

**U. S. DEPARTMENT OF ENERGY
FIELD OFFICE SAVANNAH RIVER**

**OVERVIEW OF WASTE MANAGEMENT OPERATIONS
AT THE SAVANNAH RIVER SITE**

to the

**NUCLEAR WASTE TECHNICAL REVIEW BOARD
ENGINEERED BARRIER SYSTEMS PANEL**

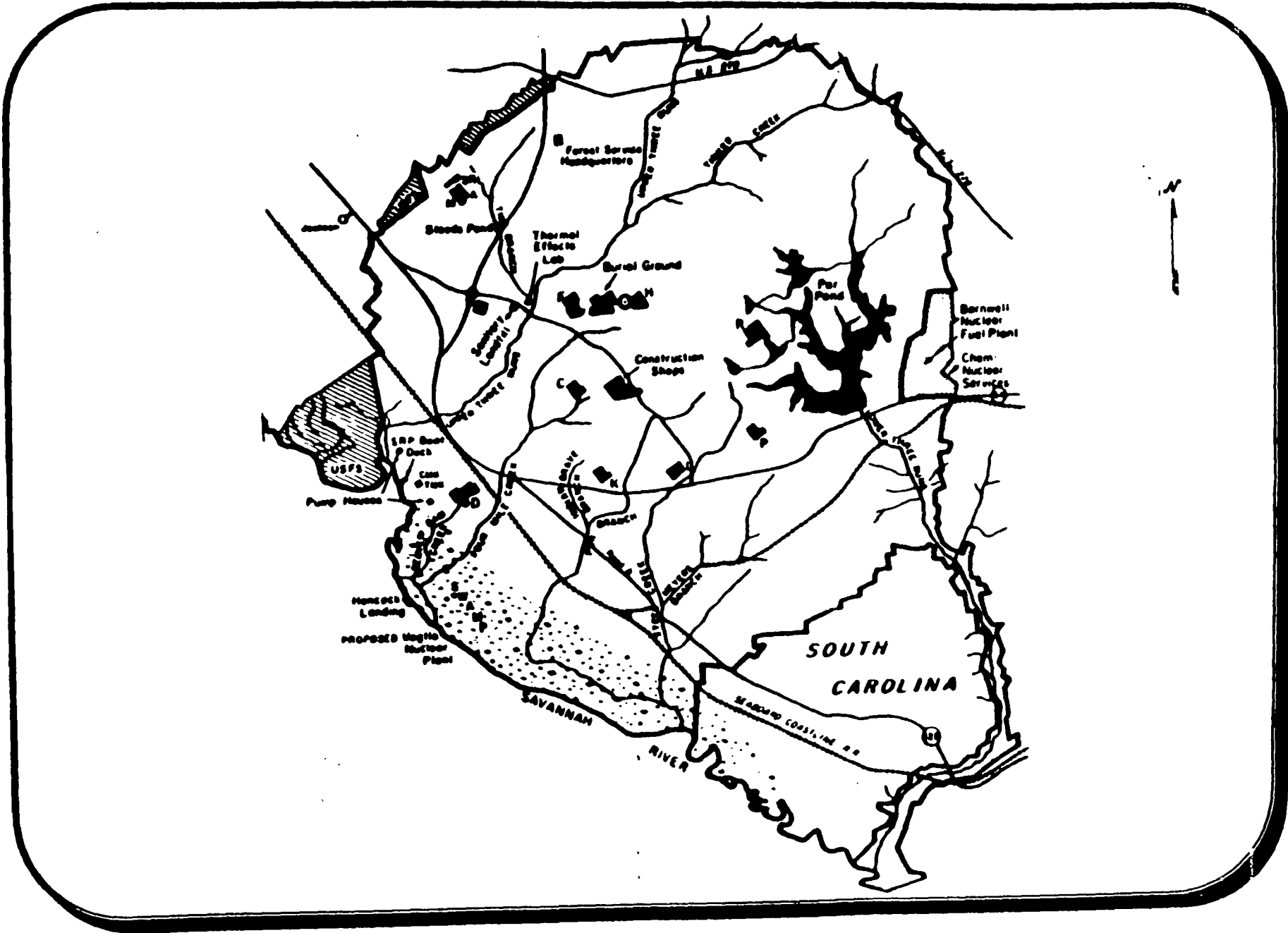


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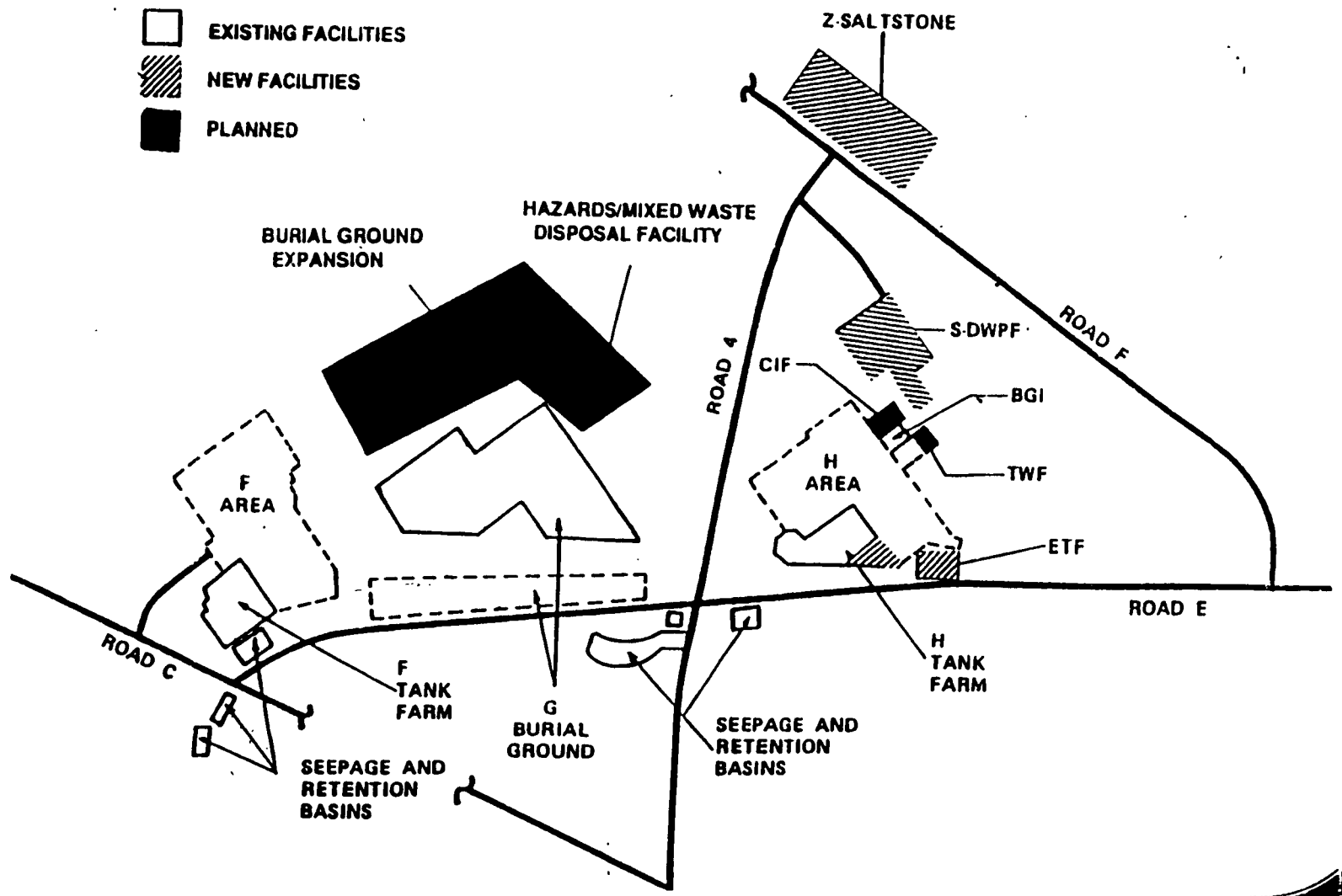
Mission

To provide safe and environmentally sound handling, storage, treatment and/or disposal of radioactive, hazardous, and mixed wastes generated at the Savannah River Site.

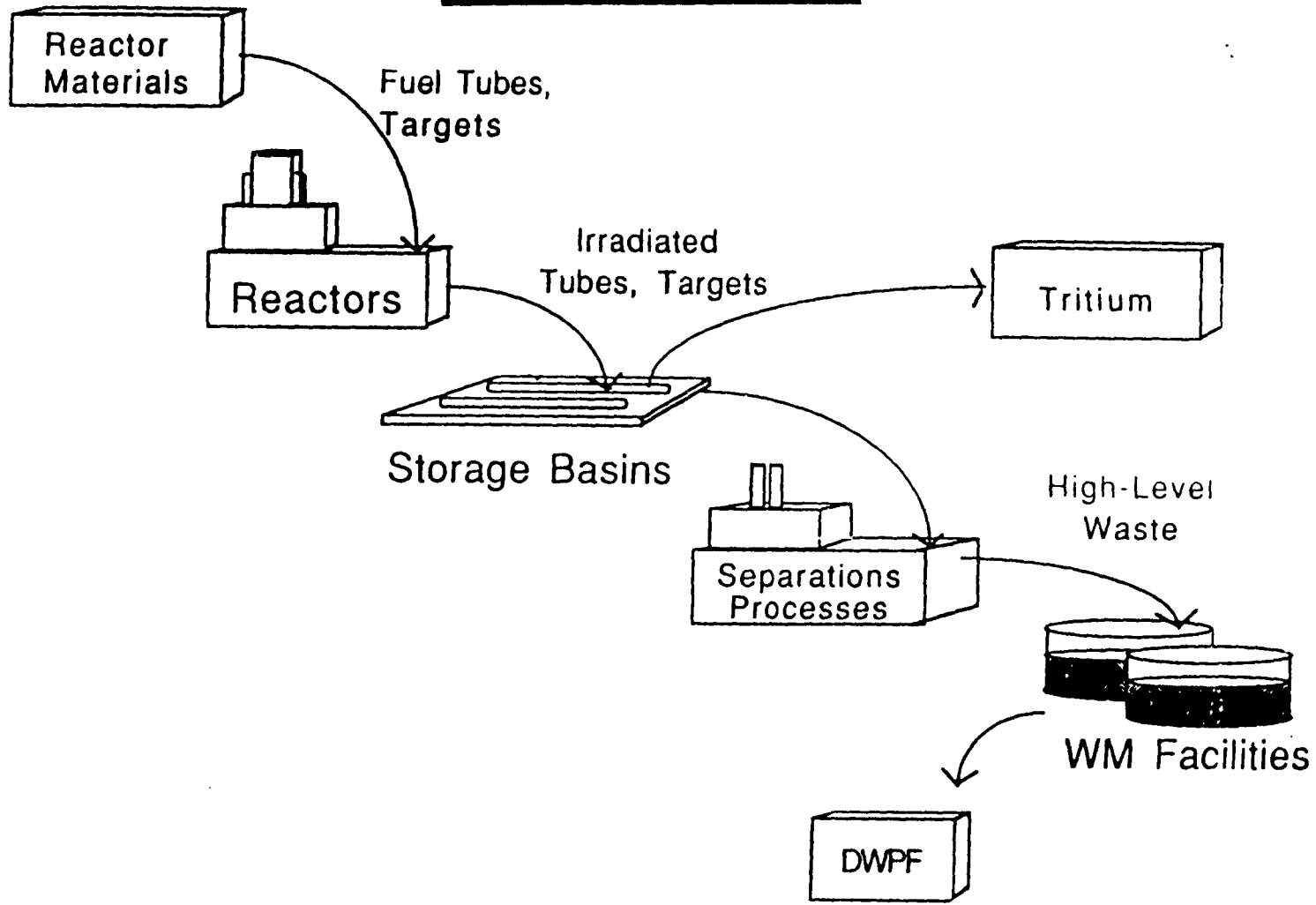


Waste Management Facilities

- EXISTING FACILITIES
- NEW FACILITIES
- PLANNED



SRS Overview



WASTE CLASSIFICATION

- LOW-LEVEL RADIOACTIVE
- INTERMEDIATE LEVEL RADIOACTIVE
- TRANSURANIC
- MIXED (RADIOACTIVE/CHEMICALLY HAZARDOUS)

LOW LEVEL WASTE

- BETA-GAMMA ACTIVITY <300 mrem/hr
- ALPHA ACTIVITY <10 nCi/g
- WASTE EXAMPLES:
 - PROTECTIVE CLOTHING
 - HAND TOOLS
 - CONSTRUCTION DEBRIS
 - SOIL
- ANNUAL GENERATION: 950,000 FT³

INTERMEDIATE LEVEL WASTE

- BETA-GAMMA ACTIVITY >300 mrem/hr
- ALPHA ACTIVITY <100 nCi/g
- WASTE EXAMPLES:
 - TRITIUM CRUCIBLES
 - SEPARATIONS PROCESS EQUIPMENT
 - REACTOR SCRAP METAL
- ANNUAL GENERATION: 75,000 FT³

MIXED WASTE

- WASTE THAT POSES BOTH CHEMICAL AND RADIOACTIVE HAZARDS
- WASTE EXAMPLES:
 - TRITIATED OIL, MERCURY
 - SCINTILLATION SOLUTIONS
 - CONTAMINATED LEAD AND CADMIUM
 - PROCESS EQUIPMENT
- ANNUAL GENERATION: 20,000 CU FT³

TRANSURANIC WASTE

- ALPHA ACTIVITY >100 nCi/g
- WASTE EXAMPLES:
 - PROTECTIVE CLOTHING
 - GLOVEBOX WASTE
 - PROCESS EQUIPMENT
- ANNUAL GENERATION: $30,000 \text{ FT}^3$

TYPES OF MATERIAL IN BURIAL GROUND

- JOB CONTROL WASTE
- CONTAMINATED PROCESS EQUIPMENT AND SHIELDING
- REACTOR AND FUEL HARDWARE
- SPENT REACTOR MODERATOR DEIONIZER RESINS
- SPENT Li-Al TARGETS FROM TRITIUM FACILITIES

SUMMARY OF LLW DISPOSAL PRACTICES

SHALLOW LAND BURIAL (1953 - 1985)

- Waste packaged in cardboard boxes
- Loose waste packaged in dumpsters
- Dumped in trenches

ENGINEERED LOW LEVEL WASTE TRENCHES (1985 --> PRESENT)

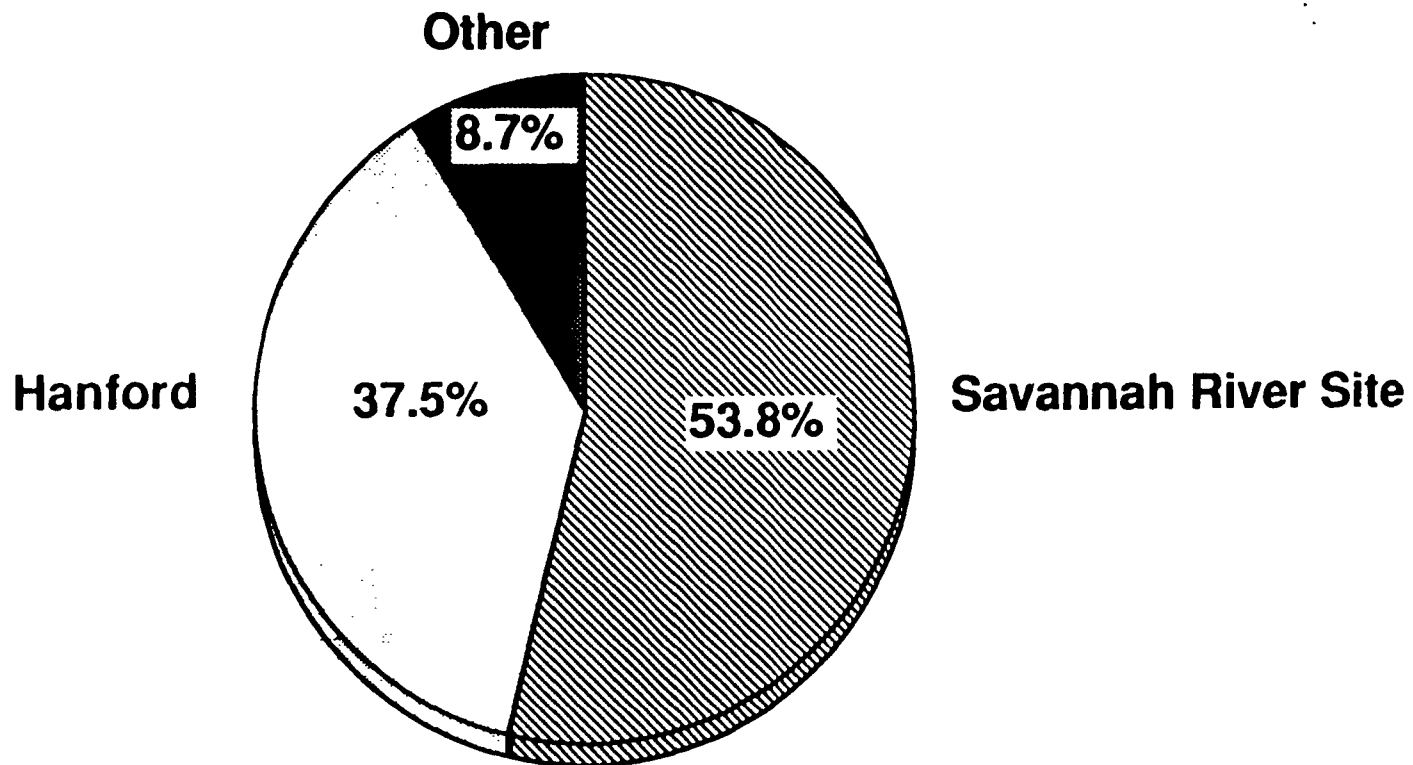
- Waste packaged in steel Boxes
- Stacked in close array
- Increased utilization of burial ground space

GREATER CONFINEMENT DISPOSAL

DEMONSTRATIONS (1985 --> PRESENT)

- High activity waste
- Boreholes
- GCD trench - Bulky Waste (Reactor Scrap, Tritium Crucibles)

DOE Defense High Level Waste



Total 1,110,000,000 Curies

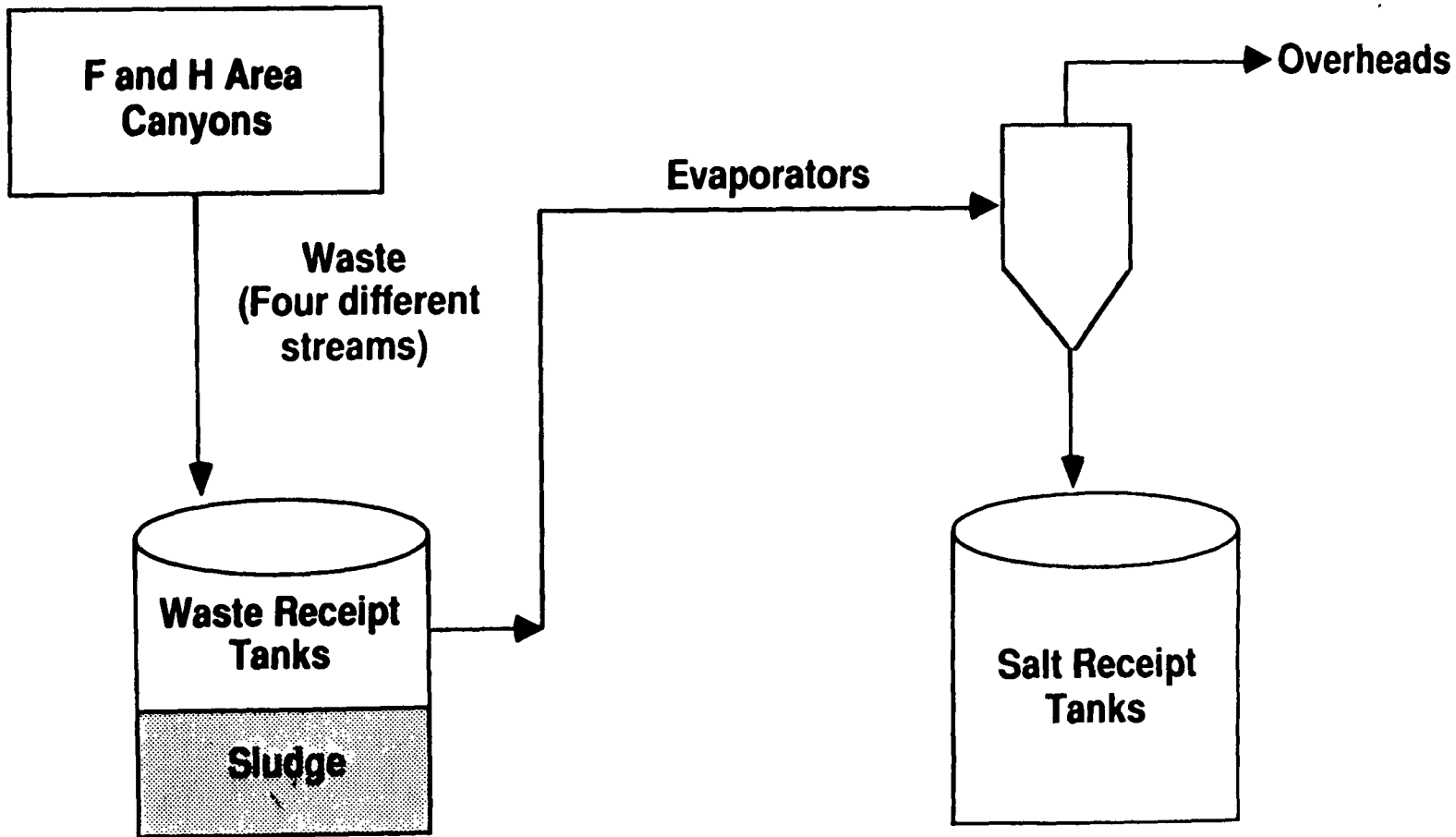
Waste Generation

- **Waste results from chemical processing of irradiated fuel assemblies**
- **Typical rate is 2-3 million gallons/year**
- **Over 86 million gallons of fresh waste generated since startup**
- **Concentrated to 35 million gallons by evaporation**
- **Current inventory of 605 million curies**

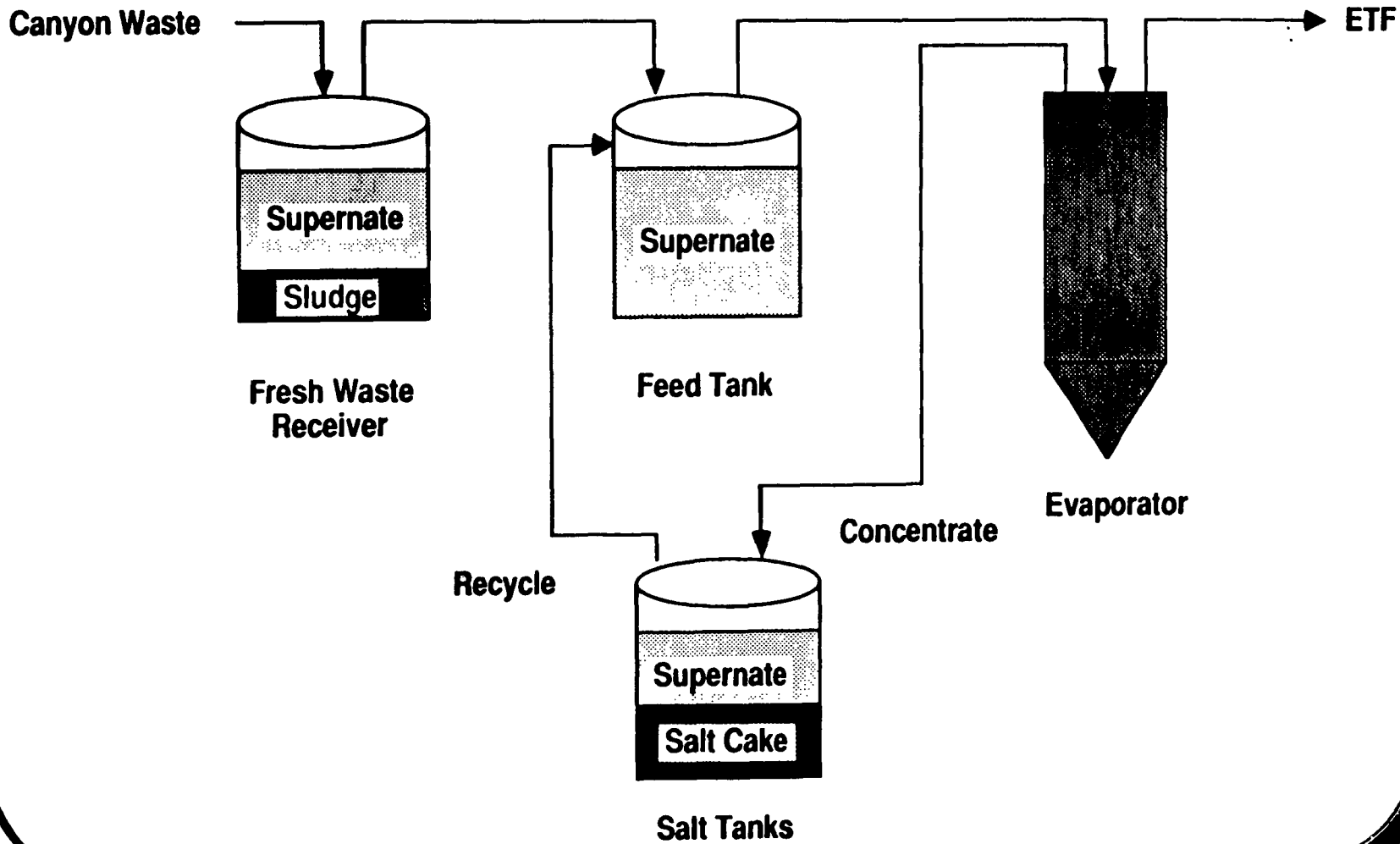
Waste Characteristics

- **Insoluble Sludges, Primarily**
 - **Iron Hydroxide**
 - **Aluminum Hydroxide**
 - **Manganese Dioxide**
- **Soluble Salts, Primarily**
 - **Sodium Nitrate**
 - **Sodium Nitrite**
 - **Sodium Hydroxide**
- **Wastes Segregated by Heat Content**
 - **High-Heat Waste**
 - **Low-Heat Waste**
- **Temperature**
 - **High-Heat Waste Sludges - 50-100°C**
 - **Other Wastes - 25 - 70°C**

Waste Segregation



Waste Concentration



Overall Program Flowsheet

Waste Removal

Sludge Tanks

Salt Tanks

In-Tank
Waste Processing
for DWPF

Sludge Washing
& Aluminum
Dissolution

In-Tank
Precipitation

DWPF

DWPF Glass

Saltstone

