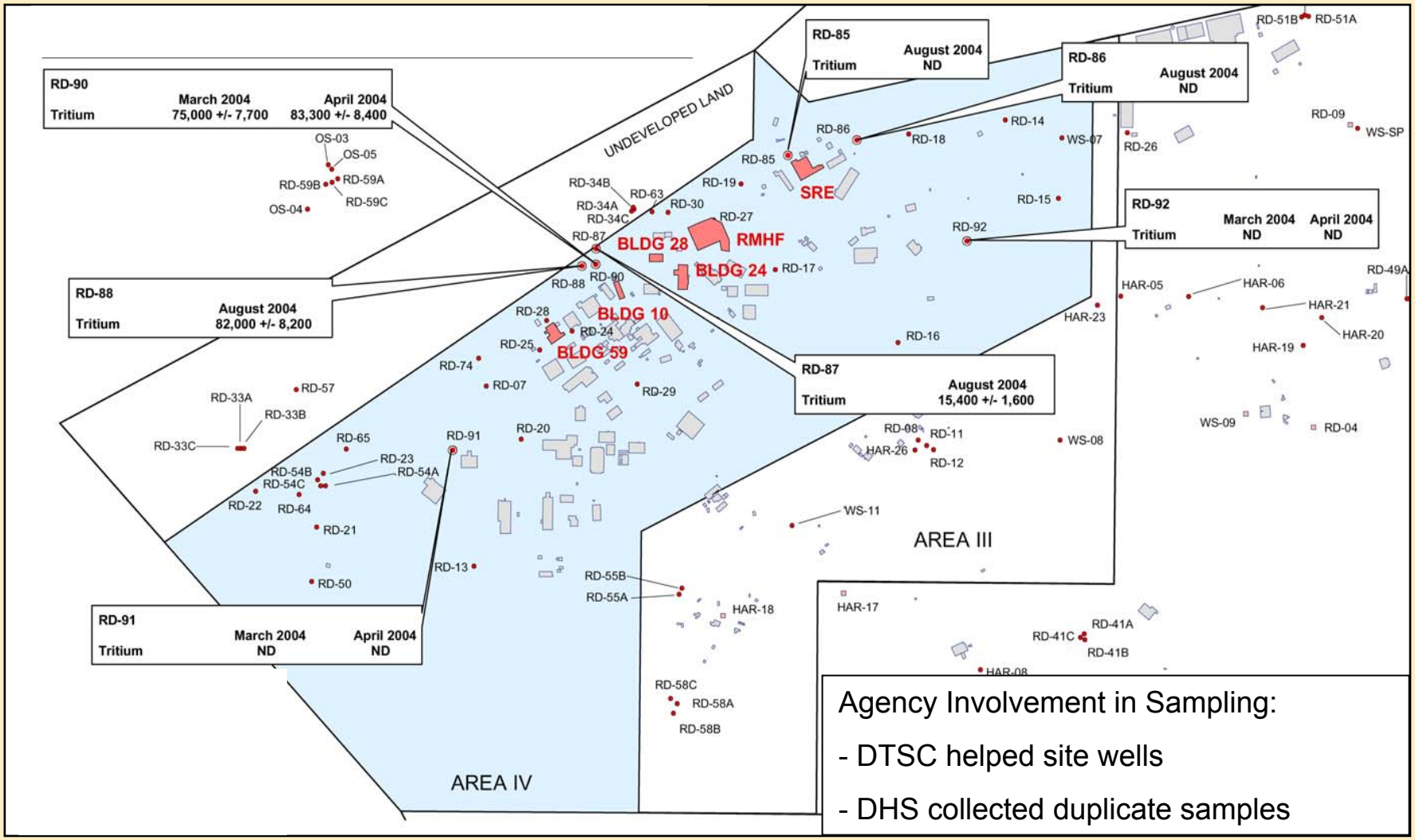
Community Meeting

September 9, 2004

Hosted by the Department of Energy

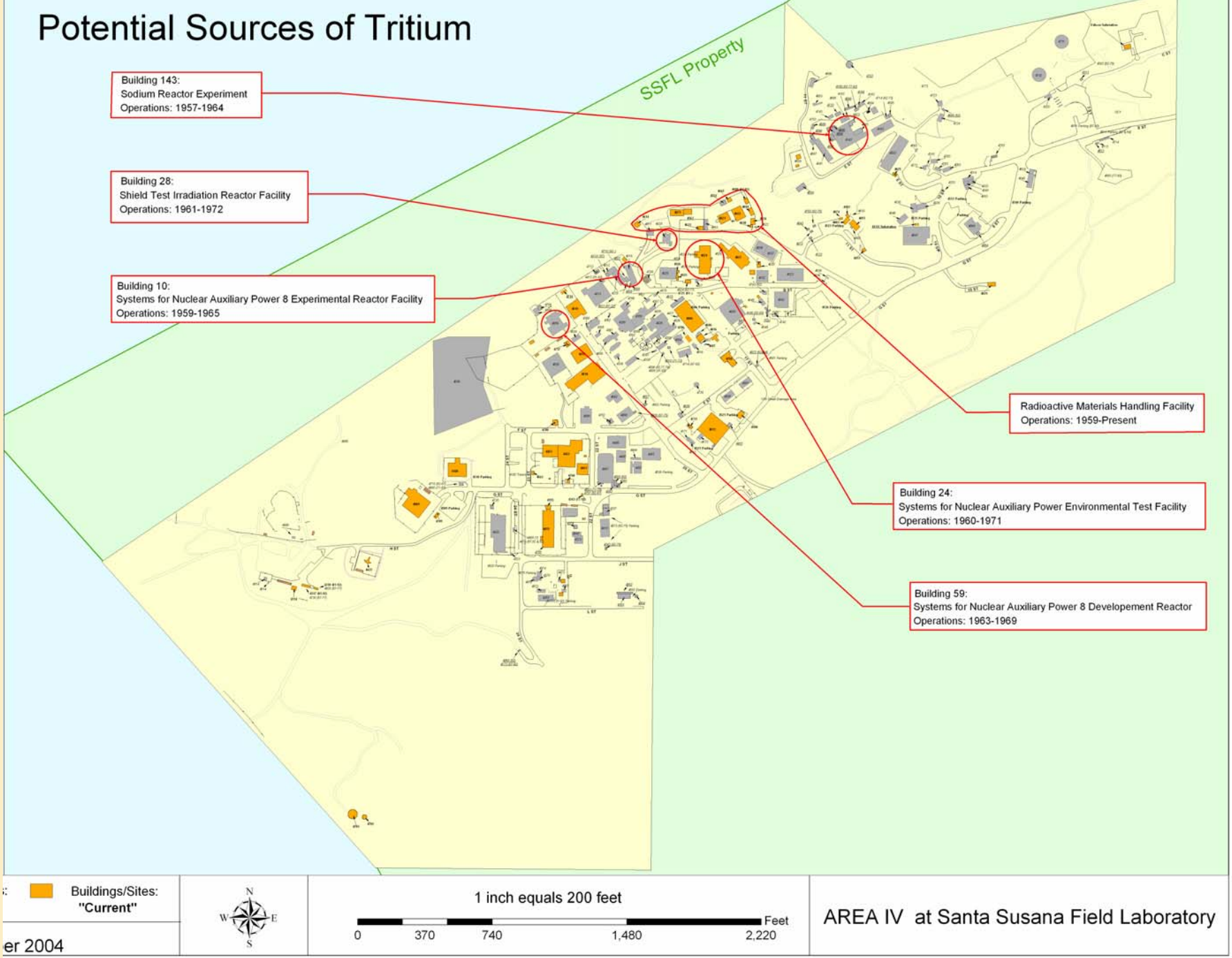
Recent Groundwater Monitoring Results



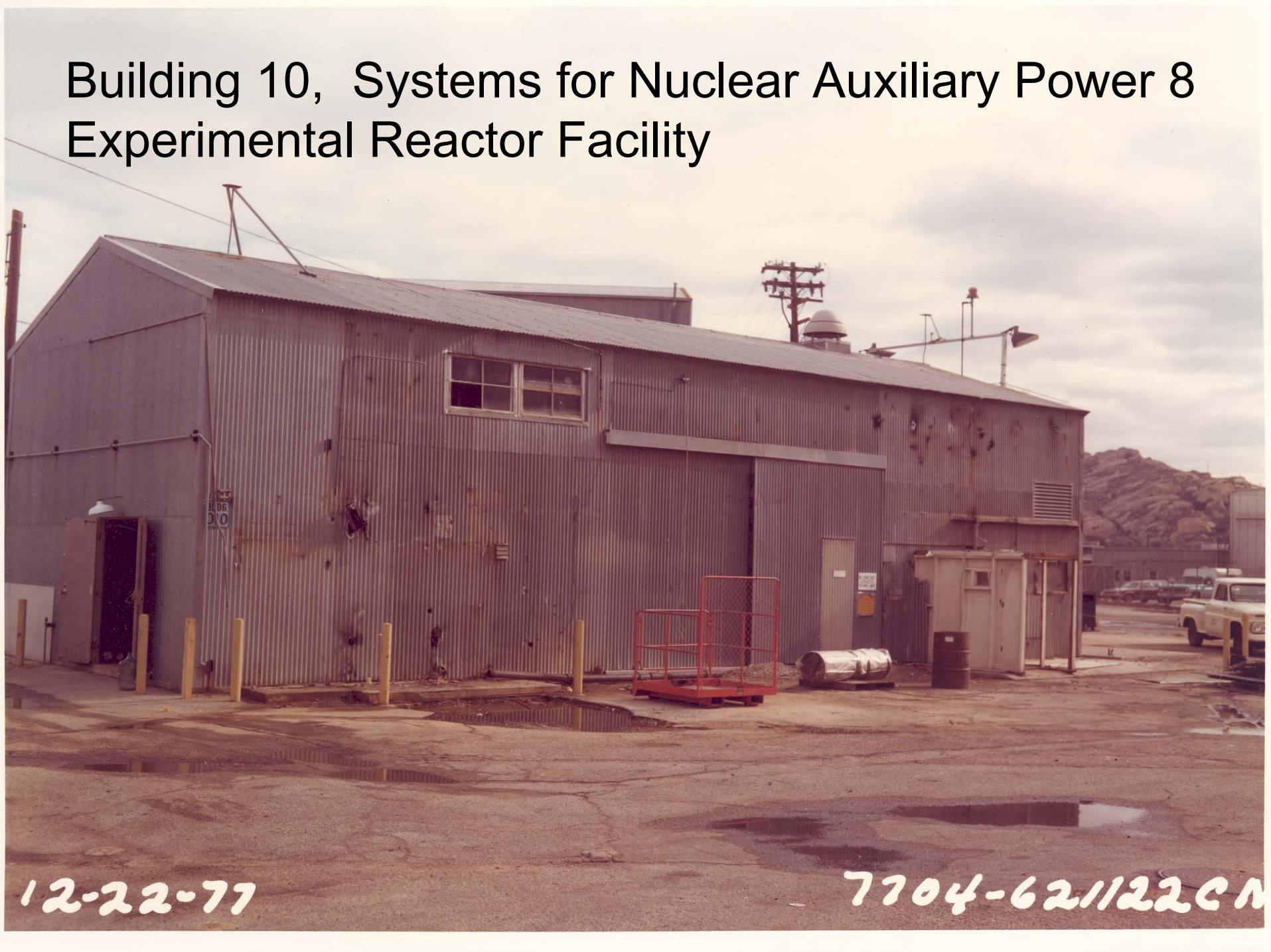
Tritium and Potential Sources

Sources of Tritium at Santa Susana Field Laboratory

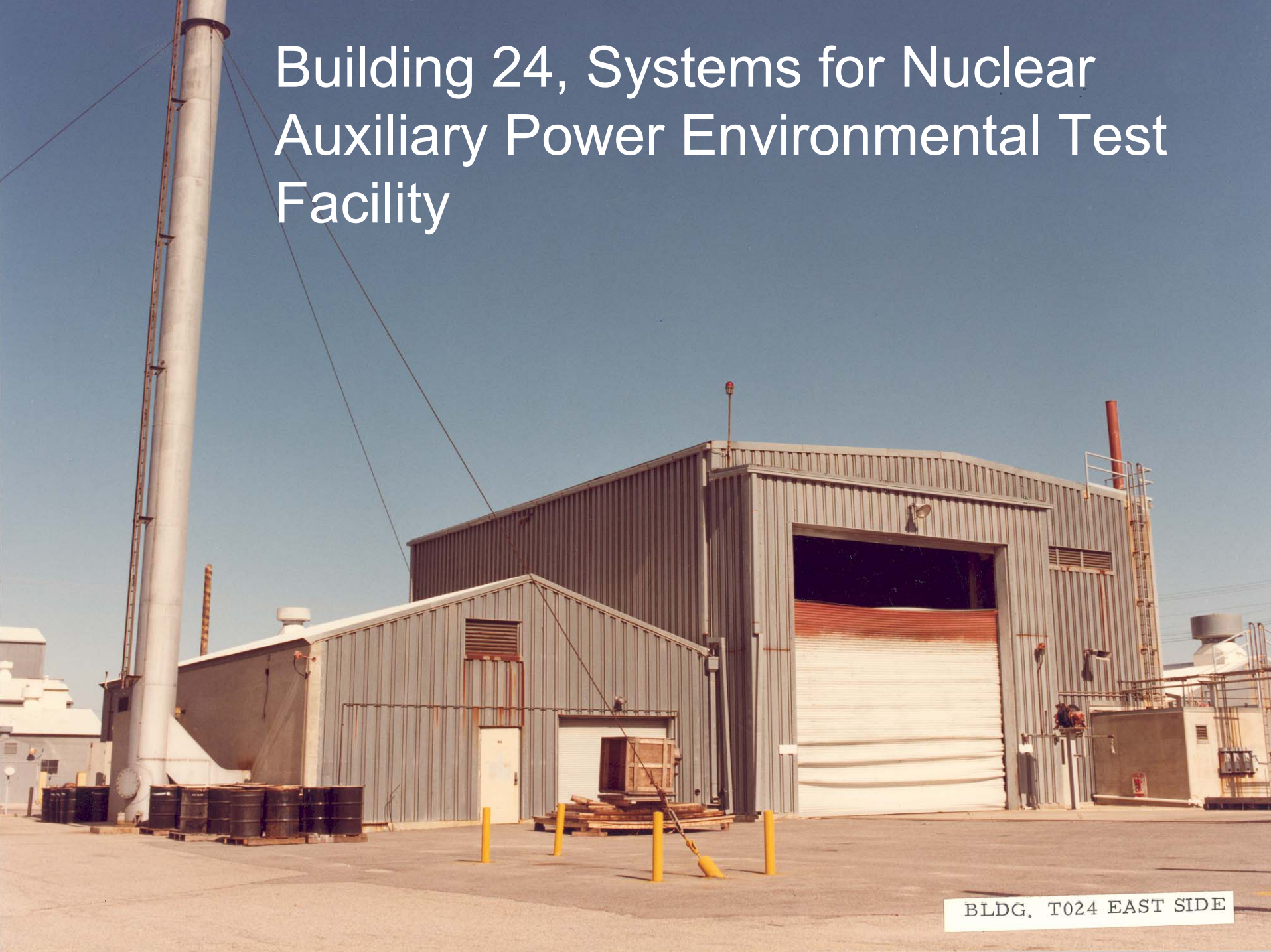
- Tritium can be formed in the fission process or by neutron activation of concrete impurities and water.
- Five test reactors produced tritium.
- The Radioactive Materials Handling Facility handled waste from these test reactors.


Potential Sources of Tritium
SSFL Property
Building 143:
Sodium Reactor Experiment
Operations: 1957-1964
Building 28:
Shield Test Irradiation Reactor Facility
Operations: 1961-1972
Building 10:
Systems for Nuclear Auxiliary Power 8 Experimental Reactor Facility
Operations: 1959-1965
Radioactive Materials Handling Facility
Operations: 1959-Present
Building 24:
Systems for Nuclear Auxiliary Power Environmental Test Facility
Operations: 1960-1971
Building 59:
Systems for Nuclear Auxiliary Power 8 Developement Reactor
Operations: 1963-1969
Buildings/Sites:
"Current"
er 2004
N
W
E
S
1 inch equals 200 feet
0
370
740
1,480
2,220
Feet
AREA IV at Santa Susana Field Laboratory

Building 10, Systems for Nuclear Auxiliary Power 8 Experimental Reactor Facility



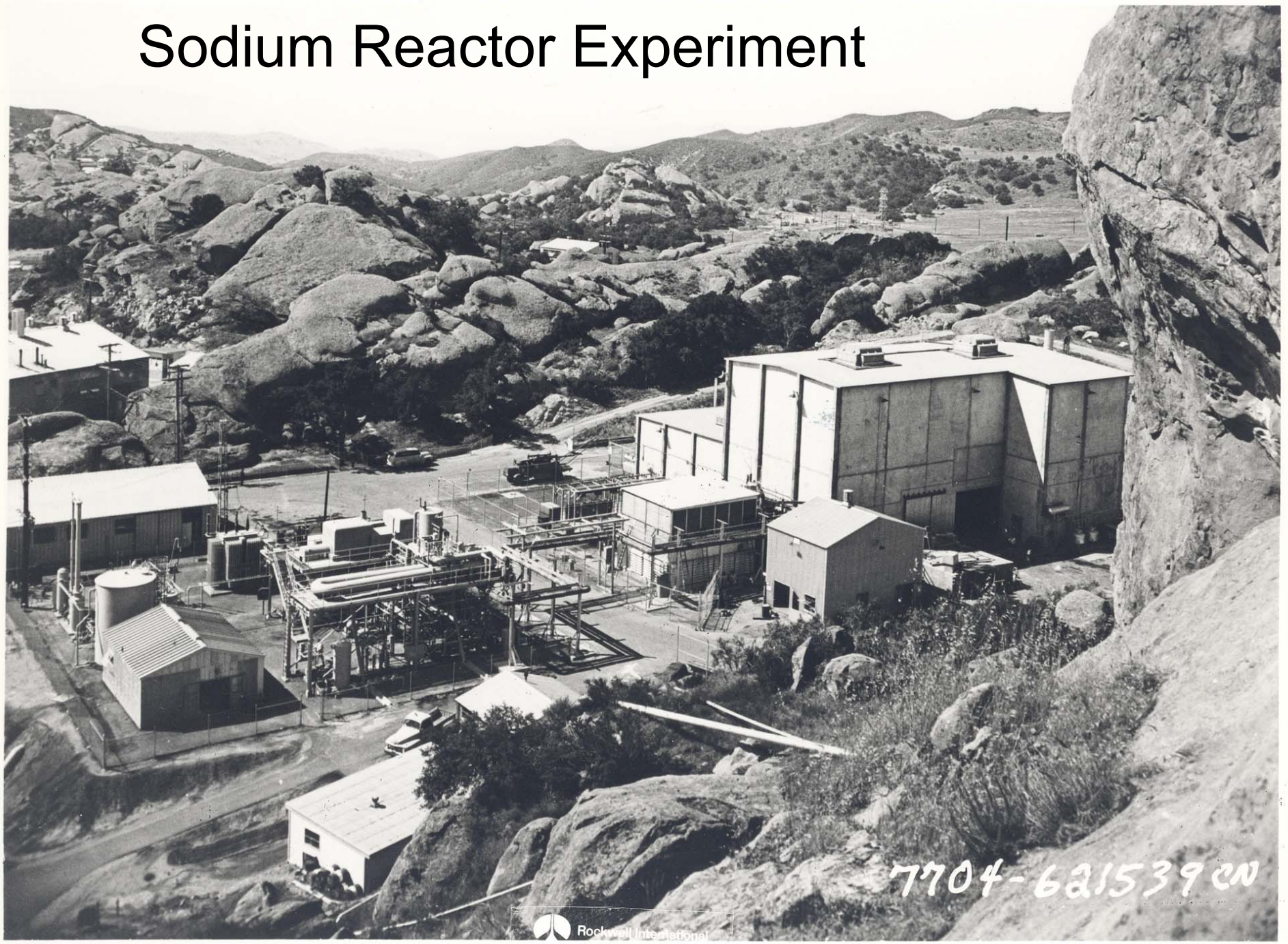
Building 24, Systems for Nuclear Auxiliary Power Environmental Test Facility



Building 28, Shield Test Irradiation Reactor Facility

Building 59, Systems for Nuclear Auxiliary Power 8 Development Reactor

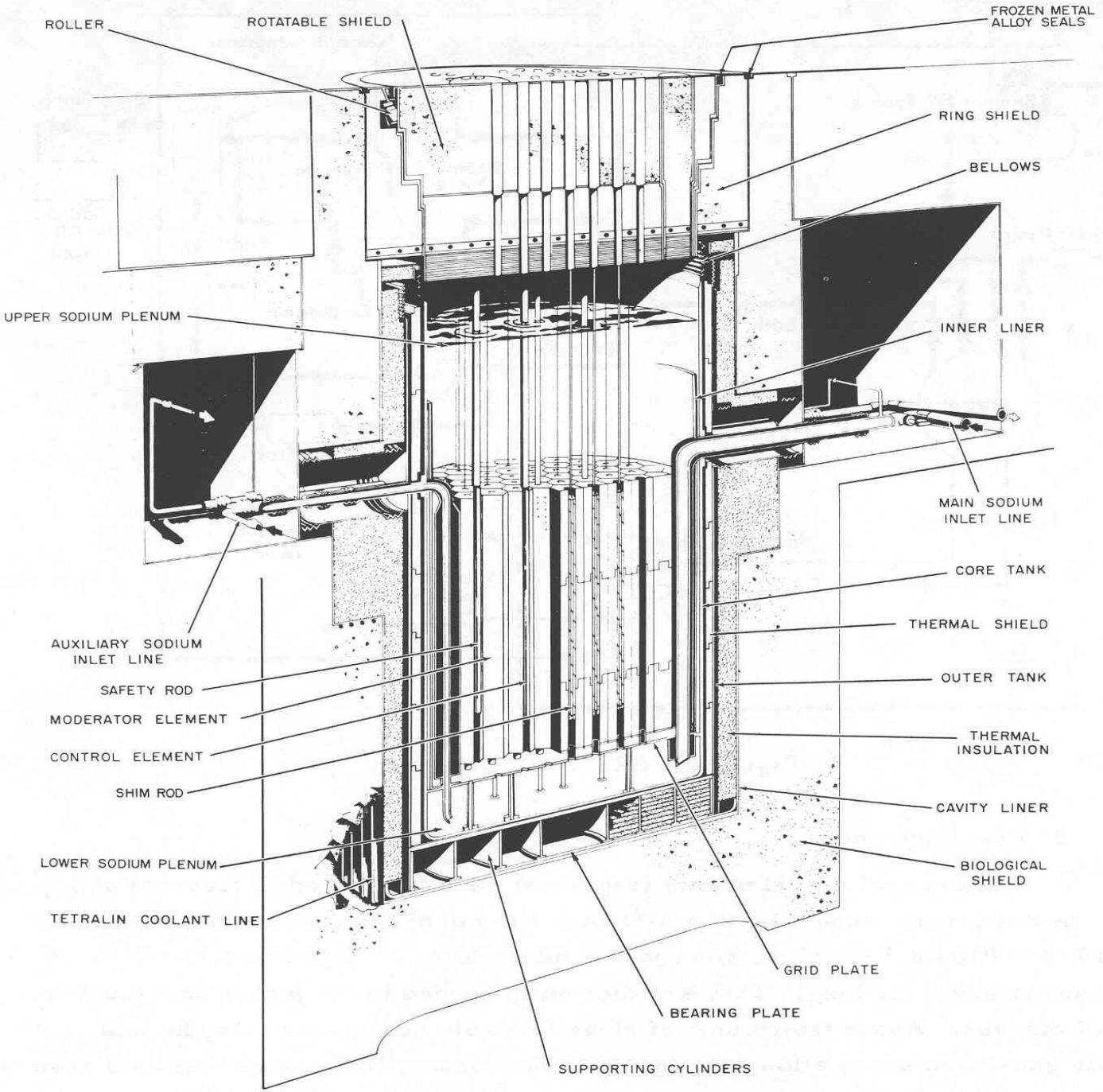
Sodium Reactor Experiment



SRE Construction

Figure 16. Reactor Passivation Piping During Installation

SRE Refueling Head



SRE Reactor Vessel

Parted Fuel Element Seen at Atomics International

During inspection of fuel elements on July 26 at the sodium reactor experiment, operated for the Atomic Energy Commission at Santa Susana by Atomics International. a division of North American Aviation Inc., a parted fuel element was observed.

The fuel element damage is not an indication of unsafe reactor conditions. No release of radioactive materials to the plant or its environs occurred and operating personnel were not exposed to harmful conditions.

In Steel Tubes

The occurrence is of [illegible] portance from a techni[illegible] [illegible]ndpoint and a detail[illegible] [illegible]nderway to d[illegible] [illegible] precise cause[illegible]

[illegible] fuel element of th[illegible] is a cluster of seven [illegible]less steel tubes, each approximately three-fourth[illegible] [illegible]ches in diameter and six feet long.

Each tube contains a column of six-inch long uranium metal slugs. These tubes are capped at the two ends.

The elements are suspended in the core of the reactor by means of hanger rods from plugs in the upper shield.

To date, 34 of the 43 elements comprising the fuel loading of the core have been examined by means of the fuel handling cask television system. Six elements have only an upper portion of the element attached to the hanger rod.

Scheduled for Removal

In each case, all seven tubes of the fuel element cluster were parted and a portion of [illegible]er end of the fuel element remained in the core.

This fuel loading, nearing the end of its useful life, was scheduled to be removed in the near future.

Preliminary indications are that the damage could have been caused by restrictions in the coolant passages resulting from inadvertent introduction of an organic material into the reactor. This material could have come from leaks in a primary coolant pump where tetralin an organic compound, is used in freeze seals to eliminate sodium leakage into the pump bearings and drive.

First Developed

Preliminary investigation of the stainless steel fuel cladding of one element indicates the element was damaged through formation of a uranium-iron alloy in the cladding in the area of the failure.

The SRE is the first experiment in the Commission's program to develop a sodium graphite reactor, one of the five original reactor concepts in the Commission's 1954 five year civilian power program.

It was designed to produce 20,000 kilowatts of heat and 6500 kilowatts of electricity.

The purpose of the SRE is to develop the technology associated with the sodium-graphite type of reactor and to provide a flexible tool to develop the advanced technology necessary to achieve economically competitive power.

This concept holds promise because of the high temperature, and high efficiences, at which heat transfer systems using liquid metals can be operated without pressurization.

Plan Second Core

The reactor has been in operation since April 1957 and has demonstrated the feasibility of the sodium graphite reactor concept. On May 22, 1959, the SRE achieved a maximum steam temperature of 1000 degrees Fahrenheit. This steam temperature is believed to be the highest ever produced by a nuclear reactor.

A second core loading of thorium-uranium alloy fuel elements has been fabricated and will be installed in the near future.

August 21, 1959
Valley Green Sheet

Occupational and Environmental Impact of SRE Accident

- No workers exposed above federal exposure limits.
- Kr-85 gas was released from the hold-up tank.
- Soil, vegetation, and water sampling did not show any increase in radioactivity.
- Air monitoring during the event indicated no impacts.

SRE: Back Into Operation

- A new core and new sodium coolant were loaded and the reactor continued operation from 1960 -1964.
- Decontaminated in early 1970's, released for unrestricted use.
- Building used for storage.
- In 1999, the SRE facility was completely demolished.


The SRE Site Today
August 2004