
Introduction To DOE-Owned Spent Nuclear Fuel

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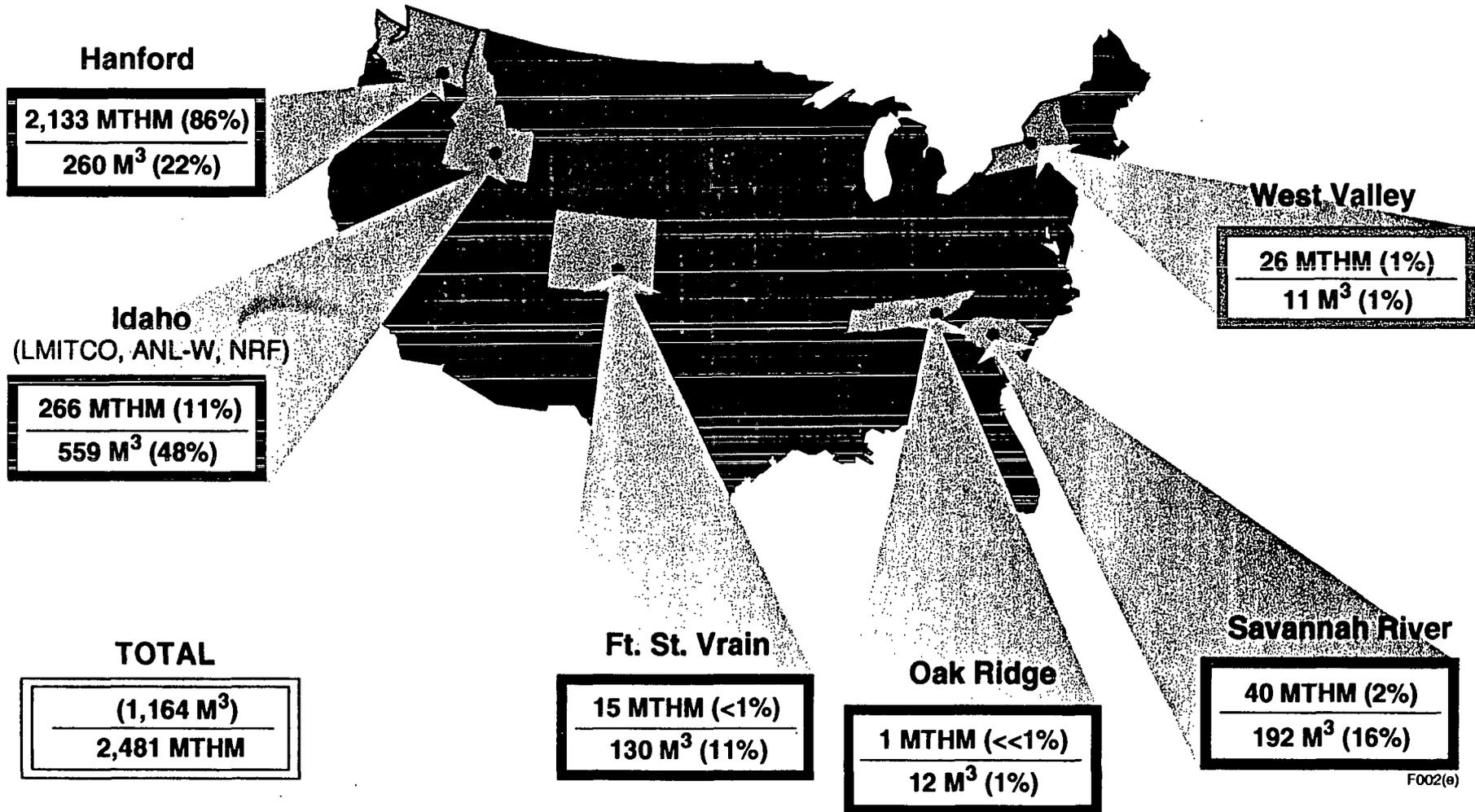
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DOE-Owned Spent Nuclear Fuel

- Current Inventory and Location
- Additions to Inventory
- Characteristics
- Management Strategy
- Cooperative Efforts between EM and RW

Current Inventory of Spent Fuel in the DOE Complex



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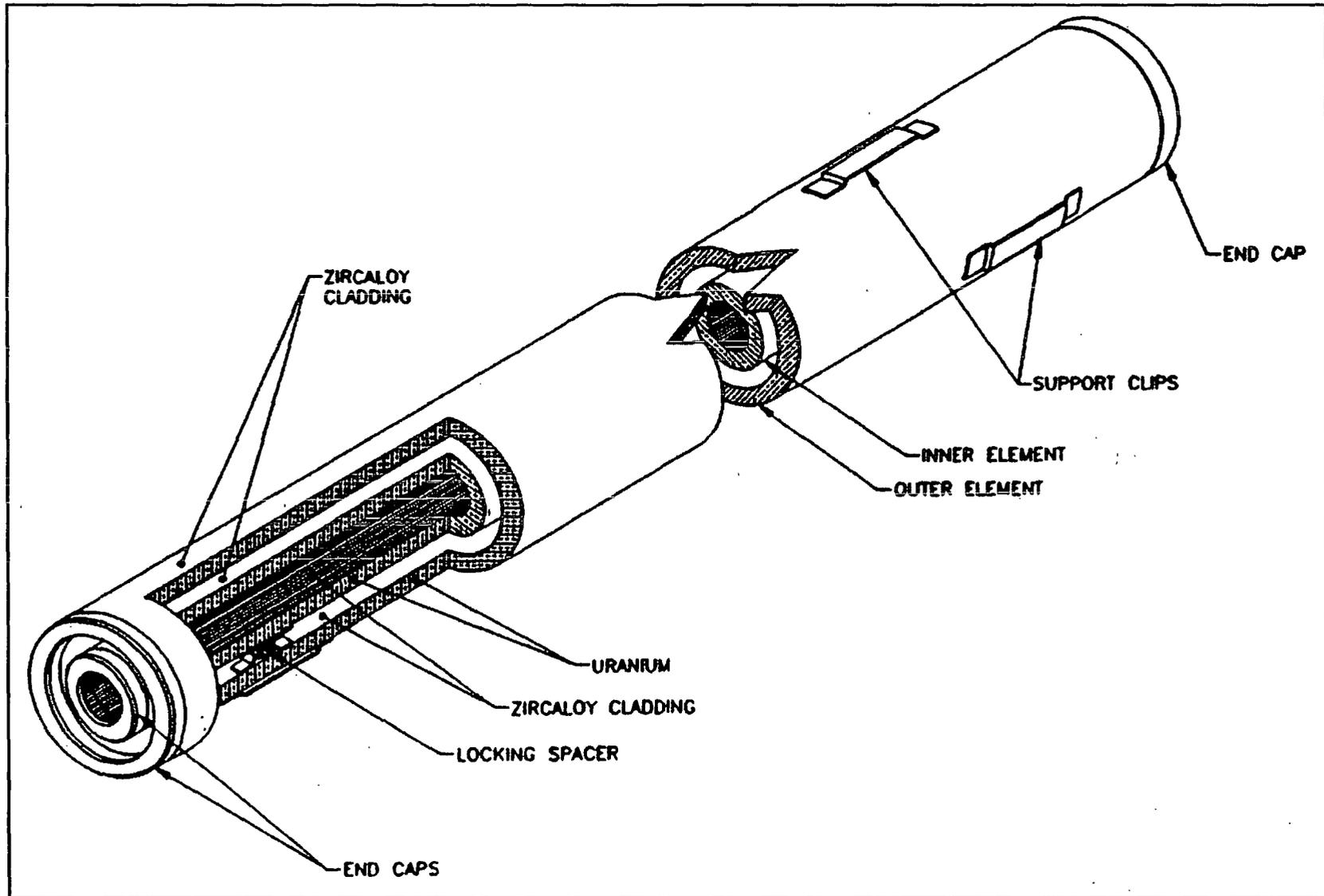
Additions to DOE Inventory Through 2035

	HEU (>20%)			LEU (<20%)		
	Mass (MTHM)	Volume (m ³)	# of Assemblies	Mass (MTHM)	Volume (m ³)	# of Assemblies
SOURCE						
Foreign Research Reactors (from up to 41 countries)	3	74	17,200	13	53	11,500
Government Research and Test Reactors (e.g., HFIR, HFBR, ATR)	4	71	6,300	0	0	0
University Research Reactors	1	12	900	1	12	1,200
Other (e.g. Navy)	49	647	4,300	0	0	0
Total	57	804	28,700	14	65	12,700
RECEIVING SITE						
Savannah River	7	210	23,300	13	62	8,400
Idaho National Engineering and Environmental Laboratory	49	594	5,400	1	3	4,300

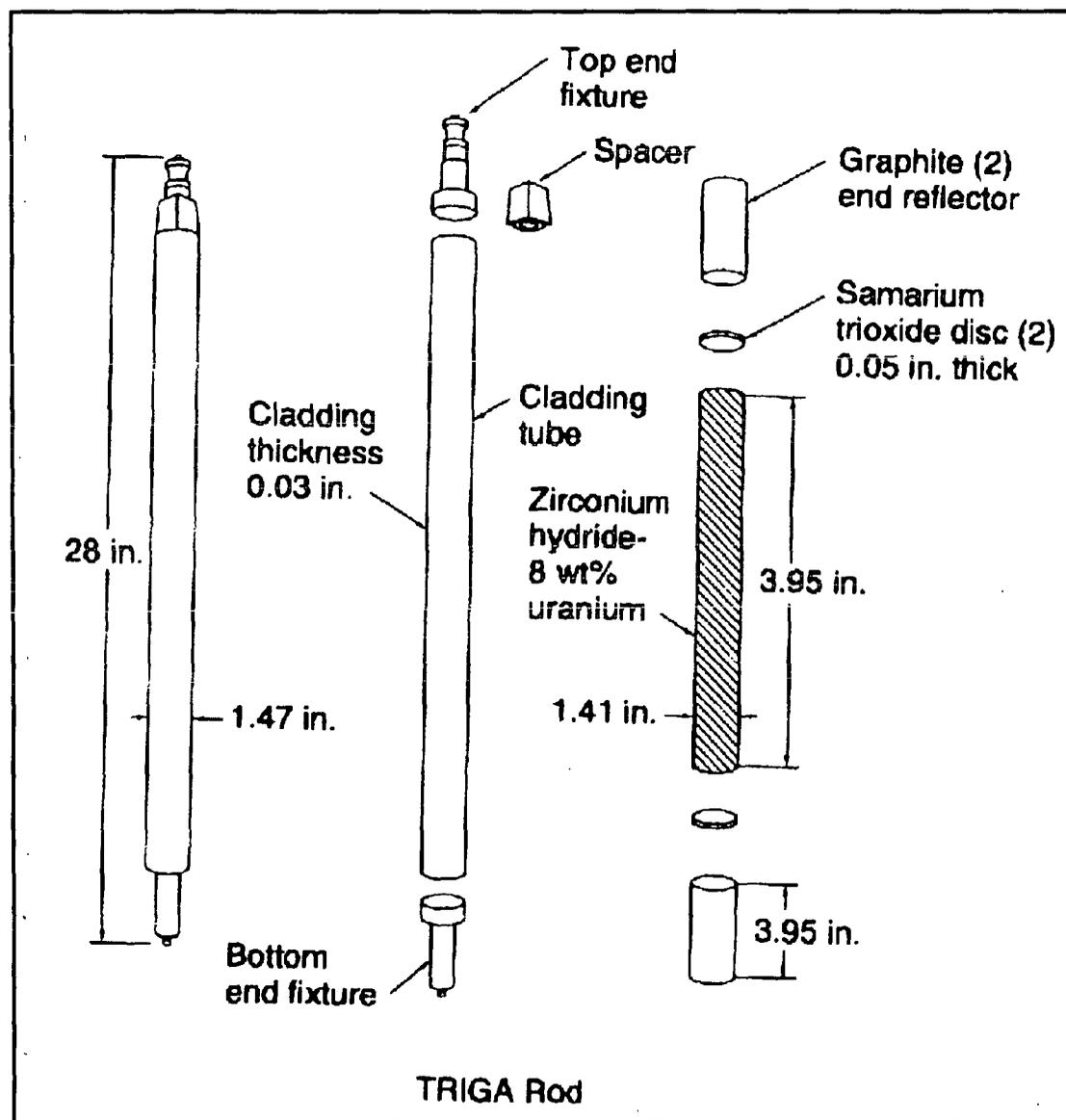
Characteristics of DOE-Owned Spent Nuclear Fuel

CHARACTERISTIC	REPRESENTATIVE FUEL TYPE
Geometry	
Concentric Cylinders	• N-Reactor
Cylindrical Rods	• TRIGA
Curved Plates (Trapezoidal Assembly)	• Advanced Test Reactor
Curved Plates (Cylindrical Assembly)	• High Flux Isotope Reactor
Hexagonal	• Fort St. Vrain
Flat Parallel Plates	• Materials Test Reactor
Fuel Meat Material	
Uranium Metal	• N-Reactor
Aluminum Alloy	• Materials Test Reactor
Uranium Oxide	• Three Mile Island
Clad Material	
Aluminum	• Materials Test Reactor
Zircaloy	• N-Reactor
Stainless Steel	• Experimental Breeder Reactor
Enrichment	
LEU (<20%)	• N-Reactor, Three Mile Island
HEU (>20%)	• Materials Test Reactor
Condition	
Pristine	• High Flux Isotope Reactor
Good	• Materials Test Reactor
Degraded	• N-Reactor
Disrupted	• Three Mile Island
Special Case	
Sodium-bonded	• Experimental Breeder Reactor
Classified	• Navy

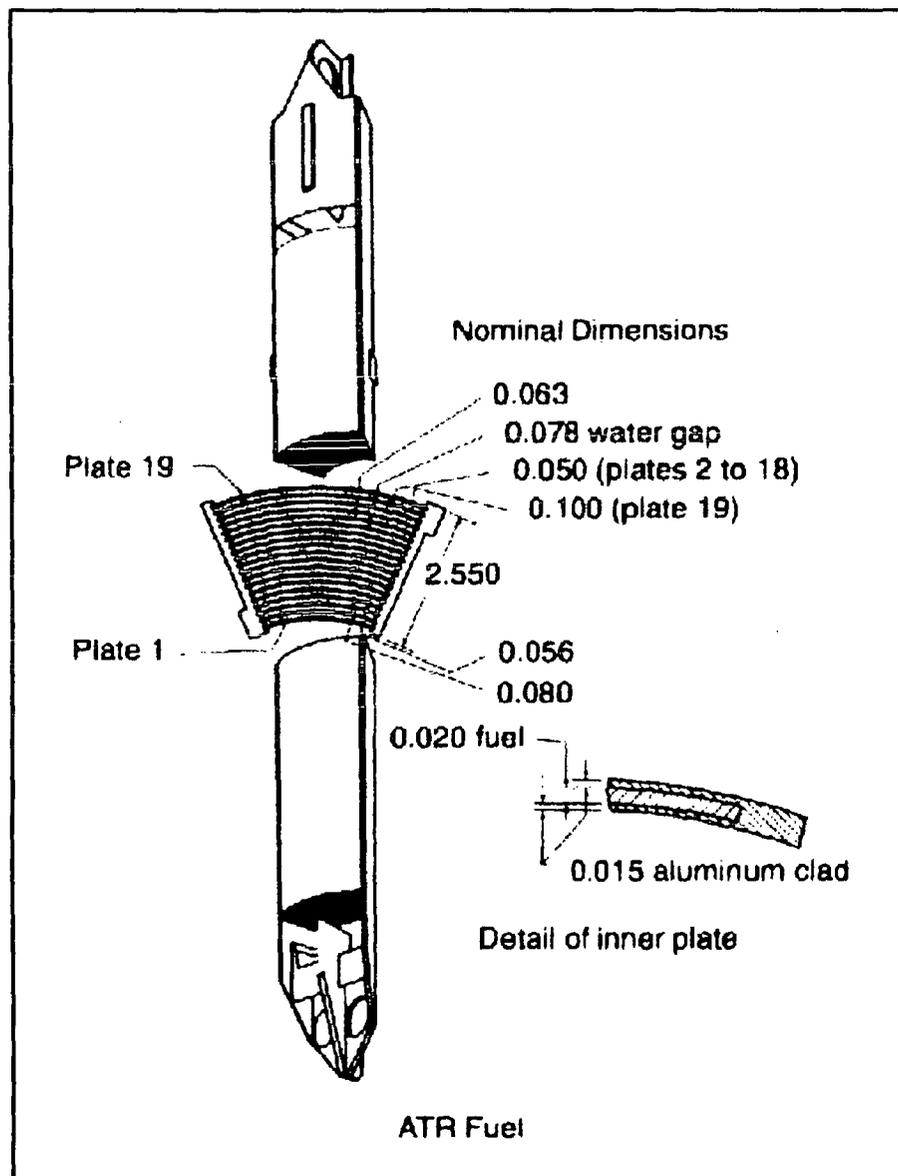
N-Reactor Fuel Assembly



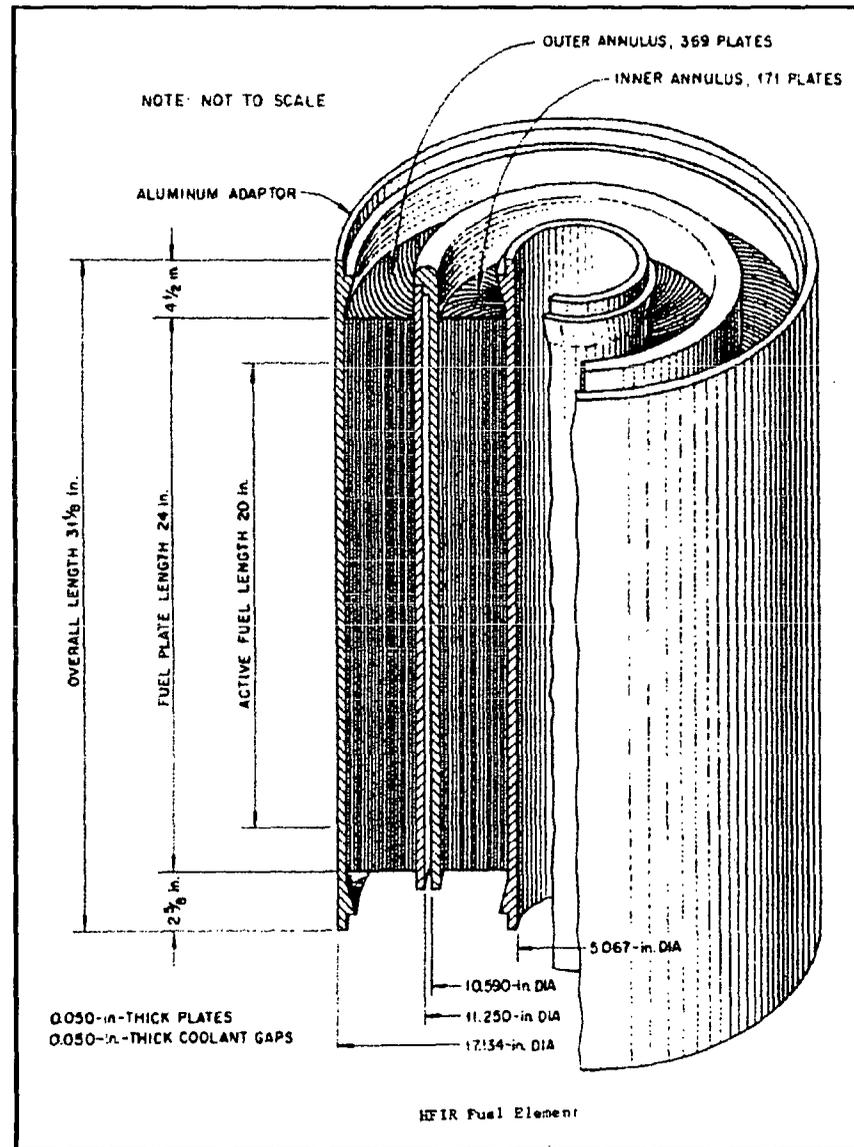
TRIGA Fuel



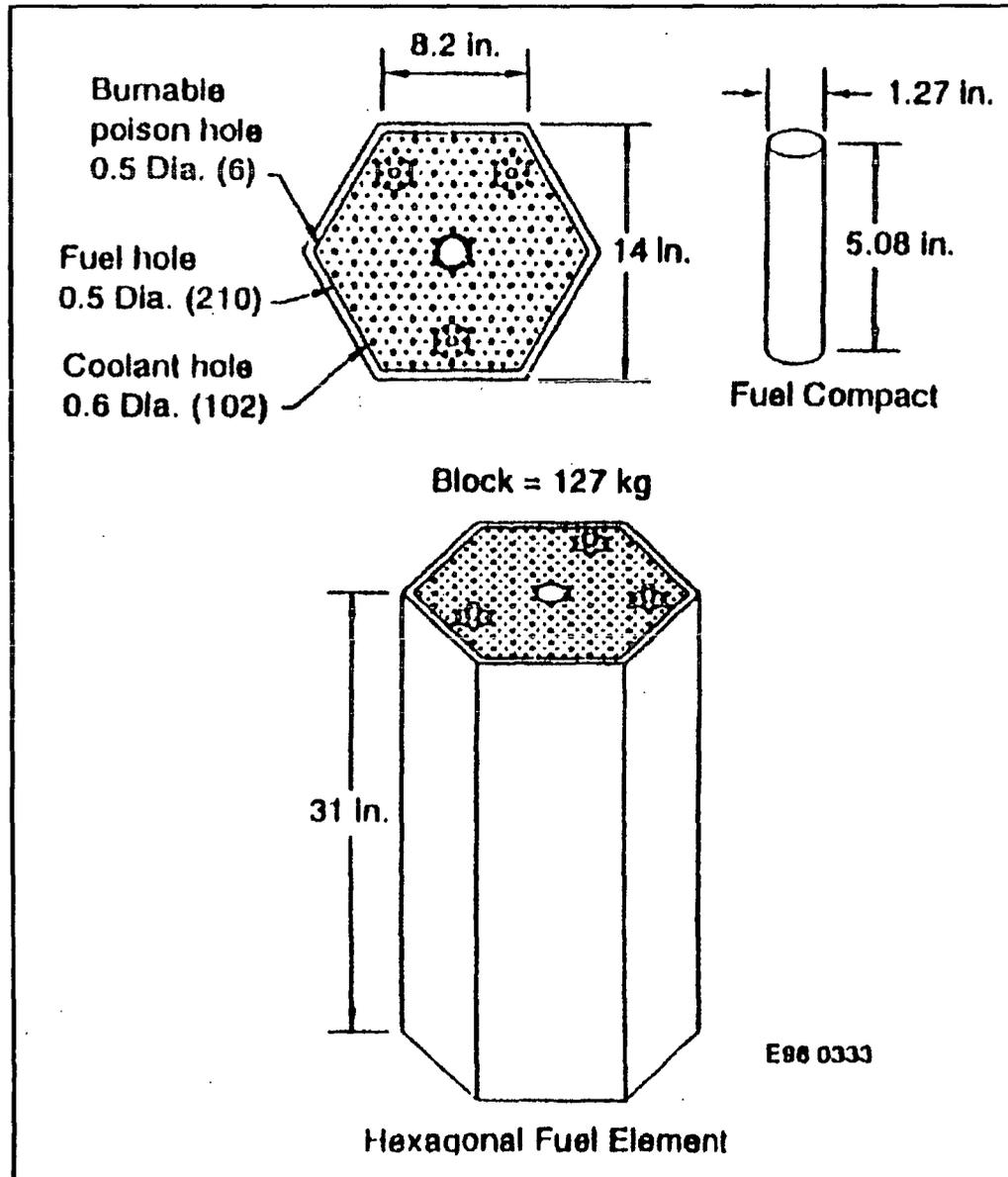
Advanced Test Reactor (ATR) Fuel



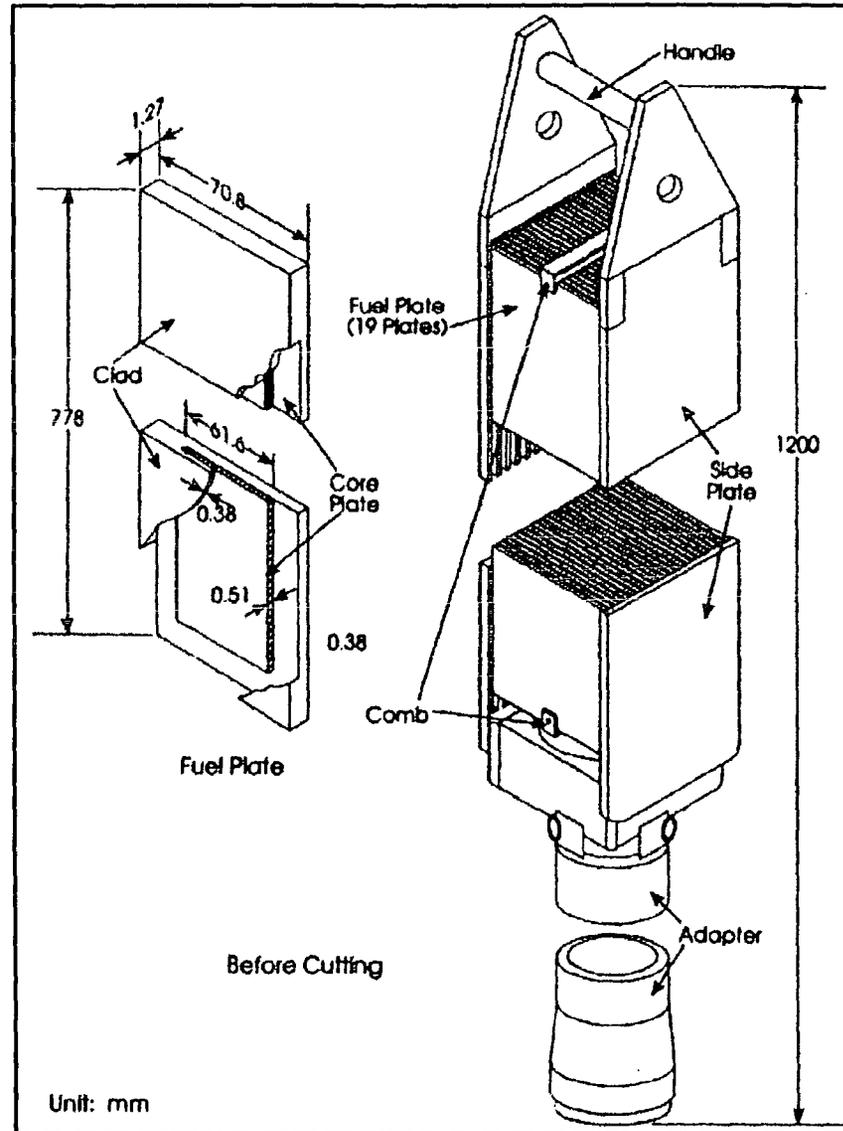
High Flux Isotope Reactor (HFIR)



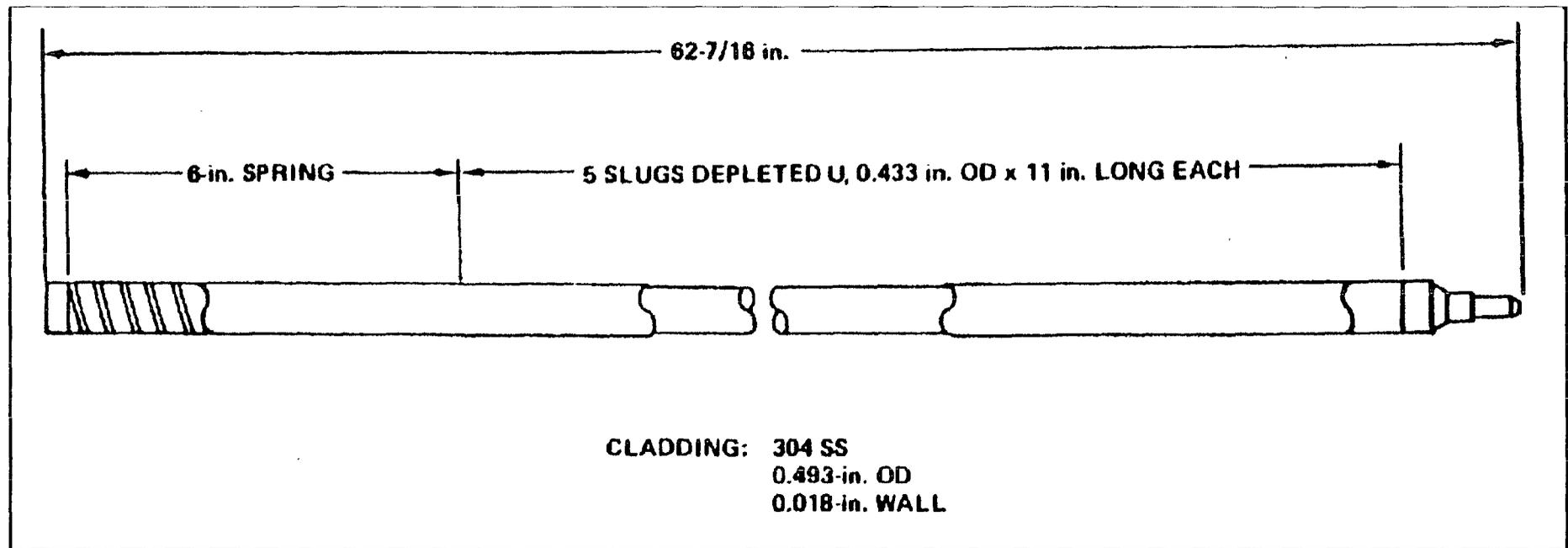
Fort St. Vrain Reactor (FSVR) Fuel



Materials Test Reactor (MTR) Fuel



Experimental Breeder Reactor (EBR-II) Blanket Fuel





Management Strategy

- Resolve vulnerabilities
- Process at-risk fuel
- Transfer fuel to new dry storage facilities
- Prepare fuel for geologic disposal

Cooperative Efforts Between EM and RW

- Memorandum of Agreement (Standard Contract) for acceptance of DOE fuel by RW prepared
- Criticality analyses of several DOE fuel types completed by RW contractor, more in progress
- DOE fuel to be included in both the 1998 Viability Assessment and 1998 Total System Life Cycle Cost evaluation
- Requirements Documents for Waste Acceptance System and Mined Geologic Disposal System under review
- Interface Control Document in preparation
- Semiannual EM/RW strategy meetings