

## Site Summary – Building 4011

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### Site Identification:

Building 4011  
Warehouse Support  
Administration and Services Building  
Development Support Shop  
Manufacturing Support Shop  
Machine Shop/QA.  
Radiation Instrument Calibration Laboratory  
Includes Building 4403, Traffic Dispatch  
Includes Building 4711, Substation

### Operational Use/History:

- Constructed in 1958.
- Building 4011 was used to support various non-nuclear programs until 1984.
- From 1984 to 1996 the north section of the building was used for calibration and repair of radiation instrumentation.
- The Property Inventory and Control Department used the south section of the building.
- Building 4011 is currently used to house communications equipment.

### Site Description:

- Building 4011 is a 15,120-square-foot building that was constructed out of steel.<sup>1</sup>
- Building 4011 had an associated leachfield. The leachfield was removed in 2000.<sup>2</sup>
- Serviced by Substation 4711.
- Serviced by Traffic Dispatch Building 4403.

### Relevant Site Information:

- Radioactive sources for calibration were handled at the facility but most were sealed and checked annually to ensure no leakage occurred. The potential contaminants of concern are Cs-137, Co-60, Sr-90, Eu-152, Eu-154, thorium and uranium.<sup>1</sup>
- There were three Radiological Incidents associated with Building 4011 that could have resulted in a release to the environment:
  - On April 28, 1960, to the west of the building, an Organic Moderated Reactor Experiment (OMRE) shipping cask leaked during a leak test and spilled radioactive liquid on the ground (mixed fission products) (A0531).
  - On April 13, 1985, a calibration source came loose from an actuator rod resulting in an exposure of Cs-137. A radiation survey indicated no contamination on any part of the rod (A0318).

## Group R

- On December 6, 1994, the 28 Ci Cs-137 calibration source dislocated from the release pull rod. A radiation survey indicated normal background levels in the source containment box and on the release pull rod (A0658).
- Following removal of the septic tank, field line, tank, tank sludge, and the soils surrounding the tank, samples for gamma emitting radionuclides were collected and the remaining soil was found to be clean.<sup>2</sup>

### Radiological Surveys:

- In 1988, the lot across the street from the building was surveyed because it was often used as a dumpsite for dirt and had the potential for contamination. The field was surveyed for mixed fission products by measuring ambient gamma exposure rates.<sup>3</sup>
  - Ambient gamma limit: < 5  $\mu\text{R/hr}$  above background (background was 15.3  $\mu\text{R/hr}$ ).
  - Maximum ambient gamma exposure rate: 13  $\mu\text{R/hr}$ .
  - Survey results were below the acceptable limits.
- A soil sample collected at the northwest corner of the building during the 1996 Area IV Radiological Characterization Survey found elevated Cs-137. The level was 0.53 pCi/g.<sup>4</sup>
- In 1998, Rocketdyne performed a final comprehensive radiological survey to measure total or removable surface activity on the walls, floors, ceilings, structural surfaces, concrete pads, sink traps and the roof.<sup>1,5</sup>
  - The walls, floors and ceilings were surveyed for total and removable alpha and beta activity and maximum alpha and beta activity. Floors were surveyed for ambient gamma readings in  $\mu\text{R/hr}$  at one meter.
    - The limit criteria for surface contamination of alpha and beta-gamma emitters was (in dpm/100cm<sup>2</sup>):
      - Sr-90, Th-natural, Th-232: <1,000 total and <200 removable
      - U-natural, U-235, U-238, and associated decay products: <5,000 total and <1,000 removable.
      - Beta-gamma emitters: <5,000 total and <1,000 removable.
    - Samples were collected from sludge in the sink traps for gamma spectroscopy analyses. The sludge was contaminated with low levels of uranium and the sink and trap were removed and disposed. An additional sludge sample was taken from a location several feet into the line and the sample met release criteria.
    - Ambient gamma limit: <5.0  $\mu\text{R/hr}$  at one meter from the surface.
  - Survey results were below the acceptable limits.
- The California Department of Health Services (DHS) performed verification surveys in 1998 and concurred that the facility met release criteria.<sup>6,7</sup>
- The Environmental Protection Agency (EPA) conducted an oversight verification survey in 2001 for alpha, beta, beta-gamma radiation (total and removable) and gamma radiation. 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 4011 were mixed fission products, uranium, transuranic compounds, and activation and corrosion products. EPA also collected concrete core samples which were analyzed for photon-emitting isotopes.<sup>8</sup>

- Acceptable limits for the survey were consistent with Nuclear Regulatory Commission (NRC) Regulatory Guide 1.86 and the proposed sitewide release criteria.
- Survey results were below the acceptable limits.
- EPA field measurements confirmed the conclusions reached by Rocketdyne.

**Status:**

- DHS released the facility for unrestricted use December 16, 1998.<sup>6</sup>
- Building 4011 is currently used to house communications equipment for Area IV.

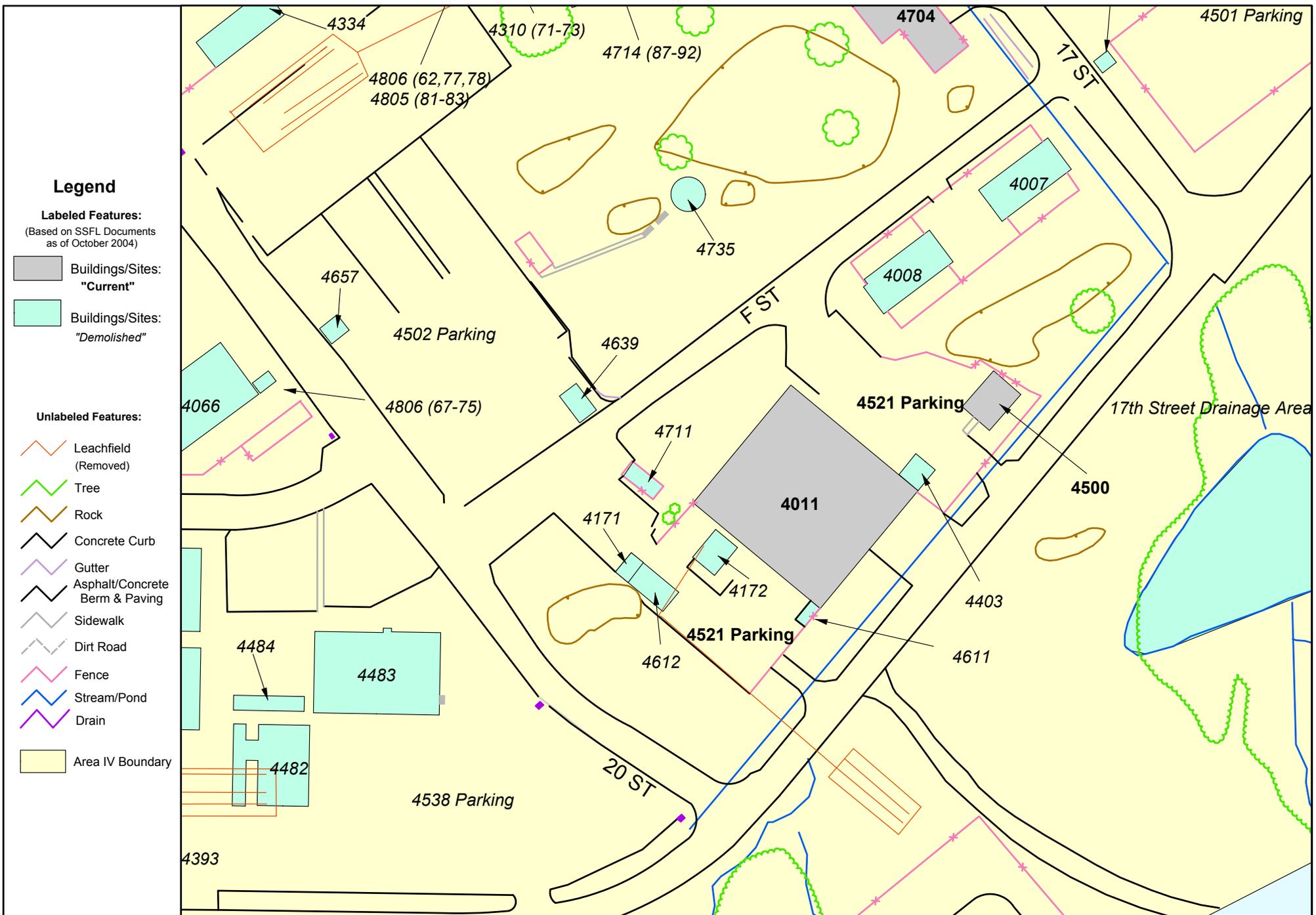
**References:**

- 1- Rocketdyne Report, N001SRR140128, "Building T011 Final Survey Procedure," April 19, 1994.
- 2- Boeing Data Package, no document number, "Septic and Leachfield Survey Data 011, 353, and 373."
- 3- ETEC Document, GEN-ZR-0011, "Radiological Survey of the T056 Landfill; Area from 23<sup>rd</sup> Street to Building T100; and an Area Across from Building T011," August 26, 1988.
- 4- Rocketdyne Document, A4CM-ZR-0011, Rev. A, "Area IV Radiological Characterization Survey," August 15, 1996.
- 5- Boeing Internal Document, no document number, "Final Radiological Survey Data Package for Building 011, SSFL," by James Barnes, July 28, 1998.
- 6- DHS/RHB, Untitled letter, from D. Wesley (DHS/RHB) to J. Barnes, December 16, 1998.
- 7- Untitled letter, from Gerard Wong to James Barnes, September 17, 1998.
- 8- 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.
- 9- Historical Site Photographs from Boeing Database.
- 10- SSFL Area IV, ETEC Industrial Planning Maps, 1962-1992.

Photograph – Building 4011

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**Legend**

**Labeled Features:**  
 (Based on SSFL Documents as of October 2004)

- Buildings/Sites: "Current"
- Buildings/Sites: "Demolished"

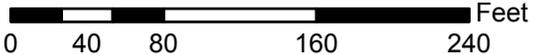
**Unlabeled Features:**

- Leachfield (Removed)
- Tree
- Rock
- Concrete Curb
- Gutter
- Asphalt/Concrete Berm & Paving
- Sidewalk
- Dirt Road
- Fence
- Stream/Pond
- Drain
- Area IV Boundary

DRAWN BY:



1 inch equals 100 feet



DATE:

May 2005

Site Summary Group R  
 AREA IV  
 Santa Susana Field Laboratory, CA