Group BB

Group BB Map

Building 4100

Includes 4100, Trench
Includes Building 4800/4710, Substation

Site 4510

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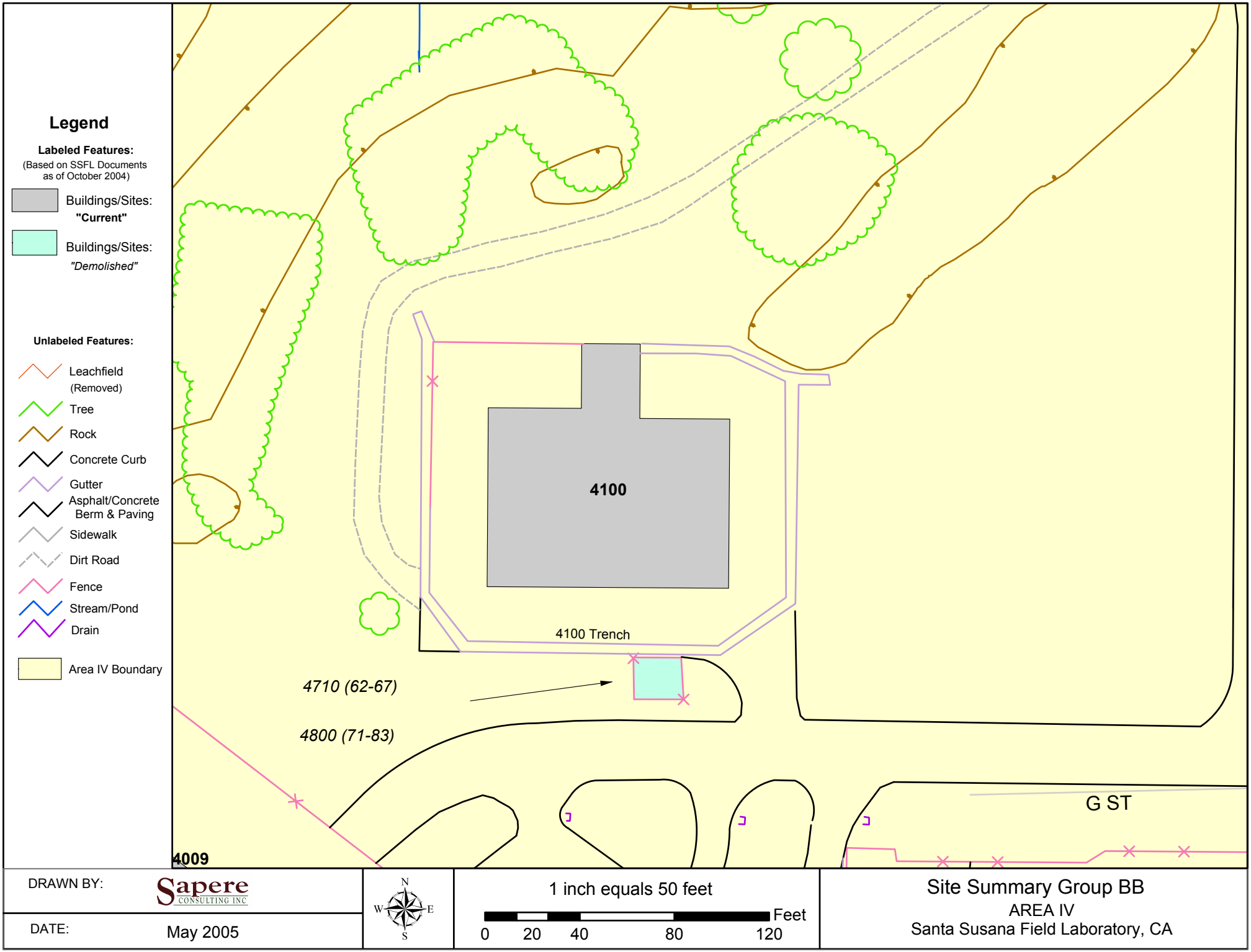
Legend
Labeled Features:
(Based on SSFL Documents as of October 2004)
Buildings/Sites: "Current"
Buildings/Sites: "Demolished"
Unlabeled Features:
Leachfield (Removed)
Tree
Rock
Concrete Curb
Gutter
Asphalt/Concrete Berm & Paving
Sidewalk
Dirt Road
Fence
Stream/Pond
Drain
Area IV Boundary
4100
4100 Trench
4710 (62-67)
4800 (71-83)
G ST
4009
DRAWN BY:
Sapere CONSULTING INC
DATE:
May 2005
N
W
E
S
1 inch equals 50 feet
0 20 40 80 120
Feet
Site Summary Group BB
AREA IV
Santa Susana Field Laboratory, CA

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Site Summary – Building 4100

Site Identification:

Building 4100
Advanced Epithermal Thorium Reactor (AETR)
Fast Critical Experiment Laboratory (FCEL)
Radiation Safety and Computed Tomography
Includes 4100, Trench
Includes Building 4800/4710, Substation

Operational Use/History:

- Constructed in 1960.
- Built for the Southwest Atomic Power Association (association of private utility companies).[1]
- Twenty different reactor core configurations were studied here. Early reactors in the AETR were thorium or uranium fueled; later tests of reactors with high-energy (fast) neutrons were conducted at the FCEL.[1]
- The program was terminated in 1974.[1]
- The Nuclear Regulatory Commission (NRC) terminated License CX-17 (for Building 4100) and released the building for unrestricted use in October 1980.[2]
- After decontamination and decommissioning (D&D) the high bay was used for sodium fire suppression experiments.[1]
- The high bay is currently used as a high energy Computer Aided Tomography (CAT) facility. The labs are used by Radiation Safety for a radioactive sample counting lab and instrument calibration facility.

Site Description

- Building 4100 is a steel and concrete structure 98 feet long by 72 feet wide, with shielded critical assembly room in one section. The other section contains a subassembly room, fuel fabrication area, control room, offices, laboratories, fuel storage vault, equipment room and change room. The facility includes two stacks, the highest reaching 50 feet above ground level, a liquid radioactive waste holdup tank and a sanitary leachfield. A security fence surrounds the facility.

Relevant Site Information:

- The facility included a trench next to the building which was used to burn construction debris and it is regulated under the Resource Conservation and Recovery Act (RCRA) for soil contamination, but it is unlikely that any regulated radiological materials were disposed of there.
- There has been one Incident Report associated with Building 4100 that may have resulted in a release to the environment:

- On December 17, 1991, a Respirator Lab washing machine was contaminated (A0217).

Radiological Surveys:

- Rockwell International performed a final radiation survey in 1980 to support the request to terminate the facility license CX-17. The survey included residual activity measurements and smears for removable activity.[3]
  - The survey concluded that all measured levels were below the acceptable contamination levels and that there was no indication of the presence of activation remaining where the critical machine was located.
  - All residual activity was <0.1 µR/hr (limit is 0.1 µR/hr).
  - Surveys in the critical component laboratory, chemical laboratory, closet adjacent to the chemical laboratory, change room, control passage way, fuel vault, subassembly room, locker room, equipment storage, materials storage and other non-operating areas showed <0.015 µR/hr beta-gamma (limit is 0.1 µR/hr).
  - All smear samples showed less than the acceptable removable activity of 20 d/m/100cm2 alpha and 50 d/m/100cm2 beta-gamma.
- NRC performed a radiological survey in 1980 to verify the results of the Rockwell International final radiation survey. The survey covered the facility and the surrounding area through meter surveys, smear and soil/liquid samples.[4]
  - The survey concluded that the facility was as described in the Rockwell International Final Radiation Report and that it met the guidelines of Regulatory Guide 1.86, *Termination of Operating Licenses for Nuclear Reactors*.
  - The meter survey detected radiation levels in the range of 5 to 50 µR/hr or 0.005 to 0.05 µR/hr (limit is 0.1 µR/hr) and 10 to 30 counts per minute (cpm) compared to a background measurement of 10 to 20 cpm (limit is twice background or 40 cpm).
  - Smear samples detected no removable contamination.
  - Soil and liquid samples revealed no significant activity.
- Rocketdyne performed a survey of the 4100 Trench area in 1988 to determine if any radioactive material had been accidentally left behind to such an extent that further surveying or decontamination was required. The survey covered the 4100 Trench through ambient gamma exposure rate measurements.[5]
  - Mean ambient gamma exposure rates were measured at 13.5 µR/hr and 15.7 µR/h maximum compared to a background of 12 to 16 µR/hr (NRC limit is 5 µR/hr above background).
  - The survey concluded that the 4100 Trench met the unrestricted release criteria.
- EPA conducted an oversight verification survey in 2001 for alpha, beta, beta-gamma radiation (total and removable) and gamma radiation (with the exception of Rooms 112, 113 and 114).[6] Surveys were performed to a quality level equal to a final status survey as defined by the Multi-Agency Radiation Survey and Site

Investigation Manual (MARSSIM). The contaminants of concern (COCs) for Building 4100 were mixed fission products, uranium, thorium, transuranic compounds and activation and corrosion products on the floors, walls and ceilings. EPA also collected concrete core samples, which were analyzed for photon-emitting isotopes.

  - Acceptable limits for the survey were consistent with NRC Regulatory Guide 1.86 and the proposed site-wide release criteria as defined in the Area IV survey.[7]
  - None of the field measurements indicated the presence of radionuclides above acceptable limits.
  - EPA field measurements confirmed the conclusions reached by both Rocketdyne and ORISE.

- In 1999, extensive instrument surveys and soil sampling were performed in the Building 4100 trench area. All instrument surveys and wipe tests of debris excavated from the trench were non-detect. Soil sample data ranged from non-detect to 0.44 pCi/g of Cs-137 (the DCGL for Cs-137 is 9.2 pCi/g).[8]
- In 2001, the Building 4100 septic tank and leachfield were removed. All instrument surveys and wipe tests of the tank and associated piping were non-detect. All soil sample data was non-detect for Cs-137. [9]

Status:

- NRC released Building 4100 for unrestricted use in October 1980.[4]
- The sanitary leachfield was removed in 2001.
- The building currently houses the radiation safety group's counting and instrument calibration labs, and a 2.5MeV industrial real time Computer Aided Tomography system.

References:

1- Phil Rutherford Website, http://rdweb/shea/radiationsafety/, accessed August 2003.
2- NRC, Letter, " NRC Inspection of Rockwell International's FCEL Inspection," from H. E. Brook (NRC) to M. E. Remley, July 11, 1980.
3- Rockwell International Report, "Report of Radiation Survey of the FCEL Reactor Facility in Support of Request to Terminate Facility License CX-17 and to Release the Facility for Unrestricted Use, Docket No. 50-147," April 30, 1980.
4- NRC, Letter, "Docket No. 50-147," from R. Reid (NRC) to M.E. Remley, October 1, 1980.
5- ETEC Document, GEN-ZR-0011, "Radiological Survey of the T056 Landfill; Area from 23rd Street to Building T100; and an Area Across from Building T011," August 26, 1988.
6- U.S. EPA Report, no document number, "Final Oversight Verification and Confirmation Radiological Survey Report for Buildings T-011, T-019, T-055, and T-100," December 20, 2002.
7- Rocketdyne Document, A4CM-ZR-0011, Rev. A, "Area IV Radiological Characterization Survey," August 15, 1996.

8- Boeing Radiation Safety Records Management System (File Drawer 156-D), “B/4100 Trench,” 1999.
9- Boeing Radiation Safety Records Management System (File Drawer 133-B), “B/4100 Septic Tank,” 2001.
10- Historical Site Photographs from Boeing Database.
11- SSFL Area IV, ETEC Industrial Planning Maps, 1962-1992.

Photograph – Building 4100

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Site Summary – Site 4510

Site Identification:

Site 4510
Parking Lot

Operational Use/History:

- Site 4510 served as a parking lot for personnel working in Building 4100 and the surrounding areas.

Site Description:

- Site 4510 was located directly west of Building 4100.[1]

Relevant Site Information:

- There are no Use Authorizations and no Incident Reports associated with Site 4510.[2]

Radiological Surveys:

- This area was covered as part of the 1994-1995 Area IV Radiological Characterization Survey.[3]
  - Background: 15.6 µ/hr.
  - Acceptable Limit: Less than 5 µ/hr above background.
  - Survey results were below the acceptable limits.

Status:

- Site 4510 is now an open field.

References:

1- SSFL Area IV, ETEC Industrial Planning Maps, 1962-1992.
2- Review of Radiation Safety Records Management System, 2003.
3- Rocketdyne Document, A4CM-ZR-0011, Rev. A, "Area IV Radiological Characterization Survey," August 15, 1996.

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