
COVER SHEET

RESPONSIBLE AGENCY: U.S. Department of Energy (DOE)

TITLE: Final Environmental Impact Statement: Accelerator Production of Tritium at the Savannah River Site (DOE/EIS-0270)

LOCATION: Aiken and Barnwell Counties, South Carolina

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ABSTRACT: The action proposed in this environmental impact statement (EIS) is to construct and operate a linear accelerator that would produce tritium, which is a gaseous radioactive isotope of hydrogen essential to the operation of the weapons in the nation's nuclear arsenal. This EIS is tiered (linked) to the *Final Programmatic Environmental Impact Statement for Tritium Supply and Recycling* (DOE/EIS-0161; October 1995), from which DOE determined that it would produce tritium either in an accelerator as described in this EIS or in a commercial light-water reactor as described in *Production of Tritium in a Commercial Light Water Reactor* (CLWR) (DOE/EIS-0288). This EIS evaluates the alternatives for the siting, construction, and operation of an accelerator on the Savannah River Site and the impacts of those alternatives on the Site's physical and manmade environment, its human and biological environment, and the regional economic and social environment.

PUBLIC COMMENTS: In preparing the Draft EIS, DOE considered comments received by letter and voice mail, and comments given at public meetings in Savannah, Georgia and Aiken, South Carolina on December 3 and 5, 1996, respectively. [NOTE: These were joint meetings held by DOE to discuss the scopes of two related EISs: this one for the accelerator production of tritium and the EIS *Construction and Operation of a Tritium Extraction Facility at the Savannah River Site* (DOE/EIS-0271D). A summary of public comments was made available on April 28, 1997, and may be obtained by contacting Andrew R. Grainger as shown above.

A 45-day comment period on the Draft APT EIS began with publication of a Notice of Availability in the *Federal Register* on December 19, 1997. A public meeting to discuss and receive comments on the Draft EIS was held on January 13, 1998, at the North Augusta Community Center, 101 Brookside Drive, North Augusta, South Carolina. The Draft EIS public comment period ended February 2, 1998. Comments were submitted by voice, e-mail, and regular mail at the address provided above. All comments received were carefully considered in the preparation of this Final EIS.

Preface

The Tritium Supply and Recycling Final Programmatic Environmental Impact Statement (PEIS) (DOE/EIS-0161), which was completed in October 1995, assessed the potential environmental impacts of technology and siting alternatives for the production of tritium for national security purposes. On December 5, 1995, DOE issued a Record of Decision (ROD) for the Tritium Supply and Recycling PEIS that selected the two most promising alternative technologies for tritium production and established a dual-track strategy that would, within 3 years, select one of those technologies to become the primary tritium supply technology. The other technology, if feasible, would be developed as a backup tritium source. Under the dual-track strategy, DOE would: (1) initiate the purchase of an existing commercial reactor (operating or partially complete) or irradiation services with an option to purchase the reactor for conversion to a defense facility; and (2) design, build, and test critical components of an accelerator system for tritium production. Under the PEIS ROD, any new facilities that might be required, i.e., an accelerator and/or a Tritium Extraction Facility to support the commercial reactor alternative, would be constructed at DOE's Savannah River Site (SRS) in South Carolina.

The PEIS described a two-phase strategy for compliance with the National Environmental Policy Act (NEPA). The first phase included completion of the PEIS and subsequent ROD. The second phase included the preparation of site-specific NEPA documents tiered from the PEIS. These EISs address the environmental impacts of specific project proposals. As a result of the PEIS and the ROD, DOE determined to prepare three site specific EISs: the Accelerator Production of Tritium at the Savannah River Site (APT) (DOE/EIS-0270), the Production of Tritium in a Commercial Light Water Reactor (CLWR) (DOE/EIS-0288), and the Tritium Extraction Facility at Savannah River Site (TEF) (DOE/EIS-0271). Each of these EISs presents an analysis of alternatives which do not affect the alternatives in the other EISs with one exception. This exception is one alternative in the TEF EIS which would require the use of space in the APT. For this alternative to be viable, the APT would have to be selected as the primary source of tritium.

On December 22, 1998, Secretary of Energy Bill Richardson announced that commercial light water reactors (CLWR) will be the primary tritium supply technology. The Secretary designated the Watts Bar Unit 1 reactor near Spring City, Tennessee, and Sequoyah Unit 1 and 2 reactors near Soddy-Daisy, Tennessee as the preferred commercial light water reactors for tritium production. These reactors are operated by the Tennessee Valley Authority (TVA), an independent government agency. The Secretary designated the APT as the "backup" technology for tritium supply. As a backup, DOE will continue with developmental activities and preliminary design, but will not construct the accelerator. Finally, selection of the CLWR reaffirms the December 1995 Tritium Supply and Recycling PEIS ROD to construct and operate a new tritium extraction capability at the SRS.

DOE has completed the final EISs for the APT, CLWR, and TEF. No sooner than 30 days after publication in the Federal Register of the Environmental Protection Agency's Notice of Availability of the final EISs for CLWR, APT, and TEF, DOE intends to issue a consolidated Record of Decision to: (1) formalize the programmatic announcement made on December 22, 1998; and (2) announce project-specific decisions for the three EISs. These decisions will include, for the selected CLWR technology, the selection of specific CLWRs to be used for tritium supply, and the location of a new tritium extraction capability at the SRS. For the backup APT technology, technical and siting decisions consistent with its backup role will be made.

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ACRONYMS AND ABBREVIATIONS

AGNS	Allied-General Nuclear Services
APT	Accelerator Production of Tritium
BA	Biological Assessment
CEQ	Council on Environmental Quality
CFR	Code of Federal Regulations
CLWR	Commercial Light-Water Reactor
DNFSB	Defense Nuclear Facilities Safety Board
DOE	U.S. Department of Energy
EIS	Environmental Impact Statement
EPA	U.S. Environmental Protection Agency
FEIS	Final Environmental Impact Statement
FR	Federal Register
GTCC	Greater-Than-Class-C
LCF	Latent Cancer Fatalities
MEI	Maximally Exposed Individual
NAAQS	National Ambient Air Quality Standards
NEPA	National Environmental Policy Act
NOI	Notice of Intent
NPDES	National Pollutant Discharge Elimination System
NRC	U.S. Nuclear Regulatory Commission
NSG	Nuclear Suppliers Group
OSHA	Occupational Safety and Health Administration
PEIS	Programmatic Environmental Impact Statement
RCRA	Resource Conservation and Recovery Act
RF	Radio Frequency
ROD	Record of Decision
SCDHEC	South Carolina Department of Health and Environmental Control
SCE&G	South Carolina Electric and Gas Company
SNM	Special Nuclear Material
SRS	Savannah River Site
TEF	Tritium Extraction Facility
TPBARS	Tritium Producing Burnable Absorber Rods
TWA	Time-Weighted Average

METRIC CONVERSION CHART

To convert into metric			To convert out of metric		
If you know	Multiply by	To get	If you know	Multiply by	To get
Length					
inches	2.54	Centimeters	centimeters	0.3937	inches
feet	30.48	Centimeters	centimeters	0.0328	feet
feet	0.3048	meters	meters	3.281	feet
yards	0.9144	meters	meters	1.0936	yards
miles	1.60934	Kilometers	kilometers	0.6214	miles
Area					
sq. inches	6.4516	sq. centimeters	sq. centimeters	0.155	sq. inches
sq. feet	0.092903	sq. meters	sq. meters	10.7639	sq. feet
sq. yards	0.8361	sq. meters	sq. meters	1.196	sq. yards
acres	0.0040469	sq. kilometers	sq. kilometers	247.1	acres
sq. miles	2.58999	sq. kilometers	sq. kilometers	0.3861	sq. miles
Volume					
fluid ounces	29.574	Milliliters	milliliters	0.0338	fluid ounces
gallons	3.7854	liters	liters	0.26417	gallons
cubic feet	0.028317	cubic meters	cubic meters	35.315	cubic feet
cubic yards	0.76455	cubic meters	cubic meters	1.308	cubic yards
Weight					
ounces	28.3495	grams	grams	0.03527	ounces
pounds	0.4536	Kilograms	kilograms	2.2046	pounds
short tons	0.90718	Metric tons	metric tons	1.1023	short tons
Temperature					
Fahrenheit	Subtract 32 then multiply by 5/9ths	Celsius	Celsius	Multiply by 9/5ths, then add 32	Fahrenheit

Metric Prefixes

Prefix	Symbol	Multiplication Factor
exa-	E	1 000 000 000 000 000 000 = 10 ¹⁸
peta-	P	1 000 000 000 000 000 = 10 ¹⁵
tera-	T	1 000 000 000 000 = 10 ¹²
giga-	G	1 000 000 000 = 10 ⁹
mega-	M	1 000 000 = 10 ⁶
kilo-	k	1 000 = 10 ³
centi-	c	0.01 = 10 ⁻²
milli-	m	0.001 = 10 ⁻³
micro-	μ	0.000 001 = 10 ⁻⁶
nano-	n	0.000 000 001 = 10 ⁻⁹
pico-	p	0.000 000 000 001 = 10 ⁻¹²
femto-	f	0.000 000 000 000 001 = 10 ⁻¹⁵
atto-	a	0.000 000 000 000 000 001 = 10 ⁻¹⁸