating the intent of the *Arms Control Export Act* by allowing the export of

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enabling technology?

Notably, high-energy particles such as those used in the beam of SNS release secondary energetic particles and radiations from collisions with target atoms through the process of nuclear spallation, which is a form of "nuclear transformation." Energy released from the process of nuclear transformation is defined at 42 *U.S.C.* 2014(c) to be "atomic energy." Per 42 *U.S.C.* 2014(d): "The term 'atomic weapon' means any device utilizing atomic energy, exclusive of the means for transporting or propelling the device (where such means is a separable and divisible part of the device), the principal purpose of which is for use as, or for development of, a weapon, a weapon prototype, or a weapon test device." Thus, any directed energy weapon utilizing a particle beam energetic enough to induce nuclear transformation by effecting spallations in the target materials may apparently be inferred legally to be an atomic weapon if not a "weapon of mass destruction." None of the existing regulations specifically address this notable aspect of SNS-related technologies. Does DOE intend to address this aspect of SNS and its implications on how SNS technologies are to be regulated in international collaboration?

Recommendations:

3-1 DOE needs to revise the SNS EIS (1) to assess the risks posed by SNS to the proliferation of the capability to produce special nuclear material without safeguards and thereby to produce weapons of mass destruction and (2) to specify the active measures to be taken by DOE in coordination with the NRC, the Department of Commerce, and the NSG to prevent or mitigate such risks. In particular, DOE might indicate when the previously-indicated rulemaking for 10 CFR Part 810 can be expected.

3-2 DOE needs to revise the SNS EIS to assess the risks posed by SNS to the proliferation of directed energy weapons and to specify the active measures to be taken by DOE in coordination with the Department of State to prevent or mitigate such risks arising from international collaborations that might lead to the export of SNS technologies. DOE also needs to explain why directed energy weapons using beam energies comparable to SNS and incorporating technologies very similar to that used in SNS do not need to be regulated as atomic weapons.

Sincerely and respectfully submitted,

/submitted electronically via e-mail at mosesa@aol.com/
David L. Moses, Ph.D., P.E.
Nuclear Engineer

cc: Earl Leming, TDEC-DOE Oversight
Stanley Lichtman, DOE/EH-42
Michael H. Mobley, TDEC-Radiation Health
Mary Ann Sullivan, DOE General Counsel

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February 5, 1999

To: David Wilfert, USDOE OROO,
200 Administration Rd, 146/SNS
Oak Ridge, TN 37831

From: Barbara Walton
85 Claymore Ln.
Oak Ridge, TN 37830

Subject: SNS Draft EIS (DOE/EIS-0247, December 1998)

1 I support the selection of the Preferred Alternative; locate the SNS in Oak Ridge to be operated by the ORNL. I recognize the importance of the research the SNS enables.

2 The draft EIS does a good job of documenting the concerns and issues raised at the scoping meeting -- except for one -- the lack of public involvement in selecting the actual, physical site. The draft EIS and associated public meetings are the first such opportunity since then. An informal, interactive work session earlier in the process would have been desirable. Unfortunately it may now be too late in the process to affect the outcome for actual adjustment of the site.

3 The document does NOT give all the environmental impacts. The site plan shown on page 3-12 and elsewhere does not show the retention basin. This basin is discussed on pages 5-20,21,30 and elsewhere but its size and location are never given. The impact of a retention basin on the top of a ridge can be very large; it could increase the footprint of the SNS. Page 5-37, last paragraph

4 mentions construction or improvement of utility corridors and a southwest access road not assessed at the time of the draft EIS; these should be included in the final EIS and not just for cultural resources.

5 The EIS does not do a good job of showing the intrusion of the SNS into environmentally sensitive areas in a way the public can easily see. In contrast, for example, the CERCLA Waste Disposal RI/FS (DOE/OR/02-1637&D2 in figures 7.2, 7.3 and 7.4) show in detail, the sensitive areas and the proximity to the candidate sites. I have used these in studying the SNS site. The inclusion of a figure similar to Figure 7.4 in section 4.1.5 or 5.2.5.4, along with the figure found

6 on page B43 of this document, is recommended. In addition, an outline of the SNS footprint should be shown on Figures 4.1.5.4-1 and 4.1.5.4-2. Figures 4.1.8.3-1 and 4.1.8.3-2, found on

7 pages 4-54 and 4-55 are not readable; an expanded view of the affected area would be an improvement.

8 The Draft EIS also does a good job of stating the impact of the SNS on the research being done in the Walker Branch Watershed. The work being done here is very important to the Nations Global Change Program. It is extremely important to mitigate such impacts. For example, in addition to the potential replacement of natural gas boilers with electric heat pumps mentioned on page 5-41, the use of an electric shuttle bus to transport people to the site during the operations period would reduce both runoff by eliminating the need for parking lots as well reducing carbon dioxide emissions from conventional vehicles.

9 There needs to be a COMMITMENT to mitigation measures BEFORE construction begins!

10 A better decommissioning plan is needed. Page 5-43 (2nd paragraph) states: "Current plans call for in-situ decommissioning of the SNS when its operational life cycle is completed." This is unacceptable. Is a 30 year operational life (page 5-19) realistic?

Other comments and errors found in the document:

11 1. Page 4-19 (3rd paragraph) states that one wetland area in the area of BCV south tributary 4 will be affected. However Table 4.1.5.2-1 and Figure 4.1.5.2-1 show BCST2.

12 2. On page 5-48 in the 2nd paragraph of the 2nd column the annual dose to members of the public, inside and outside the controlled area appear to be reversed.

13 3. On page 5-38 in the 1st column, 40RE488 is discussed in both prehistoric and historic resource section, there appears to be an error.

14 4. On page 4-5 the figure is mislabeled, it should be 4.1.1.1-3 (as referenced on page 4-7). In addition, the four borings discussed should be identified.

15 5. Figures 1 and 2 in Appendix B are unreadable.

Barbara A. Walton

Spallation Neutron Source Program

Comment Form

The U.S. Department of Energy is interested in your comments on the *Construction and Operation of the Spallation Neutron Source Facility: Draft Environmental Impact Statement.*

There are several ways to provide comments on this document, and these include:

1. Attending public meetings and giving your comments directly to DOE officials.
2. Returning this comment form to the registration desk at the public meetings.
3. Returning this comment form or other written comments to the address on the back of this form.
4. Faxing your comments to (423) 576-4542.
5. Calling toll-free (1-800-927-9964) and leaving your comments via voice mail.
6. Commenting via electronic mail to this address: nsnseis@ornl.gov.

Comments:

A couple of corrections:

page 5-45 (Table S1.5.2-1) 9b. BNL Alternative

I believe 3.4mrem is 34% of limit (not 3.4%).

page 1-3 1st ¶ – it states that cold n° are slower than thermal n°; yet, the energies listed state otherwise. Units correct?

Thank you for your input. Please use additional sheets if necessary and attach them to this form.

Name Vickie G. Davis (optional)
Organization None
Address 155 Schotzer Drive (optional)
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Phone number (423) 337-2742 (optional)
E-mail address (optional)

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SNS SPALLATION NEUTRON SOURCE

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