Group G

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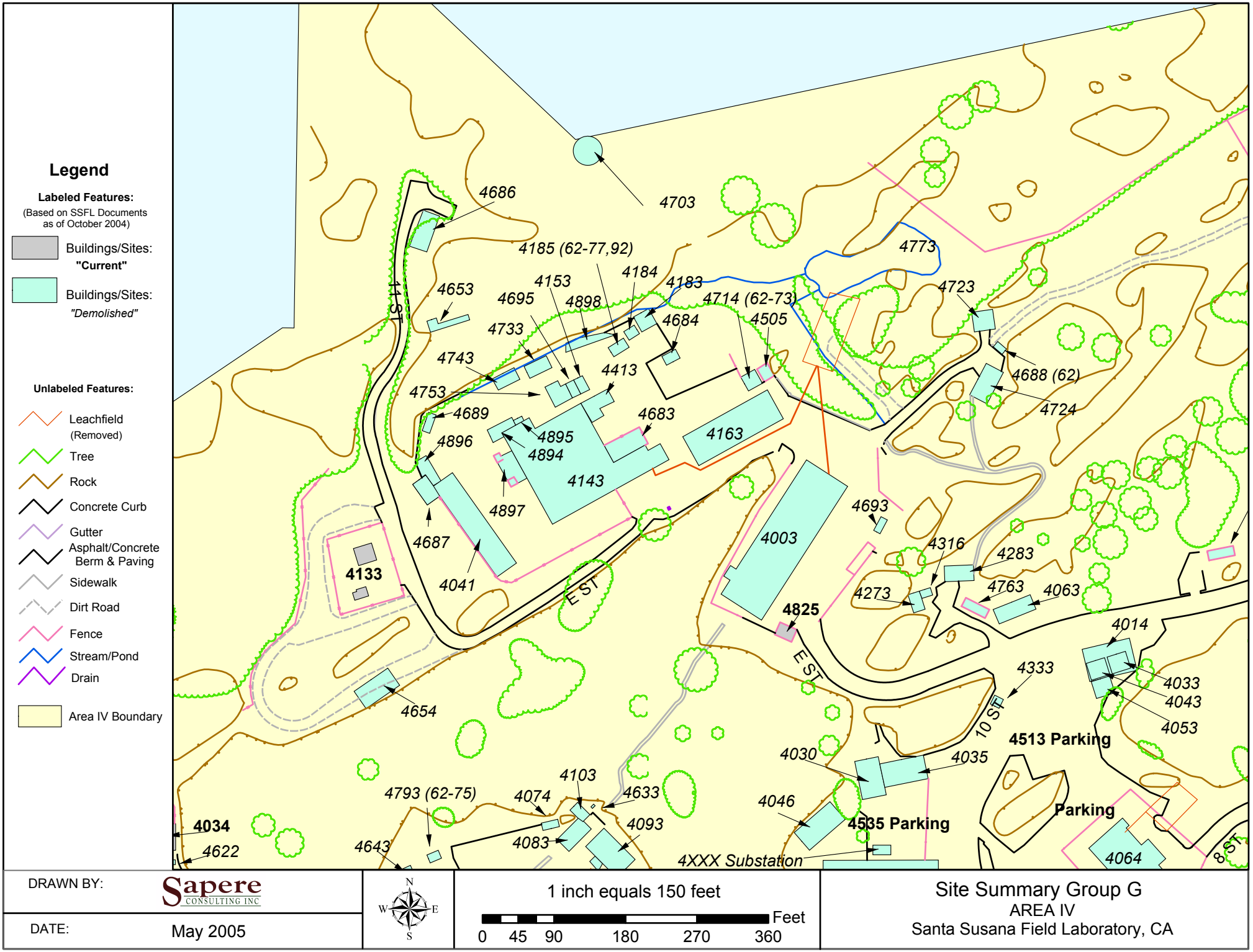
Legend
Labeled Features:
(Based on SSFL Documents as of October 2004)
Buildings/Sites: "Current"
Buildings/Sites: "Demolished"
Unlabeled Features:
Leachfield (Removed)
Tree
Rock
Concrete Curb
Gutter
Asphalt/Concrete Berm & Paving
Sidewalk
Dirt Road
Fence
Stream/Pond
Drain
Area IV Boundary
4686
4703
4185 (62-77,92)
4773
4653
4695
4153
4898
4184
4183
4714 (62-73)
4723
4733
4684
4505
4743
4413
4688 (62)
4753
4724
4689
4683
4895
4163
4896
4894
4143
4897
4693
4687
4003
4316
4283
4133
4041
4273
4763
4063
4825
4014
4654
4333
4033
4043
4053
4513 Parking
4030
4035
4103
4793 (62-75)
4074
4633
4046
4093
4034
4535 Parking
Parking
4622
4643
4083
4XXX Substation
4064
E ST
10 ST
8 ST
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Sapere CONSULTING INC
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May 2005
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1 inch equals 150 feet
0 45 90 180 270 360
Feet
Site Summary Group G
AREA IV
Santa Susana Field Laboratory, CA

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Site Summary – Building 4003

Site Identification:

Building 4003
Engineering Test Building
Excess Equipment Storage
Property Storage
Includes Building 4693, Substation

Operational Use/History:

- Constructed in 1958.
- From 1957 through 1964, Building 4003 was used to assemble fuel for the Sodium Reactor Experiment (SRE). In Building 4003, uranium and thorium metal slugs were loaded into metal tubes, the remaining tube space was filled with sodium, and the tubes were then sealed.[1]
- In the 1960s, the exterior sewer lines and sump were removed when Building 4003 was connected to the site-wide sanitary sewer system.
- Until the termination of the Systems for Nuclear Auxiliary Power (SNAP) program in 1973, Building 4003 was used for the analysis of SNAP fuel burn-up samples and the evaluation of irradiation experiments.[2]
- The prime remedial action for Building 4003 began in January 1975 and ended in June 1975, during which:
    - The Hot Cave was totally dismantled and all materials and equipment were removed from the site.[2] Dismantling included removal of:
        - The block and steel structure;
        - The floor and footings down to the original earth;
        - Radioactive liquid waste;
        - The air exhaust systems; and
        - Electrical and water support systems.
    - Other contaminated facilities removed from Building 4003 included: fume hoods, radioactive waste sinks, drain lines, holding tanks and the facility exhaust system.[3]
- Following initial decontamination activities, the building was used as a non-radioactive storage building. Industrial Planning Maps refer to Building 4003 as an Excess Equipment Storage Building from 1975 to 1992.[4]
- Sewer lines, suspected of contamination, were removed in September 1982.[3,5]
- Demolished in 1999.

Site Description:

- Building 4003 was approximately 15,000 square feet and contained a Hot Cave, fume hoods, radioactive waste sinks, drain lines, holding tanks and a radioactive exhaust system. The building was initially connected to a leach field system until it was closed and abandoned once the site-wide sewage treatment system was installed and operational in the early 1960s.
- Serviced by Substation 4693.

Relevant Site Information:

- Radioactive material was managed at this facility in the form of uranium, thorium, transuranics, mixed fission products, and Co-60 and other activation products.
- The following are incidents that could have involved releases of radioactivity to the environment:
    - On December 22, 1959, a contractor removed a radioactive exhaust stack without notifying Health Physics (A0423).
    - On September 2, 1969, laboratory equipment and portions of the floor were found to be contaminated (though the method of contamination is not clear). All affected areas were decontaminated and there was no evidence that contamination was tracked outside of Building 4003 (A0048).
    - On November 9, 1989, an incoming shipment of radioactive laser parts arrived from Stanford University without labels or authorization. Upon examination, the shipment was found not to exceed a safe level of radioactivity (A0202).
- Serviced by Substation 4693.

Radiological Surveys:

- Following decontamination activities, Building 4003 was given a preliminary release in 1975.[3]
- A survey by Argonne National Laboratory (ANL) in 1981 showed some residual contamination. In October 1981, decontamination activities were performed, including removal of all sewer lines within the building since they may have been contaminated with enriched uranium.[6]
- ANL performed a post-remedial action survey of the building following decontamination.
    - The survey found several areas of the building's interior with elevated levels of radiological contamination.
    - A detailed survey of the outside perimeter of the building revealed no detectable contamination.
- Consequently, Rockwell International conducted additional decontamination. A final post-remedial-action survey was conducted by ANL during April 1982. The areas in Building 4003 that had been found contaminated in 1981 were found to be free of radioactive contamination.[6]

  - Building 4003 was acceptably free of contamination and ANL recommended that the facility be released for unrestricted use; all areas previously contaminated in 1981 in Building 4003 were now free of radioactive contamination.
    - Allowable limits for the survey were as follows:
      - Surfaces:
        - Alpha: 100 dpm/100 cm^2 total, 20 dpm/100 cm^2 removable;
        - Beta: 0.1 mrad/hr at 1 cm through 7 mg/cm^2 absorber and 100 dpm/100 cm^2 removable;
      - Soil:
        - 100 pCi/g gross detectable beta;
        - 1,000 pCi/g gross detectable beta average below three meters;
        - 3,000 pCi/g gross detectable beta in isolated cracks below three meters.
- The Energy Systems Group (ESG) performed a final survey in 1983, and ANL performed a verification survey in 1984. The Department of Energy (DOE) subsequently released the facility for unrestricted use in 1985.
- A radiological survey performed in 1988 included the lot bordering the east side of Building 4003.[7] The results of the survey indicated the area contained no measurable residual radioactivity.[8]
- The drainage lines, septic tank and leachfield were excavated in 2001 and surveyed for radioactive contamination (See Building 4143 site summary for more information).

Status:

- DOE released the facility and surrounding soil for unrestricted use in September 1985.[7]
- Building 4003 was demolished in 1999.

References:

1- Rocketdyne Internal Website, http://rdweb/shea/radiationsafety/4003.html, accessed August 2003.
2- Rockwell International Report, AI-ERDA-13158, “Building 003 Decontamination and Disposition Final Report,” March 12, 1976.
3- Rockwell International Report, N704TI990063, “Radiological Survey Results – Release to Unrestricted Use, Building 003,” November 9, 1982.
4- SSFL Area IV, ETEC Industrial Planning Maps, 1962-1992.
5- Personnel Interview, Dan Trippeda, September 15, 2003.
6- Argonne National Laboratory Document, DOE/EV-0005/44, “Post Remedial Action Survey Report for Building 003, Santa Susana Field Laboratories, Rockwell International, Ventura County, California,” April 1982.

7- DOE/OAK, Letter, Docket #6450-01 “Certification Docket for the SRE and Building 003,” from J. K. Hartman (DOE/OAK) to G.W. Meyers, September 24, 1985.
8- ETEC Document, GEN-ZR-0009, “Radiological Survey of the T513 Parking Lot; Old R/A Laundry Area; Plot 333; and Areas Between the SRE to RMDF, and KEWB to RMDF,” August 26, 1988.
9- Historical Site Photographs from Boeing Database.

Photograph – Building 4003

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Site Summary – Building 4041

Site Identification:

Building 4041
SRE Component Storage
ETEC Equipment Storage

Operational Use/History:

- Constructed in 1958.
- During the operation of SRE from 1957-1964, this building was used as a storage area for contaminated equipment and packaged radiological material.[1]
- This facility was used for interim storage of radioactive waste prior to shipment for disposal during the SRE decommissioning in the 1970s and early 1980s.[1]
- Following the facility's release for unrestricted use, the facility was used for non-radioactive storage activities.[1]
- Demolished in 1998.

Site Description:

- Building 4041 was located west of the reactor building (Building 4143) in the SRE complex. The building was a Butler building structure, measuring approximately 138 feet by 28 feet.[2]

Relevant Site Information:

- Radioactive components and waste were stored in Building 4041.

Radiological Surveys:

- ANL conducted an interim post remedial action survey of the entire SRE area (including Building 4041) in 1982.[3]
    - The survey found that four locations in Building 4041 exceeded acceptable limits (20 dpm/100cm^2 for removable alpha, 100 dpm/100cm^2 for removable beta and 100 dpm/cm^2 for total alpha).
        - The maximum activity recorded among these four locations was 17,000 dpm/100cm^2 beta-gamma.
    - Locations exceeding release limits were decontaminated before the end of the survey.
    - The only major operation performed was the scabbling of the floor area.

- In 1982, following decontamination efforts, a radiological survey of Building 4041 was conducted.[2]
    - The building was found to be acceptably free of contamination and Rockwell recommended it be released for unrestricted use.
    - Alpha limits: 20 dpm/100 cm^2 removable.
    - Beta limits: 0.1 mrad/hr at 1 cm through 7 mg/cm^2 absorber and 100 dpm/100 cm^2 removable.
    - Removable contamination inside the building was below 5 dpm alpha and 30 dpm beta-gamma.
    - All readings were below 0.1 mrad/hr, and the average reading of 0.03 mrad/hr was recorded inside the middle of Building 4041.
    - The scope of the survey did not include soil sampling because asphalt paving covered the area.
- ANL performed an independent verification survey in 1984 as part of the SRE verification survey.[4] Results of the survey indicated Building 4041 and its surrounding area were decontaminated to below the limits specified in the draft American National Standards Institute (ANSI) Standard N13.12 and the Nuclear Regulatory Commission (NRC) guidelines dated 1982.

Status:

- DOE released the facility and surrounding soil for unrestricted use as a part of the SRE release in September 1985.[5]
- Building 4041 was demolished in 1998.

References:

1- Rockwell International Report, ESG-DOE-13403, “Sodium Reactor Experiment Decommissioning Final Report,” August 15, 1983.
2- Rockwell International Report, N704TI990037, “Radiological Survey Results – Release to Unrestricted Use, SRE, Building 041,” November 9, 1982.
3- Argonne National Laboratory Document , no document number, “Interim Post Remedial Action Survey Report for the Sodium Reactor Experiment (SRE) Facility,” May 1983.
4- Argonne National Laboratory Document, DOE-EV-0005-46, “Post Remedial Action Survey Report for the Sodium Reactor Experiment (SRE) Facility,” February 1984.
5- DOE/OAK, Letter, Docket #6450-01 “Certification Docket for the SRE and Building 003,” from J. K. Hartman (DOE/OAK) to G.W. Meyers, September 24, 1985.
6- Historical Site Photographs from Boeing Database.
7- SSFL Area IV, ETEC Industrial Planning Maps, 1962-1992.

Photograph – Building 4041

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Site Summary – Building 4133

Site Identification:

Building 4133
Hazardous Waste Treatment Facility
Hazardous Waste Management Facility

Operational Use/History:

- Building 4133 was transferred to its present location in December 1977. It was previously labeled Building 4724, Contaminated Sodium Facility. Prior to being physically moved, it was surveyed for radiological contamination and released for unrestricted use.[1]
- Building 4133 has been permitted as a hazardous waste treatment facility regulated by the California Department of Toxic Substances Control (DTSC) under the Resource Conservation and Recovery Act (RCRA).
- By 1998 Building 4133 was no longer in use. The structure is still standing.[2]

Site Description:

- Building 4133 is constructed of galvanized steel walls and roof that are anchored to a concrete slab floor. It is a single story structure.[3]

Relevant Site Information:

- There are no Use Authorizations and no Incident Reports associated with Building 4133.[4]

Radiological Surveys:

- In 1988, six soil samples were collected and analyzed just to the north of Building 4133.[5] The samples were below soil release limits.
    - Values were 7.4 to 37 pCi/g (gross alpha) and 33 to 52 pCi/g (gross beta).
- DTSC requested radiological surveys be performed for Building 4133 and that those surveys be independently verified.
- Boeing conducted a survey of Building 4133 in 1999.[6] All soil samples in the yard and scans and smears of the building and equipment were below release limits indicated that the facility and yard would be suitable for "release for unrestricted use" if Building 4133 had been a licensed facility or a radiological facility.
    - Of the 304 taken, 302 surface contamination measurements were at or below the minimum detectable activity of the instrumentation, and all 304 were below the surface contamination release criteria.

        - The highest total alpha surface contamination measured at the facility was 36 dpm/100 cm^2, and the highest removable alpha surface contamination measured at the facility was 6 dpm/100 cm^2.
        - The highest total beta surface contamination measured at the facility was 1,292 dpm/100 cm^2 and the highest removable beta surface contamination measured at the facility was 24 dpm/100 cm^2.
        - The highest observed net ambient gamma reading found inside the fenced facility was 2.9 µR/h which is below the action level of 5 µR/hr.
    - The results of 6 soil and asphalt samples taken within the 4133 fenceline indicated one soil sample at 0.1 pCi/g Cs-137 and all others with no detectable man-made activity.
- ORISE conducted a verification survey of 4133 in 2000. The survey included the interior and exterior of the building including the surrounding soil. All release criteria were met.[7]
    - On the interior of the building, surface scans did not identify any locations of direct radiation in excess of ambient background radiation.
        - Total surface beta: -900 to 2,300 dpm/100cm^2 (corrected for background).
        - Removable surface alpha: 0 to 3 dpm/100cm^2 (corrected for background).
        - Removable surface beta: –4 to 6 dpm/100cm^2 (corrected for background).
        - The exposure rates measured on the inside of the building were 7 µR/hr and 9 µR/hr.
    - On the exterior of the building, surface scans did not identify any locations of direct radiation in excess of ambient background levels.
        - Total surface beta: -440 to 770 dpm/100cm^2 (corrected for background).
        - Removable alpha: 0 to 1 dpm/100cm^2 (corrected for background).
        - Removable beta: –2 to 6 dpm/cm^2 (corrected for background).
        - The exposure rates measured ranged from 15 µR/hr to 17 µR/hr.
        - Background: 14 µR/hr.
    - Soil samples were also collected to analyze the concentration of radionuclides. The results are as follows: non-detect for Am-241, 0.3 to 0.6 pCi/g for Cs-137, 0.7 to 0.9 pCi/g for Ra-226, 1.1 pCi/g for Th-228, non-detect for Th-230, 0.9 to 1.3 pCi/g for Th-232, non-detect for U-235, and less than 0.1 to 0.8 pCi/g for U-238.
- DHS performed verification sampling in 2000.

Status:

- Building 4133 is currently undergoing closure as an RCRA-permitted hazardous waste treatment facility.

References:

1- Rockwell International, Internal Letter "Unrestricted Release of Building T724 for Unrestricted Use," from J.E Begley to R.J. Tuttle, January 18, 1978.
2- Personnel Interview, Brian Sujata, September 23, 2003.
3- Rocketdyne Internal Document, no document number, "Assessment of Department of Energy Buildings within the SSFL," September 30, 1996.
4- Review of Radiation Safety Records Management System, 2003.
5- Rocketdyne Document, A4CM-AN-0003, "Radiological Characterization Plan, Area IV, SSFL," March 30, 1994.
6- Boeing Document, RS-00015, "Building 4133 Radiation Survey Report" January 26, 2004.
7- ORISE Document, ORISE-00-0577, "Verification Survey of Building 4133, SSFL, The Boeing Company, Ventura County, California," J.R. Morton, April 2000.
8- Historical Site Photographs from Boeing Database.
9- SSFL Area IV, ETEC Industrial Planning Maps, 1962-1992.

Photograph – Building 4133

Site Summary – Building 4143 and Sites 4413, 4894, 4895, 4896, 4897, 4898

Site Identification:

Building 4143
Site 4413
Site 4894
Site 4895
Site 4896
Site 4897
Site 4898
SRE Reactor Building
ETEC Component Storage
Includes Building 4683, Substation

Operational Use/History:

- Constructed in 1957.
- The SRE operated as a high-temperature, sodium-cooled, graphite-moderated reactor between 1957 and 1964.[1]
- Sites 4413 and 4894 through 4898 are concrete pads associated with Building 4143. They were only given separate designations on the 1962 Industrial Planning Map; subsequent maps include them as a part of Building 4143.[2]
- Deactivation activities resulting in a "stored-in-place" configuration were conducted between 1967 and 1968.[1]
- Decommissioning of the SRE began in 1974 and continued through 1983.
- Demolished in 1999.
    - Demolition included the removal of the reactor and surrounding soil and concrete, as well as underground structures.

Site Description:

- The main reactor building, Building 4143, was approximately 20,000 square feet and consisted of a high bay, ground floor and mezzanine offices, and various rooms housing support equipment; a surrounding paved area; several out-buildings; and natural ground with drainage paths and a retention pond.[1] The building was initially connected to a leach field system until it was closed and abandoned once the site-wide sewage treatment system was installed and operational in the early 1960s.

Relevant Site Information:

- Radioactive material was managed at this facility in the form of fuels and fission products.

- Various radiological incidents occurred throughout the operation and decommissioning of the facility. Several incidents may have resulted in releases to the environment:
    - On June 4, 1959, an explosion resulting from an unexpected hydrogen-oxygen reaction blew a fuel element undergoing sodium cleaning out of the wash cell. Surveys indicated that no measurable release of radiation outside the building occurred (A0315).
    - On July 12, 1959, depletion in coolant flow due to blockage resulted in overheating and damage to 13 of 43 fuel elements in the reactor core. Sufficient damage was sustained on these assemblies to cause failure of cladding on all seven rods and some iron uranium eutectic was molten for a short period of time in the reactor.[3,4] Between 5,000 and 10,000 curies of mixed fission product were released and contained in the primary sodium system. Recently, it was calculated that approximately 28 curies of Kr-85 were released to the environment (A0274).
    - On March 12, 1960, a contaminated sodium fire broke out in the sodium service vault. Personnel were unable to put out the fire with the standard suppression equipment, so the vault was sealed and purged with argon. Once the fire was extinguished, surveys indicated that no significant contamination had been released (e.g., an air sample during the fire measured 1.64×10^{-10} µCi/cc) (A0340).
    - On May 25, 1960, workers improperly removed a corescope from a gas lock for the reactor core, resulting in the release of gas containing mixed fission products from the core to the high bay. One worker was contaminated at a level of 1.2 mrad/hr; however, it is believed that no contaminated gas escaped the building (A0393).
    - On June 9, 1960, failure of a gas lock for the reactor core resulted in the release of gas containing mixed fission products from the core to the high bay. Two workers were contaminated at a level of 5 mrad/hr; however, it is believed that no contaminated gas escaped the building (A0005).
    - On April 10, 1961, a contaminated sodium fire broke out in a 30-gallon drum in the sodium service vault. Surveys of the vault and of the ventilation system indicated that no release in excess of allowable limits occurred as a result of the fire (A0010).
    - On May 12, 1961, a steam cleaning operation contaminated a concrete pad. Contamination was as high as 1,200 dpm/100 cm^2. The contaminated area was decontaminated following completion of steam cleaning activities (A0282).
    - On October 20, 1962, several employees were contaminated while cutting core heaters and packaging them as radioactive waste for disposal. After completing the work, the employees changed out of the protective clothing without being properly surveyed. The contaminated employees then contaminated most doorknobs in the lower level of the SRE building (measured at 300 dpm/100 cm^2) and a large area of the floor (contamination levels of up to 600 dpm/100 cm^2 were measured). One contaminated employee went outside for lunch, but it is not known if he spread

contamination outside the building. Upon discovery of the contamination a short time later, the employees and the building were decontaminated to acceptable levels (30 dpm/100 cm^2 for the building) (A0379).

- On June 21, 1964, a component cleaning operation resulted in a high level of contamination (up to 150,000 dpm/100 cm^2) being spread throughout the west end of the high bay (A0380).
- On March 19, 1964, 3,550 gallons of water were dumped from two liquid waste storage tanks. After approximately 24 hours, it was determined that the water released was contaminated with approximately 58 mCi of irradiated corrosion products. The SRE Retention Pond captured this contaminated water, preventing its spread (A0030).
- On December 18, 1964, workers engaged in the transfer, cutting, and storage of controls rod and safety rod lower thimbles contaminated the high bay area. Smear surveys measured beta-gamma levels of up to 3,000 dpm/100 cm^2. The area was decontaminated and no contamination was thought to have escaped the high bay (A0371).
- On January 14, 1965, employees, and potentially the SRE high bay, were contaminated while moving an irradiated beryllium temperature probe with the high bay crane. Two workers each received 3.1 rem exposures during the operation (A0296).
- On December 8, 1967, radioactive water was discovered in 8-inch pipes that penetrated the maintenance cell floor (A0321).
- On October 23, 1976, core gas escaped during removal of an instrument thimble contaminating the high bay area. Removable contamination levels were found to be as high as 10,000 dpm/100 cm^2. The area was decontamination to acceptable levels (A0289).
- On August 1, 1977, while workers were moving the cold trap, the bottom fell off, contaminating the floor. Contamination levels were found to be as high as 50,000 dpm (A0059).
- On August 10, 1977, the storage pit containing reactor vessel segments leaked water. Although the exact release point was uncertain, elevated radiation levels were founds in soil at the east end of the storage pit. It was estimated that approximately 0.6 Ci were released to the soil (A0414).
- On September 23, 1977, work in the SRE high bay contaminated the floor of that area. Prior to detection of the contamination, workers walked through the area, transporting the contamination out of the high bay (A0458).
- On November 14, 1977, workers overfilled a liquid transfer tank, spilling radioactive liquid on the ground outside the SRE facility (A0062).

Radiological Surveys:

- In 1981, decontamination and decommissioning (D&D) activities took place. In order to permit unrestricted release of the facility, it needed to be structurally sound and free of radioactive contamination in excess of applicable limits. Radioactivity in all

remaining portions of the facility was reduced (by decontamination or by disposal) to levels that are as low as practicable.

- A final survey of the building was performed in 1983.[5]
  - The survey found that Building 4143 was acceptably free of contamination and recommended that the facility be released for unrestricted use.
  - Maximum soil gross beta activity was 96 pCi/g with an average of 51 pCi/g.
  - Allowable limits for the survey were as follows:
    - Surfaces:
      - Alpha: 100 dpm/100 cm^2 total, 20 dpm/100 cm^2 removable.
      - Beta: 0.1 mrad/hr at 1 cm through 7 mg/cm^2 absorber, 100 dpm/100 cm^2 removable.
    - Soil:
      - 100 pCi/g gross detectable beta.
      - 1,000 pCi/g gross detectable beta average below three meters.
      - 3,000 pCi/g gross detectable beta in isolated cracks below three meters.
- In 1983, a survey was conducted of the paved area surrounding the northern portion of Building 4143, which included the drainage path along the north side of the fence.[6]
  - The survey found the area acceptably free of contamination and recommended the area be released for unrestricted use.
  - Maximum soil gross beta activity was 98 pCi/g, with an average of 33 pCi/g.
  - Allowable limits for the survey were as follows:
    - Surfaces:
      - Alpha: 100 dpm/100 cm^2 total, 20 dpm/100 cm^2 removable.
      - Beta: 0.1 mrad/hr at 1 cm through 7 mg/cm^2 absorber, 100 dpm/100 cm^2 removable.
    - Soil:
      - 100 pCi/g gross detectable beta.
- In 1983, a survey was conducted of the paving to the south and west of Building 4143, including the drainage channel along the southwest to the south edge of the paved area.[7]
  - The survey found the area acceptably free of contamination and recommended the area be released for unrestricted use.
  - Soil sampling was not performed in this region.
  - Allowable limits for the survey were as follows:
    - Surfaces:
      - Alpha: 100 dpm/100 cm^2 total, 20 dpm/100 cm^2 removable.
      - Beta: 0.1 mrad/hr at 1 cm through 7 mg/cm^2 absorber, 100 dpm/100 cm^2 removable.
- In 1983, a survey was conducted of the area adjoining Building 4163 to the south east of Building 4143.[8]
  - The survey found the area acceptably free of contamination and recommended the area be released for unrestricted use.

  - Soil sampling was not conducted in this region.
  - Allowable limits for the survey were as follows:
    - Surfaces:
      - Alpha: 100 dpm/100 cm^2 total, 20 dpm/100 cm^2 removable.
      - Beta: 0.1 mrad hr at 1 cm through 7 mg/cm^2 absorber, 100 dpm/100 cm^2 removable.
- ANL performed an independent verification survey in 1984.[9]
  - The survey found that Building 4143 and its surrounding area was decontaminated to below the limits specified in the draft ANSI Standard N13.12 and the NRC Guidelines dated 1982. These levels met the soil cleanup standards at the time and also meet the current DOE and DHS approved soil DCGLs.
  - All isotope-specific soil analyses met the current DOE and DHS approved soil DCGLs.
- In the summer and fall of 2000, the SRE septic tank, leachfield and associated drainage pipes were excavated.[10] Radiological sampling was performed. All radiological measurements of the SRE septic tank, leachfield and surrounds displayed either background levels of radioactivity or levels that were well below the DOE and DHS approved soil cleanup standards
  - Septic tank and associated piping- numerous instrument measurements and wipe measurements were taken of the septic tank and associated piping. No surface activity was detected. Gamma spectroscopy of concrete debris from the septic tank failed to detect any man-made gamma emitting radionuclides.
  - Septic tank and piping contents- the septic tank was full of a mixture of debris and soil. Seven samples were taken of the debris within the septic tank, its inlet pipes and its outlet pipes. Gamma spectroscopy of these samples indicated cesium-137 at levels ranging from non-detect to 2.5 pCi/g. Detected cesium-137 was restricted to the inlet pipes and inlet chamber. Although this material met the DOE and DHS approved cleanup standards for cesium-137 in soil of 9.2 pCi/g, this material was segregated and packaged as radioactive waste per ALARA (as low as reasonably achievable) policy.
  - Soil beneath the septic tank- four soil samples were taken underneath the septic tank. Three samples were non-detect for man-made radionuclides. One sample indicated 0.33 pCi/g of cesium-137. This is similar to background concentrations and much less than the DOE and DHS approved cleanup standards for cesium-137 in soil of 9.2 pCi/g.
  - Leachfield- seven samples of soil/gravel were taken along the length of the leachfield lines (ENV000081, 82, 88, 121 thru 124). Four samples were non-detect. Two samples showed less than 0.1 pCi/g of cesium-137, typical of local background. One sample indicated 0.65 cesium-137, slightly exceeding local background, yet well below the DOE and DHS approved cleanup standards for cesium-137 in soil of 9.2 pCi/g.
- In 2001, soil sampling was conducted at SRE for areas that were being planned for excavation due to high mercury levels.[11] No elevated radiation levels were found in

the area proposed for excavation, but elevated levels were found in two distinct locations in a drainage ditch northeast of the former location of Building 4143.

- In the northern location of the drainage ditch, 13 samples ranged from non-detect to 30.3 pCi/g of Cs-137. Following excavation, confirmation sampling determined DCGLs had been met.
- In the western location of the drainage ditch, 12 samples ranged from non-detect to 9.4 pCi/g of Cs-137. Following excavation, confirmation sampling determined DCGLs had been met.

- In 2001, the DHS conducted soil sampling at the location of elevated soil mercury levels east of the prior SRE location.[12] All radionuclide concentrations met the site-wide release criteria.
  - Cs-137 levels ranged from 0.1 to 0.3 pCi/g.
  - Isotopic uranium analysis was consistent with background, U-238 ranged from 0.77 to 1.4 pCi/g, U-234 ranged from 0.75 to 1.4 pCi/g and isotopic ratios were consistent with non-enriched, naturally occurring uranium.
  - Thorium isotopes ranged from 0.8 to 1.7 pCi/g.
  - Exposure rates varied from 13 to 14.5 μR/hr
- Soil sampling has been conducted at Site 4773, the SRE pond and the results are summarized in the 4773 site summary.

Status:

- DOE released the facility and surrounding soil for unrestricted use in September 1985.[13]
- Building 4143 was demolished in 1999.

References:

1- Rockwell International Report, ESG-DOE-13403, "Sodium Reactor Experiment Decommissioning Final Report," August 15, 1983.
2- SSFL Area IV, ETEC Industrial Planning Maps, 1962-1992.
3- Atomics International Report, NAA-SR-4488, "SRE Fuel Element Damage: An Interim Report," November 30, 1959.
4- Rockwell International Internal Letter, "Fuel Damage in the Sodium Reactor Experiment, July 1959," May 18, 1979.
5- Rockwell International Report, N704TI990038, "Radiological Survey Results – Release to Unrestricted Use, SRE, Building 143," May 31, 1983.
6- Rockwell International Report, N704TI990035, "Radiological Survey Results – Release to Unrestricted Use, SRE Region IX," May 31, 1983.
7- Rockwell International Report, N704TI990034, "Radiological Survey Results – Release to Unrestricted Use, SRE Region VIII," May 13, 1983.
8- Rockwell International Report, N704TI990029, "Radiological Survey Results – Release to Unrestricted Use, SRE Region III," May 13, 1983.
9- Argonne National Laboratory Document, DOE-EV-0005-46, "Post Remedial Action Survey Report for the Sodium Reactor Experiment (SRE) Facility," February 1984.

10- Boeing Letter, 2001 RC-03853, “Information Regarding Permit – Septic Tank and Leachfield,” from P. Rutherford (Boeing) to J. Evans (Ventura County Environmental Health Division), October 23, 2001.
11- Boeing Letter, “Request for Approval to Ship Soil from SRE to a Landfill,” from Phil Rutherford (Boeing) to Stephen Hsu (DHS-RHB), September 25, 2001.
12- DHS Report, “Preliminary Radiological Survey of Mercury Contaminated Soils East of the Former SRE Building – Survey date: July 26, 2001,” November 19, 2002.
13- DOE-OAK, Letter, “Certification Docket for the SRE and Building 003,” from James K. Hartman (DOE/OAK) to G.W. Meyers, September 24, 1985.
14- Historical Site Photographs from Boeing Database.

Photograph – Building 4143

Site Summary – Building 4153

Site Identification:

Building 4153
SRE Sodium Service Building

Operational Use/History:

- Constructed in the late 1950s or early 1960s.
- This facility served as a sodium service building, for the SRE and contained the sodium service system.[1]
    - The main elements of the sodium service system in Building 4153 included: a 2,620-gallon secondary fill tank, a diffusion cold trap attached to the bottom of the secondary fill tank, an 80-gallon transfer tank, a sodium melt station, piping and valves, a freeze trap, electrical controls and a switch gear.[1]
        - As part of the overall Atomics International (AI) D&D Program, during 1975 the sodium brake, the cold trap, piping and the sodium coils in the air blast heater exchanger were removed from the secondary sodium system.[1]
        - By 1975, the secondary fill tank had been drained except for a trap containing solid sodium. After the trap was cut loose, the sodium was treated in Building 4163.
- This facility was demolished prior to 1977.
    - The building, concrete pad and footings were excavated to provide access for excavation equipment into the main SRE building (Building 4143). [2]

Site Description:

- Building 4153 was located just north of the SRE reactor building, near Building 4695.[3]

Relevant Site Information:

- Records do not indicate that radioactive materials were handled in Building 4153.

Radiological Surveys:

- In 1983, a radiological survey of the region was conducted as part of the Building 4143 survey. The scope of the survey included the former location of 4153.[4]
    - The survey found that the area was acceptably free of contamination and recommended it be released for unrestricted use.
        - Allowable limits for the survey applicable to this facility were as follows:
            - Surfaces:

        - Alpha: 100 dpm/100 cm^2 total, 20 dpm/100 cm^2 removable;
        - Beta: 0.1 mrad/hr at 1 cm through 7 mg/cm^2 absorber, 100 dpm/100 cm^2 removable.
    - Soil:
        - 100 pCi/g gross detectable beta.
        - 1,000 pCi/g gross detectable beta average below three meters.
        - 3,000 pCi/g gross detectable beta in isolated cracks below three meters.
  - The maximum surface beta contamination measurement for the entire region was 0.05 mrad/hr.
  - The maximum soil gross beta activity was 31.6 pCi/g, with an average of 22 pCi/g.
- ANL performed an independent verification survey in 1984 as part of the SRE verification survey.[5] Results of the survey indicated the former location of Building 4153 was below the limits specified in the draft ANSI Standard N13.12 and the NRC Guidelines dated 1982.

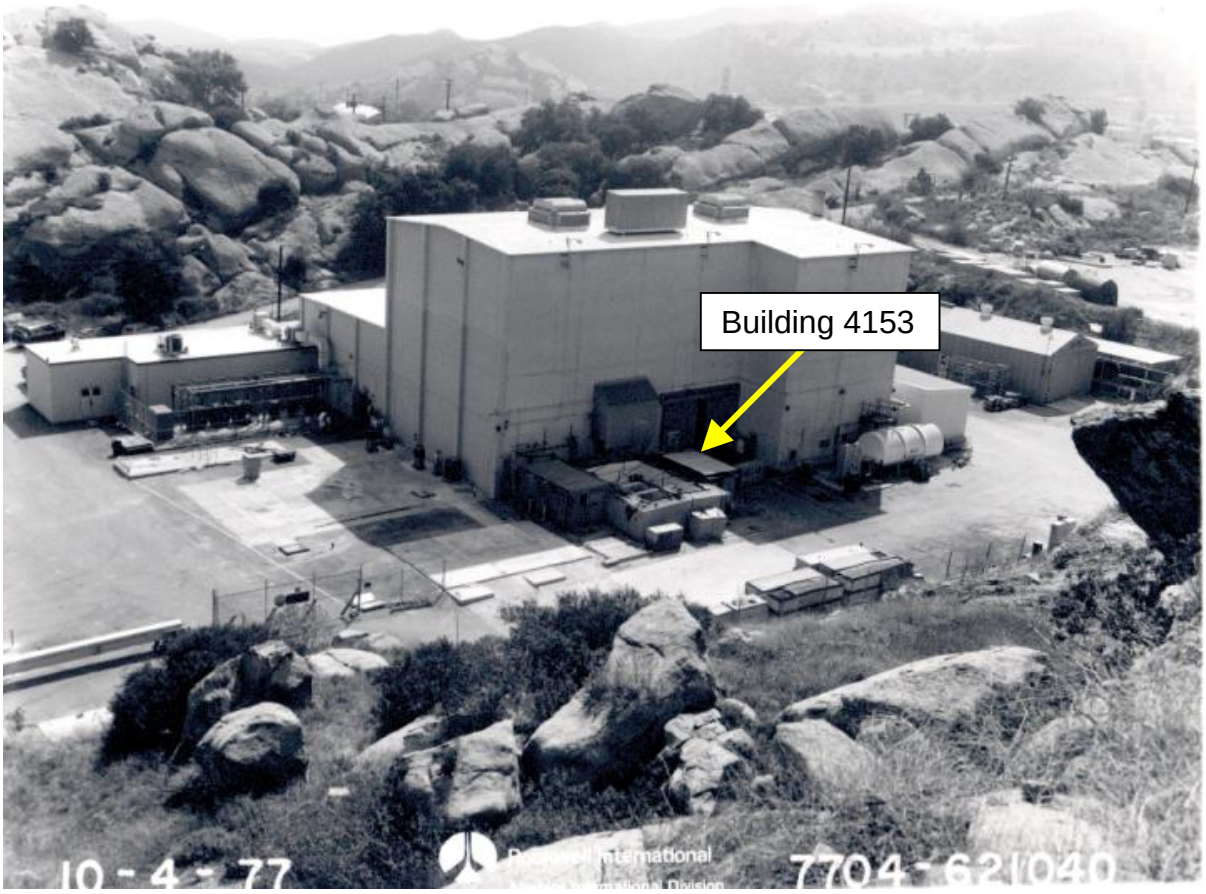
Status:

- DOE released Building 4153 for unrestricted use as a part of the SRE release in September 1985.[6]
- Building 4153 was demolished prior to 1977.

References:

1- Decontamination & Disposition of Facilities Program (Rockwell International) Document, FDP-704-990-003, "Facilities Dismantling Plan for SRE," June 24, 1975.
2- Rockwell International Report, ESG-DOE-13403, "Sodium Reactor Experiment Decommissioning Final Report," August 15, 1983.
3- SSFL Area IV, ETEC Industrial Planning Maps, 1962-1992.
4- Rockwell International Report, N704TI990035, "Radiological Survey Results – Release to Unrestricted Use, SRE Region IX," May 31, 1983.
5- Argonne National Laboratory Document, DOE-EV-0005-46, "Post Remedial Action Survey Report for the Sodium Reactor Experiment (SRE) Facility," February 1984.
6- DOE/OAK, Letter, "Certification Docket for the SRE and Building 003," from James K. Hartman (DOE/OAK) to G.W. Meyers, September 24, 1985.
7- Historical Site Photographs from Boeing Database.

Photograph – Building 4153



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Site Summary – Building 4163

Site Identification:

Building 4163
Site Service Building
Component Equipment Repair Facility (CERF)
Box Shop

Operational Use/History:

- Constructed in 1958.
- The west end of Building 4163 was designated for repair of radiologically contaminated equipment.[1]
- The east end was used for construction of wooden shipping containers and non-nuclear support work. It contains a pipe shop and machine shop.[1]
- D&D of the CERF Building 4163 began in October of 1981, and the building was available for release for unrestricted use on March 2, 1982.[2]
    - Major operations performed included the removal of the 5-ton overhead bridge crane, the radioactive exhaust system, all aluminum wainscot interior walls, and the scrabbling of the floor area. All radioactive-contaminated equipment was packaged and shipped offsite.[3]
- Demolished in 1999.

Site Description:

- Building 4163 was located in the SRE complex, approximately 50 feet northeast of the main building. The structure was separated into two sections; the first was the CERF. The CERF was a Butler building structure, approximately 40 feet by 40 feet. A floor-to-ceiling sheetrock wall separated the CERF from the remainder of Building 4163 (Box Shop). The Box Shop was used for various non-nuclear support activities and was approximately 3,200 square feet.[3,4] The building was initially connected to a leach field system until it was closed and abandoned once the site-wide sewage treatment system was installed and operational in the early 1960s.

Relevant Site Information:

- A 1981 Radiological Survey Plan for SRE lists the west end of Building 4163 (CERF) as one of the "SRE support facilities that must be considered as radiologically hazardous."[5]
- Various radiological incidents occurred throughout the operation of the facility. Several incidents may have resulted in releases to the environment:

- On December 7, 1964, an employee cut into a contaminated glove box, which began to smoke. This smoke, containing high airborne radiation, was released from the glove box, contaminating several workers (A0461).
- On December 21, 1964, an employee used a skill saw to cut into a contaminated wooden crib used in the disposition of the SRE Main Intermediate Heat Exchanger. Contaminated sawdust from cutting became airborne; however, surveys following the incident indicate no release above acceptable levels occurred (A0385).
- On November 1, 1966, cleaning of a primary sodium valve resulted in an explosion and spread of Cs-137, Na-22, Sr-90 and Y-90 airborne contamination at a level of 2×10^{-9} µC/cc. Following this incident, Building 4163 was decontaminated to acceptable levels (A0600).

Radiological Surveys:

- In 1978, a radiological survey of the east end and outside accessible areas was conducted. They paid particular attention to the areas where contamination may have migrated from the contaminated (west) side of the building.[1]
  - The survey found that the east end of Building 4163 and outside areas were acceptably free of contamination and recommended the areas be released for unrestricted use.
    - Allowable limits for the survey for surfaces were:
      - Beta: 0.1 mrad/hr at 1 cm through 7 mg/cm^2 absorber, 100 dpm/100 cm^2 removable.
    - Results for removable contamination inside the building were all below 30 dpm beta-gamma (the area was not subject to contamination by alpha emitting radionuclides).
    - An average reading of 0.06 mrad/hr was recorded outside Building 4163.
  - The scope of the survey did not include soil sampling because asphalt paving covered the region.
- In 1982, a radiological survey of the building was performed.[3]
  - Decontamination of the west end of Building 4163 was performed during 1981 and 1982 including:
    - Removal of the 5-ton overhead bridge crane, the radioactive exhaust system, all aluminum wainscot interior walls and the scabbling of the floor area.
  - The survey found that the west end of Building 4163 and outside areas were acceptably free of contamination and recommended the area be released for unrestricted use.
  - Allowable limits for the survey are as follows:
    - Surfaces:
      - Alpha: 100 dpm/100 cm^2 total, 20 dpm/100 cm^2 removable.

        - Beta: 0.1 mrad hr at 1 cm through 7 mg/cm^2 absorber, 100 dpm/100 cm^2 removable.
    - Soil:
        - 100 pCi/g gross detectable beta.
  - Removable contamination was found to be less than 20 dpm alpha and less than 75 dpm beta-gamma in all cases.
  - All surface radiation readings were below 0.1 mrad/hr.
  - Soil samples were taken from an SRE operations mockup pit that was discovered in the building. All samples contained activity less than 30 pCi/g.
  - All concrete samples that were collected contained activity less than 25 pCi/g.
- ANL performed an independent verification survey in 1984 as a part of the SRE verification survey.[6] Results of the survey indicated Building 4163 and its surrounding area was decontaminated to below the limits specified in the draft ANSI Standard N13.12 and the NRC Guidelines dated 1982.
- In 1996, surveys found the following contamination levels:[7]
    - Maximum removable beta: 300 dpm/100cm2 (found on the overhead crane rails).
    - The fixed contamination level on the floor surface of Building 4163 was 5 mrad/hr.
- Most of the contamination was imbedded in the floor and wall construction materials and had been fixed in place by painting over the contaminated surfaces.
- The drainage lines, septic tank and leachfield were excavated in 2001 and surveyed for radioactive contamination (See Building 4143 site summary for more information).

Status:

- DOE released the facility and surrounding soil for unrestricted use as a part of the SRE release in September 1985.[2]
- Building 4163 was demolished in 1999.

References:

1- Rockwell International Report, N704TI990028, "Radiological Survey Results – Release to Unrestricted Use, SRE Region II (Building 163, Box Shop)," May 4, 1978.
2- DOE/OAK, Letter, "Certification Docket for the SRE and Building 003," from James K. Hartman (DOE/OAK) to G.W. Meyers, September 24, 1985.
3- Rockwell International Report, N704TI990039, "Radiological Survey Results – Release to Unrestricted Use, SRE, Building 163," April 8, 1982.
4- SSFL Area IV, ETEC Industrial Planning Maps, 1962-1992.
5- Rockwell International Report N704TP990008, "Radiological Survey Plan, Support of D&D Operations at T-143 (SRE)," September 15, 1981.

6- Argonne National Laboratory Document, DOE-EV-0005-46, “Post Remedial Action Survey Report for the Sodium Reactor Experiment (SRE) Facility,” February 1984.
7- Rockwell International Document, Decontamination & Disposition of Facilities Program, FDP-704-990-003, “Facilities Dismantling Plan for SRE,” June 24, 1975.
8- Historical Site Photographs from Boeing Database.

Photograph – Building 4163

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Site Summary – Building 4183

Site Identification:

Building 4183
Fire Pump Building

Operational Use/History:

- Constructed in the late 1950s.
- This facility served as the fire pump building for the SRE complex.
- Demolished in 1999.

Site Description:

- Building 4183 was a small (less than 1,000 square feet) structure located northeast of Building 4143.[1,2]

Relevant Site Information:

- No records indicate that radioactive material was handled in Building 4183.

Radiological Surveys:

- In 1983, a radiological survey of the region was conducted as part of the SRE Survey.[3]
    - The survey found that the area was acceptably free of contamination and recommended it be released for unrestricted use.
        - Allowable limits for the survey applicable to this facility were as follows:
            - Surfaces:
                - Beta: 0.1 mrad/hr at 1 cm through 7 mg/cm^2 absorber.
            - Soil:
                - 100 pCi/g gross detectable beta.
        - The average soil gross beta activity for the region was 0.01 mrad/hr, with all readings below 0.1 mrad/hr.
        - The maximum soil gross beta activity for the region was 28 pCi/g with an average of 25 pCi/g.
- ANL performed an independent verification survey in 1984 as part of the SRE verification survey.[4] Results of the survey indicated Building 4183 and the surrounding area was decontaminated to below the limits specified in the draft ANSI Standard N13.12 and the NRC Guidelines dated 1982.

Status:

- DOE released Building 4183 and the surrounding soil for unrestricted use as a part of the SRE release in September 1985.[5]
- Building 4183 was demolished in 1999.

References:

1- SSFL Area IV, ETEC Industrial Planning Maps, 1962-1992.
2- Historical Site Photographs from Boeing Database.
3- Rockwell International Report, N704TI990036, "Radiological Survey Results – Release to Unrestricted Use, SRE Region X," May 31, 1983.
4- Argonne National Laboratory Document, DOE-EV-0005-46, "Post Remedial Action Survey Report for the Sodium Reactor Experiment (SRE) Facility," February 1984.
5- DOE/OAK, Letter, "Certification Docket for the SRE and Building 003," from James K. Hartman (DOE/OAK) to G.W. Meyers, September 24, 1985.

Photograph – Building 4183

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Site Summary – Building 4184

Site Identification:

Building 4184
SRE Battery Room and Diesel Generator Canopy

Operational Use/History:

- Constructed in the late 1950s.
- This facility served as the battery room and diesel generator canopy for the SRE.
- Demolished prior to 1975.

Site Description:

- Building 4184 was a small (less than 1,000 square feet) structure located northeast of Building 4143, between Buildings 4183 and 4185.[1]

Relevant Site Information:

- It is not likely radioactive material was handled at Building 4184.[2]

Radiological Surveys:

- In 1983, a radiological survey of the region was conducted as part of the SRE Survey.[2]
    - The survey found that the area was acceptably free of contamination and recommended it be released for unrestricted use.
        - Allowable limits for the survey applicable to this region were as follows:
            - Surfaces:
                - Alpha: 100 dpm/100 cm^2 total, 20 dpm/100 cm^2 removable.
                - Beta: 0.1 mrad/hr at 1 cm through 7 mg/cm^2 absorber, 100 dpm/100 cm^2 removable.
            - Soil:
                - 100 pCi/g gross detectable beta.
            - Water:
                - 3×10^{-7} µCi/ml gross detectable beta.
        - All survey results were below the allowable limits.
        - The average soil gross beta activity for the region was 29 pCi/g, with a maximum of approximately 90 pCi/g.
- ANL performed an independent verification survey in 1984 as part of the SRE verification survey.[3] The survey found that the former Building 4184 area was

decontaminated to below the limits specified in the draft ANSI Standard N13.12 and the NRC Guidelines dated 1982.

Status:

- DOE released the facility and surrounding soil for unrestricted use as a part of the SRE release in September 1985.[4]
- Building 4184 was demolished prior to 1975.

References:

1- SSFL Area IV, ETEC Industrial Planning Maps, 1962-1992.
2- Rockwell International Report, N704TI990033, "Radiological Survey Results – Release to Unrestricted Use, SRE Region VII," May 13, 1983.
3- Argonne National Laboratory Document, DOE-EV-0005-46, "Post Remedial Action Survey Report for the Sodium Reactor Experiment (SRE) Facility," February 1984.
4- DOE/OAK, Letter, "Certification Docket for the SRE and Building 003," from James K. Hartman (DOE/OAK) to G.W. Meyers, September 24, 1985.

Site Summary – Building 4185

Site Identification:

Building 4185
Steam Generator Control Building

Operational Use/History:

- Constructed in the late 1950s.[1]
- This facility served as the steam generator control building for the SRE area.[1]
- Demolished in the early 1970s.
    - The remaining concrete pad was removed in 1998.

Site Description:

- Building 4185 was a small (less than 1,000 square feet) structure located northeast of Building 4143.[2]
    - On the 1983 Industrial Planning Map, a structure south of Building 4005, is referred to as Building 4185, but all other records indicate Building 4185 was located in the SRE complex.[2,3]

Relevant Site Information:

- It is not likely that radioactive material was handled at Building 4185.

Radiological Surveys:

- Maps included in the SRE survey reports indicate that the site of Building 4185 may have been split between survey regions.[4]
- In 1983, a radiological survey of the region was conducted as part of the SRE survey. This survey was denoted as SRE Region IX; Industrial Planning Maps indicate that it covered the west half of the former building site.[4]
    - The survey found that the area was acceptably free of contamination and recommended it be released for unrestricted use.
        - Allowable limits for the survey applicable to this region were as follows:
            - Surfaces:
                - Alpha: 100 dpm/100 cm^2 total.
                - Beta: 0.1 mrad/hr at 1 cm through 7 mg/cm^2 absorber.
            - Soil:
                - 100 pCi/g gross detectable beta.
        - All survey results were below the allowable limits.

        - It was decided that smear surveys were not applicable because of the absence of suitable surfaces to smear.
        - The average surface beta contamination measurement for the region was 0.04 mrad/hr.
        - The maximum soil gross beta activity was 98 pCi/g, with an average of 33 pCi/g.
- In 1983, a radiological survey of the region was conducted as part of the SRE survey. This survey was denoted as SRE Region X, and Industrial Planning Maps indicate that it included the east half of the former building site.[5]
    - The survey found that the area was acceptably free of contamination and recommended it be released for unrestricted use.
        - Allowable limits for the survey applicable to this region were as follows:
            - Surfaces:
                - Alpha: 100 dpm/100 cm^2 total.
                - Beta: 0.1 mrad/hr at 1 cm through 7 mg/cm^2 absorber.
            - Soil:
                - 100 pCi/g gross detectable beta.
        - All survey results were below the allowable limits.
        - It was decided that smear surveys were not applicable because of the absence of suitable surfaces to smear.
        - The maximum soil gross beta activity was 28 pCi/g, with an average of 25 pCi/g.
- ANL performed an independent verification survey in 1984 as part of the SRE verification survey.[6]
    - The survey found that the former Building 4184 area was decontaminated to below the limits specified in the draft ANSI Standard N13.12 and the NRC Guidelines dated 1982.

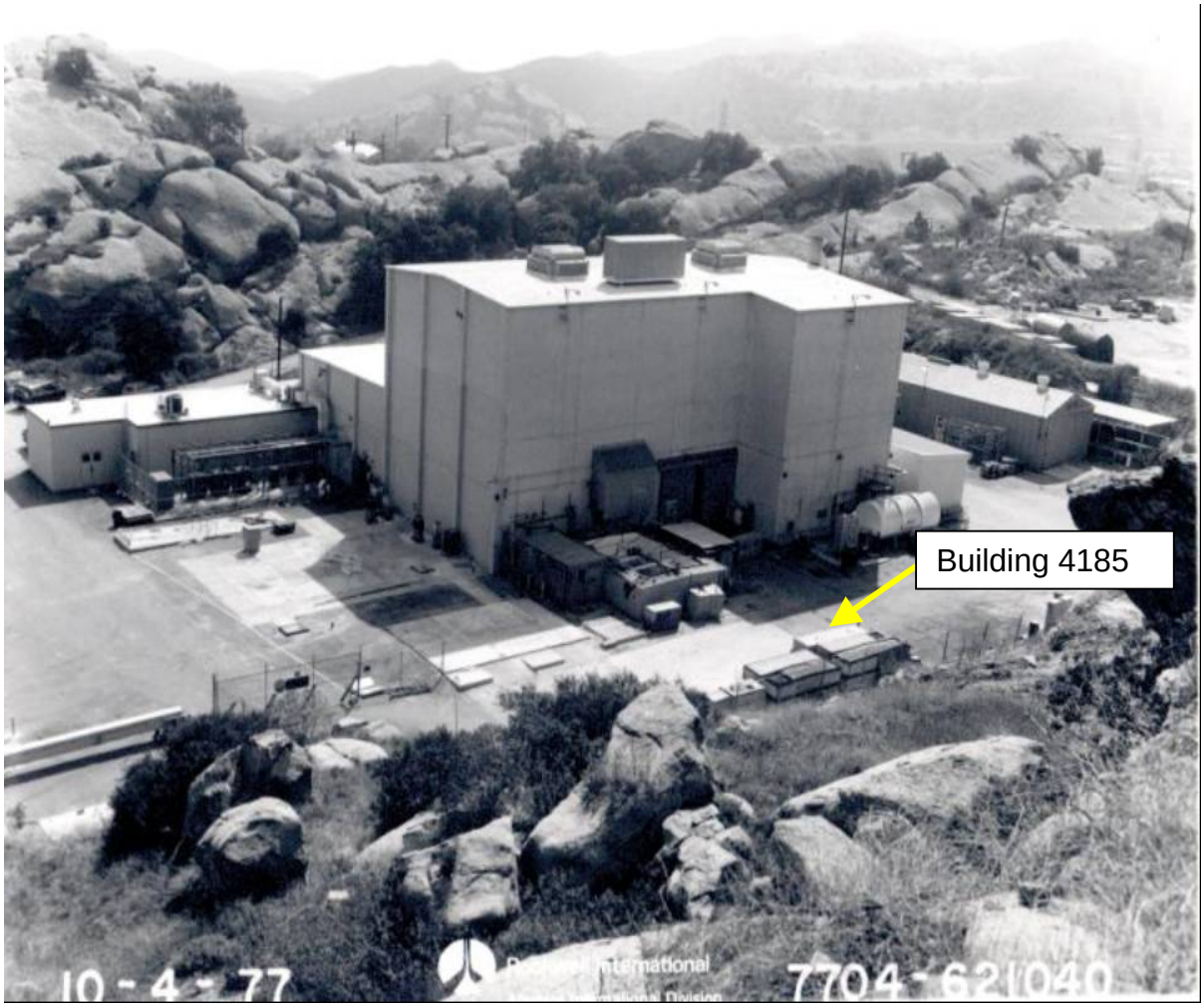
Status:

- DOE released the facility and surrounding soil for unrestricted use as a part of the SRE release in September 1985.[1]
- Building 4184 was demolished in the early 1970s.

References:

1- DOE/OAK, Letter, "Certification Docket for the SRE and Building 003," from James K. Hartman (DOE/OAK) to G.W. Meyers, September 24, 1985.
2- Historical Site Photographs from Boeing Database.
3- SSFL Area IV, ETEC Industrial Planning Maps, 1962-1992.
4- Rockwell International Report, N704TI990035, "Radiological Survey Results – Release to Unrestricted Use, SRE Region IX," May 31, 1983.
5- Rockwell International Report, N704TI990036, "Radiological Survey Results – Release to Unrestricted Use, SRE Region X," May 31, 1983.
6- Argonne National Laboratory Document, DOE-EV-0005-46, "Post Remedial Action Survey Report for the Sodium Reactor Experiment (SRE) Facility," February 1984.

Photograph – Building 4183



Site Summary – Building 4505

Site Identification:

Building 4505
Storage Area

Operational Use/History:

- Constructed prior to 1958.
- Building 4505 served as a storage area near SRE.[1] There are no records of what was stored here; however, given the proximity to SRE, radiological materials may have been stored here.
- Demolished prior to 1980.
    - The remaining concrete pad was removed in the late 1990s.

Site Description:

- Building 4505 was a small (approximately 600-800 square feet) storage shed located just northeast of Building 4163 in the SRE complex.[1, 2]

Relevant Site Information:

- It is not likely that radioactive material was handled at Building 4505.

Radiological Surveys:

- In 1978, a radiological survey of the region was conducted as part of the SRE Survey.[3]
    - The survey found that the area was acceptably free of contamination and recommended it be released for unrestricted use.
        - Allowable limits for the survey applicable to this facility were as follows:
            - Surfaces:
                - Beta: 0.1 mrad/hr at 1 cm through 7 mg/cm^2 absorber, 100 dpm/100 cm^2 removable.
        - The area was not subject to alpha contamination. Removable beta-gamma contamination was all below 100 dpm/100 cm^2.
        - The average surface beta contamination measurement for the region was 0.06 mrad/hr, with all readings below 0.1 mrad/hr.
        - The scope of the survey did not include soil sampling because asphalt paving covered the region.
- ANL performed an independent verification survey in 1984 as part of the SRE verification survey.[4] Results of the survey indicated the concrete pad remaining from

Building 4505 was below the limits specified in the draft ANSI Standard N13.12 and the NRC Guidelines dated 1982.

Status:

- DOE released the area for unrestricted use as a part of the SRE release in September 1985.[5]
- The building itself was demolished prior to 1980. The remaining concrete pad was demolished in the late 1990s.

References:

1- SSFL Area IV, ETEC Industrial Planning Maps, 1962-1992.
2- Historical Site Photographs from Boeing Database.
3- Rockwell International Report, N704TI990028, "Radiological Survey Results – Release to Unrestricted Use, SRE Region II (Building 163, Box Shop)," May 4, 1978.
4- Argonne National Laboratory Document, DOE-EV-0005-46, "Post Remedial Action Survey Report for the Sodium Reactor Experiment (SRE) Facility," February 1984.
5- DOE/OAK, Letter, "Certification Docket for the SRE and Building 003," from James K. Hartman (DOE/OAK) to G.W. Meyers, September 24, 1985.

Photograph – Building 4505

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Site Summary – Building 4653

Site Identification:

Building 4653
Interim Radioactive Waste Vault

Operational Use/History:

- Constructed in the late 1950s.
- During the operation of the SRE, this facility served as a liquid and gaseous radioactive waste holdup and decay system. All liquid waste generated by the reactor program was eventually directed to this facility prior to final disposal.[1]
- Demolished and backfilled prior to 1978.

Site Description:

- Building 4653 contained liquid and gaseous waste holdup systems, including four underground gas and two liquid holdup tanks buried on the hillside, plus several concrete vaults that housed compressors and associated piping systems. Two auxiliary vaults held ten 50-gallon holdup tanks.[2]
- "As built" drawings and photographs indicate that Building 4653 was connected to SRE by piping.[3,4]

Relevant Site Information:

- Radioactive waste was present at this facility, primarily in the form of mixed fission products and activation products.[1]
    - Decontamination work was conducted prior to 1978, and included removal of all buried tanks and associated pipes, removal of contaminated soil and scabbling of contaminated concrete within one of the vaults.
    - Remaining clean concrete was used as backfill to help stabilize the hillside, though no visual evidence of backfilling exists in this area.

Radiological Surveys:

- In 1978, a radiological survey of the region was conducted as part of the SRE survey.[2]
    - The survey found that the area was acceptably free of contamination and recommended it be released for unrestricted use.
        - Allowable limits for the survey applicable to this region were as follows:
            - Surfaces:
                - Alpha: 100 dpm/100 cm^2 total.
                - Beta: 0.1 mrad/hr at 1 cm through 7 mg/cm^2 absorber.

        - Soil:
            - 100 pCi/g gross detectable beta.
        - All survey results were below the allowable limits.
        - It was decided that smear surveys were not applicable, because of the absence of suitable surfaces to smear.
        - The maximum surface beta contamination measurement for the region was 0.08 mrad/hr.
        - Soil gross beta activity ranged between 6.6 pCi/g and 40.2 pCi/g.
- ANL performed an independent verification survey in 1984 as part of the SRE verification survey.[5]
    - The survey found that the former Building 4653 area was decontaminated to below the limits specified in the draft ANSI Standard N13.12 and the NRC Guidelines dated 1982.

Status:

- DOE released the facility and surrounding soil for unrestricted use as a part of the SRE release in September 1985.[1]
- Building 4653 was demolished prior to 1978.

References:

1- DOE/OAK, Letter, "Certification Docket for the SRE and Building 003," from James K. Hartman (DOE/OAK) to G.W. Meyers, September 24, 1985.
2- Rockwell International Report, N704TI990031, "Radiological Survey Results – Release to Unrestricted Use, SRE Region V," November 2, 1978.
3- Historical Site Photographs from Boeing Database.
4- SSFL Area IV, ETEC Industrial Planning Maps, 1962-1992.
5- Argonne National Laboratory Document, DOE-EV-0005-46, "Post Remedial Action Survey Report for the Sodium Reactor Experiment (SRE) Facility," February 1984.

Photograph – Building 4653

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Site Summary – Building 4654

Site Identification:

Building 4654
Interim Storage Facility

Operational Use/History:

- Constructed in 1958.
- Originally constructed to store dummy and spent fuel elements, shipping/storage casks and radiological waste generated at the SRE, the Organic Moderated Reactor (OMR), and SNAP programs.[1]
- Demolished and decommissioned in 1985.[1]

Site Description:

- Building 4654 was a below-ground concrete structure on which eight storage tubes were anchored. The tubes extended into holes in the bedrock and were embedded with drilling mud. A paved fenced-in pad adjacent to the storage tubes served as a storage area.[2]

Relevant Site Information:

- During excavation, a hydraulic hammer mounted on a backhoe punctured one of the storage tubes. The storage tube and surrounding area were surveyed and found to be free of contamination.[1]
- Several incidents are recorded for this facility that could have involved releases of radioactivity to the environment:
    - On January 23, 1962, contamination from equipment stored outside spread from inside the fenced area to asphalt outside the fence. Samples indicated contamination levels ranged from 2 mrad/hr to 17 mrad/hr. No decontamination was conducted (A0014).
    - On July 5, 1979, contaminated shipping casks stored in the area were found to be emitting high levels of radiation (up to 35 mR/hr) (A0079).

Radiological Surveys:

- Building 4654 was decommissioned and demolished in 1985.[1]
    - Activities included: removal of surface and imbedded contamination, excavation and removal of fuel storage tubes and restoration of site to natural grade. Waste was packaged and shipped to DOE-Hanford for burial.
- Rocketdyne performed a Phase I Radiation Survey during and after the D&D effort in 1984-85.[1]

  - The survey found that all surface contamination had been removed in the D&D effort and all radiation levels were within acceptable limits.
  - Samples (soil samples, radioactive analysis and in situ gamma radiation surveys) were taken and no measurable contamination was found in any of the logical paths of contaminant migration.
  - Soil samples were taken during excavation and at maximum depth during D&D. While some were found to be contaminated with Cs-137 (the only non-naturally occurring isotope encountered) all contamination was found to be below 2.0 pCi/g or 36 pCi/g maximum beta activity (release criterion 100 pCi/g gross detectable beta activity).
  - After D&D was completed, a statistical survey of the surface was done. The instrumentation was susceptible to sky shine and the adjusted mean exposure rate found was 12 µR/hr compared to a background level of 10 µR/hr (NRC guideline is 5 µR/hr above background).
- In 1988, Rocketdyne collected and analyzed six soil samples just to the north of Building 4654.[3] The samples were analyzed for gross alpha and gross beta. All measurements were below soil release limits, however some appeared to be higher than background.
  - Values were 7.4 to 37 pCi/g (gross alpha) and 33 to 52 pCi/g (gross beta).
- ORISE performed a document review in 1996.
  - Initial review of documentation in 1996 found that the documents available did not provide all of the information necessary for a reviewer to independently assess the status of the buildings or outside areas, relative to DOE guidelines for release for unrestricted use.[4]
  - Effectiveness of the gamma exposure rate survey was compromised by sky shine from the Radioactive Materials Disposal Facility (RMDF). ORISE recommended a 100% direct qualitative scan for gamma exposure rate followed by surface soil sampling.[5]
  - At the time of the Independent Verification Survey (IVS) review, the subsurface soil was not accessible for sampling. ORISE recommended sampling of subsurface soil throughout the depth of excavation.[5]
- ORISE performed an IVS in 1997.[6]
  - In surface scans of the site and beta-gamma scans of the extracted sample cores, no elevated direct radiation resulting from residual contamination was found.
  - Exposure rates at the Interim Storage Facility were 15 µR/hr compared with background rates between 12 and 16 µR/hr with an average of 14 µR/hr. NRC limit is 5 µR/hr above background.
  - Radionuclide concentrations from 4 surface samples and 12 surfaces sub-surface borehole samples:
    - Ra-266: less than 0.61 to 1.254 pCi/g (background: 0.20 to 1.19 pCi/g).
    - Th-232: 0.67 to 1.94 pCi/g (background: 0.56 to 1.72 pCi/g).
    - U-235: less than 0.84 pCi/g (background: less than 0.13 pCi/g).

        - U-238: less than 2.35 pCi/g (background: less than 2.15 to 2.54 pCi/g).
        - Activation and fission products: less than the minimum detectable concentration (MDC) of 1.50 pCi/g for Cr-51 (background: all less than respective MDC).
        - Cs-137 detected above MDC: less than 0.22 to 0.43 pCi/g.
        - Borehole composite samples: all less than MDC for Sr-90: 0.39 to 0.55 pCi/g.
    - ORISE concluded that the site could be released for unrestricted use.
- Rocketdyne performed a Supplemental Final Status Survey in 1997 and finalized the report in 1999.[5]
    - Ninety-three surface soil samples were taken. Cs-137 ranges from 0.02 to 6.99 pCi/g, less than the DCGL of 9.2 pCi/g. The maximum Sr-90 sample was 1.3 pCi/g, less than the DCGL of 36 pCi/g.
    - The survey concluded that the site was suitable for release for unrestricted use.
- DHS performed verification sampling in 1997.
- In August 2002, twenty soil samples were collected in Grid Blocks S-19 and T-19, neighboring Building 4654.[7] Sampling was conducted as a follow up to the 1988 survey results and the Area IV survey results. It was suspected that this area was used for storage of materials from SRE operations.
    - Sixteen of the samples had values greater than background; the highest value was 4.9 pCi/g of Cs-137
- In June 2003, twenty-two soil samples were collected in Grid Blocks S-19 and T-19, neighboring Building 4654. [8, 9] Sampling was conducted as a follow up to the 1988 survey results. It was suspected that this area was used for storage of materials from SRE operations.
    - In twenty-one samples Cs-137 ranged from non-detect to 4 pCi/g. The value of one sample was 15.1 pCi/g, which exceeded the DCGL of 9.2 pCi/g. Coincident surveys using a GPS radiation survey cart confirmed that the elevated Cs-137 was localized to approximately 15 ft x 15 ft.. This area was excavated per ALARA policy. Post remedial samples confirmed contamination had been removed.
    - Other radionuclides analyzed were Am-241 (all non-detect), Co-60 (21 non-detect, 1 sample 0.5 pCi/g), Pu-238 (all non-detect), Pu-239 (21 non-detect, one sample 0.04 pCi/g), and Sr-90 (two samples were 1.2 and 0.9 pCi/g, the rest were non-detect). Uranium and thorium were at background levels.

Status:

- Building 4654 was demolished in 1985.[1]
- A certification docket has been submitted to DOE.[2]
- On February 1, 2005 DOE provided a letter to Boeing declaring that Boeing and ORISE surveys had confirmed that DOE and DHS approved soil cleanup limits had been met, and that the 4654 site was suitable for release for unrestricted use.[10]

References:

1- Boeing Document, EID-04364, "Final Report Decontamination and Decommissioning of Interim Storage Facility 4654," May 27, 1999.
2- DOE Document, DOE/CD-ETEC-654, "Draft Docket for the Release of Building 4654 at the Energy Technology Engineering Center," May 1999.
3- Rocketdyne Document, A4CM-AN-0003, "Radiological Characterization Plan, Area IV, SSFL," March 30, 1994.
4- ORISE, Letter, "Comments on the Final Status Survey Documentation for the Interim Storage Facility; Buildings T013, T019, T024, T030, and T641; the Storage Yard West of Buildings T626 and T038; and the NW Area; Santa Susana Field Laboratory, Ventura County, California," from Timothy Vitkus (ORISE) to Don Williams, January 11, 1996.
5- ETEC Document, RS-00004, "Building T654 Supplemental Final Radiological Survey Report," January 30, 1999.
6- ORISE Document, ORISE 97-1900, "Verification Survey of the Interim Storage Facility (T654), Santa Susana Field Laboratory, Rockwell International, Ventura County, California," November 1997.
7- Boeing Document, RD02-148-01, "Site Environmental Report for Calendar Year 2002 DOE Operations at The Boeing Company, Rocketdyne Propulsion & Power," September 2003.
8- Boeing Document, RD04-170, "Site Environmental Report for Calendar Year 2003 DOE Operations at The Boeing Company, Rocketdyne Propulsion & Power," September 2004.
9- Boeing Internal Letter, "Grid S19/T19 Interim Soil Remediation," from E.R McGinnis to B. D. Sujata, November 19, 2003.
10- DOE Letter, "Release of Building 4654," from M. Lopez (DOE) to M. Lee (Boeing), February 1, 2005.
11- Historical Site Photographs from Boeing Database.
12- SSFL Area IV, ETEC Industrial Planning Maps, 1962-1992.

Photograph – Building 4654 (Note: Structure is subgrade)

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Site Summary – Building 4684

Site Identification:

Building 4684
Steam Generator Pad

Operational Use/History:

- Constructed in the late 1950s.
- This facility contained non-radioactive systems associated with the production of electricity by Southern California Edison.
- Demolished in the late 1970s.

Site Description:

- Building 4684 was a concrete pad (less than 2,000 square feet) with various systems involved in the production of electricity installed on it.[1,2,3]

Relevant Site Information:

- Radiological material was not handled at Building 4684.

Radiological Surveys:

- Building 4684 was split between three SRE survey regions.[4]
- In 1978, a radiological survey of the region was conducted as part of the SRE survey. This survey was denoted as SRE Region II, and contained a portion of Building 4684.[5]
    - The survey found that the area was acceptably free of contamination and recommended it be released for unrestricted use.
        - Allowable limits for the survey applicable to this region were as follows:
            - Surfaces:
                - Beta: 0.1 mrad/hr at 1 cm through 7 mg/cm^2 absorber, 100 dpm/100 cm^2 removable.
        - All survey results were below the allowable limits.
        - The average beta surface contamination for the region was 0.06 mrad/hr.
        - Soil samples were not taken since the region was covered in asphalt.

- In 1983, a radiological survey of the region was conducted as part of the SRE survey. This survey was denoted as SRE Region VII, and contained a portion of Building 4684. The survey found that the area was acceptably free of contamination and recommended it be released for unrestricted use.[6]
    - Allowable limits for the survey applicable to this region were as follows:
        - Surfaces:
            - Alpha: 100 dpm/100 cm^2 total, 20 dpm 100 cm^2 removable.
            - Beta: 0.1 mrad/hr at 1 cm through 7 mg/cm^2 absorber, 100 dpm/100 cm^2 removable.
        - Soil:
            - 100 pCi/g gross detectable beta.
        - Water:
            - 3 x 10^{-7} µCi/ml gross detectable beta.
    - All survey results were below the allowable limits.
- In 1983, a radiological survey of the region was conducted as part of the SRE survey. This survey was denoted as SRE Region X, and contained a portion of Building 4684.[6]
    - The survey found that the area was acceptably free of contamination and recommended it be released for unrestricted use.
        - Allowable limits for the survey applicable to this region were as follows:
            - Surfaces:
                - Alpha: 100 dpm/100 cm^2 total, 20 dpm 100 cm^2 removable.
                - Beta: 0.1 mrad/hr at 1 cm through 7 mg/cm^2 absorber, 100 dpm/100 cm^2 removable.
            - Soil:
                - 100 pCi/g gross detectable beta.
        - All survey results were below the allowable limits.
        - It was decided that smear surveys were not applicable to this survey region.
        - The soil gross beta activity for the region did not differ significantly from background.
        - The maximum soil gross beta activity in the region was 28 pCi/g, with an average of 25 pCi/g.
- ANL performed an independent verification survey in 1984 as part of the SRE verification survey.[7]
    - The survey found that the former Building 4184 area was decontaminated to below the limits specified in the draft ANSI Standard N13.12 and the NRC Guidelines dated 1982.

Status:

- DOE released the facility and surrounding soil for unrestricted use as a part of the SRE release in September 1985.[8]
- Building 4684 was demolished in the late 1970s.

References:

1- Argonne National Laboratory Document, DOE-EV-0005-46, "Post Remedial Action Survey Report for the Sodium Reactor Experiment (SRE) Facility," February 1984.
2- SSFL Area IV, ETEC Industrial Planning Maps, 1962-1992.
3- Historical Site Photographs from Boeing Database.
4- Rockwell International Report, ESG-DOE-13403, "Sodium Reactor Experiment Decommissioning Final Report," August 15, 1983.
5- Rockwell International Report, N704TI990028, "Radiological Survey Results – Release to Unrestricted Use, SRE Region II," May 4, 1978.
6- Rockwell International Report, N704TI990033, "Radiological Survey Results – Release to Unrestricted Use, SRE Region VII," May 13, 1983.
7- Rockwell International Report, N704TI990036, "Radiological Survey Results – Release to Unrestricted Use, SRE Region X," May 31, 1983.
8- DOE-OAK, Letter, "Certification Docket for the SRE and Building 003," from James K. Hartman (DOE/OAK) to G.W. Meyers, September 24, 1985.
9- Review of Radiation Safety Records Management System, 2003.

Photograph – Building 4684

Site Summary – Building 4686

Site Identification:

Building 4686
Temporary Hot Waste Storage

Operational Use/History:

- Constructed in the late 1950s.
- Beginning in 1961, this facility was used to store irradiated core components, such as moderator cans and dummy fuel elements.
- Demolished in the late 1970s.

Site Description:

- Building 4686 was located just south of the end of 11th Street.[1]

Relevant Site Information:

- Radioactive waste was present at this facility, primarily in the form of activation products and some mixed fission products.
- The above-ground facility was razed and the contaminated materials were packaged and shipped to a burial site.[2]

Radiological Surveys:

- In 1978, a radiological survey of the region was conducted as part of the SRE survey. This region contained the former location of Building 4686.[3]
    - The survey found that the area was acceptably free of contamination and recommended it be released for unrestricted use.
        - Allowable limits for the survey applicable to this region were as follows:
            - Surfaces:
                - Alpha: 100 dpm/100 cm^2 total.
                - Beta: 0.1 mrad/hr at 1 cm through 7 mg/cm^2 absorber.
            - Soil:
                - 100 pCi/g gross detectable beta.
        - All survey results were below the allowable limits.
        - It was decided that smear surveys were not applicable, because of the absence of suitable surfaces to smear.
        - The maximum surface beta contamination activity for the region was 0.08 mrad/hr.
        - Soil gross beta activity ranged between 6.6 pCi/g and 40.2 pCi/g.

- ANL performed an independent verification survey in 1984 as part of the SRE verification survey.[4] The survey found that the former Building 4686 area was decontaminated to below the limits specified in the draft ANSI Standard N13.12 and the NRC Guidelines dated 1982.

Status:

- DOE released the facility and surrounding soil for unrestricted use in 1983.[5]

References:

1- SSFL Area IV, ETEC Industrial Planning Maps, 1962-1992.
2- Rockwell International Report, N704TI990036, "Radiological Survey Results – Release to Unrestricted Use, SRE Region X," May 31, 1983.
3- Rockwell International Report, N704TI990033, "Radiological Survey Results – Release to Unrestricted Use, SRE Region VII," May 13, 1983.
4- Argonne National Laboratory Document, DOE-EV-0005-46, "Post Remedial Action Survey Report for the Sodium Reactor Experiment (SRE) Facility," February 1984.
5- DOE-OAK, Letter, "Certification Docket for the SRE and Building 003," from James K. Hartman (DOE/OAK) to G.W. Meyers, September 24, 1985.
6- Historical Site Photographs from Boeing Database (Building 4684 - Photograph Hartman (DOE/OAK)).

Photograph – Building 4686

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Site Summary – Site 4687

Site Identification:

Site 4687
Loading Dock

Operational Use/History:

- Constructed in the late 1950s or early 1960s.
- Site 4687 was used as a loading dock for Building 4041.[1]
- Demolished in 1998.
- Site Description:2[5]

Relevant Site Information:

- Radioactive components and waste were stored in Building 4041. Accordingly, radioactive components and waste were likely handled on the loading dock to 4041.[3]

Radiological Surveys:

- ANL conducted an interim post remedial action survey of the entire SRE area (including 4687) in 1982.[4]
    - The survey found that the site 4687 exceeded acceptable limits for residual contamination.
    - The maximum recorded activity for these two areas was 61,000 dpm beta-gamma. Alpha activity was at background levels.
    - Locations exceeding release limits were decontaminated before the end of the survey.
- ANL performed an independent verification survey in 1984 as part of the SRE verification survey.[5] Results of the survey indicated Building 4687 and its surrounding area was decontaminated to below the limits specified in the draft ANSI Standard N13.12 and the NRC Guidelines dated 1982.

Status:

- DOE released the facility and surrounding soil for unrestricted use as a part of the SRE release in September 1985.[3]
- Site 4687 was demolished in 1998, along with Building 4041.

References:

1- Rockwell International Report, ESG-DOE-13403, "Sodium Reactor Experiment Decommissioning Final Report," August 15, 1983.
2- SSFL Area IV, ETEC Industrial Planning Maps, 1962-1992.
3- DOE-OAK, Letter, "Certification Docket for the SRE and Building 003," from James K. Hartman (DOE/OAK) to G.W. Meyers, September 24, 1985.
4- Argonne National Laboratory Document, "Interim Post Remedial Action Survey Report for the Sodium Reactor Experiment (SRE) Facility," May 1983.
5- Argonne National Laboratory Document, DOE-EV-0005-46, "Post Remedial Action Survey Report for the Sodium Reactor Experiment (SRE) Facility," February 1984.

Site Summary – Building 4689

Site Identification:

Building 4689
Interim Storage of Contaminated Items

Operational Use/History:

- Constructed in the late 1950s.
- Building 4689 was used as a storage area for potentially contaminated items from the SRE complex.
- Demolished in the middle 1970s.

Site Description:

- Building 4689 was located west of Building 4143.[1]

Relevant Site Information:

- Radioactive waste was likely present at this facility, and would have been in the form of activation products and mixed fission products.
- This facility was totally removed prior to the SRE decommissioning. Contaminated blacktop located under and around the building was removed and the area was repaved.[2]

Radiological Surveys:

- In 1978, a radiological survey of the region was conducted as part of the SRE survey. This region contained the former location of Building 4689.[3]
    - The survey found that the area was acceptably free of contamination and recommended it be released for unrestricted use.
        - Allowable limits for the survey applicable to this region were as follows:
            - Surfaces:
                - Alpha: 100 dpm/100 cm^2 total.
                - Beta: 0.1 mrad hr at 1 cm through 7 mg/cm^2 absorber.
            - Soil:
                - 100 pCi/g gross detectable beta.
        - All survey results were below the allowable limits.
        - It was decided that smear surveys were not applicable because of the absence of suitable surfaces to smear.
        - The maximum beta surface contamination for the region was 0.08 mrad/hr.

    - Soil gross beta activity ranged between 6.6 pCi/g and 40.2 pCi/g.
- ANL performed an independent verification survey in 1984 as part of the SRE verification survey.[4] The survey found that the former Building 4654 area was decontaminated to below the limits specified in the draft ANSI Standard N13.12 and the NRC Guidelines dated 1982.

Status:

- DOE released the facility and surrounding soil for unrestricted use as a part of the SRE release in September 1985.[5]
- Building 4689 was demolished in the middle 1970s.

References:

1- SSFL Area IV, ETEC Industrial Planning Maps, 1962-1992.
2- Rockwell International Report, ESG-DOE-13403, "Sodium Reactor Experiment Decommissioning Final Report," August 15, 1983.
3- Rockwell International Report, N704TI990031, "Radiological Survey Results – Release to Unrestricted Use, SRE Region V," November 2, 1978.
4- Argonne National Laboratory Document, DOE-EV-0005-46, "Post Remedial Action Survey Report for the Sodium Reactor Experiment (SRE) Facility," February 1984.
5- DOE-OAK, Letter, "Certification Docket for the SRE and Building 003," from James K. Hartman (DOE/OAK) to G.W. Meyers, September 24, 1985.

Site Summary – Building 4695

Site Identification:

Building 4695
SRE Cold Trap Vault

Operational Use/History:

- Constructed during the late 1950s or early 1960s.
- Building 4695 contained items for the primary sodium system, including the cold trap and two hot traps.
- This facility served as a cold trap vault for the SRE, storing and trapping impurities for the SRE sodium system, including radiological materials.[1,2]
- Building 4695 demolished in the late 1970s.

Site Description:

- Building 4695 was a below-grade structure located between the primary fill/drain tank vault and the Sodium Service Building (4153).[3]

Relevant Site Information:

- During the course of reactor operations, several primary sodium leaks and fires occurred within the vault. [4]
- Radioactive materials were handled in this building because of its direct association with SRE activities.

Radiological Surveys:

- Based on preliminary surveys and process history, it was determined that Site 4695 was contaminated. As a result the total below-grade structure was removed and the area was backfilled and paved.[1]
- In 1983, a radiological survey of the region, including the land where Building 4695 had been located, was conducted as part of the Building 4143 survey.[5]
    - The survey found that the area was acceptably free of contamination and recommended it be released for unrestricted use.
        - Allowable limits for the survey applicable to this facility were as follows:
            - Surfaces:
                - Alpha: 100 dpm/100 cm^2 total, 20 dpm/100 cm^2 removable.
                - Beta: 0.1 mrad/hr at 1 cm through 7 mg/cm^2 absorber, 100 dpm/ 100 cm^2 removable.

        - Soil:
            - 100 pCi/g gross detectable beta.
            - 1,000 pCi/g gross detectable beta average below three meters.
            - 3,000 pCi/g gross detectable beta in isolated cracks below three meters.
    - All removable contamination surveys were under 10 dpm alpha and 70 dpm beta-gamma.
    - All beta surface contamination measurements for the region were under 0.1 mrad/hr.
    - The maximum soil gross beta activity was 96 pCi/g, with an average of 51 pCi/g.
- ANL performed an independent verification survey in 1983 as part of the SRE verification survey. Results of the survey indicated the former location of site 4695 was below the limits specified in the draft ANSI Standard N13.12 and the NRC Guidelines dated 1982.[6]

Status:

- DOE released the area for unrestricted use as a part of the SRE release in September 1985.[7]
- Building 4695 was demolished in the late 1970s.

References:

1- Rockwell International Report, ESG-DOE-13403, "Sodium Reactor Experiment Decommissioning Final Report," August 15, 1983.
2- Personnel Interview, Brian Sujata November 13, 2003.
3- SSFL Area IV, ETEC Industrial Planning Maps, 1962-1992.
4- Rockwell International Document, Decontamination and Disposition of Facilities, N704TP990008, "Radiological Survey Plan, Support D&D Program Operations at T-143 (SRE)," Issued: November 5, 1975, Released: September 15, 1981.
5- Rockwell International Report, N704TI990038, "Radiological Survey Results – Release to Unrestricted Use, SRE, Building 143," May 31, 1983.
6- Argonne National Laboratory Document, DOE-EV-0005-46, "Post Remedial Action Survey Report for the Sodium Reactor Experiment (SRE) Facility," February 1984.
7- DOE-OAK, Letter, "Certification Docket for the SRE and Building 003," from James K. Hartman (DOE/OAK) to G.W. Meyers, September 24, 1985.

Site Summary – Building 4703

Site Identification:

Building 4703
Water Tower

Operational Use/History:

- Constructed during the late 1950s or early 1960s.
- Building 4703 was a water tower that stored emergency cooling water for the Edison Company steam generator portion of the Sodium Reactor Program.[1]
- Building 4703 was destroyed in a brushfire prior to 1978.

Site Description:

- Building 4703 was a large wooden water tower northeast of the main reactor complex.[2]

Relevant Site Information:

- Radiological materials were not handled at Building 4703.

Radiological Surveys:

- In 1978, a radiological survey of the region was conducted.[1]
    - Allowable limits for the survey applicable to this facility were as follows:
        - Surfaces: Beta: 0.1 mrad/hr at 1 cm through 7 mg/cm^2 absorber.
        - Soil: 100 pCi/g gross detectable beta.
    - All beta surface contamination measurements for the region were under 0.05 mrad/hr.
    - The maximum soil gross beta activity was 31.6 pCi/g, with an average of 22 pCi/g.
    - The survey found that the area was acceptably free of contamination and recommended it be released for unrestricted use.
- ANL performed an independent verification survey in 1984 as part of the SRE verification survey.[3] Results of the survey indicated the former location of Building 4703 was below the limits specified in the draft ANSI Standard N13.12 and the NRC Guidelines dated 1982.

Status:

- DOE released Building 4703 for unrestricted use as a part of the SRE release in September 1985.[4]
- Building 4703 was destroyed in a brushfire prior to 1978. The remaining portion was removed in 1998.

References:

1- Rockwell International Report, N704TI990032, "Radiological Survey Results – Release to Unrestricted Use, SRE Region VI (Water Tank Area)," November 10, 1978.
2- SSFL Area IV, ETEC Industrial Planning Maps, 1962-1992.
3- Argonne National Laboratory Document, DOE-EV-0005-46, "Post Remedial Action Survey Report for the Sodium Reactor Experiment (SRE) Facility," February 1984.
4- DOE-OAK, Letter, "Certification Docket for the SRE and Building 003," from James K. Hartman (DOE/OAK) to G.W. Meyers, September 24, 1985.

Site Summary – Building 4714 (SRE Location)

Site Identification:

Building 4714
Research and Development (R&D) Shop Work Area
R&D Shop

Operational Use/History:

- Constructed in the late 1950s or early 1960s.[1]
- Building 4714 was used as an outdoor work area associated with Building 4163.
- Demolished in the middle 1970s.[1]
    - The designation 4714 was first used for a facility in the SRE complex, and later for a facility in the Power Pak area. According to Industrial Planning Maps, the buildings were not a similar size and shape, leading to the conclusion that one designation was used for two different buildings and not that the original Building 4714 was moved from one location to the next.[1]

Site Description:

- Building 4714 (SRE Location) was a small (approximately 500 square feet) outdoor work area adjoining Building 4163 on the north side.[1]

Relevant Site Information:

- Regulated radiological materials were not handled at Building 4714 (SRE Location).
- There are no Use Authorizations and no Incident Reports associated with Building 4714 (SRE Location).[2]

Radiological Surveys:

- In 1978, a radiological survey of the region was conducted.[3]
    - Beta Limits: 0.1 mrad/hr at 1 cm through 7 mg/cm^2 absorber, 100 dpm/100 cm^2 removable.
        - Results for removable contamination were all below 30 disintegrations per minute beta-gamma (the area was not subject to contamination by alpha emitting radionuclides).
        - An average beta surface contamination measurement of 0.06 mrad/hr was recorded in this area.
        - The scope of the survey did not include soil sampling because asphalt paving covered the region.
- ANL performed an independent verification survey in 1984 as part of the SRE verification survey.[4] Results of the survey indicated the former location of Building

4714 was below the limits specified in the draft ANSI Standard N13.12 and the NRC Guidelines dated 1982.

Status:

- Building 4714 (SRE location) was demolished in the middle 1970s.
- DOE released Building 4714 (SRE location) for unrestricted use as a part of the SRE release in September 1985.[5]

References:

1- SSFL Area IV, ETEC Industrial Planning Maps, 1962-1992.
2- Review of Radiation Safety Records Management System, 2003.
3- Rockwell International Report, N704TI990028, "Radiological Survey Results – Release for Unrestricted Use, SRE Region II (Building 163, Box Shop)," May 4, 1978.
4- Argonne National Laboratory Document, DOE-EV-0005-46, "Post Remedial Action Survey Report for the Sodium Reactor Experiment (SRE) Facility," February 1984.
5- DOE-OAK, Letter, "Certification Docket for the SRE and Building 003," from James K. Hartman (DOE/OAK) to G.W. Meyers, September 24, 1985.

Site Summary – Building 4723

Site Identification:

Site 4723
Sodium Cleaning Pad
Steam Cleaning Pad

Operational Use/History:

- Constructed during the late 1950s or early 1960s.
- Site 4723 was used for radiological sodium cleaning operations for equipment and materials associated with SRE.[1]
- Demolished in 1998.

Site Description:

- Site 4723 was a 25-foot x 28-foot concrete pad east of the main reactor complex; an asphalt road led to this location.[2,3]

Relevant Site Information:

- Radioactive materials were handled at Site 4723.
- An incident occurred on March 19, 1960 when employees were steam cleaning of radioactive sodium pipe, causing contamination of the area. The contaminated concrete was chipped away from the pad surface and put in barrels for disposal. Contaminated soil was excavated and packaged for disposal as well. Following decontamination, the pad was fenced to limit access to the cleaning pad (A0004).

Radiological Surveys:

- In 1978, a radiological survey of the region was conducted.[4]
    - The survey found that the area was acceptably free of contamination and recommended it be released for unrestricted use.
        - Allowable limits for the survey applicable to this facility were as follows:
            - Surfaces:
                - Beta: 0.1 mrad/hr at 1 cm through 7 mg/cm^2 absorber.
        - Building 4723 was only surveyed for surface radiation, since there were no expected contaminants. The maximum surface beta contamination for the entire region was 0.04 mrad/hr.
- ANL performed an independent verification survey in 1984 as part of the SRE verification survey.[5] Results of the survey indicated Building 4723 and its surrounding area were decontaminated to below the limits specified in the draft ANSI Standard N13.12 and the NRC Guidelines dated 1982.

Status:

- DOE released Site 4723 and the surrounding soil for unrestricted use as a part of the SRE release in September 1985.[6]
- Site 4723 was demolished in 1998.

References:

1- Rockwell International Report, ESG-DOE-13403, "Sodium Reactor Experiment Decommissioning Final Report," August 15, 1983.
2- Rockwell International Document, Decontamination & Disposition of Facilities Program, N704ACR990021, "SRE Activities Requirement No. 25. Decontamination & Dismantling of Building 724 and Pad 723," March 28, 1977.
3- SSFL Area IV, ETEC Industrial Planning Maps, 1962-1992.
4- Rockwell International Report, N704TI990027, "Radiological Survey Results – Release to Unrestricted Use, SRE Region I (Building 724 Area)," May 4, 1978.
5- Argonne National Laboratory Document, DOE-EV-0005-46, "Post Remedial Action Survey Report for the Sodium Reactor Experiment (SRE) Facility," February 1984.
6- DOE-OAK, Letter, "Certification Docket for the SRE and Building 003," from James K. Hartman (DOE/OAK) to G.W. Meyers, September 24, 1985.

Site Summary – Building 4724

Site Identification:

Building 4724
Hot Oil Sodium Cleaning Facility

Operational Use/History:

- Constructed during the late 1950s or early 1960s.
- Building 4724 operated as the Hot Oil Sodium Cleaning Facility, which was used for cleaning large pipes and assemblies from the secondary loop of the SRE reactor.[1]
- Prior to 1978, the upper portion of the building was moved to a location west of Building 4041, where it was referred to as Building 4133.[2]
- The remaining concrete pad was demolished in 1998.

Site Description:

- Building 4724 consisted of a steel building measuring 10 feet by 22 feet by 12 feet, along with an oil heater, a drain sump and an oil storage pit.[2] An asphalt road led to the site, which was located east of the main reactor complex.

Relevant Site Information:

- Building 4724 was used for cleaning large pipes and assemblies from the secondary loop of the reactor. There was a buildup of contamination from mixed fission products over the lifetime of the facility. Readings of a few mR/hr could be detected in several locations along the floor. Most of this activity was located inside a small trench along the west wall.[1]
- Prior to 1978, the metal diamond-plate floor was cut free in an attempt to remove this contamination. Contamination could be detected in the underlying concrete at that time.

Radiological Surveys:

- Prior to a survey of the area in 1978, radiological activity was identified at levels of a few mR/hr in several places along the floor:[1,3]
    - Contamination was discovered inside a small trench along the west wall, as well as on certain areas of the walls.
    - The metal diamond-plate floor was cut free in an attempt to decontaminate; contamination was discovered in the underlying concrete.
    - Contaminated concrete was identified and removed.
    - The inside and outside surfaces of the building, including ductwork, were decontaminated to levels below 50 dpm/100 cm^2 beta.

- In 1978, following decontamination activities, a radiological survey of the region was conducted.[1]
    - The survey found that the area was acceptably free of contamination and recommended it be released for unrestricted use.
        - Allowable limits for the survey were as follows:
            - Surfaces:
                - Alpha: 100 dpm/100 cm^2 total, 20 dpm/100 cm^2 removable.
                - Beta: 0.1 mrad/hr at 1 cm through 7 mg/cm^2 absorber, 100 dpm/100 cm^2 removable.
            - Soil:
                - 100 pCi/g gross detectable beta.
            - Water:
                - 3×10^{-7} µCi/ml gross detectable beta.
        - Following removal of contaminated concrete, the highest remaining activity level on the concrete pad was 48 dpm/100 cm^2 beta. The area was not subject to contamination by alpha emitting nuclides.
        - The maximum surface beta contamination for the area was 0.04 mrad/hr.
        - The maximum gross beta activity detected in soil samples was 45 pCi/g.
        - Water sampled indicated an activity of 2.3×10^{-8} µCi/cm^3.
- In 1978, a radiological survey of the building itself was conducted.[4]
    - The survey found that the area was acceptably free of contamination and recommended it be released for unrestricted use.
        - Allowable limits for the survey applicable to this building were as follows:
            - Surfaces:
                - Beta: 0.1 mrad/hr at 1 cm through 7 mg/cm^2 absorber, 100 dpm/100 cm^2 removable.
        - The building was extensively tested for removable beta contamination. The building was not subject to contamination by alpha emitting nuclides.
- ANL performed an independent verification survey in 1984 as part of the SRE verification survey.[5] Results of the survey indicated Building 4724 and its surrounding area were decontaminated to below the limits specified in the draft ANSI Standard N13.12 and the NRC Guidelines dated 1982.

Status:

- DOE released the facility and surrounding soil for unrestricted use as a part of the SRE release in September 1985.[6]
- Building 4724 was demolished in 1998.

References:

1- Rockwell International Report, N704TI990027, "Radiological Survey Results – Release to Unrestricted Use, SRE Region I (Building 724 Area)," May 4, 1978.
2- SSFL Area IV, ETEC Industrial Planning Maps, 1962-1992.
3- Rockwell International Document, Decontamination & Disposition of Facilities Program, N704ACR990021, "SRE Activities Requirement No. 25. Decontamination & Dismantling of Building 724 and Pad 723," March 28, 1977.
4- Rockwell International Report, N704TI990030, "Radiological Survey Results – Release to Unrestricted Use, SRE Region IV (West Parking Lot)," May 4, 1978.
5- Argonne National Laboratory Document, DOE-EV-0005-46, "Post Remedial Action Survey Report for the Sodium Reactor Experiment (SRE) Facility," February 1984.
6- DOE-OAK, Letter, "Certification Docket for the SRE and Building 003," from James K. Hartman (DOE/OAK) to G.W. Meyers, September 24, 1985.

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Site Summary – Building 4733

Site Identification:

Site 4733
Sodium Cleaning Pad

Operational Use/History:

- Constructed during the late 1950s or early 1960s.
- Site 4733 served as a sodium-cleaning pad for the SRE complex.[1]
- Demolished in the early 1980s.

Site Description:

- Site 4733 was located just north of the SRE reactor building near 4143 and was a small (less than 1,000 square feet) concrete pad.[2]

Relevant Site Information:

- It is not likely radioactive materials were handled at Building 4733.

Radiological Surveys:

- In 1983, a radiological survey of the region was conducted as part of the SRE survey.[1]
    - The survey found that the area was acceptably free of contamination and recommended it be released for unrestricted use.
        - Allowable limits for the survey applicable to this facility were as follows:
            - Surfaces:
                - Alpha: 100 dpm/100 cm^2 total.
                - Beta: 0.1 mrad/hr at 1 cm through 7 mg/cm^2 absorber.
            - Soil:
                - 100 pCi/g gross detectable beta.
        - The average surface beta contamination measurement for the region was 0.04 mrad/hr, with all measurements below 0.1 mrad/hr.
        - The maximum soil activity was 98 pCi/g, with an average of 33 pCi/g.
- ANL performed an independent verification survey in 1984 as part of the SRE verification survey.[3] Results of the survey indicated the former location of Building 4733 was below the limits specified in the draft ANSI Standard N13.12 and the NRC Guidelines dated 1982.

Status:

- Building 4733 was demolished in the early 1980s.
- DOE released the area for unrestricted use as a part of the SRE release in September 1985.[4]

References:

1- Rockwell International Report, N704TI990036, "Radiological Survey Results – Release to Unrestricted Use, SRE Region IX," May 31, 1983.
2- SSFL Area IV, ETEC Industrial Planning Maps, 1962-1992.
3- Argonne National Laboratory Document, DOE-EV-0005-46, "Post Remedial Action Survey Report for the Sodium Reactor Experiment (SRE) Facility," February 1984.
4- DOE-OAK, Letter, "Certification Docket for the SRE and Building 003," from James K. Hartman (DOE/OAK) to G.W. Meyers, September 24, 1985.

Site Summary – Building 4743

Site Identification:

Building 4743
Tetralin Heat Exchanger

Operational Use/History:

- Constructed during the late 1950s or early 1960s.
- Building 4743 housed a tetralin heat exchanger for SRE.[1]
- Demolished in the middle 1970s.

Site Description:

- Building 4743 was a small facility (less than 500 square feet) located just north of the SRE reactor, Building 4143.[1,2]

Relevant Site Information:

- No known radioactive materials were handled at this facility.[1]

Radiological Surveys:

- In 1983, a radiological survey of the region was conducted as part of the SRE survey.[3]
    - The survey found that the area was acceptably free of contamination and recommended it be released for unrestricted use.
        - Allowable limits for the survey applicable to this facility were as follows:
            - Surfaces:
                - Alpha: 100 dpm/100 cm^2 total.
                - Beta: 0.1 mrad/hr at 1 cm through 7 mg/cm^2 absorber.
            - Soil:
                - 100 pCi/g gross detectable beta.
        - The average surface beta contamination measurement for the region was 0.04 mrad/hr, with all measurements below 0.1 mrad/hr.
        - The maximum soil activity was 98 pCi/g, with an average of 33 pCi/g.
- ANL performed an independent verification survey in 1984 as part of the SRE verification survey.[4] Results of the survey indicated the former location of Building 4743 was below the limits specified in the draft ANSI Standard N13.12 and the NRC Guidelines dated 1982.

Status:

- Building 4743 was demolished in the middle 1970s.
- DOE released the area for unrestricted use as a part of the SRE release in September 1985.[5]

References:

1- Personnel Interview, Phil Rutherford, November 13, 2003.
2- SSFL Area IV, ETEC Industrial Planning Maps, 1962-1992.
3- Rockwell International Report, N704TI990036, "Radiological Survey Results – Release to Unrestricted Use, SRE Region IX," May 31, 1983.
4- Argonne National Laboratory Document, DOE-EV-0005-46, "Post Remedial Action Survey Report for the Sodium Reactor Experiment (SRE) Facility," February 1984.
5- DOE-OAK, Letter, "Certification Docket for the SRE and Building 003," from James K. Hartman (DOE/OAK) to G.W. Meyers, September 24, 1985.

Site Summary – Building 4753

Site Identification:

Building 4753
SRE Primary Fill Tank Vault

Operational Use/History:

- Constructed during the late 1950s or early 1960s.
- Building 4753 served as the primary fill tank vault for the SRE.[1]
- Demolished in the late 1980s.

Site Description:

- Building 4753 was a below-grade structure located just north of Building 4143.[1]

Relevant Site Information:

- Radioactive materials were handled in this building because of its direct association with SRE activities.
- A 1981 Radiological Survey Plan for SRE lists the primary sodium fill/drain tank vault as one of the "SRE support facilities that must be considered as radiologically hazardous."[2]

Radiological Surveys:

- Based on preliminary surveys and process history, it was determined Building 4753 was contaminated.
- The total below-grade structure was removed and the area was backfilled and paved.[1]
- In 1983, a radiological survey of the region was conducted as part of the Building 4143 survey.[3]
    - The survey found that the area was acceptably free of contamination and recommended it be released for unrestricted use.
        - Allowable limits for the survey applicable to this facility were as follows:
            - Surfaces:
                - Alpha: 100 dpm/100 cm^2 total, 20 dpm/100 cm^2 removable.
                - Beta: 0.1 mrad/hr at 1 cm through 7 mg/cm^2 absorber, 100 dpm/100 cm^2 removable.
            - Soil:
                - 100 pCi/g gross detectable beta.

    - 1,000 pCi/g gross detectable beta average below three meters.
    - 3,000 pCi/g gross detectable beta in isolated cracks below three meters.
  - The maximum surface beta contamination for the entire region was 0.05 mrad/hr.
  - The maximum soil gross bet activity was 31.6 pCi/g, with an average of 22 pCi/g.
- ANL performed an independent verification survey in 1984 as part of the SRE verification survey.[4] Results of the survey indicated the former location of Building 4753 was below the limits specified in the draft ANSI Standard N13.12 and the NRC Guidelines dated 1982.

Status:

- DOE released the area for unrestricted use as a part of the SRE release in September 1985.[5]
- Building 4753 was demolished in the late 1980s.

References:

1- Rockwell International Report, ESG-DOE-13403, "Sodium Reactor Experiment Decommissioning Final Report," August 15, 1983.
2- Rockwell International Document, Decontamination and Disposition of Facilities, N704TP990008, "Radiological Survey Plan, Support D&D Program Operations at T-143 (SRE)," Issued: November 5, 1975, Released: September 9, 1981.
3- Rockwell International Report, N704TI990038, "Radiological Survey Results – Release to Unrestricted Use, SRE, Building 143," May 31, 1983.
4- Argonne National Laboratory Document, DOE-EV-0005-46, "Post Remedial Action Survey Report for the Sodium Reactor Experiment (SRE) Facility," February 1984.
5- DOE-OAK, Letter, "Certification Docket for the SRE and Building 003," from James K. Hartman (DOE/OAK) to G.W. Meyers, September 24, 1985.
6- Historical Site Photographs from Boeing Database.
7- SSFL Area IV, ETEC Industrial Planning Maps, 1962-1992.

Photograph – Building 4753 (Note: Structure is subgrade)

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Site Summary – Site 4773

Site Identification:

Site 4773
SRE Drainage Control Dam and Retention Pond
Waste Water Impound Dam

Operational Use/History:

- Constructed in 1956.[1]
- Site 4773 is a drainage control dam and retention pond for the SRE area.[2]
- Demolition is pending.

Site Description:

- The retention pond dam is a compacted native earth embankment. Water levels have been determined by natural seepage and evaporation.
- The dam was damaged by storm flow in 1958. The repairs included the installation of a 1.5-foot diameter outlet pipe with a valve. Additional repairs made a year later included the installation of a 6-foot diameter overflow pipe and a pumped sump located at the confluence of the two main drain channels upstream from the pond. The sump collected all the water from the SRE improved area. The pump, acting on an automatic level switch in the sump, pumped the water at 350 gpm through a 4-inch diameter overland pipe to a channel leading to the Rocketdyne Area II Delta Ponds.[3]

Relevant Site Information:

- Radiological Materials were not deliberately dumped in the pond; however, SRE site records indicate two spills that could have potentially affected the pond:[3]
    - In the 1960s, liquid waste storage tanks near Building 4653 overflowed. The spill appeared to be confined to the local area and was cleaned up quickly.
    - On March 19, 1964, 3,550 gallons of test water were drained from liquid waste tanks at the SRE, sending radioactively contaminated solutions to the SRE Retention Pond and consequently to the Area II Delta Ponds. The total release did not exceed 60 mCi.[1] The concentration in the SRE pond was less than 2 pCi/cc, and less than 0.1 pCi/cc in the Delta Ponds (A0030).
- In 1979, the pond was drained and allowed to dry out. All areas of the pond bottom that read more than about 100 cpm above background or that exceeded 100 pCi/g gross detectable beta activity, were removed and disposed of as radioactive waste. Afterwards, soil samples were taken and the pond was returned to service.[4]

Radiological Surveys:

- In 1983, a radiological survey of the region was conducted as part of the SRE survey. The survey included the retention pond, the old leach field, the sanitary sewer pumping system and the SRE drainage back to the fence line. It also included the retention pond overflow channel downstream for a distance of about 200 feet.[4]
    - The survey found that the area was acceptably free of contamination and recommended it be released for unrestricted use.
        - Allowable limits for the survey applicable to this facility were as follows:
            - Surfaces:
                - Alpha: 100 dpm/100 cm^2 total.
                - Beta: 0.1 mrad/hr at 1 cm through 7 mg/cm^2 absorber.
            - Soil:
                - 100 pCi/g gross detectable beta.
            - Water:
                - 3×10^{-7} µCi/ml gross detectable beta.
        - The maximum soil activity was approximately 90 pCi/g, with an average of 29 pCi/g.
- ANL performed an independent verification survey in 1984 as part of the SRE verification survey.[5] Results of the survey indicated the former location of Building 4773 was below the limits specified in the draft ANSI Standard N13.12 and the NRC Guidelines dated 1982.
- In 1995 soil samples were taken in and around the SRE pond. The maximum level of cesium-137 detected was 2.4 pCi/g.[6]
- In November 2002, twelve soil samples were taken in the SRE pond and in the drainage leading to the pond.[7] Cesium-137 levels ranged from non-detect to 2.6 pCi/g.

Status:

- DOE released Site 4773 for unrestricted use as a part of the SRE release in September 1985.[8]
- The retention pond and drainage control dam are currently pending demolition.

References:

1- SSFL Area IV, ETEC Industrial Planning Maps, 1962-1992.
2- Rockwell International Report, ESG-DOE-13403, "Sodium Reactor Experiment Decommissioning Final Report," August 15, 1983.
3- Rockwell International Report, N704ACR990024, "SRE Activity Requirement No. 27, D&D of Building 143 Retention Pond and Sanitary Sewer," September 14, 1981.
4- Rockwell International Report, N704TI990033, "Radiological Survey Results – Release for Unrestricted Use, SRE Region VII," May 13, 1983.
5- Argonne National Laboratory Document, DOE-EV-0005-46, "Post Remedial Action Survey Report for the Sodium Reactor Experiment (SRE) Facility," February 1984.

6- Rocketdyne Document, A4CM-ZR-0011, Rev. A, “Area IV Radiological Characterization Survey,” August 15, 1996.
7- Personnel Interview, Phil Rutherford, February 8, 2005 (Area IV Database for Onsite and Offsite Surveys).
8- DOE-OAK, Letter, “Certification Docket for the SRE and Building 003,” from James K. Hartman (DOE/OAK) to G.W. Meyers, September 24, 1985.

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