

**Historical Site Assessment of Area IV  
Santa Susana Field Laboratory  
Ventura County, California**

**Volume 2 – Area IV Site Summaries**



*Prepared by Sapere Consulting Inc,  
for The Boeing Company  
May 2005*



# **Historical Site Assessment**

## **Volume 2**

*Prepared for the Boeing Company*  
*May 2005*

**Historical Site Assessment of Area IV  
Santa Susana Field Laboratory  
Ventura County, California**

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# SSFL AREA IV HSA

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Parking Lot 4511

*Includes Building 4113, Guard Shack*

*Includes Building 4623, Guard Shack*

Old Conservation Yard

*Includes Building 4313, Conservation Shack*

### Group B

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Site 4583, New Salvage Yard

### Group C

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Site 4583, Old ESG Storage Yard

Building 4320

Building 4731

Building 4732

### Group D

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Building 4040

*Includes Building 4624, Fire Truck Canopy*

Parking Lot 4540

## Group E

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Building 4014

*Includes Building 4783, Substation*

Building 4029

Building 4030

*Includes Building 4XXX, Electrical Substation for 4030 and 4641*

Building 4046

Building 4053

*Includes Building 4033, Skid Shack*

*Includes Building 4043, Skid Shack*

Building 4064 and Side Yard and Site 4864

*Includes Mechanical Equipment Slab (Site 4864)*

Parking Lot 4513

*Includes Building 4333, Time Clock*

4535 Parking Lot

Building 4641

*Includes Building 4XXX, Electrical Substation for 4030 and 4641*

## Group F

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Building 4063

Building 4273

*Includes Building 4316, Maintenance Skid Shack*

Building 4283

## Group G

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*Includes Building 4693, Substation*

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*Includes Building 4928, Cooling Tower*  
*Includes Building 4725, Substation*

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*Includes Building 4925, Mechanical Equipment Slab*

*Includes Building 4926, Sodium Reactor Experiment (SRE) Mock-up Equipment Area  
Includes Building 4725, Substation for 4024 and 4025*

#### Building 4027

*Includes Building 4727, Substation*

#### Building 4032

*Includes Building 4727, Substation*

#### Building 4036/4037

*Includes Building 4727, Substation*

#### Building 4042

*Includes Building 4742, Substation*

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*Includes Building 4836, Time Clock*

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#### Building 4028

*Includes Site 4811, Electrical and Mechanical Equipment Pad*

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## Group L

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#### Building 4010

*Includes Site 4807, Electrical Equipment Pad*

*Includes Site 4808, Electrical Equipment Pad*

*Includes Site 4809, Air Blast Heat Exchanger Pad*

#### Building 4012

*Includes Building 4713, Substation*

#### Building 4013

*Includes Building 4713, Substation*

*Includes Building 4823, Time Clock*

*Includes Building 4413, Uninterruptible Power Supply (UPS)*

## TOC

### Building 4019

*Includes Building 4719, Substation*

### Building 4228

*Includes Building 4708, Substation for Inbound Power*

*Includes Site 4807, Electrical Equipment Pads*

*Includes Site 4808, Electrical Equipment Pads*

*Includes Site 4809, Air Blast Heat Exchanger Pad*

*Includes Building 4710, SCTI Power Pak Cooling Tower*

## Group M

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### Building 4059

*Includes Building 4759, Substation*

### Building 4459

## Group N

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### Building 4048

### Building 4049

## Group O

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### Building 4005

*Includes Building 4705, Substation*

### Building 4006

*Includes Building 4616, Cooling Tower*

*Includes Building 4706, Substation*

### Building 4402

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### Building 4606

*Includes Building 4816, Hydrogen Recombiner Test Canopy*

### Building 4607

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## Group P

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Building 4026

*Includes Building 4726, Substation*

*Includes Building 4805, Time Clock Shack*

*Includes Building 4426, Uninterruptible Power Supply (UPS)*

Building 4226

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Building 4355

*Includes Building 4756, Substation*

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Building 4359

Building 4360

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Building 4362

Building 4392

Building 4457

Building 4478

Site 4502

*Includes Building 4806, Time Clock*

*Includes Building 4657, Guard Shack*

Building 4826

*Includes Building 4726, Substation*

## Group Q

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Building 4007

Building 4008

Site 4501

*Includes Building 4823, Time Clock*

17<sup>th</sup> Street Drainage

## Group R

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Building 4011

*Includes Building 4403, Traffic Dispatch*

*Includes Building 4711, Substation*

Building 4171

Building 4172

Building 4500

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Fuel Tank 4735

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Building 4383

*Includes Building 4393, Tower at 4383*

*Includes Building 4883, Substation*

Building 4482

*Includes Building 4784, Substation*

Building 4483

*Includes Building 4784, Substation*

Building 4484

*Includes Building 4784, Substation*

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*Includes Building 4784, Substation*  
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*Includes Building 4784, Substation*  
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Building 4462  
*Includes Building 4760, Substation*  
Building 4463  
*Includes 4780, Substation*  
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*Includes Building 4762, Substation*  
Building 4065  
*Includes Building 4762, Substation*  
Building 4066  
*Includes Building 4762, Substation*  
*Includes Building 4806, Time Clock*

## **Group V**

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Building 4038  
*Includes 4757, Substation*  
Building 4039  
4056 Landfill  
Building 4057  
*Includes 4757, Substation*  
Building 4626

## Group W

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Building 4015

*Includes Building 4707, Substation*

Building 4373

*Includes Site 4848, Pad at Building 4373*

Building 4374

Site 4573

*Includes Building 4343, Time Clock*

## Group X

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Building 4055

*Includes Building 4755, Substation*

*Includes Building 4155, Control Center, Guard Shack*

## Group Y

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Building 4173, formerly 4865

Building 4363

Building 4375

Building 4473

Site 4575

Building 4863

Building 4873

Site 4874

Site 4875

## Group Z

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Building 4353

*Includes Site 4853, Concrete Pad*

Parking Lot 4553

Building 4854

## Group AA

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Building 4020

*Includes Building 4323, Guard Building*

*Includes Building 4720, Substation*

Building 4468

Site 4520

## Group BB

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Building 4100

*Includes 4100, Trench*

*Includes Building 4800/4710, Substation*

Site 4510

## Group CC

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Building 4009

*Includes Buildings 4709, Substation*

Parking Lot 4509

## Group DD

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Building 4317

Building 4318

Building 4425

Building 4730

Building 4814

*Includes Building 4314, LLID Test Control Building*

*Includes Building 4514, Sodium-Water Reaction Test Center*

Building 4820

## Group EE

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Building 4885

Building 4886

## **Group FF**

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Building 4701

Building 4702

## **Not Built**

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Building 4001

Building 4052

Building 4638

Building 4639

Building 4640

## **Reference List**

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List of References used for each site

## **Appendix A – Acronyms and Abbreviations**

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## **Appendix B – Units**

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## **Appendix C – Industrial Planning Maps**

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## Volume Two Organization

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Volume 2 consists of all the site summaries developed for Area IV. An individual site summary was developed for each site within Area IV. Site summaries provide operational history, current status and other available information (e.g., radiological surveys, decontamination and demolition reports, industrial planning maps, aerial photographs, etc.) relevant to each site. Site summaries were developed using all available information related to Area IV available from Boeing. This consists of archived information from the Radiation Safety Records Management System (RSRMS), personnel interviews and any relevant published material (e.g., DOE reports). Figure 1 is an example site summary.

The site summaries were grouped geographically for organizational purposes. Figure 2 depicts the locations of these groupings. Table 1 is a crosswalk that can be used to determine the grouping assigned to a specific site. Individual maps and table of contents have been included with each site summary group.

References and personnel interviews used to develop each site summaries are listed in each site summary and are compiled in the Volume 2 Reference List.

Appendix A is a list of all the acronyms and abbreviations used in the site summaries. Appendix B is a list of all units used in the site summaries. Appendix C is the historical industrial planning maps used to determine locations of sites.

**Figure 1. Site Summary Organization**

<b>Site Summary – Site 4XXX</b>
<p><b>Site Identification:</b></p> <ul style="list-style-type: none"><li>• Any name the used for the site (site purpose and association changed over time, resulting in several different names). Additional support structures used to service the building not warranting an individual site summary (i.e., substations, guard shacks, timeclock structures, and construction shacks) are identified here.</li></ul>
<p><b>Operational Use/History:</b></p> <ul style="list-style-type: none"><li>• The date the building was constructed, programs the building supported, dates these programs were operating, deactivation/decontamination activities, and demolition date.</li></ul>
<p><b>Site Description:</b></p> <ul style="list-style-type: none"><li>• A physical description of the site and any holding tanks or other below ground structures, leachfield, or air filter structure (stacks, HEPA filtration) associated with the building.</li></ul>
<p><b>Relevant Site Information:</b></p> <ul style="list-style-type: none"><li>• Type of radiological material managed at the site, use authorizations, and any incidents that would have resulted in potential releases to the environment.</li></ul>
<p><b>Radiological Surveys:</b></p> <ul style="list-style-type: none"><li>• Radiological surveys performed at the site, description of survey purpose (routine, characterization, final status, verification), date conducted, agency conducting the survey, survey scope (i.e., interior, exterior), measurements collected, acceptable limits for the survey, and survey results.</li></ul>
<p><b>Status:</b></p> <ul style="list-style-type: none"><li>• Site release date and releasing agency (if applicable), and demolition date or current use.</li></ul>
<p><b>References:</b></p> <ul style="list-style-type: none"><li>• Documents, maps, photographs, personnel interviews, review of Radiation Safety Records Management System, or any other information used to develop the site summary.</li></ul>
<p><b>Photograph:</b></p> <ul style="list-style-type: none"><li>• If a photograph of the site was available, it was included in the site summary</li></ul>

**Table 1.** Site Crosswalk

<b>Site</b>	<b>Group</b>	<b>Group Reference Grid</b>
17th St. Drainage Area	Q	F-8
4001	Not Built	
4003	G	B-8, B-9
4005	O	D-7
4006	O	D-7
4007	Q	E-7
4008	Q	E-7
4009	CC	F-4
4010	L	D-6
4011	R	F-7
4012	L	D-6
4013	L	D-6
4014	E	C-9, C-10
4015	W	G-6
4019	L	D-6
4020	AA	G-5
4021	I	C-7
4022	I	C-7
4023	J	D-7, D-8

## Introduction

<b>Site</b>	<b>Group</b>	<b>Group Reference Grid</b>
4024	J	D-7, D-8
4025	J	D-7, D-8
4026	P	D-6, D-7
4027	J	D-7, D-8
4028	K	C-7
4029	E	D-10
4030	E	C-9, C-10
4032	J	D-7, D-8
4033 (Included in 4053)	E	C-9, C-10
4034	I	C-7
4035 (Included in 4030)	E	C-9, C-10
4036	J	D-7, D-8
4037	J	D-7, D-8
4038	V	E-6
4039	V	E-6
4040	D	C-10
4041	G	B-8, B-9
4042	J	D-7, D-8
4043 (Included in 4053)	E	C-9, C-10
4044	I	C-7

<b>Site</b>	<b>Group</b>	<b>Group Reference Grid</b>
4046	E	C-9, C-10
4048	N	D-8
4049	N	D-8
4052	Not Built	
4053	E	C-9, C-10
4055	X	G-6
4056 Landfill	V	E-5
4057	V	E-6
4059	M	D-6
4062	U	E-6
4063	F	B-9
4064	E	C-9, C-10
4065	U	E-6
4066	U	E-6
4073	H	C-8, C-9
4074	H	C-8, C-9
4075	I	C-7
4083	H	C-8, C-9
4093	H	C-8, C-9
4100	BB	F-5

## Introduction

<b>Site</b>	<b>Group</b>	<b>Group Reference Grid</b>
4100 Trench (Included in 4100)	BB	F-5
4103 (Included in 4083)	H	C-8, C-9
4113 (Included in 4511)	A	B-11
4114	A	B-11
4123	H	C-8, C-9
4133	G	B-8, B-9
4143	G	B-8, B-9
4153	G	B-8, B-9
4155 (Included in 4055)	X	G-6
4163	G	B-8, B-9
4171	R	F-7
4172	R	F-7
4173	Y	H-5
4183	G	B-8, B-9
4184	G	B-8, B-9
4185	G	B-8, B-9
4226	P	D-6, D-7
4228	L	D-6
4273	F	B-9
4283	F	B-9

<b>Site</b>	<b>Group</b>	<b>Group Reference Grid</b>
4293	P	D-6, D-7
4310	P, L	D-6, D-7
4313 (Included in the OCY)	A	B-11
4314 (Included in 4814)	DD	G-3
4316 (Included in 4273)	F	B-9
4317	DD	G-3
4318	DD	G-3
4320	C	A-10, A-11
4323 (Included in 4020)	AA	G-5
4333 (Included in 4513)	E	C-9, C-10
4334	P	D-6, D-7
4335	P	D-6, D-7
4343 (Included in 4573)	W	G-6
4353	Z	G-6
4354	P	D-6, D-7
4355	P	D-6, D-7
4356	P	D-6, D-7
4357	P	D-6, D-7
4358	P	D-6, D-7
4359	P	D-6, D-7

## Introduction

<b>Site</b>	<b>Group</b>	<b>Group Reference Grid</b>
4360	P	D-6, D-7
4361	P	D-6, D-7
4362	P	D-6, D-7
4363	Y	G-6
4373	W	G-6
4374	W	G-6
4375	Y	G-6
4383	S	F-6
4392	P	D-6, D-7
4393 (Included in 4383)	S	F-6
4402	O	D-7
4403 (Included in 4011)	R	F-7
4413 (Included in 4013)	L	D-6
4425	DD	G-3
4426 (Included in 4026)	P	D-6, D-7
4453	H	C-8, C-9
4457	P	D-6, D-7
4459	M	D-6
4461	T	F-6
4462	T	F-6

<b>Site</b>	<b>Group</b>	<b>Group Reference Grid</b>
4463	T	F-6
4468	AA	G-5
4473	Y	G-6
4478	P	D-6, D-7
4482	S	F-6
4483	S	F-6
4484	S	F-6
4485	S	F-6
4486	S	F-6
4487	S	F-6
4500	R	F-7
4501	Q	E-7
4502	P	D-6, D-7
4504	K	C-7
4505	G	B-8, B-9
4506	O	D-7
4509	CC	F-4
4510	BB	F-5
4511	A	B-11
4513	E	C-9, C-10

## Introduction

<b>Site</b>	<b>Group</b>	<b>Group Reference Grid</b>
4514 (Included in 4814)	DD	G-3
4520	AA	G-5
4521	R	F-7
4523	H	C-8, C-9
4524	J	D-7, D-8
4535	E	C-9, C-10
4536	J	D-7, D-8
4537	J	D-7, D-8
4538	S	F-6
4540	D	C-10
4553	Z	G-6
4563	I	C-7
4573	W	G-6
4575	Y	G-6
4583-New Salvage Yard	B	C-11
4583-Old ESG Storage Yard	C	A-10, A-11
4606	O	D-7
4607	O	D-7
4611	R	F-7
4612	R	F-7

<b>Site</b>	<b>Group</b>	<b>Group Reference Grid</b>
4614	I	C-7
4615	O	D-7
4616 (Included in 4006)	O	D-7
4621	I	C-7
4622	I	C-7
4623 (Included in 4511)	A	B-11
4624 (Included in 4040)	D	C-10
4625	J	D-7, D-8
4626	V	E-6
4633	H	C-8, C-9
4636 (Included in 4536)	J	D-7, D-8
4638	Not Built	
4639	Not Built	
4640	Not Built	
4641	E	C-9, C-10
4643	H	C-8, C-9
4653	G	B-8, B-9
4654	G	B-8, B-9
4656 (Included in 4356)	P	D-6, D-7
4657 (Included in 4502)	P	D-6, D-7

## Introduction

<b>Site</b>	<b>Group</b>	<b>Group Reference Grid</b>
4658	I	C-7
4662	T	F-6
4663	I	C-7
4664	I	C-7
4665	I	C-7
4683 (Included in 4143)	G	B-8, B-9
4684	G	B-8, B-9
4686	G	B-8, B-9
4687	G	B-8, B-9
4688	I	C-7
4689	G	B-8, B-9
4693 (Included in 4003)	G	B-8, B-9
4695	G	B-8, B-9
4701	FF	J-4
4702	FF	J-4
4703	G	B-8, B-9
4704	O	D-7
4705 (Included in 4005)	O	D-7
4706 (Included in 4006)	O	D-7
4707 (Included in 4015)	W	G-6

<b>Site</b>	<b>Group</b>	<b>Group Reference Grid</b>
4708 (Included in 4228)	L	D-6
4709 (Included in 4009)	CC	F-4
4710 (Included in 4228)	L, CC	D-6
4711 (Included in 4011)	R	F-7
4713 (Included in 4012, 4013)	L	D-6
4714	G, O	B-8, B-9
4719 (Included in 4019)	L	D-6
4720 (Included in 4020)	AA	G-5
4723	G	B-8, B-9
4724	G	B-8, B-9
4725 (Included in Building 4024, 4025)	J	D-7, D-8
4726 (Included in 4026)	P	D-6, D-7
4727 (Included in Building 4027, 4032, 4036, 4037)	J	D-7, D-8
4730	DD	G-3
4731	C	A-10, A-11
4732	C	A-10, A-11
4733	G	B-8, B-9
4735	R	F-7
4742 (Included in Building 4042)	J	D-7, D-8

## Introduction

<b>Site</b>	<b>Group</b>	<b>Group Reference Grid</b>
4743	G	B-8, B-9
4753	G	B-8, B-9
4755 (Included in 4055)	X	G-6
4756 (Included in 4355)	P	D-6, D-7
4757 (Included in 4038, 4057)	V	E-6
4759 (Included in 4059)	M	D-6
4760 (Included in 4462)	T	F-6
4762 (Included in 4062, 4065, 4066)	U	E-6
4763 (Included in 4063)	F	B-9
4773	G	B-8, B-9
4780 (Included in 4463)	T	F-6
4783 (Included in 4014)	E	C-9, C-10
4784 (Included in 4482, 4483, 4484, 4485, 4486)	S	F-6
4793	H, N	C-8, C-9
4800 (Included in 4100)	BB	F-5
4805 (Included in 4026)	P	D-6, D-7
4806 (Included in 4502)	P, U	D-6, D-7
4807 (Included in 4010, 4228)	L	D-6
4808 (Included in 4010, 4228)	L	D-6

<b>Site</b>	<b>Group</b>	<b>Group Reference Grid</b>
4809 (Included in 4010, 4228)	L	D-6
4810	Not Built	
4811 (Included in 4028)	K	C-7
4814	DD	G-3
4816 (Included in 4606)	O	D-7
4820	DD	G-3
4823 (Included in 4013)	L,Q	D-6
4826	P	D-6, D-7
4836 (Included in 4536)	J	D-7, D-8
4848 (Included in 4373)	W	G-6
4853 (Included in 4353)	Z	G-6
4854	Z	G-6
4863	Y	G-6
4864 (Included in 4064)	E	C-9, C-10
4865 (Included in 4173)	Y	D-10
4873	Y	G-6
4874	Y	G-6
4875	Y	G-6
4883 (Included in 4383)	S	F-6
4885	EE	G-3

## Introduction

<b>Site</b>	<b>Group</b>	<b>Group Reference Grid</b>
4886	EE	G-3
4893 (Included in 4093)	H	C-8, C-9
4894 (Included in 4143)	G	B-8, B-9
4895 (Included in 4143)	G	B-8, B-9
4896 (Included in 4143)	G	B-8, B-9
4897 (Included in 4143)	G	B-8, B-9
4898 (Included in 4143)	G	B-8, B-9
4924 (Included in 4025)	J	D-7, D-8
4925 (Included in 4025)	J	D-7, D-8
4926 (Included in 4025)	J	D-7, D-8
4927	J	D-7, D-8
4928 (Included in 4024)	J	D-7, D-8
4XXX (Included in 4030 and 4641)	E	C-9, C-10
4XXX (Included in 4228)	L	D-6
Old Conservation Yard (OCY)	A	B-11

## Group A

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Group A Map

Building 4114

Parking Lot 4511

*Includes Building 4113, Guard Shack*

*Includes Building 4623, Guard Shack*

Old Conservation Yard

*Includes Building 4313, Conservation Shack*

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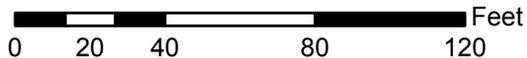
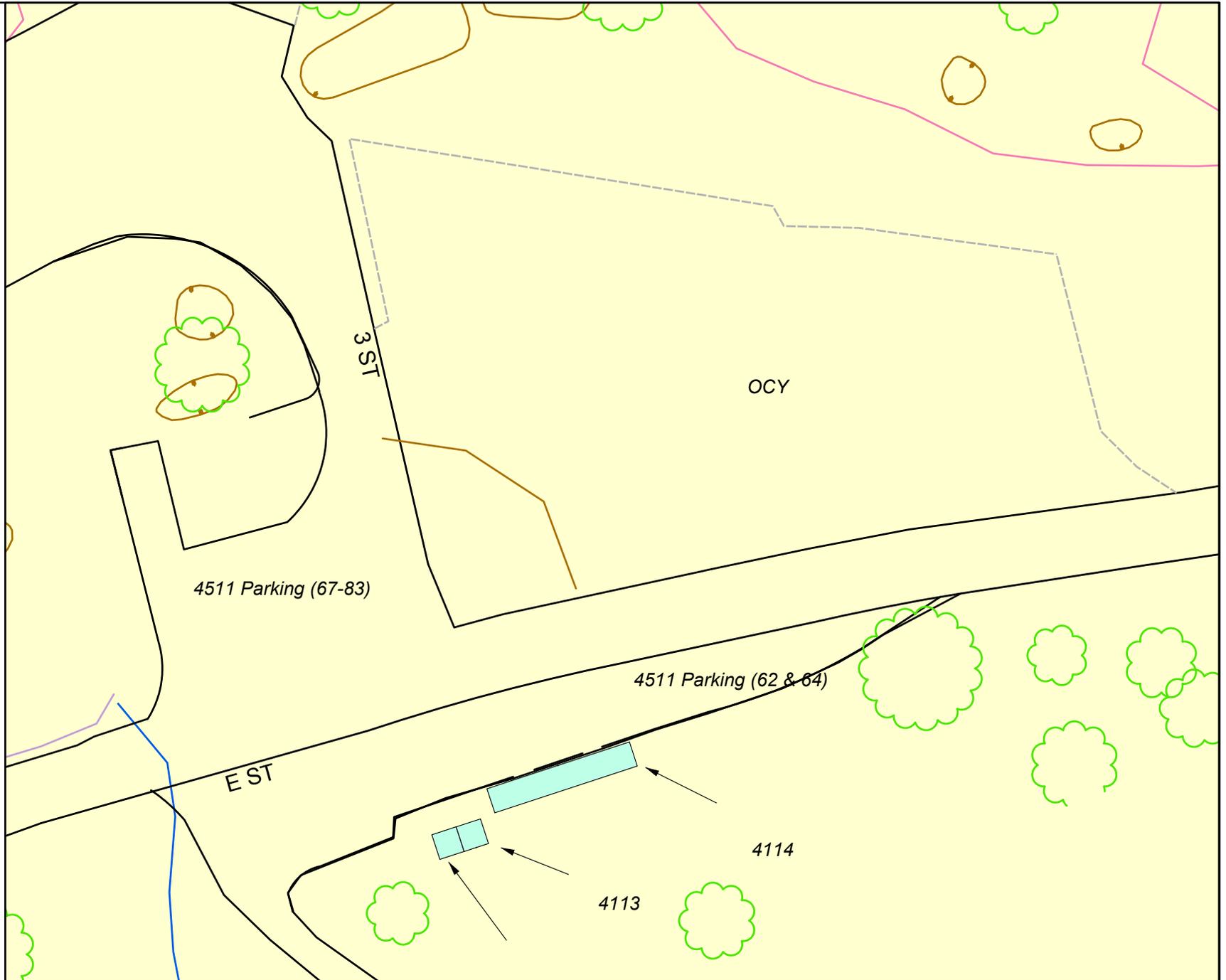
### Legend

**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



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## Site Summary – Building 4114

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### Site Identification:

Building 4114  
Decontamination Trailer

### Operational Use/History:

- Constructed in approximately 1981.<sup>1</sup>
- Building 4114 was designed as a radiological decontamination station for personnel involved in accidents; however, the decontamination trailer was never used for this purpose.<sup>2,3,4</sup>
- Demolished in approximately 1992.<sup>5</sup>

### Site Description:

- Building 4114 was a trailer located on the 4511 Parking Lot.<sup>1</sup>

### Relevant Site Information:

- There are no Use Authorizations and no Incident Reports associated with Building 4114.<sup>3</sup>

### Radiological Surveys:

- Radiological surveys specific to Building 4114 have not been conducted.
- This site was included in the Area IV Radiological Characterization Survey, conducted in 1994 through 1995.<sup>6</sup>
  - Scope/Purpose: Designed to locate and characterize any previously unknown areas of elevated radioactivity in Area IV.
  - Background: 15.6  $\mu\text{R/hr}$ .
  - Acceptable Limit: Less than 5  $\mu\text{R/hr}$  above background.
  - The survey found the area to be below acceptable limits.

### Status:

- Building 4114 was demolished in approximately 1992.<sup>2</sup>

## Group A

### References:

- 1- SSFL Area IV, ETEC Industrial Planning Maps, 1962-1992.
- 2- Personnel Interview, Dan Trippeda, September 10, 2003.
- 3- Review of Radiation Safety Records Management System, 2003.
- 4- Personnel Interview, Bob Tuttle, December 12, 2003.
- 5- Personnel Interview, Phil Rutherford, November 12, 2003.
- 6- Rocketdyne Document, A4CM-ZR-0011, Rev. A, "Area IV Radiological Characterization Survey," August 15, 1996.
- 7- Historical Site Photographs from Boeing Database.

## Site Summary – Parking Lot 4511

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### Site Identification:

Site 4511  
Parking Lot At Main Gate  
Includes Building 4113, Guard Shack  
Includes Building 4623, Guard Shack

### Operational Use/History:

- Constructed prior to 1962.<sup>1</sup>
- Site 4511 served as a parking lot for personnel working in the Old Conservation Yard (OCY) and adjacent areas.
- The parking lot is no longer in use.

### Site Description:

- Parking Lot 4511 was an asphalt pad that was located between the OCY and Site 4583.
- Serviced by Guard Shack 4113.
- Serviced by Guard Shack 4623.

### Relevant Site Information:

- There are no Use Authorizations and no Incident Reports associated with Parking Lot 4511.<sup>2</sup>

### Radiological Surveys:

- A radiological survey of the Old Energy Systems Group (ESG) Salvage Yard (Old), Rocketdyne Barrel Storage/Conservation Yard and New Salvage Yard was conducted in 1988.<sup>3</sup>
  - Scope/ Purpose: In 1988, the ESG Salvage Yard (also known as the OCY), Barrel Storage/Conservation Yard and former location of 4113 were surveyed for fixed and removable alpha/beta contamination. Ambient gamma exposure rate measurements were taken in the Storage Yards. Soil samples were collected because radioactivity was indicated by exposure rate measurements in the southwest corner of the Barrel Storage/Conservation Yard.
  - Background: 15  $\mu$ R/hr.
  - Acceptable Limit: Less than 5  $\mu$ R/hr above background.
  - Average Ambient Gamma: 14.3  $\mu$ R/hr.
  - Survey results were below the acceptable limits.

## Group A

### Status:

- Parking Lot 4511 is no longer in use.

### References:

- 1- SSFL Area IV, ETEC Industrial Planning Maps, 1962-1992.
- 2- Review of Radiation Safety Records Management System, 2003.
- 3- ETEC Document, GEN-ZR-008, "Radiological Survey of the ESG Salvage Yard (Old), Rocketdyne Barrel Storage Yard, and New Salvage Yard (T583)," August 22, 1988.
- 4- Historical Site Photographs from Boeing Database.

Photograph – Site 4511

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## Site Summary – Old Conservation Yard

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### Site Identification:

OCY  
Rocketdyne Barrel Storage/Conservation Yard  
Includes Building 4313, Conservation Shack

### Operational Use/History:

- This area has been used to support research and development work at the Santa Susana Field Laboratory (SSFL) since the 1950s.<sup>1</sup>
- During the 1960s to late 1970s, the OCY was used extensively in support of predominately nuclear-related work.<sup>1</sup>
- When the nuclear-related projects came to an end in approximately 1977, the OCY was cleaned, and all salvageable, non-radioactive materials were moved to the New Salvage Yard (Site 4583).<sup>1</sup>
- In late 1969, the OCY was converted to a material storage yard for the Plant Services Department.<sup>1</sup>
- In 1986, the OCY was converted to a parking area for trailers and other vehicles.<sup>1</sup>

### Site Description:

- The OCY is a natural terrain yard, and did not have a fenced boundary. It is located on an irregular plateau in a mountainous area and is approximately three acres.<sup>2</sup>
- The Barrel Storage Yard was partially paved, gravel and dirt and is approximately one acre.<sup>1</sup>
- Serviced by Conservation Shack 4313.

### Relevant Site Information:

- The OCY was used to store salvageable materials from nuclear-related facilities at SSFL from the late 1960s to the late 1970s.<sup>1</sup>
- Controls were instituted to prevent storage of radioactively contaminated material in the OCY. Radioactive materials were not deliberately dumped or placed in this area. However, some contamination is known to have occurred.<sup>1</sup>
  - On January 15, 1976, a radioactive spill was detected in the OCY. Investigation revealed that a number of barrels (with measurements ranging from 2 mR/hr gamma to 6 mR/hr) were stored on pallets. One particularly rusty barrel was thought to have been the source of the contamination in the area. Despite best efforts, it was never determined where the barrel had come from or exactly what it had contained. All contaminated soil, asphalt, barrels and pallets were removed from the OCY and dispositioned appropriately (A0288).

## Group A

- When the nuclear-related projects came to an end in approximately 1977, the OCY was cleaned and surveyed.
- It is believed that the Barrel Storage Yard was contaminated by a mixed fission product spill.<sup>1</sup>
- In 1989, the site was remediated to remove contamination identified during the 1988 radiological survey.<sup>2</sup>

### Radiological Surveys:

- In 1988, Rocketdyne conducted a radiological Survey of the ESG Salvage Yard (Old), the Rocketdyne Barrel Storage Yard, and the New Salvage Yard (4583).<sup>1</sup>
  - Scope/ Purpose: The ESG Salvage Yard, OCY and New Salvage Yard were surveyed to determine if any residual radioactive contamination remained as a result of storage operations to confirm that further surveying or decontamination was necessary. The area was surveyed for fixed and removable alpha/beta contamination. Ambient gamma exposure rate measurements were taken in the Storage Yards. Soil samples were collected, because radioactivity was indicated by exposure rate measurements in the southwest corner of the Barrel Storage/Conservation Yard.<sup>2</sup>
  - During this survey, ambient gamma exposure measurements within the fenced storage yard indicated a contaminated mud puddle in the southwest corner of the Barrel Storage/Conservation Yard. The value was approximately three times ambient background, above the acceptable limits (5  $\mu\text{R/hr}$  above ambient background). Additional soil samples were collected in this area.
  - All other areas of the site were below Derived Concentration Guideline Levels for ambient gamma exposure rates.
  - Soil sampling in the area found the average Cs-137 concentration at 81 pCi/g, which was above the DCGL of 60.4 pCi/g.
- The site was remediated in 1989 to remove contamination found during the 1988 radiological survey. The top four inches of soil were removed from a 20-foot by 20-foot area in the Barrel Storage/Conservation Yard. Confirmation samples were collected.<sup>2</sup>
  - Ambient gamma: 2.1  $\mu\text{R/hr}$  above background.
  - Limit: 5  $\mu\text{R/hr}$  above background.
  - Average Cs-137 concentration in soil was 13.1 pCi/g.
- In 1993, the Oak Ridge Institute for Science and Education (ORISE) conducted a final verification survey of the area. The verification survey included gamma surface scans and soil sampling:<sup>3</sup>
  - Acceptable limit: 5  $\mu\text{R/hr}$  above background (background is 14  $\mu\text{R/hr}$ ).
  - A composite soil sample indicated 0.6 pCi/g for Cs-137, non-detect for Sr-90 and 1.4 pCi/g for U-238.
  - Acceptable limit: 60.4 pCi/g.

- The California Department of Health Services (DHS) performed verification sampling on September 14, 1995, and found no residual contamination in excess of current limits.<sup>4</sup>
- In March 2000, metal debris was discovered in the hillside of the OCY to the northeast of the remediated area discussed above. The debris was surveyed using beta and alpha instruments and wipes. No radioactive contamination was detected at the debris. Four surface soil samples were taken from the debris field and analyzed for gamma emitting radionuclides.
  - Uranium and thorium daughters were at background levels of 1 pCi/g or less. Cs-137 was detected at 0.14, 0.097, 0.18, and 0.071 pCi/g. All samples were within the range of background.
  - The surrounding 80,000 ft<sup>2</sup> (grid blocks V28 and V29) were surface scanned for radiation exposure. No elevated areas were detected.<sup>5</sup>
- Twenty-seven soil samples taken at the OCY in April 2002 ranged from non-detect to 2.7 pCi/g (gross Cs-137). All were less than the Cs-137 DCGL of 9.2 pCi/g.<sup>6</sup>

**Status:**

- DHS concurred with the radiological release of the site in 1995.<sup>4</sup>
- The site is currently undergoing RCRA cleanup.

**References:**

- 1- ETEC Document, GEN-ZR-008, "Radiological Survey of the ESG Salvage Yard (Old), Rocketdyne Barrel Storage Yard, and New Salvage Yard (T583)," August 22, 1988.
- 2- Rocketdyne Report, N704SRR990030, "Final Report, Decontamination and Radiological Survey of the Old Conservation Yard," August 16, 1990.
- 3- ORISE Document, 93/J-107, "Verification Survey of the OCY, Building T064 Side Yard and Building T028, SSFL, Rockwell International, Ventura County, California," Tim Vitkus, October 1993.
- 4- DHS/RHB Letter, "Rocketdyne's letter dated July 6, 1995 with attachments concerning the release of Buildings T029, T028, and OCY," from Gerard Wong (DHS/RHB) to Phil Rutherford, December 21, 1995.
- 5- Boeing Letter from Majelle Lee to Roger Lupo, "Old Conservation Yard Debris Field," May 12, 2000.
- 6- Personnel Interview, Phil Rutherford, January 30, 2005 (Area IV Database for Onsite and Offsite Surveys).
- 7- SSFL Area IV, ETEC Industrial Planning Maps, 1962-1992.
- 8- Historical Site Photographs from Boeing Database.

Photograph – Old Conservation Yard (OCY)

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## Group B

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Group B Map

Site 4583, New Salvage Yard

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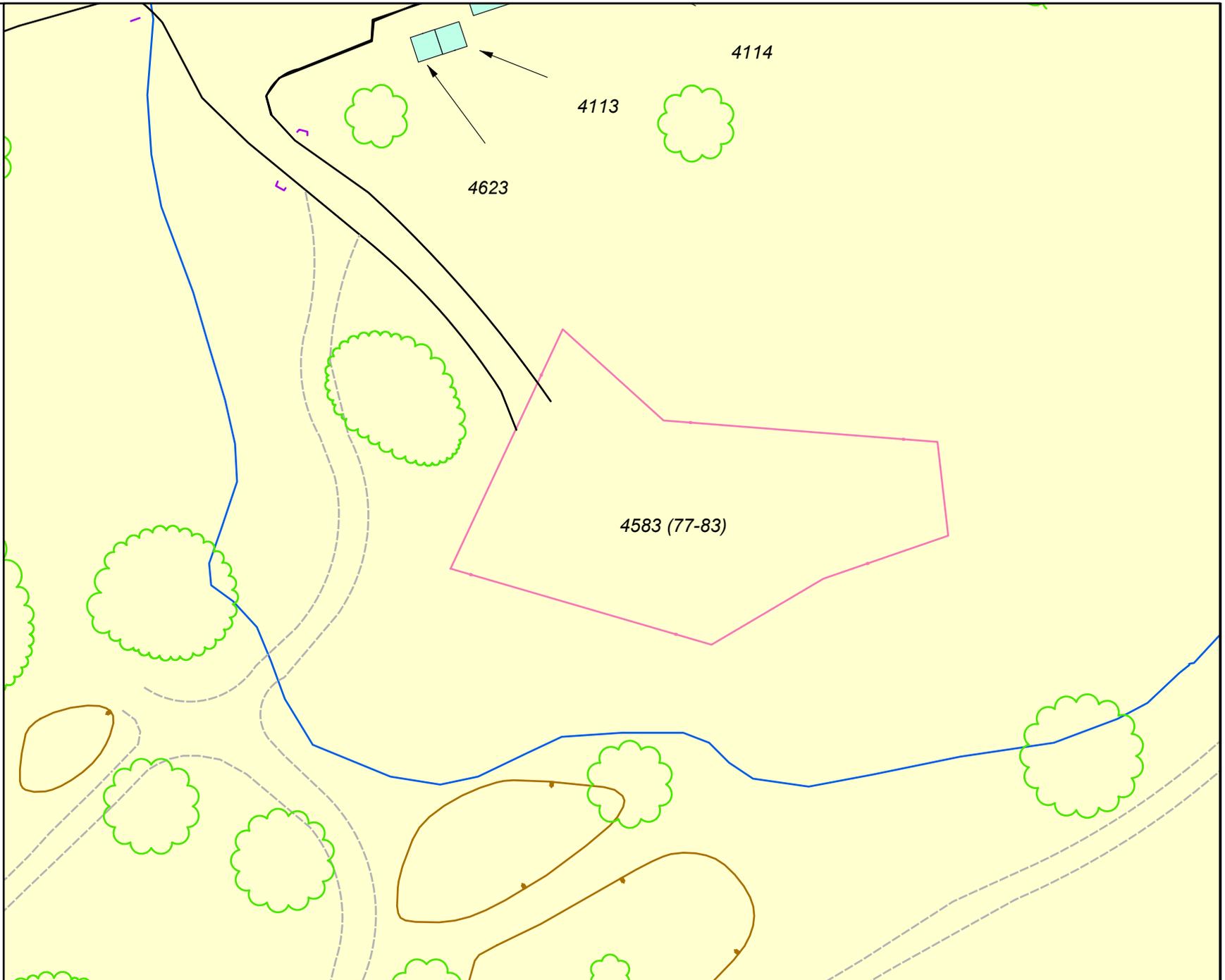
**Legend**

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

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

**Unlabeled Features:**

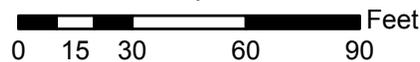
-  Leachfield  
(Removed)
-  Tree
-  Rock
-  Concrete Curb
-  Gutter
-  Asphalt/Concrete  
Berm & Paving
-  Sidewalk
-  Dirt Road
-  Fence
-  Stream/Pond
-  Drain
-  Area IV Boundary



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1 inch equals 50 feet



DATE:

May 2005

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

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## Site Summary – Site 4583, New Salvage Yard

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### Site Identification:

Site 4583  
New Salvage Yard

### Operational Use/History:

- This area has been used to support research and development work at the Santa Susana Field Laboratory (SSFL) since 1977.<sup>1</sup>
- When the Old Conservation Yard (OCY) and the Old ESG Storage Yard (which was also Site 4583) ceased to be used to support nuclear-related projects in approximately 1977, they were cleaned and all salvageable, non-radioactive materials were moved to the New Salvage Yard.<sup>1</sup>
- No longer in use.

### Site Description:

- New Salvage Yard was a half-acre area located south of E Street.<sup>2</sup> It was gravel-covered and fenced.<sup>1</sup>
- A surface drainage gully, running near the west boundary line of the New Salvage Yard, drained water pumped from the old Sodium Reactor Experiment (SRE) catch pond (4773).

### Relevant Site Information:

- Radiologically contaminated items were not transferred from the OCY or the Conservation Yard to the New Salvage Yard. Radioactive controls were instituted to ensure that no radioactive materials were stored in the New Salvage Yard.<sup>1</sup>
- The drainage gully, described above, may have been slightly contaminated, because it carried surface runoff from the SRE to the catch pond.<sup>1</sup>

### Radiological Surveys:

- In 1988, Rocketdyne conducted a radiological Survey of the ESG Salvage Yard (Old), the Rocketdyne Barrel Storage Yard, and the New Salvage Yard (4583).<sup>1</sup>
  - The Conservation Yard, OCY, and New Salvage Yard were surveyed to determine if any residual radioactive contamination remained as a result of storage operations to confirm that further surveying or decontamination was necessary.<sup>1</sup> The area was surveyed for fixed and removable alpha/beta contamination.
  - Ambient gamma exposure rate measurements were collected for the New Salvage Yard and the drainage gully to the west.
    - Average ambient surface gamma: 14.7  $\mu$ R/hr.

## Group B

- Background: 15  $\mu\text{R/hr}$ .
- Acceptable Limit: Less than 5  $\mu\text{R/hr}$  above background.
- The survey found the area to be below acceptable limits.

### Status:

- The New Salvage Yard is empty and no longer in use.

### References:

- 1- ETEC Document, GEN-ZR-008, "Radiological Survey of the ESG Salvage Yard (Old), Rocketdyne Barrel Storage Yard, and New Salvage Yard (T583)," August 22, 1988.
- 2- SSFL Area IV, ETEC Industrial Planning Maps, 1962-1992.
- 3- Historical Site Photographs from Boeing Database.

## Group C

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Group C Map

Site 4583, Old ESG Storage Yard

Building 4320

Building 4731

Building 4732

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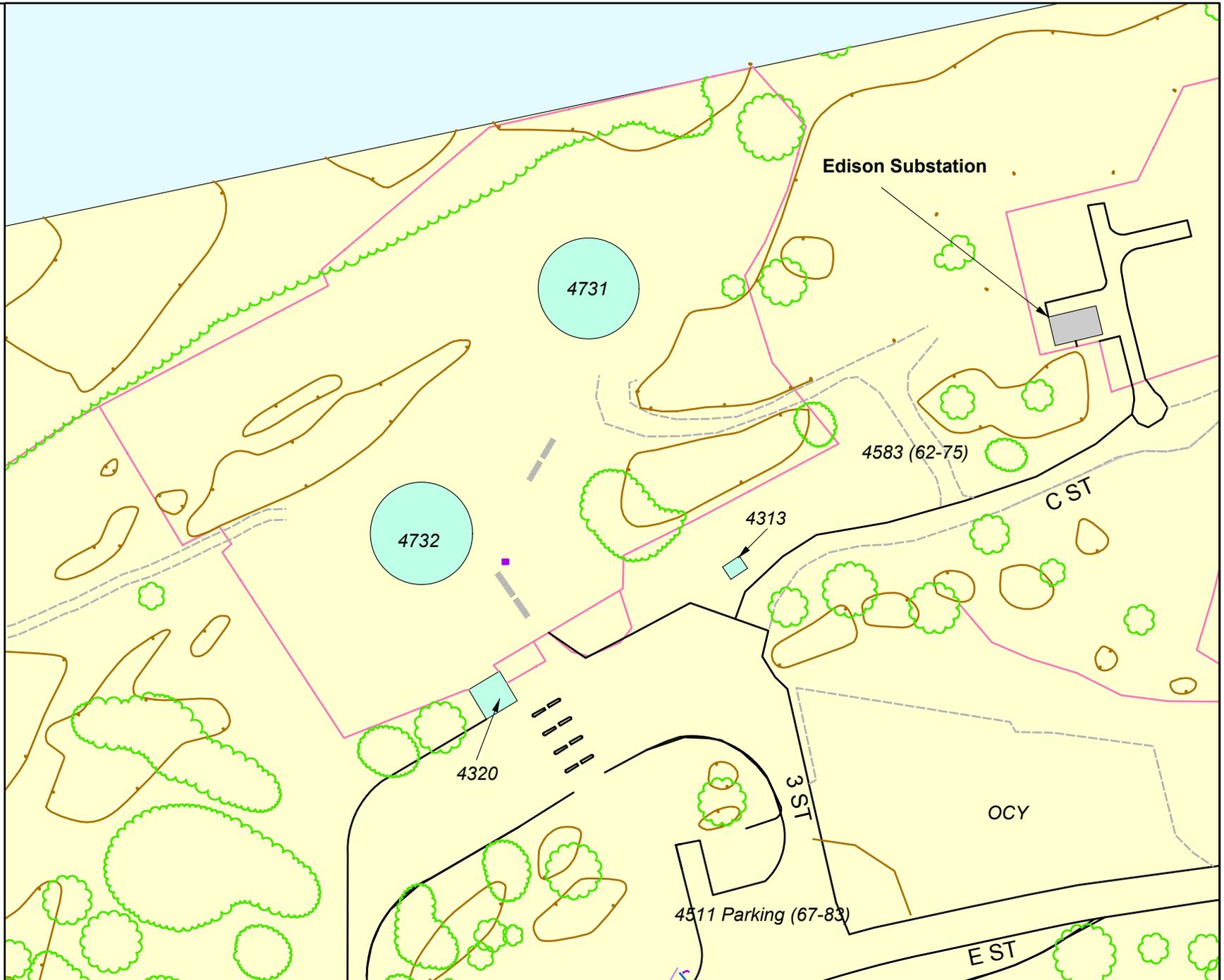
### Legend

**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

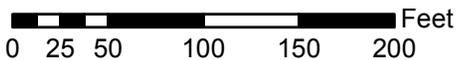


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**Sapere**  
CONSULTING INC



1 inch equals 100 feet



DATE:

May 2005

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

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## Site Summary – Site 4583, Old ESG Storage Yard

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### Site Identification:

Site 4583  
Conservation Yard  
Old ESG Storage Yard

### Operational Use/History:

- This area has been used to support research and development work at Santa Susana Field Laboratory (SSFL) since the 1950s.<sup>1</sup>
- The Old ESG Storage Yard was used extensively during the 1960s to late 1970s predominately in support of nuclear-related work.<sup>1</sup>
- When the Old ESG Storage Yard ceased to be used to support nuclear-related projects in approximately 1977, it was cleaned and all salvageable non-radioactive materials were moved to the New Salvage Yard.<sup>1</sup>
- In the early 1980s, the Old ESG Storage Yard, which was no longer in use, became the Fuel Oil Tank Farm. The area was fenced in 1982.

### Site Description:

- The Old ESG Storage Yard was a three-acre area of mostly natural terrain in the northeastern corner of Area IV, north of C Street.<sup>1,2</sup>

### Relevant Site Information:

- During various construction, dismantling and refurbishing phases of facilities that supported nuclear-related programs at SSFL, excess salvageable materials were kept primarily in the Old ESG Storage Yard.<sup>1</sup>
- Excess materials spread to the surrounding areas, including the Old Conservation Yard, which was located south of the Old ESG Storage Yard.<sup>1</sup>
- Since the Old ESG Storage Yard was used to support nuclear-related work, the area was surveyed for radiological contamination on a regular basis.<sup>1</sup>
- Deliberate dumping or placing of materials did not occur, but contaminated items (uranium and mixed fission products) were occasionally found during routine radiation surveys.<sup>1</sup>

### Radiological Surveys:

- In 1988, Rocketdyne conducted a radiological Survey of the ESG Salvage Yard (Old), the Rocketdyne Barrel Storage Yard, and the New Salvage Yard (4583).<sup>1</sup>
  - The Old ESG Storage Yard, OCY, and New Salvage Yard were surveyed to determine if any residual radioactive contamination remained as a result of storage operations to confirm that further surveying or decontamination was

## Group C

necessary.<sup>1</sup> The area was surveyed for fixed and removable alpha/beta contamination.

- Ambient gamma exposure rate measurements were collected for the New Salvage Yard and the drainage gully to the west.
  - Average ambient surface gamma: 14.7  $\mu\text{R/hr}$ .
  - Background: 15  $\mu\text{R/hr}$ .
  - Acceptable Limit: Less than 5  $\mu\text{R/hr}$  above background.
  - The survey found the area to be below acceptable limits.

### Status:

- The Old ESG Storage Yard became the Fuel Oil Tank Farm in the early 1980s. The Fuel Tank Farm and associated piping were demolished in 1999.

### References:

- 1- ETEC Document, GEN-ZR-008, "Radiological Survey of the ESG Salvage Yard (Old), Rocketdyne Barrel Storage Yard, and New Salvage Yard (T583)," August 22, 1988.
- 2- SSFL Area IV, ETEC Industrial Planning Maps, 1962-1992.
- 3- Historical Site Photographs from Boeing Database.

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## Site Summary – Building 4320

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**Site Identification:**

Building 4320  
Fuel Oil Control/Pump Building

**Operational Use/History:**

- Constructed in 1977.<sup>1</sup>
- Building 4320 sat on a concrete pad and housed four pumps used to pump fuel oil from two tanks (referred to as Buildings 4731 and 4732) to Building 4735, an 86,000-gallon day tank located near Building 4008.<sup>1</sup>
- Demolished in 1999.<sup>2</sup>

**Site Description:**

- Building 4320 was a 500-square-foot structure constructed of prefabricated steel. It sat on a concrete pad and was connected to the tanks by carbon steel pipes ranging from three to six inches in diameter. The entire area was fenced and paved.

**Relevant Site Information:**

- There are no Use Authorizations and no Incident Reports associated with Building 4320.<sup>3</sup>

**Radiological Surveys:**

- Radiological surveys specific to Building 4320 have not been conducted, though information about this site was included in the radiological survey of the ESG Salvage Yard (Old).<sup>1</sup>
- This site was included in the Area IV Radiological Characterization Survey, conducted in 1994 through 1995.<sup>4</sup>
  - Scope/Purpose: Designed to locate and characterize any previously unknown areas of elevated radioactivity in Area IV.
  - Background: 15.6  $\mu$ R/hr.
  - Acceptable Limit: Less than 5  $\mu$ R/hr above background.
  - The survey found the area to be below acceptable limits.

**Status:**

- The Tank Farm and associated piping were demolished in 1999.

## Group C

### References:

- 1- ETEC Document, GEN-ZR-008, "Radiological Survey of the ESG Salvage Yard (Old), Rocketdyne Barrel Storage Yard, and New Salvage Yard (T583)," August 22, 1988.
- 2- ETEC Document, GEN-SP-00051, "Removal of Fuel Oil Storage and Distribution System," November 2, 1998.
- 3- Review of Radiation Safety Records Management System, 2003.
- 4- Rocketdyne Document, A4CM-ZR-0011, Rev. A, "Area IV Radiological Characterization Survey," August 15, 1996.
- 5- Historical Site Photographs from Boeing Database.
- 6- SSFL Area IV, ETEC Industrial Planning Maps, 1962-1992.

Photograph – Building 4320

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## Site Summary – Building 4731

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### Site Identification:

Building 4731  
1.5 Million Gallon Fuel Oil Storage Tank

### Operational Use/History:

- Constructed in 1977.
- Building 4731 was located in the Fuel Tank Farm area of the Old ESG Storage Yard (Site 4583).<sup>1</sup>
- A second tank, called Building 4732, was constructed in 1982. The areas surrounding both tanks were fenced.<sup>1</sup>
- The tank, referred to as Building 4731, stored fuel that was pumped by the pump station to Building 4735, an 86,000-gallon day tank, located near Building 4008. A control building (Building 4320) was also located at the Fuel Tank Farm.<sup>1</sup>
- Demolished in 1999.<sup>2</sup>

### Site Description:

- Building 4731 had a capacity of 1.5 million gallons, and measured 74 feet in diameter and 48 feet high. It was above ground, vented and constructed of carbon steel. The Fuel Tank Farm also contained a pump station and interconnecting piping systems, a control building, concrete supports and foundations, asphalt paving and chain link fencing.<sup>2</sup>

### Relevant Site Information:

- There are no Use Authorizations and no Incident Reports associated with Building 4731.<sup>3</sup>

### Radiological Surveys:

- Prior to construction of the Fuel Tank Farm, the area of the Old ESG Storage Yard was surveyed to confirm that the area was free of radiological contamination.<sup>1</sup>
- This site was included in the Area IV Radiological Characterization Survey, conducted in 1994 through 1995.<sup>4</sup>
  - Scope/Purpose: Designed to locate and characterize any previously unknown areas of elevated radioactivity in Area IV.
  - Background: 15.6  $\mu$ R/hr.
  - Acceptable Limit: Less than 5  $\mu$ R/hr above background.
  - The survey found the area to be below acceptable limits.

## Group C

### Status:

- The Fuel Tank Farm and associated piping were demolished in 1999.<sup>2</sup>

### References:

- 1- ETEC Document, GEN-ZR-008, "Radiological Survey of the ESG Salvage Yard (Old), Rocketdyne Barrel Storage Yard, and New Salvage Yard (T583)," August 22, 1988.
- 2- ETEC Document, GEN-SP-00051, "Removal of Fuel Oil Storage and Distribution System," November 2, 1998.
- 3- Review of Radiation Safety Records Management System, 2003.
- 4- Rocketdyne Document, A4CM-ZR-0011, Rev. A, "Area IV Radiological Characterization Survey," August 15, 1996.
- 5- Historical Site Photographs from Boeing Database.
- 6- SSFL Area IV, ETEC Industrial Planning Maps, 1962-1992.

Photograph – Building 4731

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## Site Summary – Building 4732

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### Site Identification:

Building 4732  
1.5 Million Gallon Fuel Oil Storage Tank

### Operational Use/History:

- Constructed in 1982.
- Building 4732 was located adjacent to Building 4731 in the area of the Old ESG Storage Yard.<sup>1</sup>
- The tank, referred to as Building 4732, stored fuel that was pumped by the pump station to Building 4735, an 86,000-gallon day tank, located near Building 4008. A control building (Building 4320) was also located at the Fuel Tank Farm.<sup>1</sup>
- Demolished in 1999.<sup>2</sup>

### Site Description:

- Building 4732 had a capacity of 1.5 million gallons, and measured 74 feet in diameter and 48 feet high. It was above ground, vented and constructed of carbon steel. The Fuel Tank Farm also contained a pump station and interconnecting piping systems, a control building, concrete supports and foundations, asphalt paving and chain link fencing.<sup>2</sup>

### Relevant Site Information:

- There are no Use Authorizations and no Incident Reports associated with Building 4732.<sup>3</sup>

### Radiological Surveys:

- Prior to construction of the Fuel Tank Farm, the area of the Old ESG Storage Yard was surveyed to confirm that the area was free of radiological contamination.<sup>1</sup>
- This site was included in the Area IV Radiological Characterization Survey, conducted in 1994 through 1995.<sup>4</sup>
  - Scope/Purpose: Designed to locate and characterize any previously unknown areas of elevated radioactivity in Area IV.
  - Background: 15.6  $\mu$ R/hr.
  - Acceptable Limit: Less than 5  $\mu$ R/hr above background.
  - The survey found the area to be below acceptable limits.

### Status:

- The Fuel Tank Farm and associated piping were demolished in 1999.<sup>2</sup>

## Group C

### References:

- 1- ETEC Document, GEN-ZR-008, "Radiological Survey of the ESG Salvage Yard (Old), Rocketdyne Barrel Storage Yard, and New Salvage Yard (T583)," August 22, 1988.
- 2- ETEC Document, GEN-SP-00051, "Removal of Fuel Oil Storage and Distribution System," November 2, 1998.
- 3- Review of Radiation Safety Records Management System, 2003.
- 4- Rocketdyne Document, A4CM-ZR-0011, Rev. A, "Area IV Radiological Characterization Survey," August 15, 1996.
- 5- Historical Site Photographs from Boeing Database.
- 6- SSFL Area IV, ETEC Industrial Planning Maps, 1962-1992.

Photograph – Building 4732

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## Group D

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Group D Map

Building 4040

*Includes Building 4624, Fire Truck Canopy*

Parking Lot 4540

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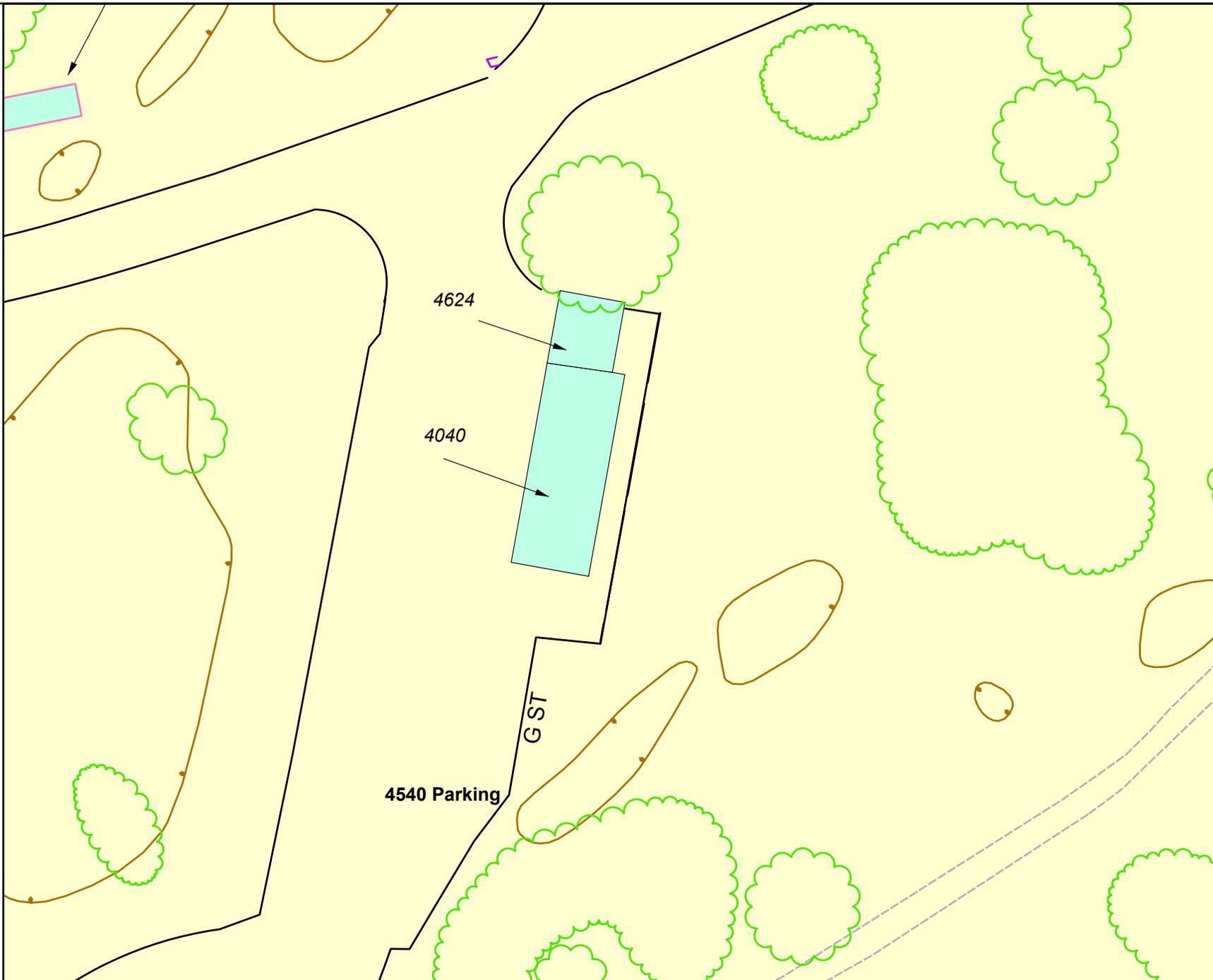
### Legend

**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

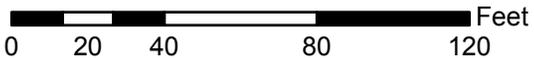


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**Sapere**  
CONSULTING INC



1 inch equals 50 feet



DATE:

May 2005

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

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## Site Summary – Building 4040

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### Site Identification:

Building 4040  
Protective Services Control Center  
Contaminated Medical Facility  
Facilities and Industrial Engineering  
Office Supply Storage  
Energy Technology Engineering Center (ETEC) Equipment Storage  
Includes Building 4624, Fire Truck Canopy

### Operational Use/History:

- Constructed in 1960 as an office building.<sup>1</sup>
- Building 4040 housed a health physics counting lab for an unspecified period of time.<sup>2</sup>
  - The lab used sealed check sources and a laboratory low-background alpha/beta counting system. This system would have been used for counting air samples and wipe samples with activities permitted under a blanket use authorization for health physics to use radiation-counting equipment.
- Demolished in 1997.<sup>2</sup>

### Site Description:

- Building 4040 was a 2,800-square-foot structure with steel walls, a steel roof and a concrete slab floor.<sup>1</sup>
- Building 4624, a fire truck canopy, was adjacent to Building 4040 and appears only on the 1962 Industrial Planning Map.<sup>3</sup>

### Relevant Site Information:

- Building 4040, housed sealed check sources and a laboratory low-background alpha/beta counting system, used for counting air samples and wipe samples. Such activities would have been permitted under a blanket use authorization for health physics to use radiation-counting equipment.<sup>2</sup> Sealed sources were checked annually to ensure that no leaks had occurred.
- There are no additional Use Authorizations and no Incident Reports associated with Building 4040.<sup>4</sup>

### Radiological Surveys:

- Direct frisk surveys were performed in February 1996 and survey results were below the acceptable limits.<sup>5</sup>

## Group D

- A smear survey was performed in February 16, 1996 and the survey results were below the acceptable limits (Acceptable Limits: 20 dpm/100 cm<sup>2</sup> alpha, 100 dpm/100cm<sup>2</sup> beta).<sup>5</sup>
- Ambient gamma was measured in 4040 on February 20, 1996. Levels between 10 µR/hr and 12 µR/hr were detected.<sup>5</sup>
- Direct frisk survey were performed in May 1, 1997, and survey results were below the acceptable limits (NDA).<sup>6</sup>

### Status:

- Building 4040 was demolished in 1997.<sup>2</sup>

### References:

- 1- DOE Document, N-083E-A02-DV001, Rev. A, "Site Development and Facility Utilization Planning FY 1984-FY 1989," April 1984.
- 2- Personnel Interview, Phil Rutherford, September 4, 2003.
- 3- SSFL Area IV, ETEC Industrial Planning Maps, 1962-1992.
- 4- Review of Radiation Safety Records Management System, 2003.
- 5- Rockwell International Internal Document, no document number, Radiation Survey Report, Building T040, 1996.
- 6- Rockwell International Internal Document, no document number, Radiation Survey Report, Building T040, 1997.
- 7- Historical Site Photographs from Boeing Database.

Photograph – Building 4040

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## Site Summary – Parking Lot 4540

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**Site Identification:**

Site 4540  
Parking Lot

**Operational Use/History:**

- Parking Lot 4540 was located directly south of Building 4040 and was used by personnel working in the building.
- Following the demolition of Building 4040 in 1997, Parking Lot 4540 was no longer used.<sup>1</sup>

**Site Description:**

- Parking Lot 4540 was located directly south of Building 4040.<sup>2</sup>

**Relevant Site Information:**

- There are no Use Authorizations and no Incident Reports associated with Parking Lot 4540.<sup>3</sup>

**Radiological Surveys:**

- Radiological surveys specific to Building 4540 have not been conducted.<sup>1,3</sup>

**Status:**

- Building 4040 was demolished in 1997. Parking Lot 4540 is no longer used.

**References:**

- 1- Personnel Interview, Phil Rutherford, September 4, 2003.
- 2- SSFL Area IV, ETEC Industrial Planning Maps, 1962-1992.
- 3- Review of Radiation Safety Records Management System, 2003.

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## Group E

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Group E Map

Building 4014

*Includes Building 4783, Substation*

Building 4029

Building 4030

*Includes Building 4XXX, Electrical Substation for 4030 and 4641*

Building 4046

Building 4053

*Includes Building 4033, Skid Shack*

*Includes Building 4043, Skid Shack*

Building 4064 and Side Yard and Site 4864

*Includes Mechanical Equipment Slab (Site 4864)*

Parking Lot 4513

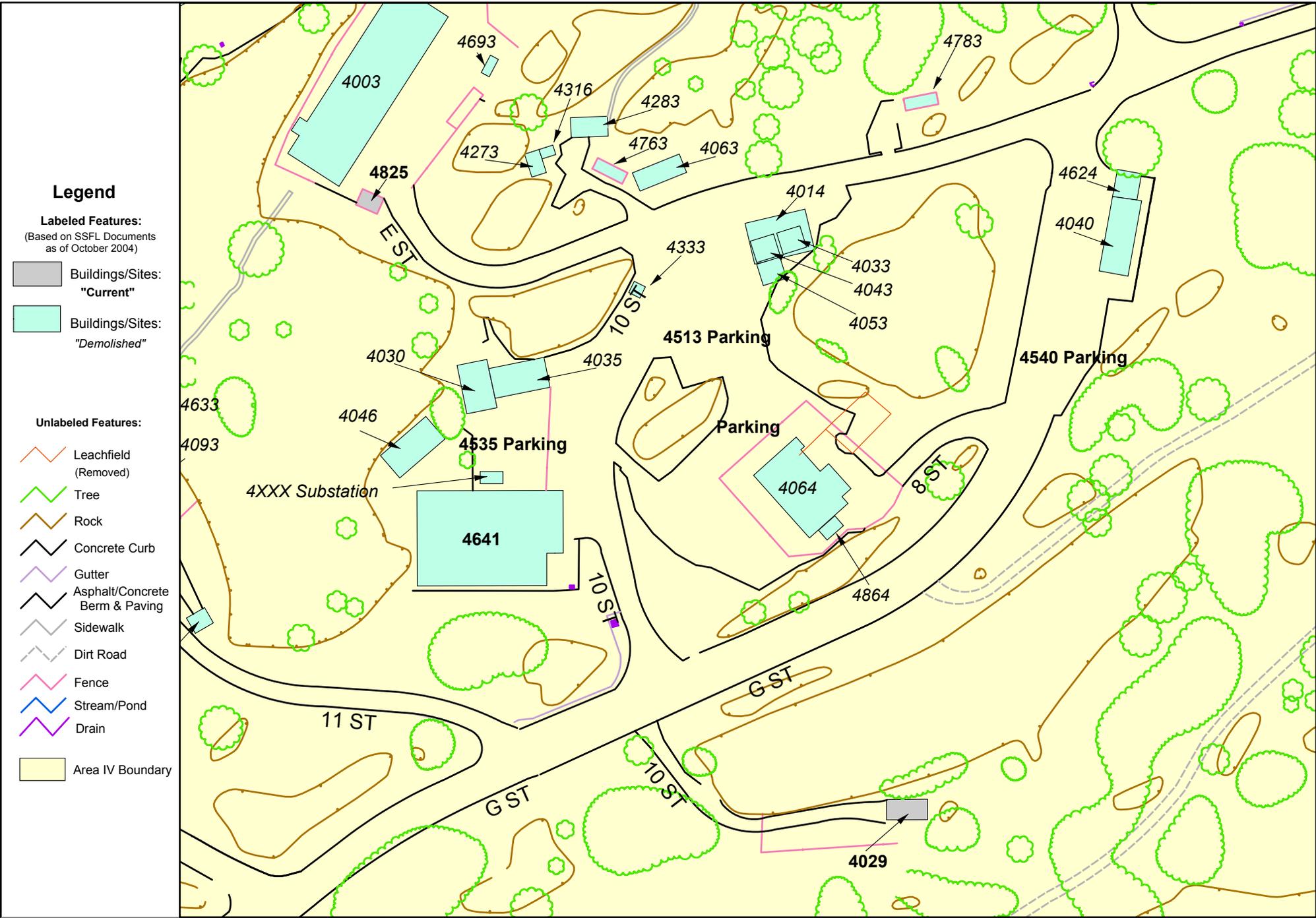
*Includes Building 4333, Time Clock*

4535 Parking Lot

Building 4641

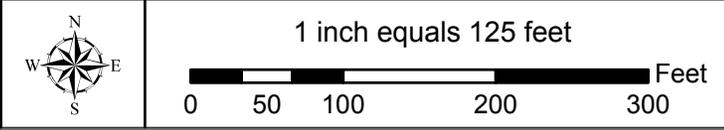
*Includes Building 4XXX, Electrical Substation for 4030 and 4641*

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DRAWN BY: **Sapere CONSULTING INC**

DATE: May 2005



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

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## Site Summary – Building 4014

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### Site Identification:

Building 4014  
Sodium Storage Building  
Includes Building 4783, Substation

### Operational Use/History:

- Constructed in approximately 1978.<sup>1,2</sup>
- Building 4014 was used to store metallic sodium.
- Demolished in 2003.<sup>1,3</sup>

### Site Description:

- Building 4014 was a 2,100-square-foot structure located near Buildings 4064 and 4030.
- Building 4014 was serviced by Substation 4783.

### Relevant Site Information:

- There are no Use Authorizations and no Incident Reports associated with Building 4014.<sup>4</sup>

### Radiological Surveys:

- This site was included in the Area IV Radiological Characterization Survey, conducted in 1994 through 1995.<sup>5</sup>
  - Scope/Purpose: Designed to locate and characterize any previously unknown areas of elevated radioactivity in Area IV.
  - Background: 15.6  $\mu$ R/hr.
  - Acceptable Limit: Less than 5  $\mu$ R/hr above background.
  - The survey found the area to be below acceptable limits.

### Status:

- Demolished in 2003.<sup>1,3</sup>

### References:

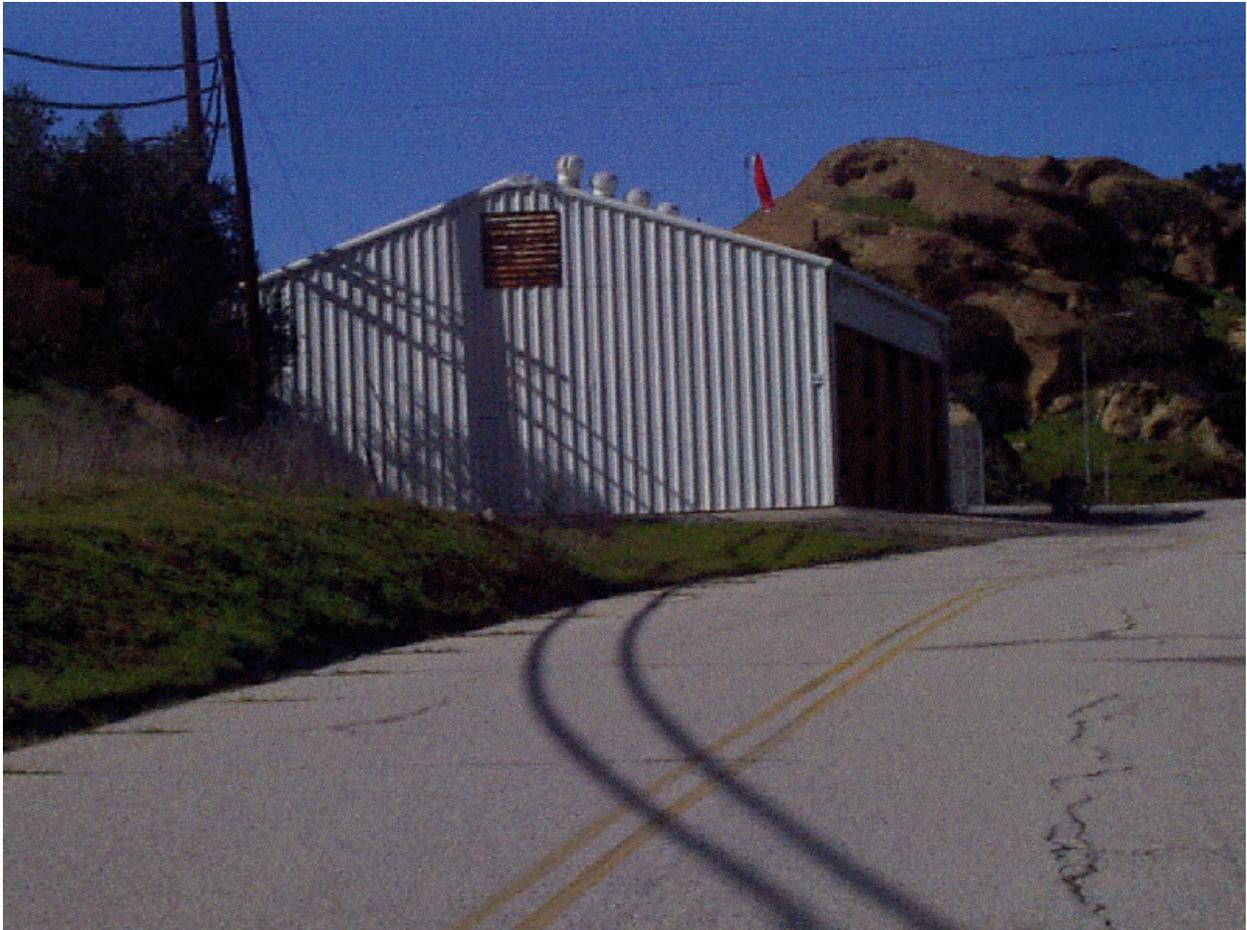
- 1- SSFL Area IV, ETEC Industrial Planning Maps, 1962-1992.
- 2- Personnel Interview, Dan Trippeda, September 2003.

## Group E

- 3- Historical Site Photographs from Boeing Database.
- 4- Review of Radiation Safety Records Management System, 2003.
- 5- Rocketdyne Document, A4CM-ZR-0011, Rev. A, "Area IV Radiological Characterization Survey," August 15, 1996.

Photograph – Building 4014

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## Site Summary – Building 4029

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### Site Identification:

Building 4029  
Radioactive Measurement Facility  
Old Calibration Facility  
Hazardous Waste Storage Facility  
Hazardous Waste Management Facility

### Operational Use/History:

- Constructed in 1959.
- Originally constructed to store radioactive source materials (i.e., Ra-226, Co-60, PoBe, PuBe and Cs-137) (which were checked annually to ensure no leakage occurred) for instrument calibration.<sup>1</sup>
- All radioactive source materials were removed on April 29, 1974 and the facility was partially decommissioned.<sup>2</sup>
- Following source materials removal, the building became a non-radioactive hazardous materials storage building for alkali metals (Na, NaK, Li, LiH<sub>2</sub>) and alkali metal contaminated components.<sup>3</sup>
- In 1988, all below-grade enclosures were removed and disposed of as low level waste, the exhaust system was removed for reuse, and the excavations were backfilled to allow for continued use of the facility.<sup>1</sup>
- DOE released the site without radiological restrictions February 5, 1993.<sup>4</sup>

### Site Description

- Building 4029 is a single open bay, Butler-type building with a steel frame, corrugated metal siding and roofing. The building measures 20 x 40 feet with a 12-foot eave height and the ceilings and walls are insulated with fiberglass mat. Three below-grade enclosures were constructed to hold radioactive calibration sources: a 10-foot deep concrete well with three separate galvanized pipe casings for source storage, a 10-foot deep concrete and lead well with a 4-foot above-grade section (14 feet total) with galvanized pipe casing for instrument calibration, and a 3 x 3 feet concrete pit 2 feet deep for source storage.<sup>1,3</sup>

### Relevant Site Information:

- Some barrels with unknown contents (assumed to be non-radioactive) were stored outside the building for a short period of time in the early 1960s. Later surveys found no detectable activity at the storage area.<sup>3</sup>
- Two reported incidents may have resulted in potential releases to the environment:

## Group E

- On March 24, 1964, a leaking calibration source contaminated the building and personnel with 24.8 mCi Ra-226; the contamination was primarily confined to the source storage well and the source thimble. The area outside the source holder was decontaminated and surveyed, and the damaged source was removed and sealed to prevent further leakage (A0032).
- On January 20, 1970, the encapsulation of a 4.6 Ci Cs-137 calibration source failed during use, resulting in the source getting stuck in the storage well. It was estimated that external radiation level of the source was 16 R/hr one foot away from the source (A0577).

### Radiological Surveys:

- Rocketdyne performed a Radiological Survey in 1988 measuring the gamma exposure rate of the building, surrounding area and entrance road to clarify and identify areas needing further radiological inspection or requiring remedial action.<sup>3</sup>
  - Average gamma:  $14.4 \pm 1.55$   $\mu$ R/hr. ( $-0.84 \pm 1.55$   $\mu$ R/hr corrected for background)
    - DOE limit: 20  $\mu$ R/h above background.
    - Nuclear Regulatory Commission (NRC) limit: 5  $\mu$ R/hr above background.
    - Survey results were below the acceptable limits.
  - Source wells were contaminated (2,800  $\alpha$ -dpm/100  $\text{cm}^2$ ) and it was recommended that they be remediated during the final decommissioning and demolition (D&D) of the facility.
  - The survey concluded that with the exception of the wells, the facility is clean of any residual radioactive contamination.
- DHS performed verification sampling in 1995.
- Rocketdyne took soil samples as part of the D&D effort and the survey results are documented in the 1996 Final D&D Report.<sup>1</sup>
  - The survey found all radiation to be in acceptable ranges around background levels:
    - Excavation results for Pb-214 were 0.28 and 0.27 pCi/g compared to a background measurement of 0.84 pCi/g.
    - Excavation results for K-40 were 23.1 and 23.6 pCi/g compared to a background measurement of 22.2 pCi/g.
  - Based on these measurements and the 1988 radiological survey, the facility was released for unrestricted use.
- ORISE performed an Independent Verification Survey in 1993.<sup>4</sup>
  - The survey consisted of surface scans for elevated direct radiation. Results of the survey did not indicate any locations of elevated direct radiation using the NRC limit of 5  $\mu$ R/hr (DOE limit is 20  $\mu$ R/hr above background).<sup>4</sup>
  - Based on these findings ORISE recommended that the facility be released without radiological restrictions.

- EPA conducted an oversight verification survey in 2001 for alpha and beta contamination.<sup>5</sup> The survey included scans for alpha and beta and fixed point measurements for alpha and beta. Six swipe samples were collected and dust samples were collected from two ventilation ducts. Swipe samples were analyzed for removable contamination and dust samples were analyzed for the presence of radium daughter products. The contaminant of concern (COC) for Building 4029 was Ra-226 on the floors and walls.
  - Acceptable limits for the survey were consistent with NRC Regulatory Guide 1.86 (Ra-226 levels of 100 dpm/100 cm<sup>2</sup> average, 300 dpm/100 cm<sup>2</sup> maximum and 20 dpm/100 cm<sup>2</sup> removable) and the proposed sitewide release criteria in accordance with Area IV survey.<sup>6</sup>
  - None of the field measurements indicated the presence of radionuclides above acceptable limits.
  - The Environmental Protection Agency (EPA) field measurements confirmed the conclusions reached by both Rocketdyne and ORISE.

**Status:**

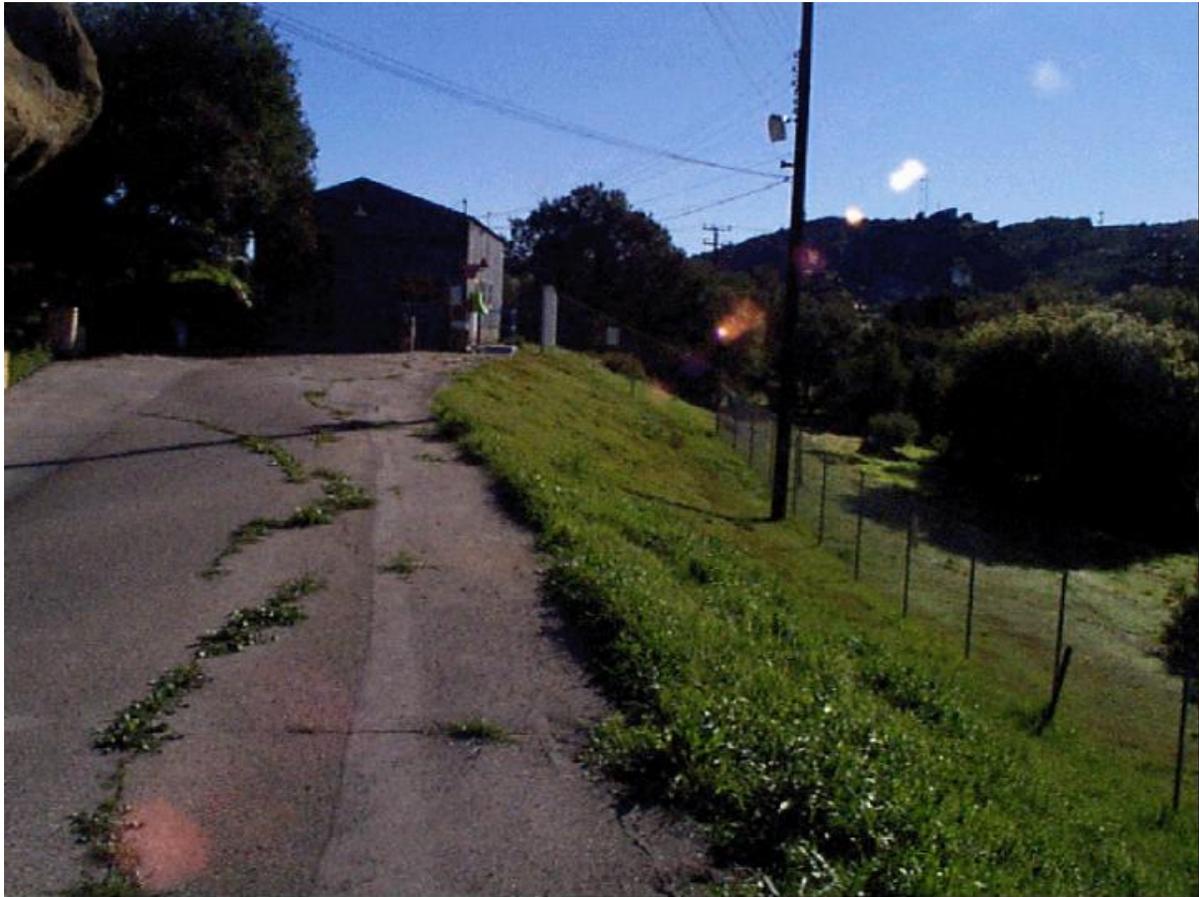
- DHS concurred that Building 4029 met the approved standards for unrestricted release on December 21, 1995.
- DOE released Building 4029 without radiological restrictions on April 21, 1997.<sup>4</sup>
- Building 4029 is currently used to store non-radioactive hazardous materials prior to disposal.<sup>4</sup>

**References:**

- 1- ETEC Document, 029-AR-0001, "Final D&D Report for Building T029," March 28, 1996.
- 2- Rockwell Health and Safety, Letter, "Transfer of Radioactive Sources from T029," from J. D. Moore (Rockwell Health and Safety) to W. F. Heine, May 1, 1974.
- 3- ETEC Document, GEN-ZR-0006, "Radiological Survey of the Old Calibration Facility – Building T029," August 19, 1988.
- 4- ORISE, Letter, "Type A Verification of Building T029, Santa Susana Field Laboratory, Rockwell International, Canoga Park, California," from T. Vitkus (ORISE) to A. Kluk, February 5, 1993.
- 5- U.S. EPA Report, no document number, "Final Oversight Verification and Confirmation Radiological Survey Report for Buildings T-012, T-029, and T-363," December 20, 2002.
- 6- Rocketdyne Document, A4CM-ZR-0011, Rev. A, "Area IV Radiological Characterization Survey," August 15, 1996.
- 7- Historical Site Photographs from Boeing Database.
- 8- SSFL Area IV, ETEC Industrial Planning Maps, 1962-1992.

Photograph – Building 4029

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## Site Summary – Building 4030

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### Site Identification:

Building 4030  
AE-6 Counting Room & Workshop (4030)\*  
AE-6 Office Annex (4035)  
Particle Accelerator Facility  
Site Purchasing Office  
Traffic and Warehousing  
Includes Building 4XXX, Electrical Substation for 4030 and 4641

### Operational Use/History:

- Constructed in 1958, for research with a small accelerator neutron source.<sup>1</sup>
- A Van de Graff accelerator was moved into the facility in 1960; it operated through 1964 in support of the Systems for Nuclear Auxiliary Power (SNAP) program.<sup>1</sup>
- In 1966, the accelerator was removed. Beginning in 1972, the building was used as a purchasing office for the site and for traffic and warehousing.<sup>1</sup>
- Building 4030 was demolished in 1999.

### Site Description:

- Building 4030 had a total enclosed area of 2,311 square feet, which consisted of two connected sections, each with steel framing, siding and roof. The western portion of Building 4030 was constructed at a right angle to the front office section.<sup>1</sup>
- The front section of Building 4030 was known as Building 4035 before the rear section was added, and the two buildings were combined to form Building 4030.<sup>1</sup>
- The rear section of Building 4030 was configured to house a Van de Graaf accelerator, which provided an adjustable energy proton beam to bombard a tritium target to produce neutrons.<sup>2</sup>
- An outside concrete wall was constructed to the north and east sides of the rear section to provide shielding for the proton beam.<sup>2</sup>
- Drawings indicate the building had an associated leachfield that was likely used until 1961-1962, when the building was connected to the newly-built Area III site-wide sewage system.<sup>3</sup>
- Rock outcroppings extend from the building to the west, northwest and northeast.
- Building 4641 was adjacent to Building 4030; a fenced-in area between the buildings was used as a palletized material holding area.<sup>1</sup>
- Serviced by Substation 4XXX.

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\* Buildings 4030 and 4035 were combined to form Building 4030.

## Group E

### Relevant Site Information:

- Regulated radiological materials were managed at this facility. The potential contaminant of concern (COC) is tritium. Activation of building materials was negligible because drums of borated water were used around the target to thermalize and capture neutrons.<sup>1</sup>
- The accelerator was removed in 1966.
- The associated leachfield was not located during decontamination and demolition and it is most likely located beneath Building 4641.
- There are no Incident Reports associated with Building 4030.<sup>4</sup>

### Radiological Surveys:

- Tritium Smear Survey on Building 4030 and associated equipment, March 29, 1966.<sup>5</sup>
  - Maximum sample: 75,000 dpm.
  - Tritium contamination was detected.
  - Areas of contamination were decontaminated.
- General Rocketdyne Survey, 1988.<sup>2</sup>
  - In 1988, Rocketdyne performed a survey to clarify and identify areas at Santa Susana Field Laboratory (SSFL) requiring further radiological inspection or remediation. Radiological contamination quantities were compared against unrestricted-use acceptable contamination prescribed by DOE 5400.1.<sup>2</sup>
  - Building 4030 was included and the scope of the survey, which included ambient gamma exposure rate measurements, “indication” beta surveys of the accelerator room and outside paved area (palletized-container storage area). Exterior soil samples were checked for tritium content.<sup>2</sup>
  - Average ambient gamma radiation: 12.7  $\mu\text{R/hr}$ .
  - Limit: 5  $\mu\text{R/hr}$  above background.
  - Background: between 15.6 and 14  $\mu\text{R/hr}$ .
  - Beta radiation: no detectable activity (NDA)
  - Average tritium activity concentration in soil: 5.31 pCi/l.
  - Maximum acceptable contamination: 366 pCi/l
  - Survey results were below the acceptable limits.
- The Oak Ridge Institute for Science and Education (ORISE) conducted an independent verification survey for Building 4030 in 1995.<sup>3</sup>
  - Surface scans for alpha, beta and gamma activity and single-point direct measurements for total alpha and total beta activity were performed on floors, walls, equipment and outside soil. These levels were compared to the guidelines specified in DOE 5400.1.
  - Total Alpha Surface Activity: less than 55 dpm/100cm<sup>2</sup>.
  - Total Beta Surface Activity: less than 1,400 dpm/100cm<sup>2</sup>.
  - One sample of total tritium activity exceeded the average guideline (5,000  $\beta\text{-}\gamma$  dpm/100 cm<sup>2</sup>) for beta-gamma emitters (6,600 dmp/100 cm<sup>2</sup>), and ORISE recommended additional sampling be performed in this area.

- Exposure rate measurements were performed at 1 meter above surface.
  - Results: 10 to 12  $\mu\text{R/hr}$ .
  - Background: 8  $\mu\text{R/hr}$ .
  - Acceptable Limit: 5  $\mu\text{R/hr}$  above background.
- In 1996, Rocketdyne performed a Final Comprehensive Radiological Survey designed to measure total or removable surface activity and provide additional sampling for tritium activity in the accelerator area.<sup>6</sup>
  - Scope: 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 1 meter.
  - Total alpha and beta limits: 5,000 dpm/100  $\text{cm}^2$ .
  - Removable alpha and beta limits: 1,000 dpm/100  $\text{cm}^2$ .
  - Removable tritium limit: 10,000 dpm/100 $\text{cm}^2$ .
  - Ambient gamma limit: <5.0  $\mu\text{R/hr}$  at 1 meter from surface.
  - Survey results were below the acceptable limits.
- DHS performed verification sampling in 1996 and 1998 to support concurrence of release for unrestricted use.

#### Status:

- Building 4030 was demolished in 1999 and the site was paved. Disposition of the accelerator could not be determined.<sup>1</sup>
- Department of Energy (DOE) released the facility for unrestricted use in October 1997.<sup>7</sup>
- California Department of Health Services (DHS) concurred with the release of the facility for unrestricted use on January 15, 1999.<sup>8</sup>

#### References:

- 1- Rocketdyne Report, 030-AR-0002, "Decontamination and Decommissioning (D&D) of Building T030," November 13, 1997.
- 2- ETEC Document, GEN-ZR-0007, "Radiological Survey of Shipping /Receiving and Old Accelerator Area- Buildings T641 and T030," August 19, 1988.
- 3- ORISE Document 96/C-4, "Verification Survey of the Interim Storage Facility; Buildings T030, T641, and T013; an Area Northwest of Buildings T019, T013, T012, and T059; and a Storage Yard West of Buildings T626 and T038, SSFL, Rockwell International, Ventura County, California," Vitkus, T. J., and T. L. Bright, February 1996.
- 4- Review of Radiation Safety Records Management System, 2003.
- 5- Atomics International Internal, Letter, "Tritium Smear Survey, Building T030 Van de Graaf Accelerator," A.R. Mooeres to W.F. Heine, March 29, 1966.
- 6- Rocketdyne Report, 030-AR-0001, "Final Radiological Survey Report for Building T030," January 22, 1997.
- 7- DOE Document, DOE/CD-ETEC-030, "Certification of the Radiological Condition of Building T030 at ETEC near Chatsworth, California," November 1997.

## Group E

- 8- DHS/RHB, Untitled letter, from Gerard Wong (DHS/RHB) to Phil Rutherford, January 15, 1999.
- 9- Historical Site Photographs from Boeing Database.
- 10- SSFL Area IV, ETEC Industrial Planning Maps, 1962-1992.

Photograph – Building 4030



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## Site Summary – Building 4046

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**Site Identification:**

Building 4046  
Material Office Annex

**Operational Use/History:**

- Constructed in approximately 1977.<sup>1</sup>
- Radiological materials were not handled in Building 4046. A more detailed description of activities associated with Building 4046 could not be located.
- Demolished in approximately 1981.<sup>1</sup>

**Site Description:**

- Building 4046 was located west of Building 4030, just north of Parking Lot 4535.<sup>1</sup>

**Relevant Site Information:**

- There are no Use Authorizations and no Incident Reports associated with Building 4046.<sup>2</sup>

**Radiological Surveys:**

- Radiological surveys specific to Building 4046 have not been conducted.

**Status:**

- Building 4046 was demolished in approximately 1981.<sup>1</sup>

**References:**

- 1- SSFL Area IV, ETEC Industrial Planning Maps, 1962-1992.
- 2- Review of Radiation Safety Records Management System, 2003.

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## Site Summary – Building 4053

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### Site Identification:

Building 4053  
Fire Department Service Building  
Includes Building 4033, Skid Shack  
Includes Building 4043, Skid Shack

### Operational Use/History:

- Constructed prior to 1962.<sup>1</sup>
- Building 4053 served as the Fire Department Service Building.
- Demolished in the late 1970s.<sup>1</sup>

### Site Description:

- Building 4053 was located directly south of the current location of Building 4014.<sup>1</sup>
- Serviced by Skid Shack 4033 (storage area).
- Serviced by Skid Shack 4043.

### Relevant Site Information:

- There are no Use Authorizations and no Incident Reports associated with Building 4053.<sup>2</sup>

### Radiological Surveys:

- Radiological surveys specific to Building 4053 have not been conducted.

### Status:

- Buildings 4033, 4043 and 4053 were demolished in the late 1970s.<sup>1</sup>

### References:

- 1- SSFL Area IV, ETEC Industrial Planning Maps, 1962-1992.
- 2- Review of Radiation Safety Records Management System, 2003.

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## Site Summary – Building 4064 and Side Yard and Site 4864

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### Site Identification:

Building 4064 and Side Yard  
Fuel Storage Facility  
Includes Mechanical Equipment Slab (Site 4864)

### Operational Use/History:

- The building was constructed in two phases. The first phase began in 1958, the second phase in 1963.<sup>1</sup>
- The fuel storage facility was a vault built to provide secure storage for non-irradiated, fissionable nuclear material (enriched uranium and plutonium) used to make reactor fuel.
- Enriched uranium powders and source material powder packages were split into smaller units or combined into larger units in a glove box.<sup>1</sup>
- In the early 1960s, the yard areas in the front, side and back of the building were used to store 55-gallon drums of low-level enriched recoverable scrap.<sup>1</sup>
- By the early 1980s, most reactor contracts had ended. Following removal of all fissionable material, miscellaneous equipment and containers of radioactive waste (principally soil) were stored in the building.<sup>1</sup>
- The facility operated until 1993, when all nuclear material was removed and the building was decontaminated.<sup>1</sup>
- Demolished in 1997.<sup>1</sup>

### Site Description:

- Building 4064 was constructed in two phases:
  - Phase One: A 2,127-square-foot reinforced concrete structure with 11-inch thick walls was constructed on a concrete slab and a fume hood was installed.
  - Phase Two: A new bay was added to the north of the original structure, increasing the total size to 4,418 square feet. The addition was constructed with 12-inch thick concrete blocks.<sup>1</sup>
    - The fenced-in yard was a 6,580-square-foot area within a security fence. This area included a mechanical equipment slab, which was designated Site 4864 on the 1962 Industrial Planning Map.<sup>2</sup> Site 4864 is not included on any subsequent maps and was absorbed by Building 4064.<sup>3</sup>
    - The side yard was designated as the 4,500-square-foot area near Building 4064.<sup>4</sup>
    - Included in the two-acre area surrounding the facility were drainage pathways, former parking lot areas, the side yard, septic tank and a leachfield.<sup>1</sup>

### Relevant Site Information:

- Regulated radiological materials were managed at this facility. The potential COCs include various uranium isotopes, plutonium, thorium, and activation products.<sup>3</sup>
- There were no sinks or processing equipment in the building; the only water supply was in the restroom. Initially, sanitary wastewater was discharged to a septic tank and leach field. In the early 1960s, the facility was connected to the local sewage system, and the leach field was disconnected. The facility was equipped with a high-efficiency particulate air (HEPA) filtered exhaust system.<sup>1</sup>
- Several incidents are recorded for this facility that could have involved releases of radioactivity to the environment:
  - On February 18, 1963, an area of soil and concrete was discovered to have elevated levels of radioactivity ( $1 \times 10^6$  dpm/gram for Cs-137 and  $2 \times 10^5$  dpm/gram for Cs-134). Further surveys showed that 700 square feet of soil and concrete were contaminated with mixed fission products with a maximum of 700 mrad/hr at 2 inches. Though no firm evidence of the source was discovered, it was assumed that the contamination was a result of a leak from a drum containing irradiated Seawolf submarine reactor fuel pins. It is likely that the drum plug rusted through and allowed any liquid in the drum to leak out. The area was excavated, reducing the contamination to an acceptable level of 0.5 mrad/hr (A0028).
  - On October 8, 1964, following shipment to the vault, it was discovered that a can of uranium carbide had oxidized inside the shipping container (“birdcage”), causing the lid of the can to blow open and the bottom of the can to warp. This resulted in alpha radiation levels on the concrete dock to increase from less than 1 dpm/100 cm<sup>2</sup> (clean level) up to 200 dpm/100 cm<sup>2</sup> (A0468).
  - On July 20, 1967, a significant increase in alpha radioactivity was detected on vegetation in the Side Yard. Investigation revealed that a 55-gallon drum containing U<sub>3</sub>O<sub>8</sub> had been opened outside on a piece of plastic sheeting. U<sub>3</sub>O<sub>8</sub> was visible on the sheeting and it was believed that some had been dispersed by wind in the area, contaminating the vegetation. The plastic sheeting was removed and appropriately dispositioned (A0622).

### Radiological Surveys:

- In 1988, Rocketdyne conducted a radiological survey of the source and special nuclear material (SNM) storage vault in Building 4064.<sup>5</sup>
  - Scope: Ambient gamma exposure rate measurements were taken in the storage yard and surrounding area. Soil samples, debris and miscellaneous items were also analyzed. Radiological contamination quantities were compared against unrestricted-use acceptable contamination limits prescribed by DOE 5400.1.<sup>2</sup>
  - Samples were taken in the interior of the building to test for alpha and beta contamination.
  - Average alpha value: 10.5 dpm/100cm<sup>2</sup>
  - Average beta: 388 dpm/100 cm<sup>2</sup>.

- Derived Concentration Guideline Level (DCGL): 5000 dpm/100cm<sup>2</sup>.
- Survey results for the interior walls and floors were below the acceptable limits.
- Miscellaneous building features were surveyed by indication only. The light fixtures, a floor mop and the fume hood were found to be contaminated.
- The area within the fenced storage yard was surveyed for ambient gamma. A contaminated area was found bordering and outside of the eastern fence. This area, measuring approximately 300 square feet, was significantly contaminated with rate readings of 50-100  $\mu$ R/hr at one meter. Soil samples from the vicinity showed elevated Cs-137 activity (2,500 pCi/g, DCGL 100 pCi/g). Further remedial action for that area was required.
  - Remedial action occurred in 1990. The top layer materials for the side yard were removed and the residual activity was analyzed and compared to previous data. It was concluded that radiation and contamination levels in the side yard and other surrounding areas are well below acceptable regulatory limits.<sup>4</sup>
- ORISE performed a final verification survey in December 1992, during which three Cs-137 hotspots in the Building 4064 Side Yard were discovered. One hotspot was found to contain 210 pCi/g of Cs-137. The second was measured at 35.1 pCi/g, and the third was measured at 27.7 pCi/g. (Allowable limits for Cs-137 were 7.08 pCi/g average in 100 m<sup>2</sup> or 70.8 pCi/g maximum in 100 m<sup>2</sup>.) Following additional remediation of these areas, ORISE conducted an additional verification survey and published its findings in 1993.<sup>6</sup>
- The site was included in the Area IV survey in 1995, and additional locations above release limits were found in the side yard and across the street (G Street). Additional remediation occurred in 1997 and 1998.<sup>7</sup>
- In 1998, Rocketdyne performed a final status survey for Building 4064.<sup>7</sup>
  - The entire area was surveyed and sampled. A direct surface gamma scan and ambient gamma exposure measurements at 1 meter above ground were performed. Soil samples were also collected.
    - The highest Cs-137 concentration in soil was 3.1 pCi/g or 28 percent of the DCGL (9.2 pCi/g) for Cs-137.
    - The average net ambient gamma measurement was 4  $\mu$ R/hr, which is below the acceptance limit of 5  $\mu$ R/hr above background.
- In 1998, ORISE conducted a final verification survey of the Building 4064 side yard and other land areas following the demolition of the building and remediation of the yard.<sup>6</sup>
  - ORISE performed gamma surface scans and conducted soil sampling at the site.
    - One area was identified with elevated gamma radiation. Additional remediation was performed immediately and post remediation samples were collected. Post remediation samples had gamma exposure rates ranging from 9 to 13  $\mu$ R/hr, which is below the acceptable limit of 5  $\mu$ R/hr above background (background is 14  $\mu$ R/hr).

## Group E

- Soil samples ranged from less than 0.06 to 2.9 pCi/g for Cs-137, which is below the DCGL of 9.2 pCi/g.
- DHS also performed a verification survey in October 1998.<sup>1</sup>

### Status:

- DOE released Building 4064 for demolition in 1996.<sup>8</sup>
- DHS concurred with the release of the building for demolition in 1996.<sup>9</sup>
- Building 4064 was demolished and the septic tank and leach field were removed in 1997.<sup>1</sup>
- A certification docket has been submitted to DOE.<sup>3</sup>
- On January 31, 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 4064 site was suitable for release for unrestricted use.<sup>10</sup>

### References:

- 1- Boeing Document, EID-04600, "Final Report, Decontamination and Decommissioning (D&D) of Fuel Storage Facility 4064," September 11, 1999.
- 2- SSFL Area IV, ETEC Industrial Planning Maps, 1962-1992.
- 3- U.S. DOE, Oakland Operations Office Document, DOE/CD-ETEC-4064, "Draft Docket for the Release of Facility 4064 at the Former Energy Technology Engineering Center," September 1999.
- 4- Rocketdyne Report, N704SRR990031, "Final Decontamination and Radiological survey of the Building T064 Side Yard," October 20, 1990.
- 5- ETEC Document, GEN-ZR-005, "Radiological Survey of the Source and Special Nuclear Material Storage Vault at Building T064," August 19, 1988.
- 6- ORISE, Letter, "Second Addendum to the Verification Survey of Buildings T064 Side-Yard, SSFL, Ventura County, California (ORISE 1993 and 1994)," from T. Vitkus, (ORISE) to A. Gupta (DOE), January 25, 1999.
- 7- ETEC Document, RS-00003, "Area 4064 Final Status Survey Report," March 30, 1999.
- 8- DOE, Letter, "Demolition of Building 064," from M. Lopez (DOE) to M. Lee, (Rocketdyne) June 25, 1996.
- 9- DHS/RHB, Letter, "Demolition and Disposal of Structural Material from Building T064 at SSFL," from G. Wong (DHS/RHB) to P. Rutherford, August 19, 1996.
- 10- DOE Letter, "Release of Building 4064," from M. Lopez (DOE) to M. Lee (Boeing), January 31, 2005.
- 11- Historical Site Photographs from Boeing Database.

Photograph 1 – Building 4064



Photograph 2 – Building 4064

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## Site Summary – Parking Lot 4513

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### Site Identification:

Site 4513  
Parking Lot between Building 4064 and Building 4030  
Includes Building 4333, Time Clock

### Operational Use/History:

- Constructed in approximately 1967.<sup>1</sup>
- Site 4513 was a parking lot located on the east side of 10<sup>th</sup> Street. It was used by personnel working in Buildings 4064, 4641 and 4030.<sup>2</sup>
- Parking Lot 4513 is still in use.

### Site Description:

- Site 4513 is an asphalt parking lot located on the east side of 10<sup>th</sup> Street.<sup>1,2</sup>
- Serviced by Time Clock 4333.

### Relevant Site Information:

- All of the facilities surrounding the parking lot handled radioactive material or radiologically contaminated equipment. No known contamination incidents occurred, but radioactive contaminants were suspect in this area because of its operational history.<sup>1</sup>

### Radiological Surveys:

- In 1988, Rocketdyne performed a radiological survey for areas that were used to support nuclear-related facilities to determine if radioactive material was accidentally left behind. The parking lot surface and 4333 was surveyed for mixed fission products, by measuring ambient gamma exposure rates.<sup>1</sup>
  - Average Ambient Gamma:  $-1.26 \mu\text{R/hr}$  (corrected for background).
  - Acceptable Limit:  $5 \mu\text{R/hr}$  above background.
  - Survey results were below the acceptable limits.

### Status:

- Parking Lot 4513 is still in use.

## Group E

### References:

- 1- SSFL Area IV, ETEC Industrial Planning Maps, 1962-1992.
- 2- ETEC Document, GEN-ZR-0009, "Radiological Survey of the T513 Parking Lot; Old R/A Laundry Area; Plot 333; and Areas Between SRE to RMDF, and KEWB to RMDF," August 26, 1988.
- 3- Historical Site Photographs from Boeing Database.

Photograph – Parking Lot 4513



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## Site Summary – 4535 Parking Lot

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### Site Identification:

Site 4535  
Parking Lot between Building 4641 and Building 4030

### Operational Use/History:

- Constructed in approximately 1967.
- Site 4535 is located on the east side of 10<sup>th</sup> Street.<sup>1</sup> Personnel working in Buildings 4030 and 4641 used this lot. It is adjacent to Parking Lot 4513.
- Parking Lot 4535 currently is used as a storage area.

### Site Description:

- Site 4535 is an asphalt parking lot located on the east side of 10<sup>th</sup> Street, adjacent to Site 4513.<sup>1</sup>

### Relevant Site Information:

- All the facilities surrounding the parking lot handled radioactive material or radioactively contaminated equipment. No known contamination incidents occurred, but radioactive contaminants were suspect in this area because of operational history.

### Radiological Surveys:

- In 1988, Rocketdyne performed a radiological survey for Buildings 4030 and 4641 to clarify and identify areas at SSFL requiring further radiological inspection or remediation. The ambient gamma exposure rates were measured at Building 4641 loading dock and Building 4030. The parking lot was included in the survey:<sup>2</sup>
  - Background: 8  $\mu$ R/hr.
  - Acceptable Limit: Less than 5  $\mu$ R/hr above background.
  - Average Ambient Gamma: 12.7  $\mu$ R/hr.
  - Survey results were below the acceptable limits.

### Status:

- Parking Lot 4535 is used as a storage area.

## Group E

### References:

- 1- SSFL Area IV, ETEC Industrial Planning Maps, 1962-1992.
- 2- ETEC Document, GEN-ZR-0007, "Radiological Survey of Shipping/Receiving and Old Accelerator Area- Buildings T641 and T030," August 19, 1988.
- 3- Historical Site Photographs from Boeing Database.

Photograph – Parking Lot 4535



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## Site Summary – Building 4641

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### Site Identification:

Building 4641  
Shipping and Receiving  
Includes Building 4XXX, Electrical Substation for 4030 and 4641

### Operational Use/History:

- Constructed in 1964 to be used for shipping and receiving.<sup>1</sup>
- Building 4641 served as a transfer point for all SSFL incoming and outgoing shipments. Through 1985, this included radioactive materials. Non-radioactive materials were stored in the warehouse.<sup>1</sup>
- In 1985, Building 4641 was designated as an on-site, internal moving and transport facility, and radioactive materials ceased being handled there.<sup>1</sup>
- Building 4641 was demolished in 2004.

### Site Description:

- Building 4641 is adjacent to Building 4030.<sup>2</sup> The building has 7,680 square feet of storage space, 240 square feet of office space, and a loading dock for shipping and receiving. A fenced area between 4030 and 4641 was used as a palletized material holding area. South and west of the building are outcroppings of Chatsworth sandstone formation.<sup>3</sup>
- Substation 4XXX serviced Buildings 4030 and 4641.<sup>1</sup>

### Relevant Site Information:

- Radioactive and nuclear shipments were handled only on the outdoor dock; they were never stored in the warehouse. Radioactive materials included individual gamma-graphic sources, radioactive laundry and shipping casks. All radioactive materials being shipped or received were always completely containerized and packaged. Containers were not opened in the area of Building 4641.<sup>1</sup>
- A radiation detector alarm system was installed in the dock; the alarm system was never triggered.<sup>1</sup>
- The storage area may have been used to store drums containing mixed fission products.<sup>1</sup>
- One incident is recorded for this facility that could have involved releases of radioactivity to the environment:
  - On June 20, 1989, 13 mCi of Be-7 arrived at the facility without any labels or controls, in violation of State of California regulations (A0581).

## Group E

### Radiological Surveys:

- Rocketdyne performed a general radiological survey to clarify and identify areas at SSFL requiring further radiological inspection or remediation. The ambient gamma exposure rates were measured at the Building 4641 loading dock and the storage yard. A surface survey for beta-emitting contamination was performed outside in the storage yard “for indication.”<sup>1</sup>
  - Background: 8  $\mu$ R/hr.
  - Acceptable Limit: Less than 5  $\mu$ R/hr above background.
  - Average Ambient Gamma: 12.7  $\mu$ R/hr.
  - Survey results were below the acceptable limits.
  - The criteria for maximum acceptable contamination limits for beta emitters was 5,000 dpm/100 cm<sup>2</sup> for total surface averaged over 1 square meter.
    - Beta radiation measurements showed no detectable activity.
    - Survey results were below the acceptable limits.
- In 1995, ORISE performed an independent verification survey for Building 4641:<sup>3</sup>
  - Surface scans for alpha, beta and gamma activity and single-point direct measurements for total alpha and total beta activities were performed on the loading dock.
    - Surface activity levels were less than 100 dpm/100cm<sup>2</sup> for total alpha and less than 1,400 dpm/100cm<sup>2</sup> for total beta on the loading dock. These levels were compared to the guidelines specified in DOE 5400.1 and are considered radiologically clean.
  - Exposure rate measurements were performed at 1 meter above the surface using a proportional ionization counter and ranged from 10 to 12  $\mu$ R/hr. Background exposure rate is 8  $\mu$ R/hr.

### Status:

- Building 4641 was demolished in 2004.

### References:

- 1- ETEC Document, GEN-ZR-0007, “Radiological Survey of Shipping/Receiving and Old Accelerator Area- Buildings T641 and T030,” August 19, 1988.
- 2- SSFL Area IV, ETEC Industrial Planning Maps, 1962-1992.
- 3- ORISE Document 96/C-4, “Verification Survey of the Interim Storage Facility; Buildings T030, T641, and T013; an Area Northwest of Buildings T019, T013, T012, and T059; and a Storage Yard West of Buildings T626 and T038, SSFL, Rockwell International, Ventura County, California,” Vitkus, T. J., and T. L. Bright, November 1995.
- 4- Historical Site Photographs from Boeing Database.

Photograph – Building 4641

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## Group F

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Group F Map

Building 4063

Building 4273

*Includes Building 4316, Maintenance Skid Shack*

Building 4283

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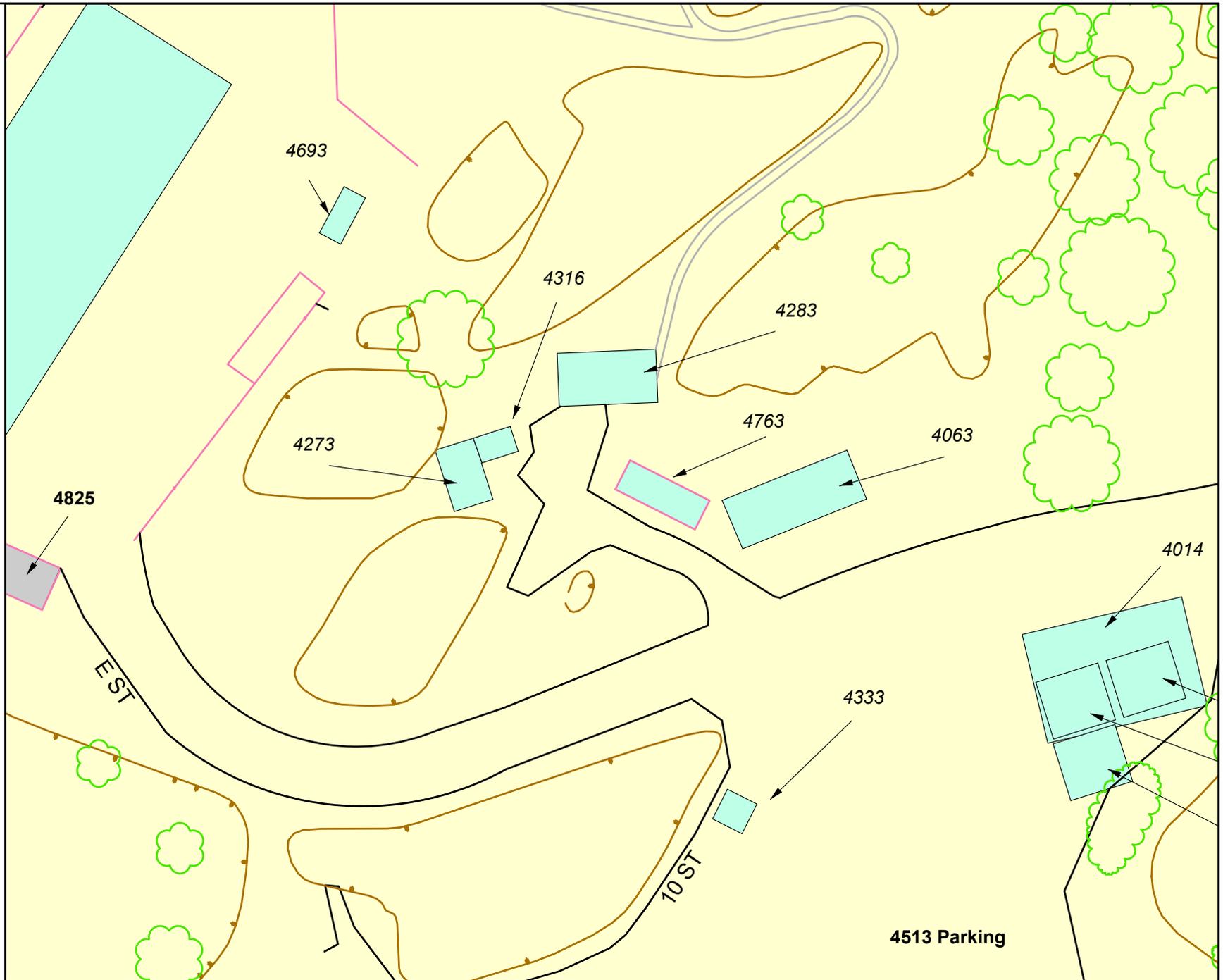
### Legend

**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

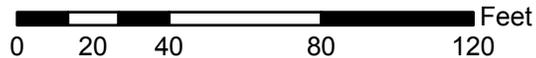


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**Sapere**  
CONSULTING INC



1 inch equals 50 feet



DATE:

May 2005

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

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## Site Summary – Building 4063

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### Site Identification:

Building 4063  
Electronics Shop  
Maintenance Service Building  
Storage Building  
Includes Building 4763, Substation

### Operational Use/History:

- Constructed in approximately 1962.<sup>1</sup>
- Building 4063 was initially used as an electronics shop.<sup>1</sup>
- By 1967, Building 4063 was being used as a maintenance service building for non-radiological equipment.<sup>1,2,3</sup>
- By 1972, Building 4063 was being used as a storage building and housed non-radiological equipment.<sup>1,2,3</sup>
- Demolished in the early 1970s.<sup>1,2</sup>

### Site Description:

- A site description for building 4063 could not be located.
- Serviced by Substation 4763.

### Relevant Site Information:

- Regulated radiological materials were not handled in Building 4063.
- There are no Use Authorizations and no Incident Reports associated with Building 4063.<sup>4</sup>

### Radiological Surveys:

- In October 1988, a radiological survey was conducted at the Department of Energy's (DOE) Santa Susana Field Laboratory (SSFL) to determine whether radioactive material was accidentally left behind. Building 4063, which was part of what was known as the "Old Radioactive Laundry," area was surveyed for mixed fission products by measuring ambient gamma exposure rates.<sup>5</sup>
  - Average: 0.4  $\mu$ R/hr (corrected for background).
  - Acceptable limit: 5  $\mu$ R/hr above background.
  - Survey results were below the acceptable limits.

## Group F

### Status:

- Demolished in the early 1970s.<sup>1,2</sup>

### References:

- 1- SSFL Area IV, ETEC Industrial Planning Maps, 1962-1992.
- 2- Personnel Interview, Dan Trippeda, September 18, 2003.
- 3- Personnel Interview, Randy Ingersoll, September 18, 2003.
- 4- Review of Radiation Safety Records Management System, 2003.
- 5- ETEC Document, GEN-ZR-0009, "Radiological Survey of the T513 Parking Lot; Old R/A Laundry Area; Plot 333; and Areas Between SRE to RMDF, and KEWB to RMDF," August 26, 1988.

## Site Summary – Building 4273

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### Site Identification:

Building 4273  
Protective Clothing Storage  
Radioactive (R/A) Laundry  
Includes Building 4316, Maintenance Skid Shack

### Operational Use/History:

- Constructed in approximately 1962.<sup>1</sup>
- Contaminated laundry from the Sodium Reactor Experiment (SRE), the Engineering Test Building (ETB) and the Radioactive Materials Disposal Facility (RMDF) was brought to Building 4273 and shipped off-site for cleaning.<sup>2,3,4</sup>
- Operation was discontinued in 1971.<sup>3</sup>
- Demolished in 1976.<sup>1</sup>

### Site Description:

- The Old R/A Laundry Area was located north of E Street, at its intersection with 10<sup>th</sup> Street.<sup>1</sup>

### Relevant Site Information:

- Minor contamination incidents and spills may have occurred in Building 4273. Because contaminated protective clothing was stored in this facility, contamination may have been spread during operation.<sup>3,5</sup>

### Radiological Surveys:

- In October 1988, a radiological survey was conducted at the Department of Energy's (DOE) Santa Susana Field Laboratory (SSFL) to determine whether radioactive material was accidentally left behind. Building 4273, which was part of what was known as the "Old Radioactive Laundry," area was surveyed for mixed fission products by measuring ambient gamma exposure rates.<sup>3</sup>
  - Average: 0.4  $\mu$ R/hr (corrected for background).
  - Acceptable limit: 5  $\mu$ R/hr above background.
  - Survey results were below the acceptable limits

## Group F

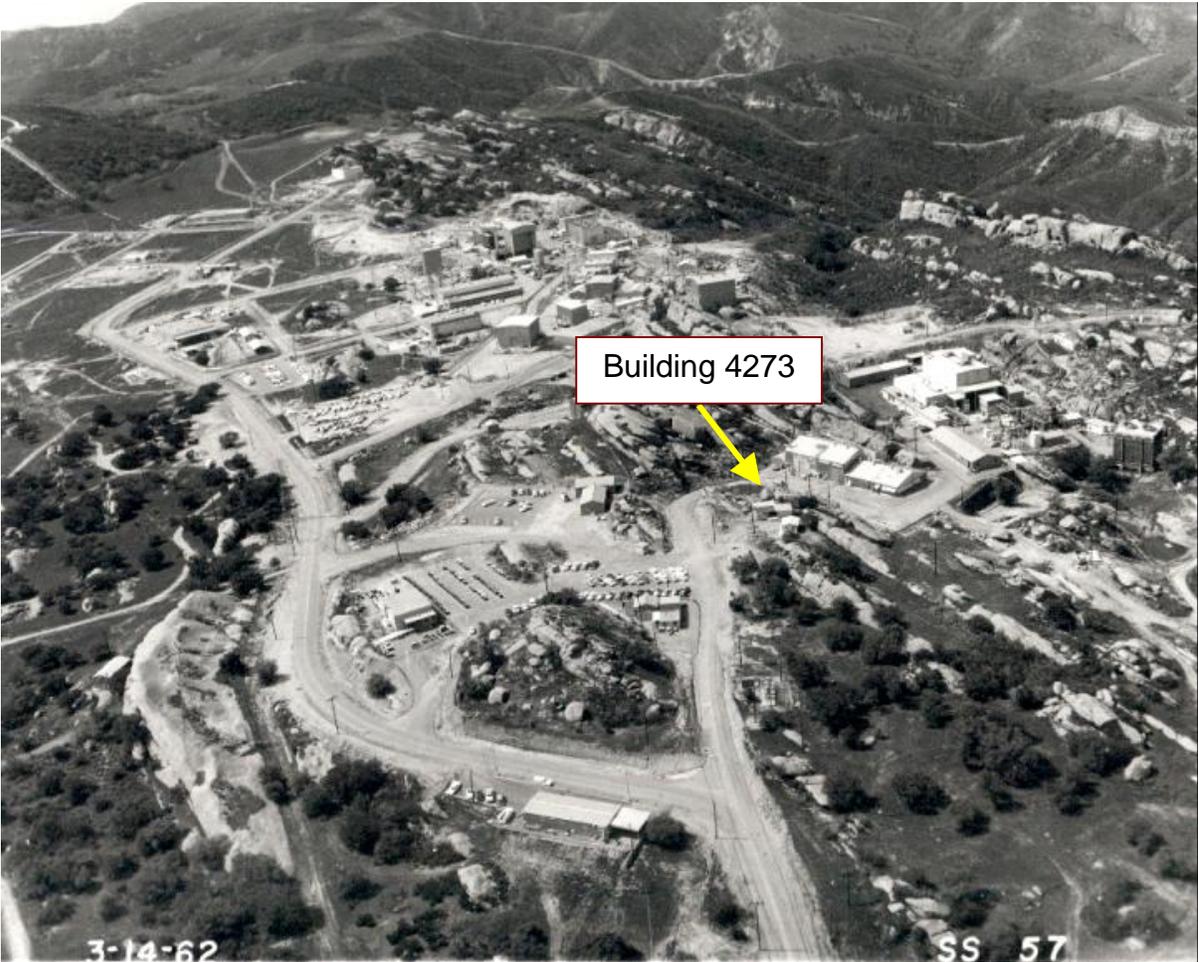
### Status:

- Building 4273 was demolished in 1976. A concrete slab remains.

### References:

- 1- SSFL Area IV, ETEC Industrial Planning Maps, 1962-1992.
- 2- Personnel Interview, Paul Waite, September 22, 2003.
- 3- ETEC Document, GEN-ZR-0009, "Radiological Survey of the T513 Parking Lot; Old R/A Laundry Area; Plot 333; and Areas Between SRE to RMDF, and KEWB to RMDF," August 26, 1988.
- 4- Personnel Interview, Bob Tuttle, December 12, 2003.
- 5- Review of Radiation Safety Records Management System, 2003.
- 6- Historical Site Photographs from Boeing Database.

Photograph – Building 4273



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## Site Summary – Building 4283

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### Site Identification:

Building 4283  
Protective Clothing Storage  
Radioactive Laundry

### Operational Use/History:

- Constructed in approximately 1962.<sup>1</sup>
- Contaminated laundry from SRE, ETB, and RMDF was brought to Building 4283 and shipped off-site for cleaning.<sup>2,3</sup>
- Operation was discontinued in 1971.<sup>4</sup>
- Demolished in approximately 1976.<sup>4</sup>

### Site Description:

- The Old R/A Laundry Area was located north of E Street, at its intersection with 10<sup>th</sup> Street.<sup>4</sup>

### Relevant Site Information:

- Minor contamination incidents and spills may have occurred in Building 4283. Because contaminated protective clothing was stored in this facility, contamination may have been spread during operation.<sup>4,5</sup>

### Radiological Surveys:

- In October 1988, a radiological survey was conducted at the Department of Energy's (DOE) Santa Susana Field Laboratory (SSFL) to determine whether radioactive material was accidentally left behind. Building 4283, which was part of what was known as the "Old Radioactive Laundry," area was surveyed for mixed fission products by measuring ambient gamma exposure rates.<sup>4</sup>
  - Average: 0.4  $\mu$ R/hr (corrected for background).
  - Acceptable limit: 5  $\mu$ R/hr above background.
  - Survey results were below the acceptable limits

### Status:

- Building 4283 was demolished in approximately 1976.<sup>4</sup>

## Group F

### References:

- 1- SSFL Area IV, ETEC Industrial Planning Maps, 1962-1992.
- 2- Personnel Interview, Paul Waite, September 22, 2003
- 3- Personnel Interview, Bob Tuttle, December 12, 2003.
- 4- ETEC Document, GEN-ZR-0009, "Radiological Survey of the T513 Parking Lot; Old R/A Laundry Area; Plot 333; and Areas Between SRE to RMDF, and KEWB to RMDF," August 26, 1988.
- 5- Review of Radiation Safety Records Management System, 2003.
- 6- Historical Site Photographs from Boeing Database.

Photograph – Building 4283



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## Group G

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Group G Map

Building 4003

*Includes Building 4693, Substation*

Building 4041

Building 4133

Building 4143 and Sites 4413, 4894, 4895, 4896, 4897, 4898

*Includes Building 4683, Substation*

Building 4153

Building 4163

Building 4183

Building 4184

Building 4185

Building 4505

Building 4653

Building 4654

Building 4684

Building 4686

Site 4687

Building 4689

Building 4695

Building 4703

Building 4714 (SRE Location)

Building 4723

Building 4724

Building 4733

Building 4743

Building 4753

Site 4773

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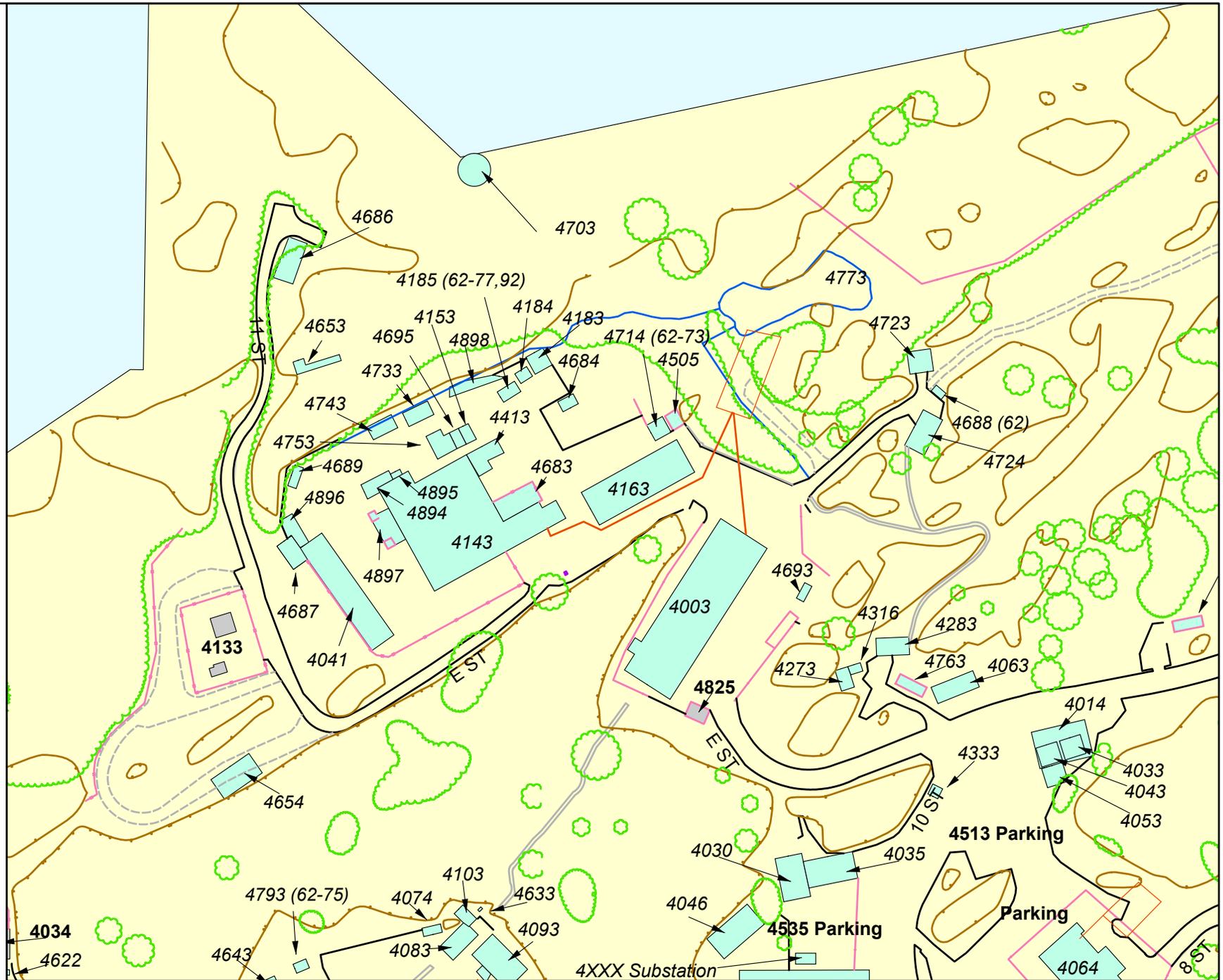
### Legend

**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



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1 inch equals 150 feet



DATE:

May 2005

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

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## Site Summary – Building 4003

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### 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.<sup>1</sup>
- 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.<sup>2</sup>
- 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.<sup>2</sup> 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.<sup>3</sup>
- 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.<sup>4</sup>
- Sewer lines, suspected of contamination, were removed in September 1982.<sup>3,5</sup>
- Demolished in 1999.

## Group G

### 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.<sup>3</sup>
- 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.<sup>6</sup>
- 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.<sup>6</sup>

- 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<sup>2</sup> total, 20 dpm/100 cm<sup>2</sup> removable;
      - Beta: 0.1 mrad/hr at 1 cm through 7 mg/cm<sup>2</sup> absorber and 100 dpm/100 cm<sup>2</sup> 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.<sup>7</sup> The results of the survey indicated the area contained no measurable residual radioactivity.<sup>8</sup>
- 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.<sup>7</sup>
- 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.

## Group G

- 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

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**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.<sup>1</sup>
- 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.<sup>1</sup>
- Following the facility's release for unrestricted use, the facility was used for non-radioactive storage activities.<sup>1</sup>
- 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.<sup>2</sup>

**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.<sup>3</sup>
  - The survey found that four locations in Building 4041 exceeded acceptable limits (20 dpm/100cm<sup>2</sup> for removable alpha, 100 dpm/100cm<sup>2</sup> for removable beta and 100 dpm/cm<sup>2</sup> for total alpha).
    - The maximum activity recorded among these four locations was 17,000 dpm/100cm<sup>2</sup> 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.

## Group G

- In 1982, following decontamination efforts, a radiological survey of Building 4041 was conducted.<sup>2</sup>
  - 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<sup>2</sup> removable.
  - Beta limits: 0.1 mrad/hr at 1 cm through 7 mg/cm<sup>2</sup> absorber and 100 dpm/100 cm<sup>2</sup> 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.<sup>4</sup> 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.<sup>5</sup>
- 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

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**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.<sup>1</sup>
- 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.<sup>2</sup>

**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.<sup>3</sup>

**Relevant Site Information:**

- There are no Use Authorizations and no Incident Reports associated with Building 4133.<sup>4</sup>

**Radiological Surveys:**

- In 1988, six soil samples were collected and analyzed just to the north of Building 4133.<sup>5</sup> 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.<sup>6</sup> 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.

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- The highest total alpha surface contamination measured at the facility was 36 dpm/100 cm<sup>2</sup>, and the highest removable alpha surface contamination measured at the facility was 6 dpm/100 cm<sup>2</sup>.
- The highest total beta surface contamination measured at the facility was 1,292 dpm/100 cm<sup>2</sup> and the highest removable beta surface contamination measured at the facility was 24 dpm/100 cm<sup>2</sup>.
- 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.<sup>7</sup>
  - 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<sup>2</sup> (corrected for background).
    - Removable surface alpha: 0 to 3 dpm/100cm<sup>2</sup> (corrected for background).
    - Removable surface beta: -4 to 6 dpm/100cm<sup>2</sup> (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<sup>2</sup> (corrected for background).
    - Removable alpha: 0 to 1 dpm/100cm<sup>2</sup> (corrected for background).
    - Removable beta: -2 to 6 dpm/cm<sup>2</sup> (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

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

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### 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.<sup>1</sup>
- 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.<sup>2</sup>
- Deactivation activities resulting in a “stored-in-place” configuration were conducted between 1967 and 1968.<sup>1</sup>
- 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.<sup>1</sup> 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.

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- 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.<sup>3,4</sup> 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  $1.64 \times 10^{-10}$   $\mu\text{Ci/cc}$ ) (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  $\text{cm}^2$ . 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  $\text{cm}^2$ ) and a large area of the floor (contamination levels of up to 600 dpm/100  $\text{cm}^2$  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<sup>2</sup> 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<sup>2</sup>) 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<sup>2</sup>. 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<sup>2</sup>. The area was decontaminated 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 found 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

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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.<sup>5</sup>
  - 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<sup>2</sup> total, 20 dpm/100 cm<sup>2</sup> removable.
      - Beta: 0.1 mrad/hr at 1 cm through 7 mg/cm<sup>2</sup> absorber, 100 dpm/100 cm<sup>2</sup> 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.<sup>6</sup>
  - 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<sup>2</sup> total, 20 dpm/100 cm<sup>2</sup> removable.
      - Beta: 0.1 mrad/hr at 1 cm through 7 mg/cm<sup>2</sup> absorber, 100 dpm/100 cm<sup>2</sup> 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.<sup>7</sup>
  - 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<sup>2</sup> total, 20 dpm/100 cm<sup>2</sup> removable.
      - Beta: 0.1 mrad/hr at 1 cm through 7 mg/cm<sup>2</sup> absorber, 100 dpm/100 cm<sup>2</sup> removable.
- In 1983, a survey was conducted of the area adjoining Building 4163 to the south east of Building 4143.<sup>8</sup>
  - 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<sup>2</sup> total, 20 dpm/100 cm<sup>2</sup> removable.
    - Beta: 0.1 mrad hr at 1 cm through 7 mg/cm<sup>2</sup> absorber, 100 dpm/100 cm<sup>2</sup> removable.
- ANL performed an independent verification survey in 1984.<sup>9</sup>
  - 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.<sup>10</sup> 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.<sup>11</sup> No elevated radiation levels were found in

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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.<sup>12</sup> 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.<sup>13</sup>
- 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.

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Photograph – Building 4143



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## Site Summary – Building 4153

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### 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.<sup>1</sup>
  - 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.<sup>1</sup>
    - As part of the overall Atomic 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.<sup>1</sup>
    - 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).<sup>2</sup>

### Site Description:

- Building 4153 was located just north of the SRE reactor building, near Building 4695.<sup>3</sup>

### 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.<sup>4</sup>
  - 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:

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- Alpha: 100 dpm/100 cm<sup>2</sup> total, 20 dpm/100 cm<sup>2</sup> removable;
  - Beta: 0.1 mrad/hr at 1 cm through 7 mg/cm<sup>2</sup> absorber, 100 dpm/100 cm<sup>2</sup> 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.<sup>5</sup> 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.

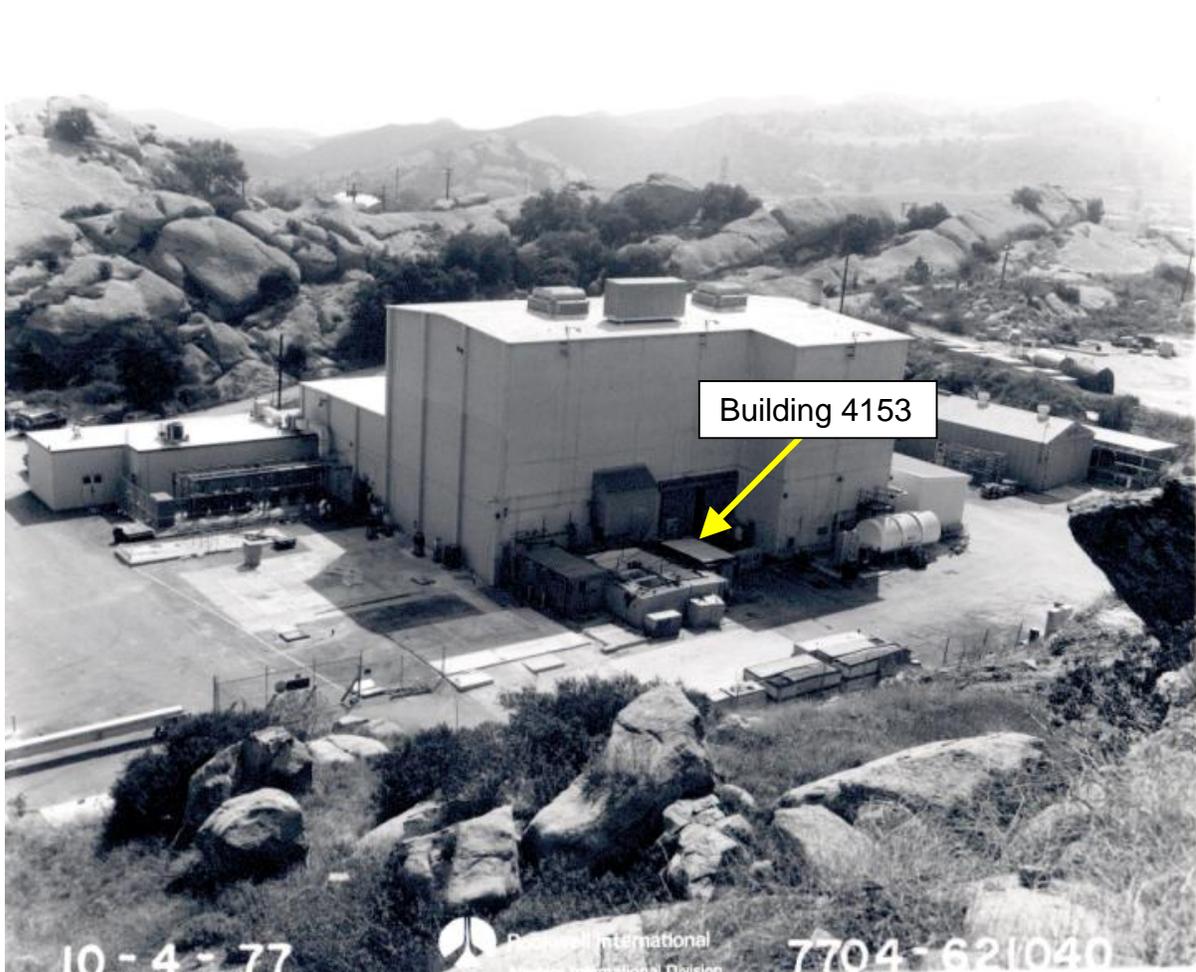
### Status:

- DOE released Building 4153 for unrestricted use as a part of the SRE release in September 1985.<sup>6</sup>
- 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

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### 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.<sup>1</sup>
- The east end was used for construction of wooden shipping containers and non-nuclear support work. It contains a pipe shop and machine shop.<sup>1</sup>
- 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.<sup>2</sup>
  - Major operations performed included the removal of the 5-ton overhead bridge crane, the radioactive exhaust system, all aluminum wainscot interior walls, and the scrubbing of the floor area. All radioactive-contaminated equipment was packaged and shipped offsite.<sup>3</sup>
- 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.<sup>3,4</sup> 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.”<sup>5</sup>
- Various radiological incidents occurred throughout the operation of the facility. Several incidents may have resulted in releases to the environment:

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- 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  $2 \times 10^{-9} \mu\text{C}/\text{cc}$ . 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.<sup>1</sup>
  - 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<sup>2</sup> absorber, 100 dpm/100 cm<sup>2</sup> 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.<sup>3</sup>
  - 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<sup>2</sup> total, 20 dpm/100 cm<sup>2</sup> removable.

- Beta: 0.1 mrad hr at 1 cm through 7 mg/cm<sup>2</sup> absorber, 100 dpm/100 cm<sup>2</sup> 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.<sup>6</sup> 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:<sup>7</sup>
  - Maximum removable beta: 300 dpm/100cm<sup>2</sup> (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.<sup>2</sup>
- 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.

## Group G

- 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

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### 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.<sup>1,2</sup>

### 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.<sup>3</sup>
  - 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<sup>2</sup> 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.<sup>4</sup> 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.

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### Status:

- DOE released Building 4183 and the surrounding soil for unrestricted use as a part of the SRE release in September 1985.<sup>5</sup>
- 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

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### 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.<sup>1</sup>

### Relevant Site Information:

- It is not likely radioactive material was handled at Building 4184.<sup>2</sup>

### Radiological Surveys:

- In 1983, a radiological survey of the region was conducted as part of the SRE Survey.<sup>2</sup>
  - 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<sup>2</sup> total, 20 dpm/100 cm<sup>2</sup> removable.
        - Beta: 0.1 mrad/hr at 1 cm through 7 mg/cm<sup>2</sup> absorber, 100 dpm/100 cm<sup>2</sup> removable.
      - Soil:
        - 100 pCi/g gross detectable beta.
      - Water:
        - $3 \times 10^{-7}$  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.<sup>3</sup> The survey found that the former Building 4184 area was

## Group G

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.<sup>4</sup>
- 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.

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## Site Summary – Building 4185

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### Site Identification:

Building 4185  
Steam Generator Control Building

### Operational Use/History:

- Constructed in the late 1950s.<sup>1</sup>
- This facility served as the steam generator control building for the SRE area.<sup>1</sup>
- 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.<sup>2</sup>
  - 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.<sup>2,3</sup>

### 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.<sup>4</sup>
- 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.<sup>4</sup>
  - 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<sup>2</sup> total.
        - Beta: 0.1 mrad/hr at 1 cm through 7 mg/cm<sup>2</sup> absorber.
      - Soil:
        - 100 pCi/g gross detectable beta.
    - All survey results were below the allowable limits.

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- 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.<sup>5</sup>
  - 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<sup>2</sup> total.
        - Beta: 0.1 mrad/hr at 1 cm through 7 mg/cm<sup>2</sup> 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.<sup>6</sup>
  - 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.

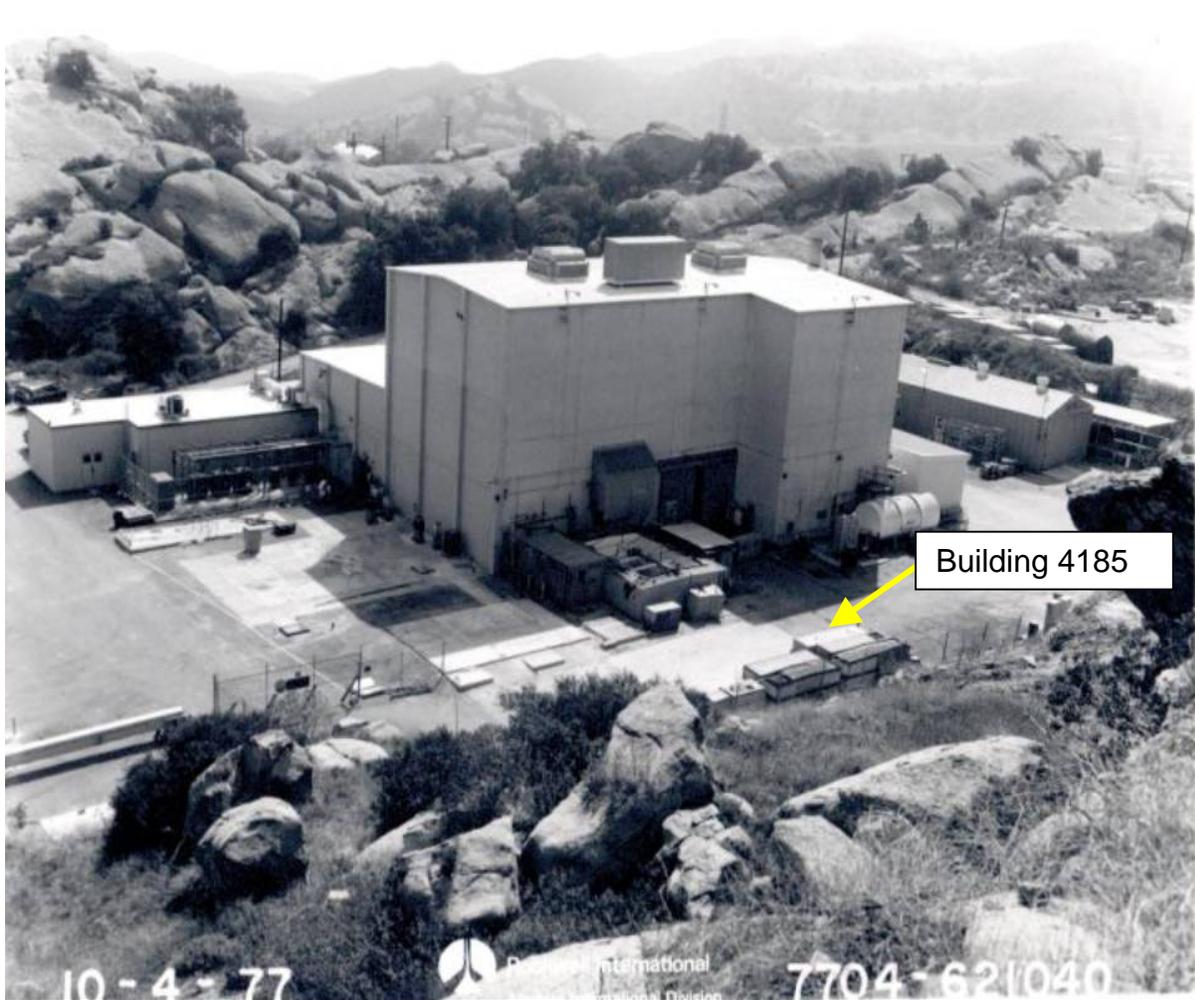
### Status:

- DOE released the facility and surrounding soil for unrestricted use as a part of the SRE release in September 1985.<sup>1</sup>
- 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

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### Site Identification:

Building 4505  
Storage Area

### Operational Use/History:

- Constructed prior to 1958.
- Building 4505 served as a storage area near SRE.<sup>1</sup> 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.<sup>1,2</sup>

### 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.<sup>3</sup>
  - 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<sup>2</sup> absorber, 100 dpm/100 cm<sup>2</sup> removable.
      - The area was not subject to alpha contamination. Removable beta-gamma contamination was all below 100 dpm/100 cm<sup>2</sup>.
      - 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.<sup>4</sup> Results of the survey indicated the concrete pad remaining from

## Group G

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.<sup>5</sup>
- 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

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### 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.<sup>1</sup>
- 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.<sup>2</sup>
- “As built” drawings and photographs indicate that Building 4653 was connected to SRE by piping.<sup>3,4</sup>

### Relevant Site Information:

- Radioactive waste was present at this facility, primarily in the form of mixed fission products and activation products.<sup>1</sup>
  - 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.<sup>2</sup>
  - 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<sup>2</sup> total.
        - Beta: 0.1 mrad/hr at 1 cm through 7 mg/cm<sup>2</sup> absorber.

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- 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.<sup>5</sup>
  - 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.<sup>1</sup>
- 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

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### 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.<sup>1</sup>
- Demolished and decommissioned in 1985.<sup>1</sup>

### 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.<sup>2</sup>

### 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.<sup>1</sup>
- 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.<sup>1</sup>
  - 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.<sup>1</sup>

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- 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  $\mu$ R/hr compared to a background level of 10  $\mu$ R/hr (NRC guideline is 5  $\mu$ R/hr above background).
- In 1988, Rocketdyne collected and analyzed six soil samples just to the north of Building 4654.<sup>3</sup> 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.<sup>4</sup>
  - 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.<sup>5</sup>
  - 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.<sup>5</sup>
- ORISE performed an IVS in 1997.<sup>6</sup>
  - 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  $\mu$ R/hr compared with background rates between 12 and 16  $\mu$ R/hr with an average of 14  $\mu$ R/hr. NRC limit is 5  $\mu$ R/hr above background.
  - Radionuclide concentrations from 4 surface samples and 12 surfaces subsurface borehole samples:
    - Ra-226: 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.<sup>5</sup>
  - 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.<sup>7</sup> 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.<sup>8,9</sup> 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.<sup>1</sup>
- A certification docket has been submitted to DOE.<sup>2</sup>
- 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.<sup>10</sup>

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### References:

- 1- Boeing Document, EID-04364, "Final Report Decontamination and Decommissioning of Interim Storage Facility 4654," May 27, 1999.
- 2- DOE Document, DOE/CD-EETEC-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

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### 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.<sup>1,2,3</sup>

### Relevant Site Information:

- Radiological material was not handled at Building 4684.

### Radiological Surveys:

- Building 4684 was split between three SRE survey regions.<sup>4</sup>
- 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.<sup>5</sup>
  - 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<sup>2</sup> absorber, 100 dpm/100 cm<sup>2</sup> 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.

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- 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.<sup>6</sup>
  - Allowable limits for the survey applicable to this region were as follows:
    - Surfaces:
      - Alpha: 100 dpm/100 cm<sup>2</sup> total, 20 dpm 100 cm<sup>2</sup> removable.
      - Beta: 0.1 mrad/hr at 1 cm through 7 mg/cm<sup>2</sup> absorber, 100 dpm/100 cm<sup>2</sup> removable.
    - Soil:
      - 100 pCi/g gross detectable beta.
    - Water:
      - $3 \times 10^{-7}$   $\mu$ Ci/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.<sup>6</sup>
  - 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<sup>2</sup> total, 20 dpm 100 cm<sup>2</sup> removable.
        - Beta: 0.1 mrad/hr at 1 cm through 7 mg/cm<sup>2</sup> absorber, 100 dpm/100 cm<sup>2</sup> 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.<sup>7</sup>
  - 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.<sup>8</sup>
- 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

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## Site Summary – Building 4686

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### 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 11<sup>th</sup> Street.<sup>1</sup>

### 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.<sup>2</sup>

### 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.<sup>3</sup>
  - 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<sup>2</sup> total.
        - Beta: 0.1 mrad/hr at 1 cm through 7 mg/cm<sup>2</sup> 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.

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- ANL performed an independent verification survey in 1984 as part of the SRE verification survey.<sup>4</sup> 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.<sup>5</sup>

### 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

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**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.<sup>1</sup>
- Demolished in 1998.
- Site Description:<sup>2</sup>

**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.<sup>3</sup>

**Radiological Surveys:**

- ANL conducted an interim post remedial action survey of the entire SRE area (including 4687) in 1982.<sup>4</sup>
  - 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.<sup>5</sup> 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.<sup>3</sup>
- Site 4687 was demolished in 1998, along with Building 4041.

## Group G

### 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.

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## Site Summary – Building 4689

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### 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.<sup>1</sup>

### 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.<sup>2</sup>

### 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.<sup>3</sup>
  - 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<sup>2</sup> total.
        - Beta: 0.1 mrad hr at 1 cm through 7 mg/cm<sup>2</sup> 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.

## Group G

- 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.<sup>4</sup> 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.<sup>5</sup>
- 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

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### 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.<sup>1,2</sup>
- 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).<sup>3</sup>

### Relevant Site Information:

- During the course of reactor operations, several primary sodium leaks and fires occurred within the vault.<sup>4</sup>
- 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.<sup>1</sup>
- 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.<sup>5</sup>
  - 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<sup>2</sup> total, 20 dpm/100 cm<sup>2</sup> removable.
        - Beta: 0.1 mrad/hr at 1 cm through 7 mg/cm<sup>2</sup> absorber, 100 dpm/ 100 cm<sup>2</sup> removable.

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- 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.<sup>6</sup>

### Status:

- DOE released the area for unrestricted use as a part of the SRE release in September 1985.<sup>7</sup>
- 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.

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## Site Summary – Building 4703

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**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.<sup>1</sup>
- 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.<sup>2</sup>

**Relevant Site Information:**

- Radiological materials were not handled at Building 4703.

**Radiological Surveys:**

- In 1978, a radiological survey of the region was conducted.<sup>1</sup>
  - 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<sup>2</sup> 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.<sup>3</sup> 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.

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### Status:

- DOE released Building 4703 for unrestricted use as a part of the SRE release in September 1985.<sup>4</sup>
- 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.

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## Site Summary – Building 4714 (SRE Location)

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### 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.<sup>1</sup>
- Building 4714 was used as an outdoor work area associated with Building 4163.
- Demolished in the middle 1970s.<sup>1</sup>
  - 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.<sup>1</sup>

### Site Description:

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

### 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).<sup>2</sup>

### Radiological Surveys:

- In 1978, a radiological survey of the region was conducted.<sup>3</sup>
  - Beta Limits: 0.1 mrad/hr at 1 cm through 7 mg/cm<sup>2</sup> absorber, 100 dpm/100 cm<sup>2</sup> 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.<sup>4</sup> Results of the survey indicated the former location of Building

## Group G

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.<sup>5</sup>

### 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

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### 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.<sup>1</sup>
- 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.<sup>2,3</sup>

### 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.<sup>4</sup>
  - 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<sup>2</sup> 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.<sup>5</sup> 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.

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### Status:

- DOE released Site 4723 and the surrounding soil for unrestricted use as a part of the SRE release in September 1985.<sup>6</sup>
- 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.

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## Site Summary – Building 4724

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### 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.<sup>1</sup>
- 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.<sup>2</sup>
- 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.<sup>2</sup> 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.<sup>1</sup>
- 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:<sup>1,3</sup>
  - 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<sup>2</sup> beta.

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- In 1978, following decontamination activities, a radiological survey of the region was conducted.<sup>1</sup>
  - 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<sup>2</sup> total, 20 dpm/100 cm<sup>2</sup> removable.
        - Beta: 0.1 mrad/hr at 1 cm through 7 mg/cm<sup>2</sup> absorber, 100 dpm/100 cm<sup>2</sup> removable.
      - Soil:
        - 100 pCi/g gross detectable beta.
      - Water:
        - $3 \times 10^{-7}$   $\mu$ Ci/ml gross detectable beta.
    - Following removal of contaminated concrete, the highest remaining activity level on the concrete pad was 48 dpm/100 cm<sup>2</sup> 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  $2.3 \times 10^{-8}$   $\mu$ Ci/cm<sup>3</sup>.
- In 1978, a radiological survey of the building itself was conducted.<sup>4</sup>
  - 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<sup>2</sup> absorber, 100 dpm/100 cm<sup>2</sup> 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.<sup>5</sup> 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.<sup>6</sup>
- 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

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### 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.<sup>1</sup>
- 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.<sup>2</sup>

### 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.<sup>1</sup>
  - 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<sup>2</sup> total.
        - Beta: 0.1 mrad/hr at 1 cm through 7 mg/cm<sup>2</sup> 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.<sup>3</sup> 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.

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### 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.<sup>4</sup>

### 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

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### 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.<sup>1</sup>
- 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.<sup>1,2</sup>

### Relevant Site Information:

- No known radioactive materials were handled at this facility.<sup>1</sup>

### Radiological Surveys:

- In 1983, a radiological survey of the region was conducted as part of the SRE survey.<sup>3</sup>
  - 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<sup>2</sup> total.
        - Beta: 0.1 mrad/hr at 1 cm through 7 mg/cm<sup>2</sup> 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.<sup>4</sup> 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.

## Group G

### 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.<sup>5</sup>

### 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

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### 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.<sup>1</sup>
- Demolished in the late 1980s.

### Site Description:

- Building 4753 was a below-grade structure located just north of Building 4143.<sup>1</sup>

### 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.”<sup>2</sup>

### 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.<sup>1</sup>
- In 1983, a radiological survey of the region was conducted as part of the Building 4143 survey.<sup>3</sup>
  - 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<sup>2</sup> total, 20 dpm/100 cm<sup>2</sup> removable.
        - Beta: 0.1 mrad/hr at 1 cm through 7 mg/cm<sup>2</sup> absorber, 100 dpm/100 cm<sup>2</sup> removable.
      - Soil:
        - 100 pCi/g gross detectable beta.

## Group G

- 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.<sup>4</sup> 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.<sup>5</sup>
- 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

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### Site Identification:

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

### Operational Use/History:

- Constructed in 1956.<sup>1</sup>
- Site 4773 is a drainage control dam and retention pond for the SRE area.<sup>2</sup>
- 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.<sup>3</sup>

### 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:<sup>3</sup>
  - 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.<sup>1</sup> 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.<sup>4</sup>

## Group G

### 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.<sup>4</sup>
  - 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<sup>2</sup> total.
        - Beta: 0.1 mrad/hr at 1 cm through 7 mg/cm<sup>2</sup> absorber.
      - Soil:
        - 100 pCi/g gross detectable beta.
      - Water:
        - $3 \times 10^{-7}$  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.<sup>5</sup> 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.<sup>6</sup>
- In November 2002, twelve soil samples were taken in the SRE pond and in the drainage leading to the pond.<sup>7</sup> 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.<sup>8</sup>
- 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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## Group H

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Group H Map

Building 4073

Building 4074

Building 4083

*Includes Building 4103, Reactor Kinetics Lab and Storage*

Building 4093

*Includes Site 4893, Pad (AE-6)*

Building 4123

Building 4453

Parking Lot 4523

Site 4633

Building 4643

Building 4793

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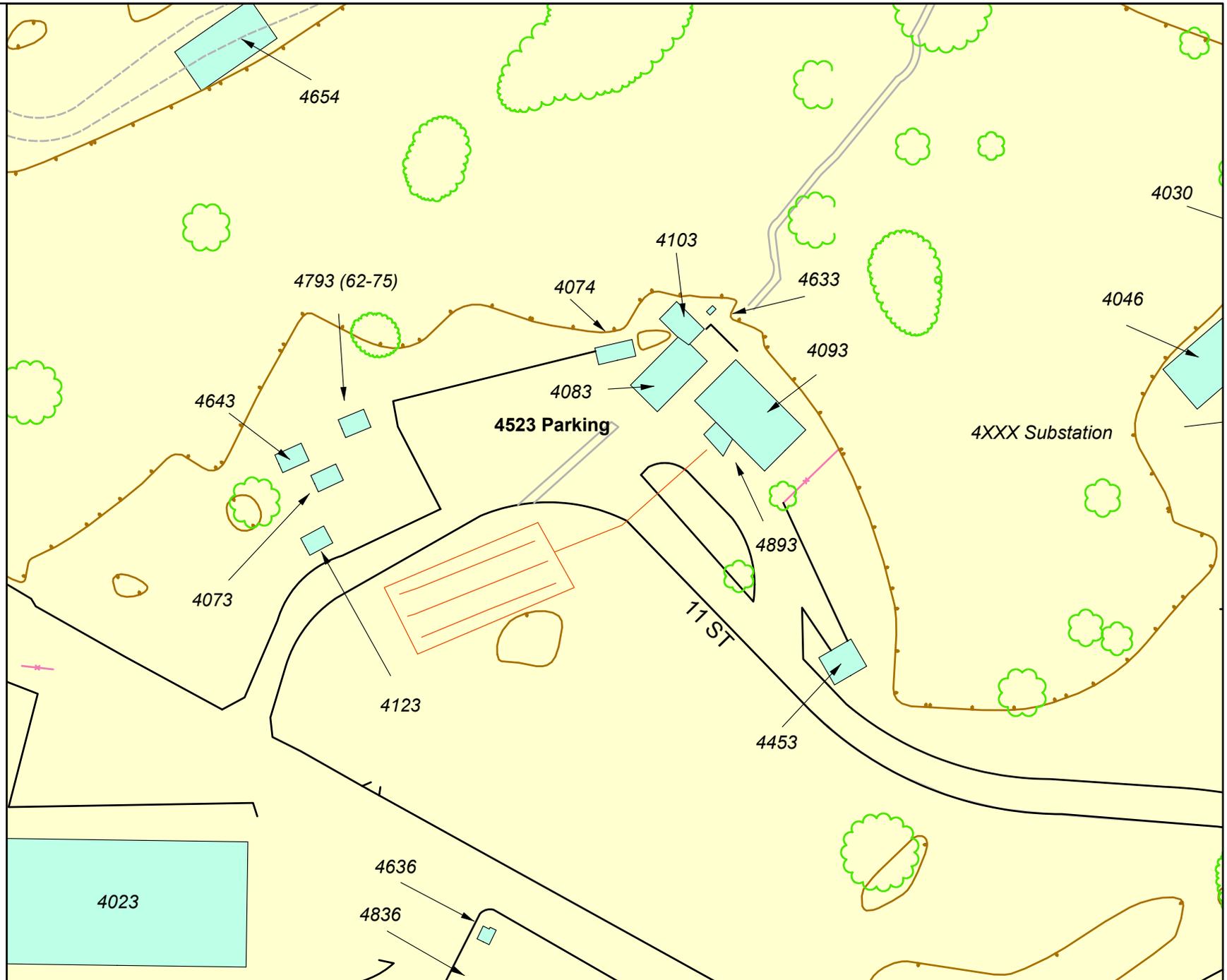
### Legend

**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

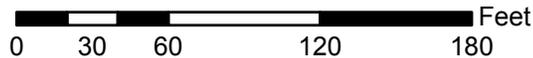


DRAWN BY:

**Sapere**  
CONSULTING INC



1 inch equals 75 feet



DATE:

May 2005

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

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## Site Summary – Building 4073

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### Site Identification:

Building 4073  
Reactor Kinetics Test Building  
Kinetics Experiment Water Boiler (KEWB)

### Operational Use/History:

- Constructed in the early 1950s.
- The KEWB reactor was a small graphite-encased research reactor that used a water solution of uranyl sulfate as fuel.<sup>1</sup>
- The “A” Core (spherical) went critical on July 13, 1956, and was removed in August of 1959.
- The “B” Core (cylindrical) went critical March 1960.
- Operations halted in 1966.
- In 1968 the fuel was drained and decontamination began.
- Demolished in 1975. Activities included the following:
  - Demolition of all non-concrete portions of 4073.
  - Removal of the tank system.
  - Backfilling the remaining floor and walls with asphalt rubble and covering it with six feet of earth.
  - Grading and re-vegetating of the site.
- The site was released for unrestricted use on March 3, 1976, by the Energy Research and Development Administration (ERDA).<sup>2</sup>

### Site Description:

- The KEWB reactor building consisted of an underground concrete structure and an above-ground wood and metal changing/workroom. The underground portion of the reactor building measured 15 x 26 feet and was 10 feet tall. The facility included a gaseous and liquid holdup tank system consisting of one 300-gallon tank and two 1,000-gallon tanks, located underground near the structure.<sup>3</sup> The ventilation system for Building 4073 was housed in Building 4643, which was connected to the reactor building.

### Relevant Site Information:

- The reactor had a capacity of 50 kWt, but did not normally operate at full power; the majority of reactor operations were conducted at a power level of 1 kWt or less.<sup>1</sup>
- Reactor fuel for the KEWB reactor was U-235 dissolved as uranyl sulfate in solution. The radionuclides of concern are Co-60, Cs-137, Eu-152, Eu-154, Sr-90, U-238 and U-235.<sup>1</sup>

## Group H

- Two incidents associated occurred in Building 4073 that resulted in employee exposure, and could have resulted in a potential release to the environment:
  - On February 10, 1958, KEWB reactor operators received weekly exposures greater than 300 mrem while performing core maintenance activities. Upon further investigation, it was concluded that the elevated levels were a result of dosimeter error, and that actual exposures were within permissible levels (A0522).
  - From April 1 to June 30, 1961, a research engineer conducting KEWB reactor core experiments received a quarterly exposure to gamma and neutron radiation at levels greater than 3 rem. These core experiments were required for successful termination of the KEWB Program and resulted in high radiation levels in the reactor room, and consequently caused the employee's exposure. The employee was aware of his high cumulative exposure in early May; however, due to the importance of the tests and lack of other qualified operators, he continued to conduct "unreflected" core experiments without prior approval to exceed the 3 rem quarterly limit (A0504).

### Radiological Surveys:

- In July 1975, Rocketdyne performed a surface scan of the KEWB site to confirm that no radiological contamination remained.<sup>4</sup>
  - The survey found no levels of beta-gamma surface contamination above the measured background (0.15 – 0.25 mrad/hr).
  - Survey results were below acceptable limits.
- In 1976, Rocketdyne performed a final radiological survey during decontamination and demolition (D&D) of the facility and published results in the final D&D report.<sup>3</sup>
  - Survey results found that all remaining surfaces were decontaminated to levels as low as reasonably achievable; in all cases below the levels for future unrestricted use (removable contamination of 20 dpm/100cm<sup>2</sup>α or 100 dpm/100cm<sup>2</sup>β).
  - Survey results were below the acceptable limits.
- In May 1983, Argonne National Laboratories performed a post-remediation radiological survey.<sup>5</sup>
  - The survey performed a surface scan to determine ambient gamma exposure rate and low-level radiation level. Also, soil samples were taken and analyzed for gamma radiation and uranium.
  - The survey found no measurements above background. Background is relatively high (40 μR/hr and 8,000 cts/min) due to shine from nearby Building 4021 and Building 4022.
  - The survey concluded that the site could be released for unrestricted use.
- In August 1988, Rocketdyne performed a surface scan measuring ambient gamma exposure rate to ensure no contamination existed as a result of radioactive materials movement.<sup>6</sup>

- Mean exposure rate:  $17.4 \pm 0.96$   $\mu\text{R/hr}$  ( $-0.2 \pm 0.96$   $\mu\text{R/hr}$  when corrected for background).
- Background: 17.0  $\mu\text{R/hr}$ .
- Acceptable limit: 5.0  $\mu\text{R/hr}$  above background.
- Survey results were below the acceptable limits.

**Status:**

- Building 4073 was demolished in 1975.<sup>5</sup>
- The Energy Research and Development Administration released the facility and surrounding area for unrestricted use in 1976.<sup>2</sup>

**References:**

- 1- Rocketdyne Report, N001ER000017, "Nuclear Operations at Rockwell's Santa Susana Field Laboratory – A Factual Perspective," September 1991.
- 2- Letter from Stanley Stamp (ERDA) to W. F. Heine, "Decontamination and Disposition of ERDA Facilities," March 3, 1976.
- 3- Rockwell International Report, AI-ERDA-13159, "KEWB Facilities Decontamination and Disposition Final Report," February 25, 1976.
- 4- Letter from R.K. Owen (Rockwell International) to R.J. Tuttle, "Radiation Survey – T073 (KEWB) Site," July 17, 1975.
- 5- Argonne National Laboratory Report, no document number, "Surplus Facilities Management Program, Interim Post Remedial Action Survey Report for Kinetic Experiment Water Boiler (KEWB) Facility, Santa Susana Field Laboratory, Rockwell International, Canoga Park, California," May 1983.
- 6- 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.
- 7- Historical Site Photographs from Boeing Database.
- 8- SSFL Area IV, ETEC Industrial Planning Maps, 1962-1992.

Photograph – Building 4073

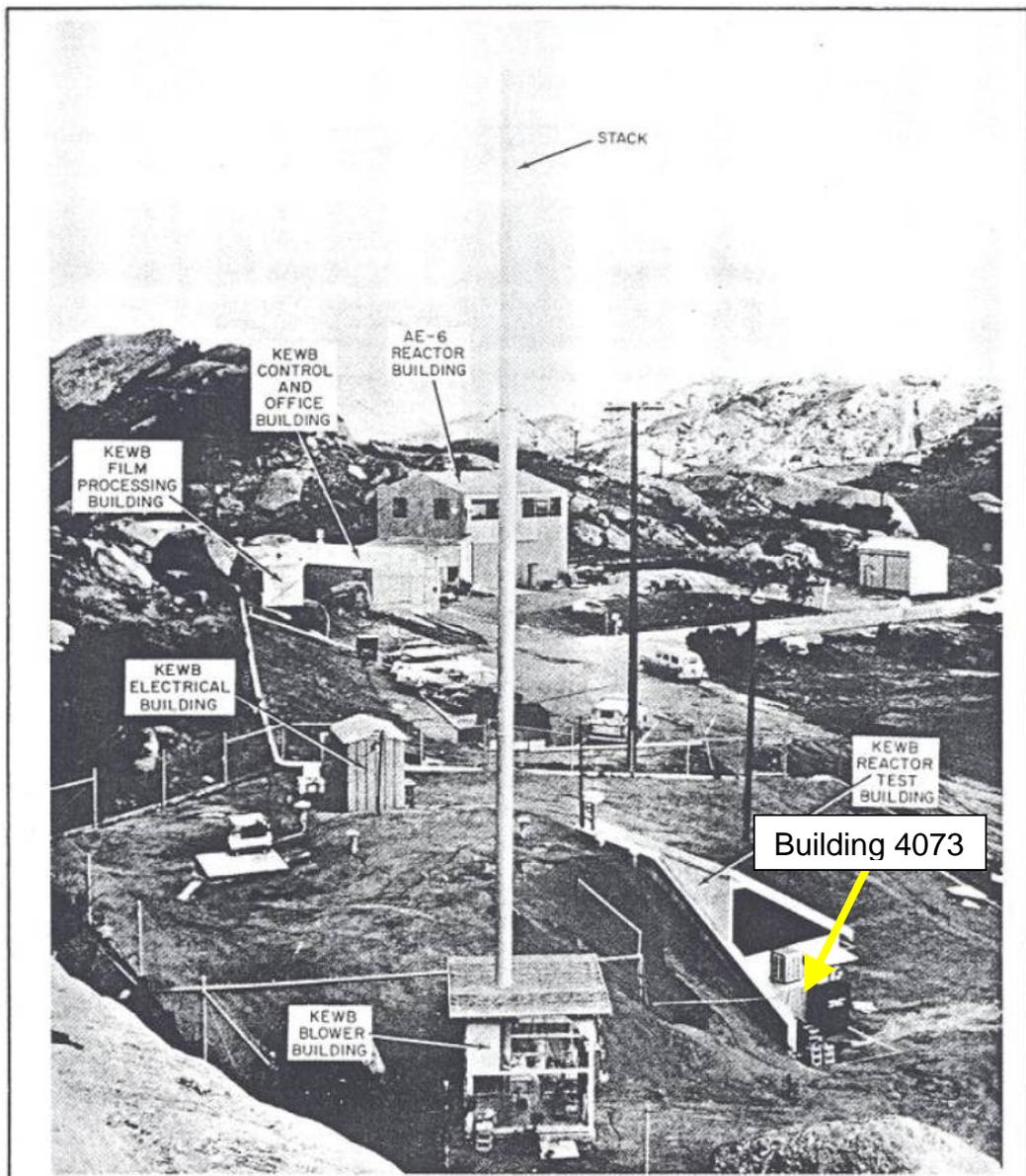


Figure 2 - Photograph of Kinetic Experiment Water Boiler Area and Facilities

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## Site Summary – Building 4074

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### Site Identification:

Building 4074  
Storage Building  
KEWB Film Processing Building

### Operational Use/History:

- Constructed in 1958.
- Building 4074 was constructed to serve as a storage and film processing building where personnel processed photographic oscillograph paper for KEWB.
- Ownership transferred from AEC to Rockwell in 1972.<sup>1</sup>
- The Nuclear Regulatory Commission (NRC) licensed the facility on January 5, 1972 (R-118 Docket No. 50-375).<sup>1</sup>
- Demolished in 1980. The foundation and any remaining concrete were left in place.
- Released for unrestricted use and NRC license terminated March 19, 1987.<sup>2</sup>

### Site Description:

- Building 4074 was a storage building consisting of a steel frame covered in sheet metal located near Parking Lot 4523.<sup>3</sup>

### Relevant Site Information:

- There are no Use Authorizations and no Incident Reports associated with Building 4074.<sup>4</sup>

### Radiological Surveys:

- In 1985, Rocketdyne conducted a final radiological survey, releasing the final report in March 1986. (The survey included Buildings 4073, 4074, 4083, 4084, 4093, 4453 and 4453).<sup>1</sup>
  - Soil samples showed no evidence of radioactivity due to facility operations.
  - Maximum average alpha: 17.2 dpm/100cm<sup>2</sup> (limit is 5,000 dpm/100cm<sup>2</sup>).
  - Maximum average beta: 1,987 dpm/100cm<sup>2</sup> (limit is 5,000 dpm/100cm<sup>2</sup>).
  - The maximum ambient exposure rate was originally found to be 23.1 µR/hr (limit is 18.9 µR/hr). The ambient exposure rates over the limit were attributed to the nearby Radioactive Materials Disposal Facility (RMDF) and do not represent residual contamination.
  - The survey found that measured radiation levels were below acceptable limits, making the site acceptable for unrestricted use.

## Group H

- NRC conducted a decommissioning inspection in 1987. Results of the inspection determined the maximum exposure rate to be below the limit of 5  $\mu$ R/hr above background, meeting the criteria for unrestricted use.<sup>5</sup>

### Status:

- NRC released the site for unrestricted use in 1987.<sup>2</sup>
- Building 4074 was demolished in 1995.

### References:

- 1- Rocketdyne Report N001SSR140087, "Radiation Survey for Release for Unrestricted Use – L-85 Reactor Facility," March 6, 1986.
- 2- Letter from F.J. Miraglia (NRC) to M.E. Remley, "Order Terminating Facility License R-118, for the Rockwell International L-85 Nuclear Examination Reactor," April 8, 1987.
- 3- Atomics International Document, AI-70-73, "Safety Analysis Report for L-85 Nuclear Examination Reactor," November 25, 1970.
- 4- Review of Radiation Safety Records Management System, 2003.
- 5- Letter from Frank Wenslawski (NRC Region V) to Herbert Berkow, "Closeout Inspection for Rockwell International L-85 Reactor, Docket No. 50-375," March 19, 1987.
- 6- SSFL Area IV, ETEC Industrial Planning Maps, 1962-1992.
- 7- Historical Site Photographs from Boeing Database.

Photograph – Building 4074

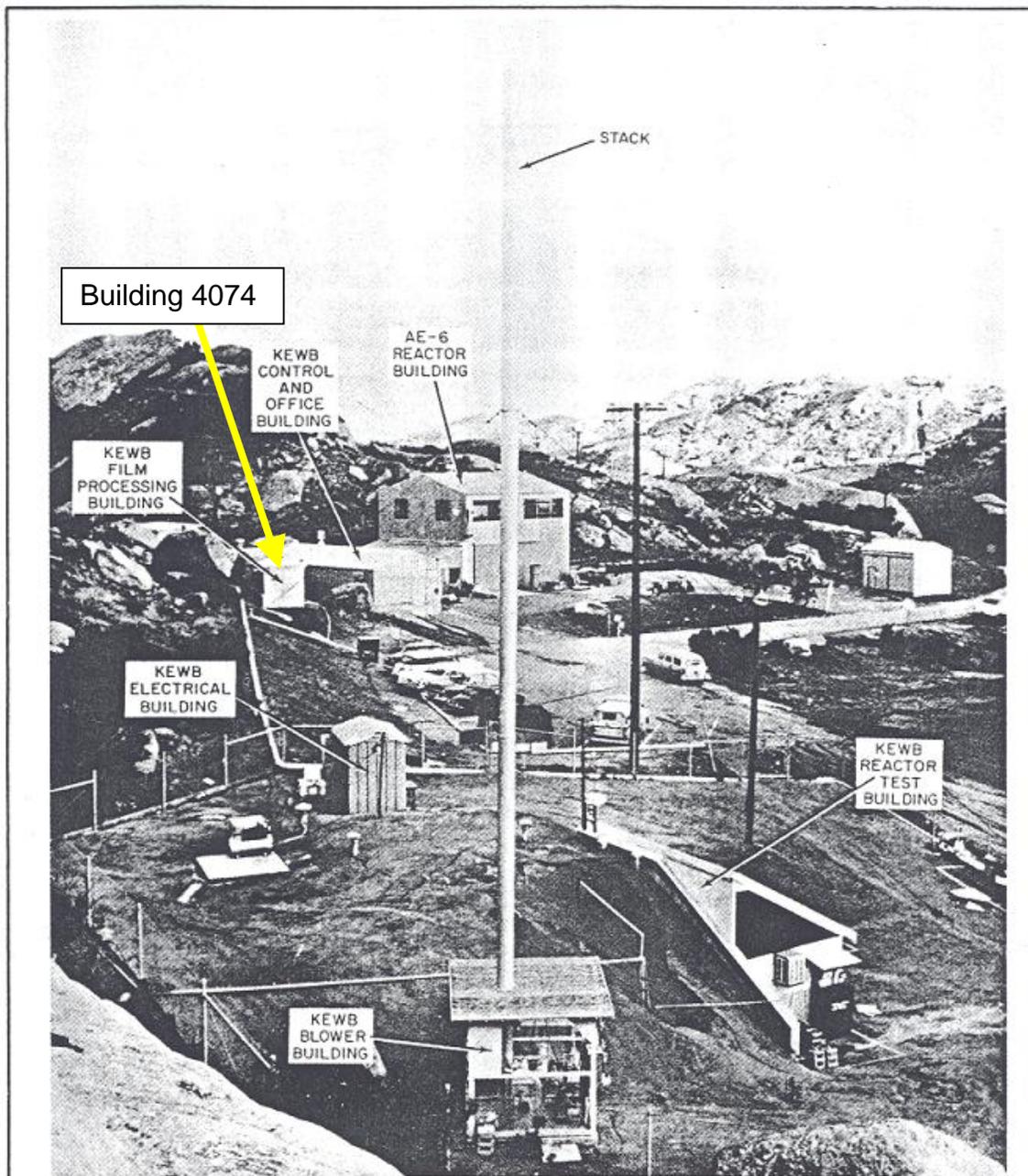


Figure 2 - Photograph of Kinetic Experiment Water Boiler Area and Facilities

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## Site Summary – Building 4083

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### Site Identification:

Building 4083  
Reactor Kinetics Control Building  
Office and Laboratory Building  
Includes Building 4103, Reactor Kinetics Lab and Storage

### Operational Use/History:

- Constructed in 1958.
- Building 4083 was constructed to serve as the control building for the KEWB reactor.
- Ownership transferred from the Atomic Energy Commission (AEC) to Rockwell in 1972.<sup>1</sup>
- NRC Licensed the facility January 5, 1972 (R-118 Docket No. 50-375).<sup>1</sup>
- In the early 1970s, Building 4083 was modified to include the Reactor Kinetics Lab and Storage (Building 4103), changing the footprint of Building 4083.
- Demolished in 1980. The foundation and any remaining concrete were left in place.
- Building 4083 was released for unrestricted use by NRC and the NRC license was terminated March 19, 1987.<sup>2</sup>

### Site Description:

- Building 4083 consisted of a wood frame covered in sheet metal.<sup>3</sup>

### Relevant Site Information:

- There are no Use Authorizations and no Incident Reports that may have resulted in a release to the environment associated with Building 4083 or Building 4103.<sup>4</sup>

### Radiological Surveys:

- In 1985, Rocketdyne conducted a final radiological survey, releasing the final report in March 1986. (The survey included buildings 4073, 4074, 4083, 4084, 4093, 4453 and 4453).<sup>1</sup>
  - Soil samples showed no evidence of radioactivity due to facility operations.
  - Maximum average alpha: 17.2 dpm/100cm<sup>2</sup> (limit is 5,000 dpm/100cm<sup>2</sup>).
  - Maximum average beta: 1,987 dpm/100cm<sup>2</sup> (limit is 5,000 dpm/100cm<sup>2</sup>).

## Group H

- The maximum ambient exposure rate was originally found to be 23.1  $\mu\text{R/hr}$  (limit is 18.9  $\mu\text{R/hr}$ ). The ambient exposure rates over limit were attributed to the nearby RMDF and do not represent residual contamination.
- The survey found that measured radiation levels are below acceptable limits, making the site acceptable for unrestricted use.
- NRC conducted a decommissioning inspection in 1987. Results of the inspection determined the maximum exposure rate to be below the limit of 5  $\mu\text{R/hr}$  above background meeting the criteria for unrestricted use.<sup>5</sup>

### Status:

- NRC released the site for unrestricted use in 1987.<sup>2</sup>
- Building 4083 was demolished in 1995.

### References:

- 1- Rocketdyne Report, N001SSR140087, "Radiation Survey for Release for Unrestricted Use – L-85 Reactor Facility," March 6, 1986.
- 2- Letter from F.J. Miraglia (NRC) to M.E. Remley, "Order Terminating Facility License R-118, for the Rockwell International L-85 Nuclear Examination Reactor," April 8, 1987.
- 3- Atomics International Document, AI-70-73, "Safety Analysis Report for L-85 Nuclear Examination Reactor," November 25, 1970.
- 4- Review of Radiation Safety Records Management System, 2003.
- 5- Letter from Frank Wenslawski (NRC Region V) to Herbert Berkow, "Closeout Inspection for Rockwell International L-85 Reactor, Docket No. 50-375," March 19, 1987.
- 6- SSFL Area IV, ETEC Industrial Planning Maps, 1962-1992.
- 7- Historical Site Photographs from Boeing Database.

Photograph 1 – Building 4083 and 4103

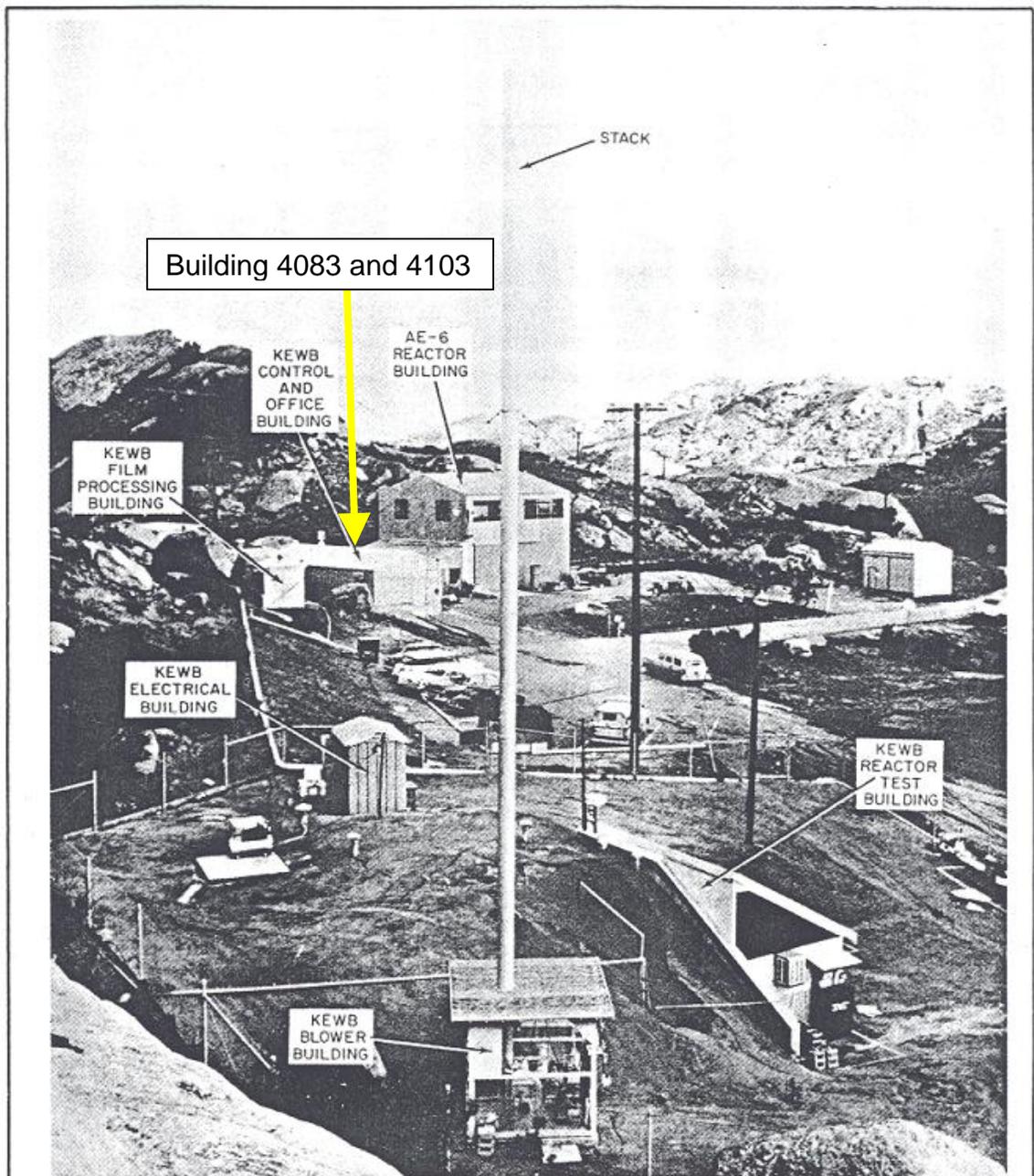
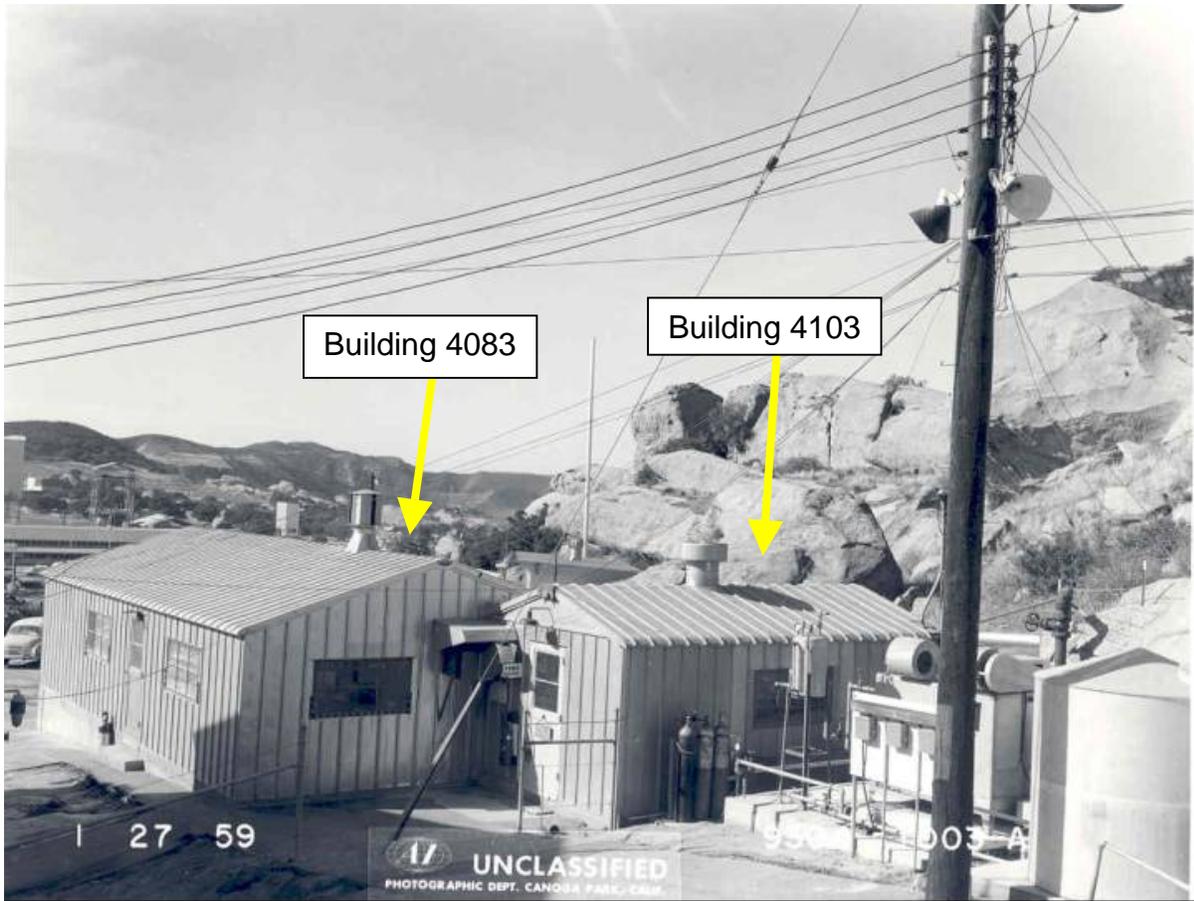


Figure 2 - Photograph of Kinetic Experiment Water Boiler Area and Facilities

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Photograph 2 – Building 4083 and 4103



## Site Summary – Building 4093

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### Site Identification:

Building 4093  
Neutron Radiography Building  
AE-6 Reactor  
Reactor L-85  
Includes Site 4893, Pad (AE-6)

### Operational Use/History:

- Constructed in 1958.
- Building 4093 was constructed to house the AE-6 Reactor.
- The AE-6 Reactor was originally called the Water Boiler Neutron Source (WBNS) reactor. Built in 1952 in Downey, CA, the WBNS had a maximum power of 0.5 Wt. The WBNS was modified to produce a maximum power of 3 kWt and moved to Santa Susana Field Laboratory (SSFL), where it was referred to as the AE-6 Reactor.
- Ownership was transferred from AEC to Rockwell in 1972, and the reactor was renamed L-85.
- The NRC licensed the facility in 1972 (R-118 Docket No. 50-375) and it operated until February 29, 1980.<sup>1</sup>
- Demolition began in 1982 with removal of uranyl sulfate. The rest of the building, excluding the foundation, was demolished in 1995.
- The sanitary leachfield for Building 4093 was removed in 1999.
- The site was released for unrestricted use by NRC and the NRC license was terminated March 19, 1987.<sup>2</sup>

### Site Description:

- Building 4093 was constructed of steel beam frames, wood frames, sheet metal and concrete. It contained a 12 x 31-foot control room and a 31 x 38-foot high bay. The reactor had various forms of concrete structures for shielding (e.g., logs, blocks and walls).<sup>3</sup> The building was connected to a sanitary leach field, which was removed in 1999.
- Serviced by Pad 4893.

### Relevant Site Information:

- Reactor fuel for the L-85/AE-6 reactor consisted of U-235 (93.11% enrichment), dissolved as uranyl sulfate in 12.5l of 0.35 molar H<sub>2</sub>SO<sub>4</sub> solution.<sup>3</sup> The radionuclides of concern are Co-60, Cs-137, Eu-152, Eu-154, Sr-90, U-238 and U-235.

## Group H

- There have been three incidents associated with Building 4093 that may have resulted in a release to the environment:
  - On March 25, 1959, fission gas was released into the air, contaminating part of the high bay and employees. Contamination levels were measured from 7.5 mR/hr to 13 mR/hr (A0275).
  - On July 30, 1982, rinse water contaminated with 5 ml of U-235 was spilled during the fuel draining operation, contaminating an employee and an area of the high bay floor. The area was partially decontaminated at the time and fully decontaminated during facility decommissioning (A0106).
  - On May 24, 1995, a radioactive high efficiency particulate air (HEPA) filter was found in a pile of debris. The filter was taken to RMHF, where it was packaged for disposal as low-level radioactive waste (A0661).

### Radiological Surveys:

- In 1985, Rocketdyne conducted a final radiological survey, releasing the final report in March 1986. (The survey included buildings 4073, 4074, 4083, 4084, 4093, 4453 and 4453).<sup>1</sup>
  - Soil samples showed no evidence of radioactivity due to facility operations.
  - Maximum average alpha: 63.0 dpm/100cm<sup>2</sup> (limit is 5,000 dpm/100cm<sup>2</sup>).
  - Maximum average beta: 3102 dpm/100cm<sup>2</sup> (limit is 5,000 dpm/100cm<sup>2</sup>).
  - The maximum ambient exposure rate was originally found to be 21.3 µR/hr (limit is 18.9 µR/hr). The concrete was removed from areas measuring over the limit and the re-survey showed them all to be under the limit, with the highest measurement at 18.2 µR/hr.
  - Survey results were below the acceptable limits.
- Oak Ridge Associated Universities conducted a confirmatory survey in 1986; the final report was released in December 1986. (The survey included Buildings 4073, 4084, 4093 and 4453.)<sup>4</sup>
  - The survey concluded that the L-85 reactor building (4093) had been remediated to the existing NRC criteria with the exception of exposure rate criteria. Restoration of the remediated area would reduce the exposure rate to the levels established by the Dismantling Order.
- NRC conducted a decommissioning inspection in 1987. The results of the inspection determined the maximum exposure rate to be below the limit of 5 µR/hr above background, meeting the criteria for unrestricted use.<sup>5</sup>
- In 1999, confirmatory samples collected after the removal of the septic tank found no detectable activity (limit was 20 dpm/100cm<sup>2</sup> for alpha and 100 dpm/100 cm<sup>2</sup> for beta).<sup>6</sup>

### Status:

- NRC released site for unrestricted use March 19, 1987.<sup>2</sup>
- The facility was demolished leaving only the foundation in 1995.

**References:**

- 1- Rocketdyne Report, N001SSR140087, "Radiation Survey for Release for Unrestricted Use – L-85 Reactor Facility," March 6, 1986.
- 2- Letter from F.J. Miraglia (NRC) to M.E. Remley, "Order Terminating Facility License R-118, for the Rockwell International L-85 Nuclear Examination Reactor," April 8, 1987.
- 3- Atomics International Document, AI-70-73, "Safety Analysis Report for L-85 Nuclear Examination Reactor," November 25, 1970.
- 4- Oak Ridge Associated Universities, no document number, "Confirmatory Radiological Survey of the L-85 Reactor Facility, Rocketdyne Division, Rockwell International Corporation, Santa Susana, California," December 1986.
- 5- Letter from Frank Wenslawski (NRC Region V) to Herbert Berkow, "Closeout Inspection for Rockwell International L-85 Reactor, Docket No. 50-375," March 19, 1987.
- 6- Boeing Radiation Survey Reports, L-85 Facility Septic Tank Area, July and September 1999.
- 7- Historical Site Photographs from Boeing Database.
- 8- SSFL Area IV, ETEC Industrial Planning Maps, 1962-1992.

Photograph 1 – Building 4093



Photograph 2 – Building 4093

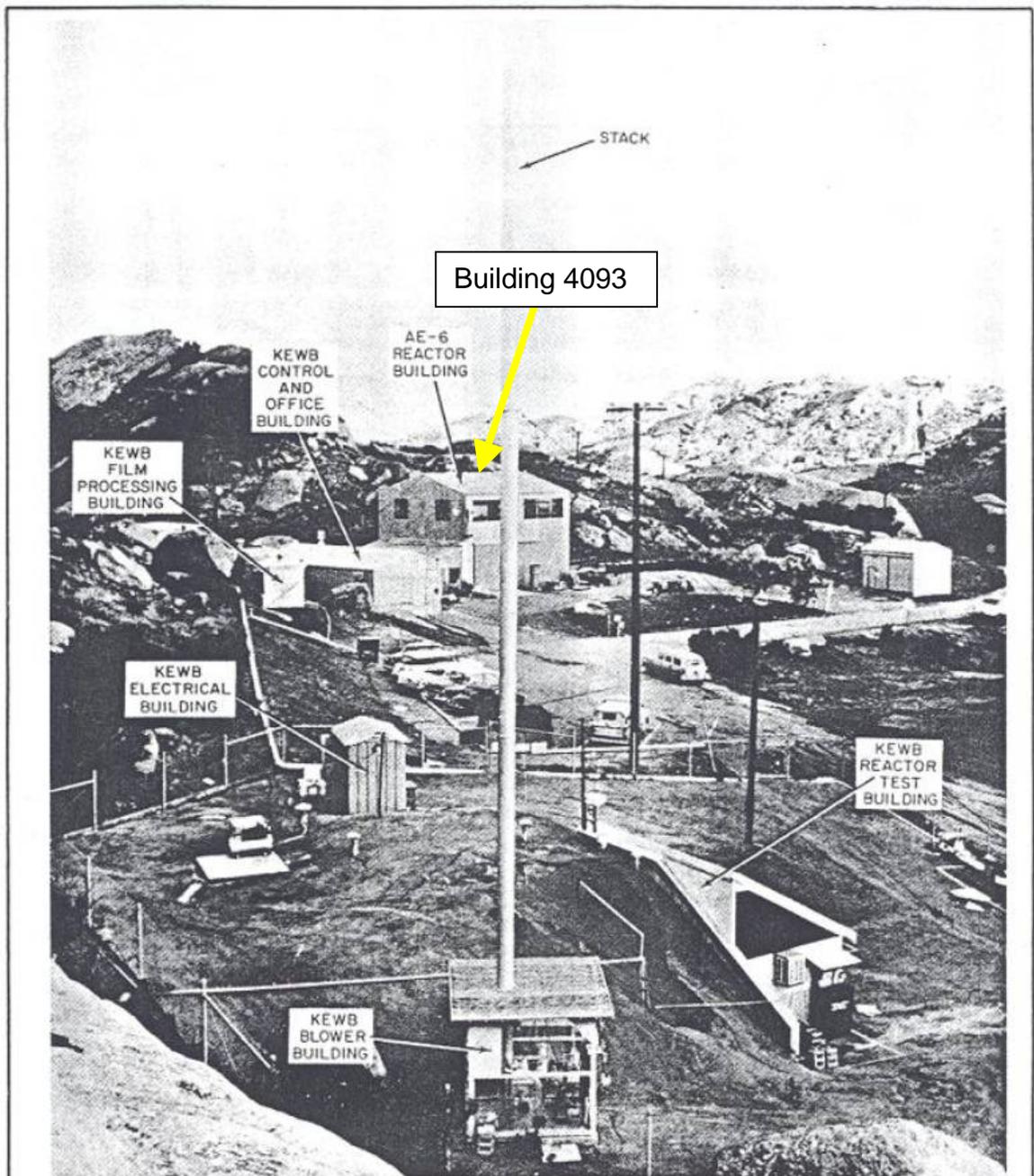


Figure 2 - Photograph of Kinetic Experiment Water Boiler Area and Facilities

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## Site Summary – Building 4123

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### Site Identification:

Building 4123  
KEWB Waste Storage Building

### Operational Use/History:

- Constructed in the early 1950s.
- Building 4123 was used for the temporary storage of radiological waste material.
- Demolished in 1975.
- On March 3, 1976, the ERDA released the land on which Building 4123 had been located for unrestricted use.<sup>1</sup>

### Site Description:

- Building 4123 was a small above-ground concrete block structure with two steel-lined concrete wells (6 feet deep and 2 feet wide) in the floor.

### Relevant Site Information:

- There are no Use Authorizations and no Incident Reports associated with Building 4123.<sup>2</sup>

### Radiological Surveys:

- In 1975, Rocketdyne performed a final radiological survey during D&D of the facility, publishing the results in the final D&D report in 1976.<sup>1</sup>
  - The survey found that all remaining surfaces were decontaminated to levels as low as reasonably achievable, and in all cases below the levels for future unrestricted use (removable contamination of 20 dpm/100cm<sup>2</sup>α or 100dpm/100cm<sup>2</sup>β).
  - The survey concluded that the site was free of radioactivity except for normal background.
- In July 1975, Rocketdyne performed a surface scan of the KEWB site to validate that no radiological contamination remained.<sup>3</sup>
  - The survey found no levels of beta-gamma surface contamination above the measured background (0.15 – 0.25 mrad/hr).
- In May 1983, Argonne National Laboratories performed a post remediation radiological survey to verify that the site was free of radioactivity except for normal background.<sup>4</sup>
  - The survey performed a surface scan to determine the ambient gamma exposure rate and low-level radiation level. Also soil samples were collected and analyzed for gamma radiation and uranium.

## Group H

- The survey found no measurements above background. Background is relatively high (40  $\mu\text{R/hr}$  and 8,000 cts/min) due to the shine from nearby Buildings 4021 and 4022.
- The survey concluded that the site could be released for unrestricted use.
- In August 1988, Rocketdyne performed a surface scan of the terrains measuring the ambient gamma exposure rate to ensure no contamination exists as a result of radioactive materials movement.<sup>5</sup>
  - Mean ambient gamma:  $17.4 \pm 0.96 \mu\text{R/hr}$ .
  - Background:  $17.0 \mu\text{R/hr}$ .
  - Acceptable limit:  $5.0 \mu\text{R/hr}$  above background.
  - Survey results were below the acceptable limits.

### Status:

- Building 4123 was demolished in 1975.
- The Energy Research and Development Administration released the land on which Building 4123 had been located and the surrounding area for unrestricted use in 1976.<sup>6</sup>

### References:

- 1- Rockwell International Report, AI-ERDA-13159, "KEWB Facilities Decontamination and Disposition Final Report," February 25, 1976.
- 2- Review of Radiation Safety Records Management System, 2003.
- 3- Letter from R.K. Owen (Rockwell International) to R.J. Tuttle, "Radiation Survey – T073 (KEWB) Site," July 17, 1975.
- 4- Argonne National Laboratory Report, no document number, "Surplus Facilities Management Program, Interim Post Remedial Action Survey Report for Kinetic Experiment Water Boiler (KEWB) Facility, Santa Susana Field Laboratory, Rockwell International, Canoga Park, California," May 1983.
- 5- 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.
- 6- Letter from Stanley Stamp (ERDA) to W. F. Heine, "Decontamination and Disposition of ERDA Facilities," March 3, 1976.
- 7- SSFL Area IV, ETEC Industrial Planning Maps, 1962-1992.

## Site Summary – Building 4453

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### Site Identification:

Building 4453  
AE-6 Fuel Handling Building

### Operational Use/History:

- Constructed in 1958.
- Fuel for the L-85 reactor in the form of uranyl sulfate was handled in Building 4453.
- Ownership of Building 4453 was transferred from AEC to Rockwell in 1972.
- The NRC licensed the facility on January 5, 1972 (R-118 Docket No. 50-375).<sup>1</sup>
- Demolished in 1980. The foundation and concrete remain.
- Building 4453 was released for unrestricted use by NRC and the NRC license terminated March 19, 1987.<sup>2</sup>

### Site Description:

- Building 4453 consisted of a steel frame covered in sheet metal.<sup>3</sup>

### Relevant Site Information:

- Fuel for the L-85 reactor in the form of uranyl sulfate was handled in Building 4453. Accordingly, the contaminant of concern is uranium.<sup>1</sup>
- There are no Use Authorizations associated with Building 4453.<sup>4</sup>
- No incidents in which contamination may have been released the environment occurred in Building 4453.<sup>4</sup>

### Radiological Surveys:

- In 1985, Rocketdyne conducted a final radiological survey, releasing the final report in March 1986. (The survey included Buildings 4073, 4074, 4083, 4084, 4093, 4453 and 4453).<sup>1</sup>
  - Soil samples showed no evidence of radioactivity due to facility operations.
  - Maximum average alpha: 17.2 dpm/100cm<sup>2</sup> (limit is 5,000 dpm/100cm<sup>2</sup>).
  - Maximum average beta: 1987 dpm/100cm<sup>2</sup> (limit is 5,000 dpm/100cm<sup>2</sup>).
  - The maximum ambient exposure rate was originally found to be 23.1 μR/hr (limit is 18.9 μR/hr). The ambient exposure rates over the limit were attributed to the nearby RMDF and do not represent residual contamination.
  - Survey results were below the acceptable limits.
- NRC conducted a decommissioning inspection in 1987. Results of the inspection determined the maximum exposure rate to be below the limit of 5 μR/hr above background meeting the criteria for unrestricted use.<sup>5</sup>

## Group H

### Status:

- NRC released Building 4453 for unrestricted in 1987.<sup>2</sup>
- Building 4453 was demolished in 1995.

### References:

- 1- Rocketdyne Report N001SSR140087, "Radiation Survey for Release for Unrestricted Use – L-85 Reactor Facility," March 6, 1986.
- 2- Letter from F.J. Miraglia (NRC) to M.E. Remley, "Order Terminating Facility License R-118, for the Rockwell International L-85 Nuclear Examination Reactor," April 8, 1987.
- 3- Atomics International Document, AI-70-73, "Safety Analysis Report for L-85 Nuclear Examination Reactor," November 25, 1970.
- 4- Review of Radiation Safety Records Management System, 2003.
- 5- Letter from Frank Wenslawski (NRC Region V) to Herbert Berkow, "Closeout Inspection for Rockwell International L-85 Reactor, Docket No. 50-375," March 19, 1987.
- 6- SSFL Area IV, ETEC Industrial Planning Maps, 1962-1992.
- 7- Historical Site Photographs from Boeing Database.

Photograph – Building 4453

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## Site Summary – Parking Lot 4523

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**Site Identification:**

Site 4523  
Parking Lot

**Operational Use/History:**

- Constructed in the 1950s.<sup>1,2</sup>
- Site 4523 was a parking lot used by personnel working in L-85, KEWB and the adjacent facilities.
- Site 4523 was demolished.<sup>1,2</sup>

**Site Description:**

- Site 4523 was located between the L-85 and KEWB facilities.

**Relevant Site Information:**

- There are no Use Authorizations and no Incident Reports associated with Site 4523.<sup>3</sup>

**Radiological Surveys:**

- Radiological surveys specific to Site 4523 have not been conducted.

**Status:**

- Site 4523 has been demolished, and the area is now covered with vegetation.

**References:**

- 1- SSFL Area IV, ETEC Industrial Planning Maps, 1962-1992.
- 2- Historical Site Photographs from Boeing Database.
- 3- Review of Radiation Safety Records Management System, 2003.

Photograph – Site 4523

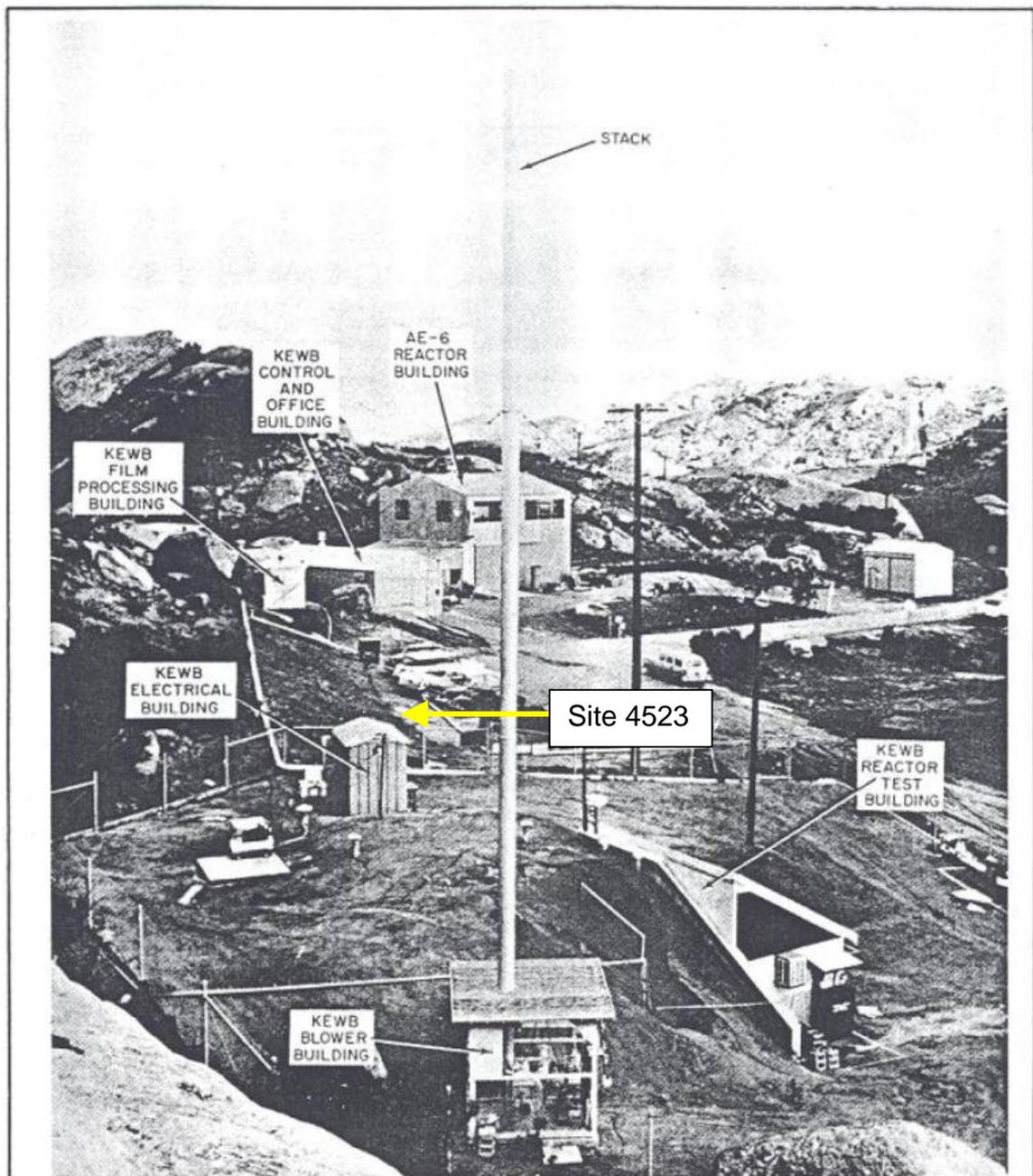


Figure 2 - Photograph of Kinetic Experiment Water Boiler Area and Facilities

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## Site Summary – Site 4633

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**Site Identification:**

Site 4633  
Reactor Cooling Water Pad

**Operational Use/History:**

- Constructed prior to 1962.<sup>1</sup>
- There is no record of activities associated with Site 4633.
- Demolished in the late 1980s.

**Site Description:**

- Site 4633 was located northeast of Parking Lot 4523.

**Relevant Site Information:**

- Regulated radiological materials were not handled in Site 4633.
- There are no Use Authorizations and no Incident Reports associated with Site 4633.<sup>2</sup>

**Radiological Surveys:**

- Radiological surveys specific to Site 4633 have not been conducted.

**Status:**

- Site 4633 was demolished.

**References:**

- 1- SSFL Area IV, ETEC Industrial Planning Maps, 1962-1992.
- 2- Review of Radiation Safety Records Management System, 2003.

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## Site Summary – Building 4643

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### Site Identification:

Building 4643  
KEWB Exhaust Building

### Operational Use/History:

- Constructed in early the 1950s.
- Building 4643 was an exhaust building that provided ventilation for the KEWB reactor building.
- Demolished in 1975.
- The land on which Building 4643 was located was released for unrestricted use on March 3, 1976, by the ERDA.<sup>1</sup>

### Site Description:

- Building 4643 was a small mechanical building with a 60-foot exhaust stack. It was located near Parking Lot 4523.

### Relevant Site Information:

- There are no Use Authorizations and no Incident Reports associated with Site 4643.<sup>2</sup>

### Radiological Surveys:

- In July 1975, Rocketdyne performed surface scans of the KEWB site to validate that no radiological contamination remained.<sup>3</sup>
  - The survey found no levels of beta-gamma surface contamination above the measured background (0.15 – 0.25 mrad/hr).
  - The survey concluded that there was no radiation above background levels observed away from the site.
- In 1976, Rocketdyne performed a final radiological survey during D&D of the facility; the results were published in the final D&D report.<sup>4</sup>
  - The survey found that all remaining surfaces were decontaminated to levels as low as reasonably achievable; in all cases below the levels for future unrestricted use (removable contamination of 20 dpm/100cm<sup>2</sup>α or 100 dpm/100cm<sup>2</sup>β).
  - The survey concluded that the site was free of radioactivity except for normal background.
- In May 1983, Argonne National Laboratories performed a post remediation radiological survey to verify that the site was free of radioactivity except for normal background.<sup>5</sup>

## Group H

- The survey performed a surface scan to determine the ambient gamma exposure rate and low-level radiation level. Soil samples were collected and analyzed for gamma radiation and uranium.
- The survey found no measurements above background. Background is relatively high (40  $\mu\text{R/h}$  and 8,000 cts/min) due to the shine from nearby Buildings 4021 and 4022.
- The survey concluded that the site could be released for unrestricted use.
- On August 1988, Rocketdyne performed a surface scan of the terrain measuring ambient gamma exposure rates to ensure that no contamination existed as a result of radioactive materials movement.<sup>6</sup>
  - Mean ambient gamma:  $17.4 \pm 0.96$   $\mu\text{R/hr}$ .
  - Background: 17.0  $\mu\text{R/hr}$ .
  - Acceptable limit: 5.0  $\mu\text{R/hr}$  above background.
  - The survey results found no contamination above background levels.

### Status:

- Building 4643 was demolished in 1975.
- The Energy Research and Development Administration released the land on which Building 4643 was located and the surrounding area for unrestricted use in 1976.<sup>1</sup>

### References:

- 1- Letter from Stanley Stamp (ERDA) to W. F. Heine, "Decontamination and Disposition of ERDA Facilities," March 3, 1976.
- 2- Review of Radiation Safety Records Management System, 2003.
- 3- Letter from R.K. Owen (Rockwell International) to R.J. Tuttle, "Radiation Survey – T073 (KEWB) Site," July 17, 1975.
- 4- Rockwell International Report, AI-ERDA-13159, "KEWB Facilities Decontamination and Disposition Final Report," February 25, 1976.
- 5- Argonne National Laboratory, no document number, "Surplus Facilities Management Program, Interim Post Remedial Action Survey Report for Kinetic Experiment Water Boiler (KEWB) Facility, Santa Susana Field Laboratory, Rockwell International, Canoga Park, California," May 1983.
- 6- 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.
- 7- SSFL Area IV, ETEC Industrial Planning Maps, 1962-1992.
- 8- Historical Site Photographs from Boeing Database.

Photograph – Building 4643

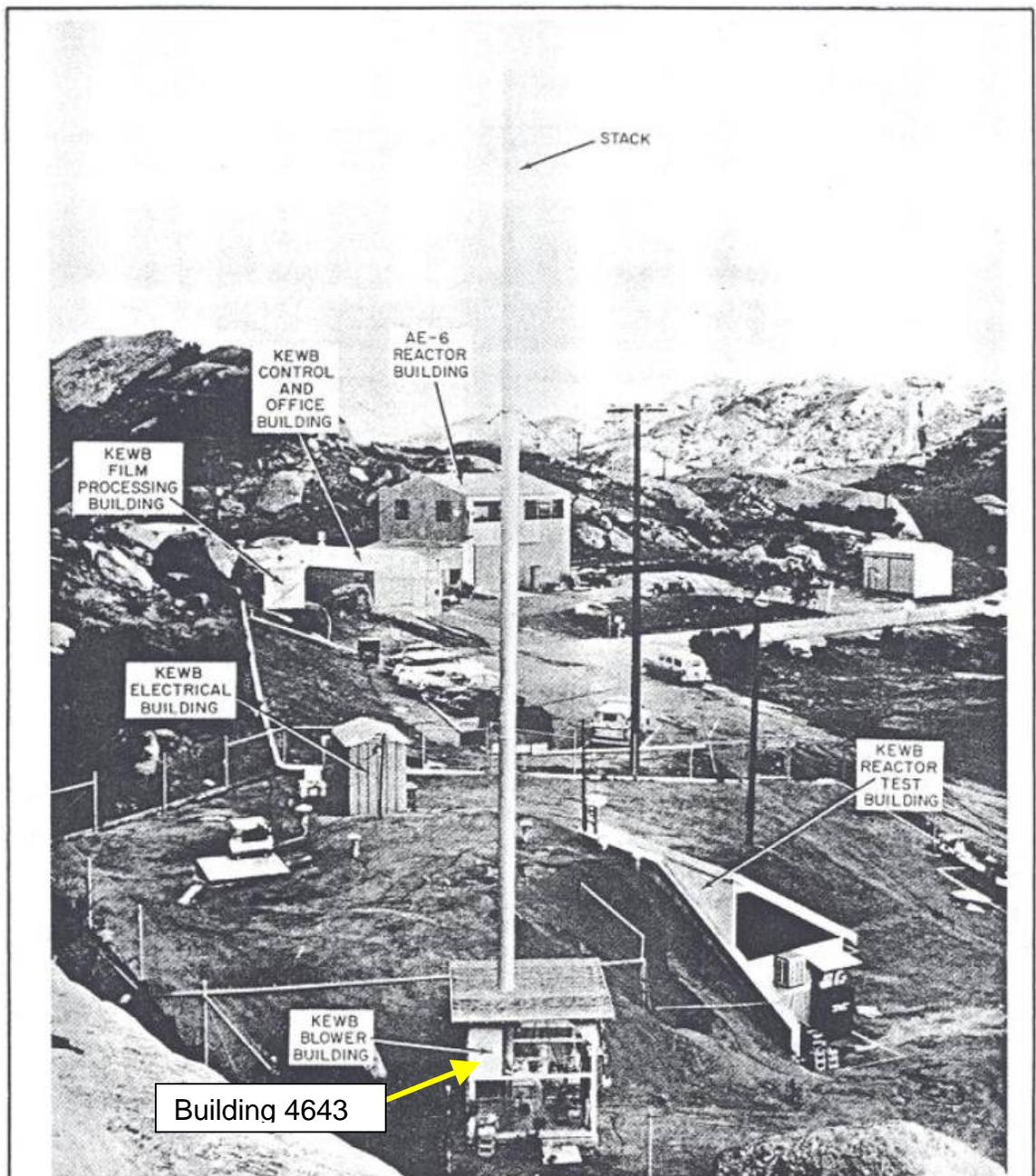


Figure 2 - Photograph of Kinetic Experiment Water Boiler Area and Facilities

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## Site Summary – Building 4793

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### Site Identification:

Building 4793  
KEWB Electrical Building

### Operational Use/History:

- Constructed in the early 1950s.
- Building 4793 housed the heating and air conditioning systems for the KEWB reactor building.
- Demolished in 1975.
- The land on which Building 4793 was located was released for unrestricted use March 3, 1976, by the ERDA.<sup>1</sup>

### Site Description:

- Building 4793 was a small above-ground mechanical building located east of the KEWB reactor building.

### Relevant Site Information:

- There are no Use Authorizations and no Incident Reports associated with Building 4793.<sup>2</sup>

### Radiological Surveys:

- In 1975, Rocketdyne performed a final radiological survey during D&D of the facility; the results were published in the final D&D report in 1976.<sup>3</sup>
  - The survey found that all remaining surfaces were decontaminated to levels as low as reasonably achievable; in all cases below the levels for future unrestricted use (removable contamination of 20 dpm/100cm<sup>2</sup>α or 100 dpm/100cm<sup>2</sup>β).
  - The survey concluded that the site was free of radioactivity except for normal background.
- In July 1975, Rocketdyne performed surface scans of the KEWB to confirm that no radiological contamination remained.<sup>4</sup>
  - The survey found no levels of beta-gamma surface contamination above the measured background (0.15 – 0.25 mrad/hr).
  - The survey concluded that there was no radiation above background levels.
- In May 1983, Argonne National Laboratories performed a post remediation radiological survey to verify that the site was free of radioactivity except for normal background.<sup>5</sup>

## Group H

- The survey performed a surface scan to determine the ambient gamma exposure rate and low-level radiation levels. Soil samples were collected and analyzed for gamma radiation and uranium.
- The survey found no measurements above background. Background is relatively high (40  $\mu\text{R/hr}$  and 8,000 cts/min) due to the shine from nearby Buildings 4021 and 4022.
- The survey concluded that the site could be released for unrestricted use.
- In August 1988, Rocketdyne performed surface scans measuring ambient gamma exposure rates to ensure that no contamination existed as a result of radioactive materials movement.<sup>6</sup>
  - Mean ambient gamma:  $17.4 \pm 0.96 \mu\text{R/hr}$ .
  - Background:  $17.0 \mu\text{R/hr}$ .
  - Acceptable limit:  $5.0 \mu\text{R/hr}$  above background.
  - The survey found no contamination above background levels.

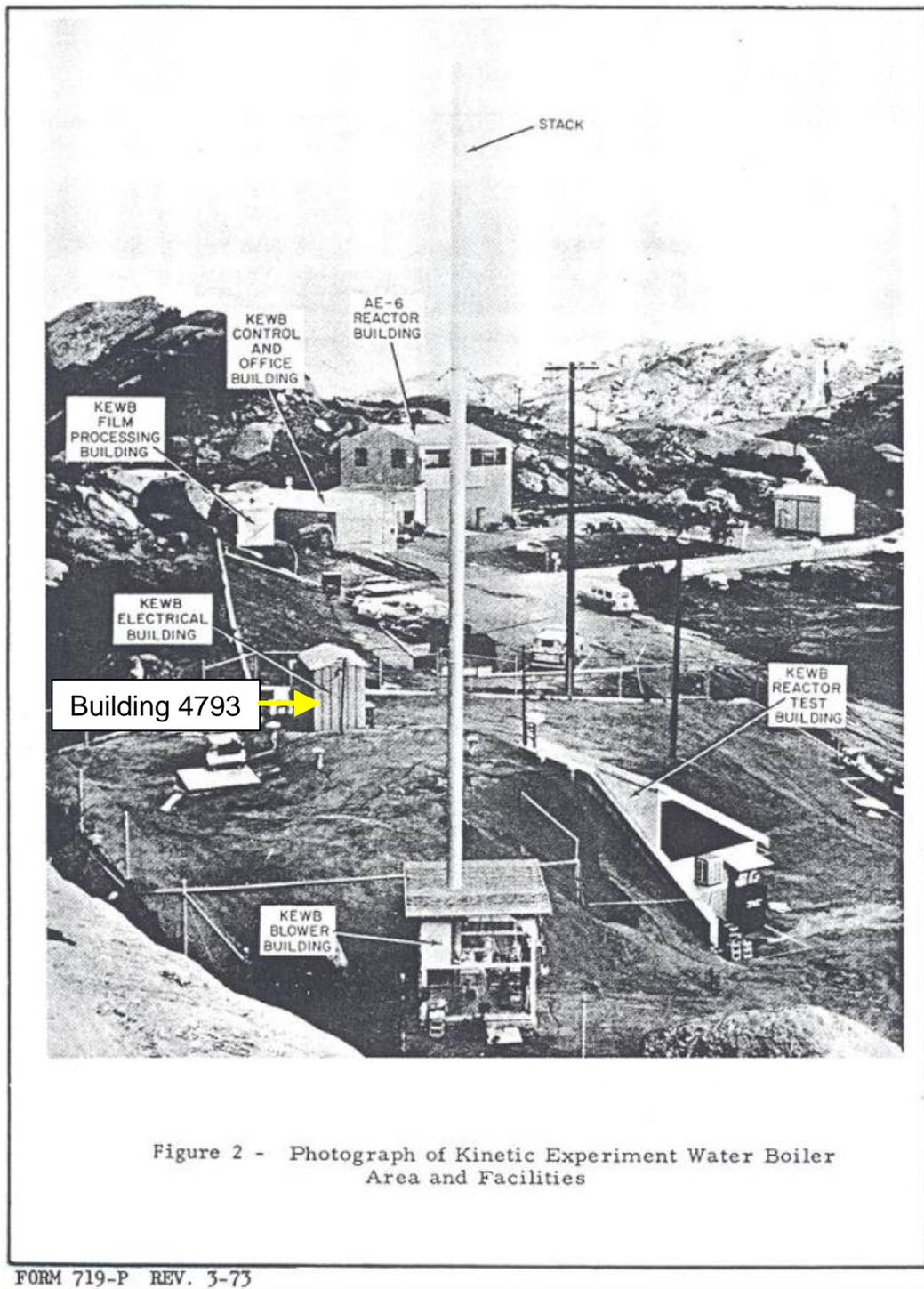
### Status:

- Building 4793 was demolished in 1975.
- The Energy Research and Development Administration released the land on which Building 4793 was located and the surrounding area for unrestricted use in 1976.<sup>1</sup>

### References:

- 1- Letter from Stanley Stamp (ERDA) to W. F. Heine, "Decontamination and Disposition of ERDA Facilities," March 3, 1976.
- 2- Review of Radiation Safety Records Management System, 2003.
- 3- Rockwell International Report, AI-ERDA-13159, "KEWB Facilities Decontamination and Disposition Final Report," February 25, 1976.
- 4- Letter from R.K. Owen (Rockwell International) to R.J. Tuttle, "Radiation Survey – T073 (KEWB) Site," July 17, 1975.
- 5- Argonne National Laboratory, no document number, "Surplus Facilities Management Program, Interim Post Remedial Action Survey Report for Kinetic Experiment Water Boiler (KEWB) Facility, Santa Susana Field Laboratory, Rockwell International, Canoga Park, California," May 1983.
- 6- 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.
- 7- Historical Site Photographs from Boeing Database.
- 8- SSFL Area IV, ETEC Industrial Planning Maps, 1962-1992.

Photograph – Building 4793



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## Group I

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Group I Map

Building 4021

Building 4022

Building 4034

Building 4044

Building 4075

Building 4563

Site 4614

Building 4621

Building 4622

Building 4658

Building 4663

Building 4664

Building 4665

Building 4688

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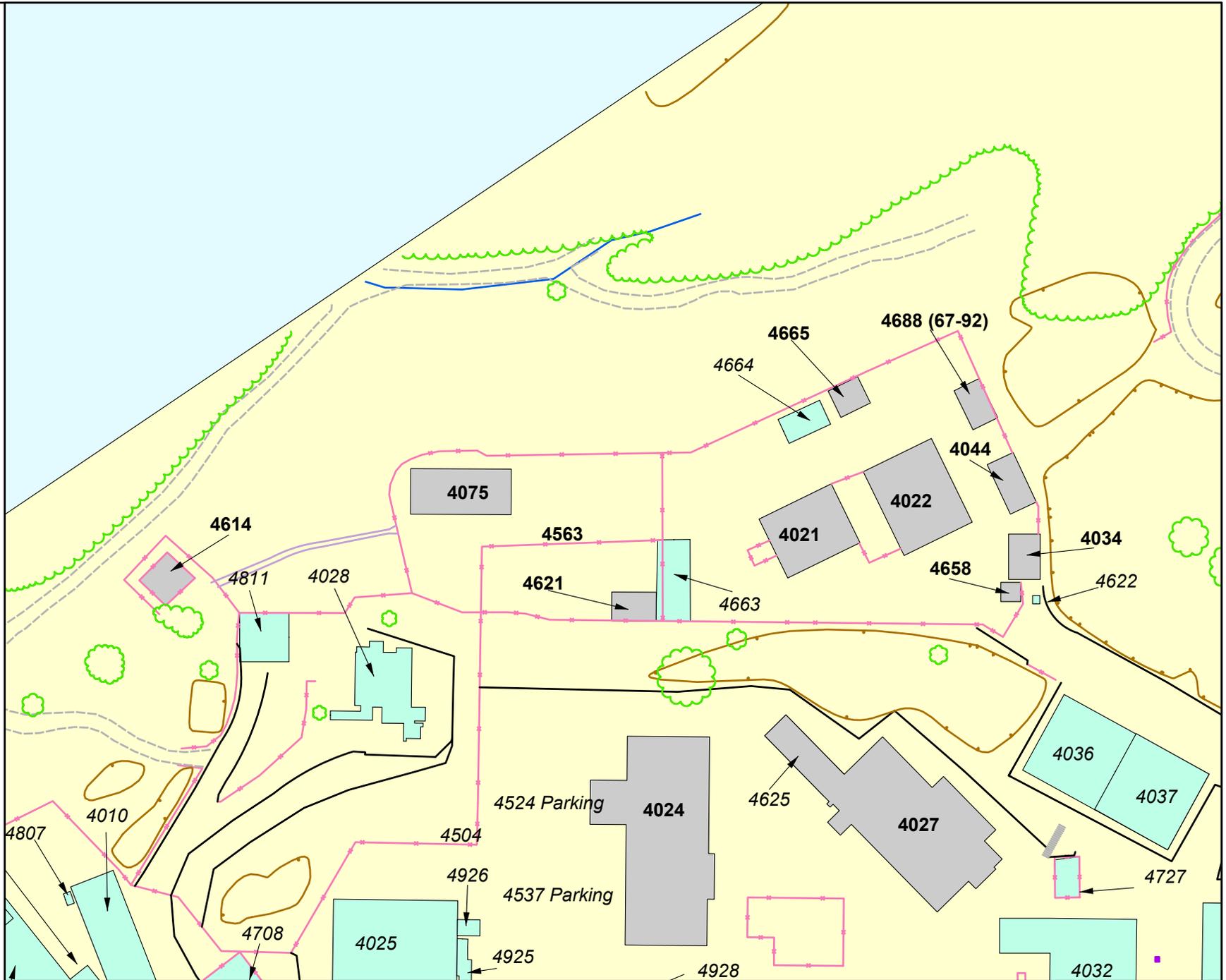
### Legend

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

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

**Unlabeled Features:**

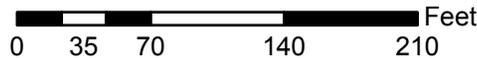
-  Leachfield (Removed)
-  Tree
-  Rock
-  Concrete Curb
-  Gutter
-  Asphalt/Concrete Berm & Paving
-  Sidewalk
-  Dirt Road
-  Fence
-  Stream/Pond
-  Drain
-  Area IV Boundary



DRAWN BY:



1 inch equals 100 feet



DATE:

May 2005

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

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## Site Summary – Building 4021

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### Site Identification:

Building 4021  
Radioactive Material Handling Facility (RMHF) Waste Decontamination and Packaging  
Radioactive Material Disposal Facility (RMDF) Waste Decontamination and Packaging

### Operational Use/History:

- Constructed in 1959.
- Building 4021 has been used during decommissioning programs to process waste materials from the Sodium Reactor Experiment (SRE), Southwest Experimental Fast Oxide Reactor (SEFOR), Experimental Breeder Reactor (EBR), Fermi Reactor, Systems for Nuclear Auxiliary Power (SNAP) and other on-site programs.<sup>1</sup>
- Building 4021 is still active and continues to be used as a processing area for wastes from various on-site decontamination and decommissioning (D&D) programs.

### Site Description:

- Building 4021 is a 3,000-square-foot single-story metal building that consists of a decontamination room, packaging room, hot and cold change rooms and an office area. Floor drains in the building discharge to a sump located at the west side of the building. The water system was once connected to a flocculation tower on the northern fence line of RMHF. The building is connected to a high-efficiency particulate air (HEPA) filtered exhaust system that is located between Buildings 4021 and 4022. This system discharges through a stack connected to Building 4022. Prior to 1961, this facility was connected to a leach field located north of the facility, outside of the fence line.<sup>1</sup>

### Relevant Site Information:

- Radioactive materials were handled in Building 4021 primarily in the form of mixed fission products and fuels.
- Multiple incidents have occurred at this facility. The following are incidents which may have involved releases to the environment:
  - On June 10, 1964, an explosion and fire broke out in a storage can as a result of a sodium reaction. Contaminated smoke caused increased levels of airborne contamination, though the smoke did not escape the building (A0408).
  - On July 21, 1964, an explosion and fire broke out in a storage can as a result of a sodium reaction. Contaminated smoke caused increased levels of airborne contamination, though the smoke did not escape the building (A0413).
  - On December 22, 1964, a component from the Sodium Reactor Experiment was taken to Building 4021 for decontamination. The component had water in

## Group I

it, which leaked when a plastic covering broke. As a result, a concrete pad, asphalt, and a forklift required decontamination (A0448).

- On May 13, 1965, the flocculation tower overflowed, spilling radioactive water onto equipment, the pad and the surrounding soil (A0489).
- On November 11, 1966, a water evaporator pan caught fire, causing the filters to plug and collapse. Sampling indicated that no significant release of radioactive materials occurred (A0297).
- On November 3, 1976, the leach field connected to the building was found to be contaminated at levels up to 200 mrad/hr (A0056).
- On February 15, 1978, the contaminated leach field flooded with rainwater, resulting in the release of water contaminated with Sr-90 at a level of  $4 \times 10^5$   $\mu\text{Ci/ml}$  gross beta activity (A0064).
- On October 3, 1997, four concrete blocks in the parking lot were found to have beta contamination ranging from 100 to 800 counts per minute. The concrete blocks were decontaminated, resurveyed and released without radiological restrictions (A0680).
- The following activities occurred relating to the leach field associated with Building 4021:<sup>2,3,4</sup>
  - The RMHF leach field was constructed in the spring of 1959 as a sanitary sewer leach field.
  - In 1961, the leach field became unnecessary when the Area III sewage disposal system began accepting sanitary waste.
  - In the fall of 1962 or spring of 1963, a valve to the RMHF radioactive water processing system was inadvertently left partially open and allowed an unknown amount of contaminated water to enter the leach field system.
  - In 1976, contamination of the leach field was discovered and decontamination and removal plans were prepared. Levels of contamination were as high as 115,000 pCi/g.
  - Decontamination and removal activities occurred from 1976 to 1978. Approximately 36,250 cubic feet of contaminated soil and sludge were shipped to radioactive waste disposal sites. An estimated 0.6 mCi of radioactive material remains sequestered in inaccessible recesses and three contaminated cracks in the bedrock.
  - During January and February of 1978, heavy rains caused contaminated water to leach out of the soil (see incident A0064 referenced above)

### Radiological Surveys:

- A special environmental survey of the RMHF area was performed in January 1966. Gross beta/gamma radioactivity concentrations for samples of soil, vegetation and water were obtained along the north fence (outside), the drum storage yard and in the ravine below the facility.<sup>5</sup>
  - The survey consisted of 17 soil samples, 12 vegetation samples, and 8 water samples
    - Gross beta gamma radioactivity ranged from:

- 26 to 1005 pCi/gram beta-gamma in soil
  - 161 to 70,680 pCi/gram beta-gamma in vegetation
  - 30 to 30,400 pCi/liter beta-gamma in water
- In 1978, the leach field was surveyed at the end of decontamination activities.<sup>2,3</sup>
  - The survey consisted of 79 random soil samples taken from the surface of the leach field cover.
    - Gross beta activities of the soil ranged from 15 to 46 pCi/g.
  - A complete walk-through survey was also conducted.
    - The maximum gamma exposure rate following backfill was 30 to 50  $\mu$ R/hr, apparently from stored waste at the RMHF just a few hundred yards away. No contribution from the leach field itself could be detected.
  - The site was left with a minor amount of radioactive material in three cracks in the sandstone rock (estimated 0.6 mCi). The cracks are over 10 feet below the surface and were sealed with bituminous asphalt mastic.
  - Survey results indicated that the site was suitable for unrestricted use.
- In 1981 a survey was conducted to support the RMHF decommissioning. The survey indicated there were low levels of fixed and removable contamination on and in some portions of the RMHF asphalt and in the soil beneath the asphalt paving. There were also spot areas of contamination in the soil outside the north, west and south fence perimeters.<sup>6</sup>
  - There were 37 soil samples collected at the surface and 12 inches below the surface at each sample location and analyzed for gross beta/gamma activity.
    - The activities of the soils at the surface ranged from 21 to 1143 pCi/g
    - The activity of the soil at 12" depth ranged from 20 to 104 pCi/g
- In 1989, soil samples were collected around the RMHF Leach Field. In addition, boulders located on the north slope of the leach field backfill, leading down to, and including the ravine were surveyed for beta radiation.<sup>7</sup>
  - One boulder at the bottom of the ravine was emitting beta radiation above background levels. The highest level was 400,000 dpm/100cm<sup>2</sup>
  - 15 soils samples were collected from 6 areas surrounding the leach field
    - Gross alpha ranged from 28.9 to 313.1 pCi/g
    - Gross beta ranged from 26.0 to 2121.0 pCi/g
- In 2000, a survey of the RMHF and surrounding area was conducted.<sup>8</sup>
  - 23 soil samples were collected south, west, and north of the RMHF fenceline and analyzed for Cs-137:
    - 13 samples were <MDA to 1 pCi/g
    - 6 samples were 1 to 10 pCi/g
    - 4 samples were 10 to 53 pCi/g
  - 6 samples were taken from the leach field area
    - 5 samples were typical of background (<0.2 pCi/g)
    - 1 sample was 1.2 pCi/g

## Group I

- In 2003, 49 soil samples were collected from a localized area outside the south fence of RMHF to characterize the area. Cs-137 was detected in most of the samples.<sup>9</sup>
  - The average Cs-137 concentration was 27 pCi/g, ranging from non-detectable to 124 pCi/g.
  - Following excavation (~12 ft x ~50 ft x ~2 ft), six confirmation samples were collected and the average Cs-137 concentration was lowered to 3.75 pCi/g, ranging from 1.65 to 7.08 pCi/g
- The entire RMHF facility, including Building 4021, will be surveyed and decontaminated for unrestricted use at the time of RMHF closure.

### Status:

- Building 4021 is active.
- The Building 4021 leach field was recommended for release for unrestricted use by the Department of Energy (DOE).<sup>2</sup>

### References:

- 1- Rockwell International Document, RMDF-AN-0001, "ETEC RMDF Decontamination and Decommissioning (D&D) Project Management Plan," February 10, 1993.
- 2- Rockwell International Document, ESG-DOE-13385, "RMDF Leach Field Decontamination Final Report," September 15, 1982.
- 3- Rockwell International Document, N704TI990042, "Radiological Survey Results—Release to Unrestricted Use, RMDF Leach Field, SSFL," November 29, 1978.
- 4- Rockwell International Document, ESG-DOE-13365, "Radioactive Materials Disposal Facility Leach Field Environmental Evaluation Report," February 23, 1982.
- 5- Atomics International Internal Letter from J.D. Moore to R.M. Hill, "Environmental Survey Report, Building 022 Santa Susan Area," January 26, 1966.
- 6- Rockwell International Document, N704TI990059, "Relevant Information to support RMDF and Interim Storage Facility Decommissioning," November 5, 1981.
- 7- Rockwell International Internal Letter from J.A. Chapman to R.J. Tuttle, "RMDF Leach Field: Soil samples collected in the General Vicinity May 17, 1989," May 24, 1989.
- 8- Boeing Data Package, "Results of the RMHF Surrounds Radiological Survey," Phil Rutherford, 2000
- 9- Boeing Document, RD04-170, "Site Environmental Report for Calendar Year 2003 DOE Operations at The Boeing Company, Rocketdyne Propulsion & Power," September, 2004.
- 10- SSFL Area IV, ETEC Industrial Planning Maps, 1962-1992.
- 11- Historical Site Photographs from Boeing Database.

Photograph – Building 4021

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## Site Summary – Building 4022

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### Site Identification:

Building 4022  
RMDF Radioactive Vault Storage  
RMHF Radioactive Vault Storage

### Operational Use/History:

- Constructed in 1959.
- The vaults in Building 4022 have been used for the storage of SRE fuel, SEFOR fuel, EBR-II blanket assemblies, SRE decommissioned waste, plutonium, Fermi Reactor fuel, high-level radioactive waste and other waste from on-site decommissioning activities.<sup>1</sup>
- Building 4022 is active, and continues to be used as a storage area for wastes from decommissioning activities throughout the site. The building also contains a compactor, which is used to size reduce low-level radioactive waste.

### Site Description:

- Building 4022 contains seven individual below-grade storage vaults. A high bay metal building and bridge crane are constructed over the underground vaults, which were used to handle materials that were stored in the vaults. One of the vaults contains an 8,000-gallon liquid radioactive waste holdup storage tank. Water from the vaults drains into a sump, which pumps into the Building 4021 holding tank. Air from the building passes through the filter system located between Buildings 4021 and 4022, and is released through the Building 4022 stack.<sup>1</sup>

### Relevant Site Information:

- Radioactive materials were handled in Building 4022 primarily in the form of mixed fission products and fuels.
- Multiple incidents were associated with this facility. The incidents involving a possible release to the environment were:
  - On December 29, 1965, drums of contaminated sodium exploded in a rain storm and burned the outside of the building (A0588).
  - On May 21, 1967, a drum of uranium carbide sludge exploded on a truck outside of the building, contaminating asphalt and evaporator equipment. Contamination levels ranged from 300 to 5,000 dpm/100 cm<sup>2</sup>. Decontamination of the asphalt and equipment was successful (A0615).
  - On May 21, 1967, a 55-gallon drum containing uranium metal under CaCO<sub>3</sub> was found burning in the RMHF storage yard. Workers believed the drum was likely to explode, so three rifle shots were fired into the drum to relieve the pressure building inside. The fire was successfully extinguished and the drum

## Group I

was left outside to cool overnight. It was then moved to Building 4021 for storage (A0616).

- On May 22, 1978, the sump pump stopped working and contaminated liquid flowed out of a holdup tank, contaminating asphalt, which later contaminated eight truck tires placed on the pavement. Both the tires and the asphalt were decontaminated (A0070).
- On August 14, 1979, a shipping box loaded on a waste truck for offsite disposal leaked radioactive liquid containing Cs-137 and Sr-90 on the asphalt outside RMHF. The area was successfully decontaminated shortly after the incident (A0314).
- Because of the operational and incident history of this building, as well as the entire RMHF facility, the building and its surroundings will be surveyed and decontaminated at the time of RMHF closure.

### **Radiological Surveys:**

- There have been several surveys of the entire RMHF complex, including Building 4022, during its operation. The results of these surveys are summarized in the 4021 site summary.
- The entire RMHF facility, including Building 4022, will be surveyed and decontaminated for unrestricted use at the time of RMHF closure.

### **Status:**

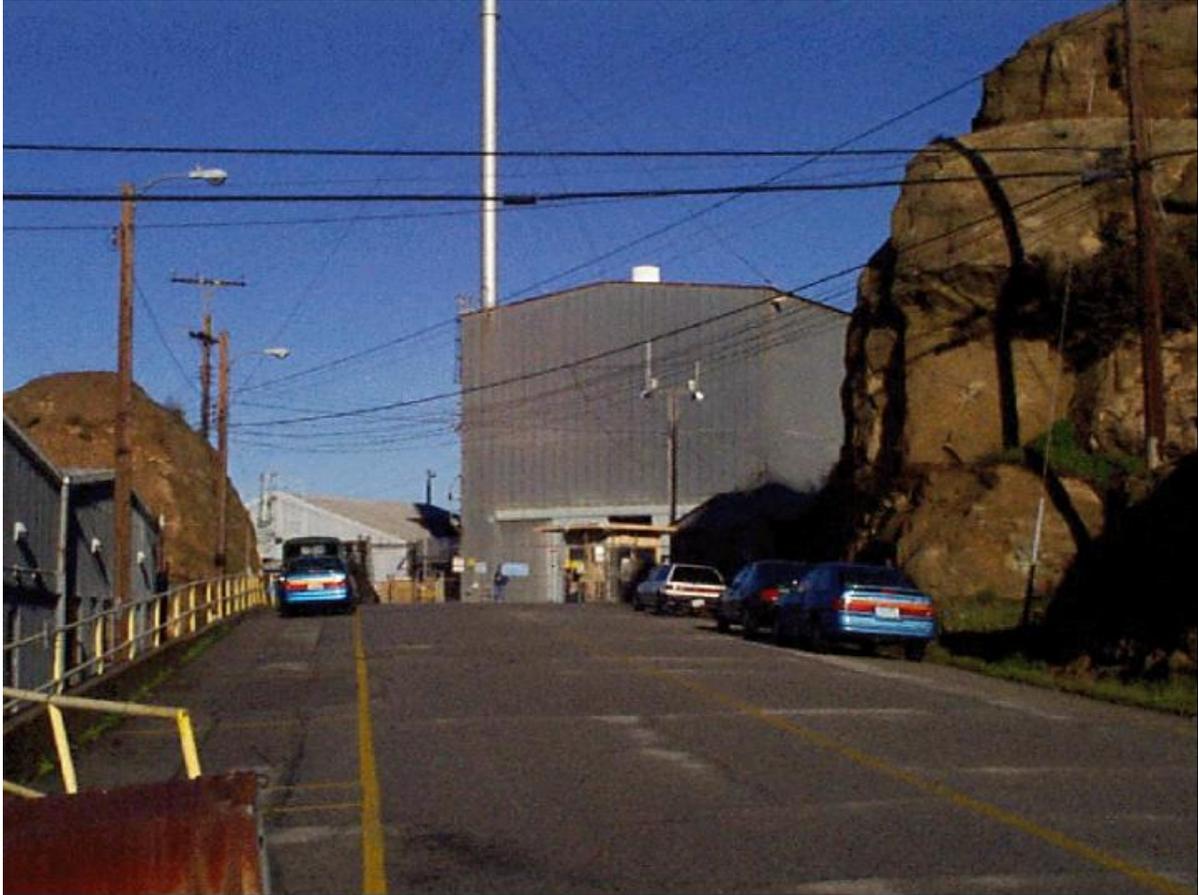
- Building 4022 is actively used as a storage area for wastes from decommissioning activities throughout the site.

### **References:**

- 1- Rockwell International Document, RMDF-AN-0001, "ETEC RMDF Decontamination and Decommissioning (D&D) Project Management Plan," February 10, 1993.
- 2- Historical Site Photographs from Boeing Database.
- 3- SSFL Area IV, ETEC Industrial Planning Maps, 1962-1992.

Photograph – Building 4022

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## Site Summary – Building 4034

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**Site Identification:**

Building 4034  
RMDF Office Building  
RMHF Office Building

**Operational Use/History:**

- Constructed in 1961.
- Building 4034 was an office building for RMDF (which was later referred to as RMHF).
- The facility is active, and serves as the main office and point of entry for RMHF.

**Site Description:**

- The building is a small (approximately 650 square feet) steel structure consisting of two main office areas and restrooms.<sup>1,2</sup>

**Relevant Site Information:**

- There are no Use Authorizations and no Incident Reports associated with Building 4034.<sup>3</sup>

**Radiological Surveys:**

- There have been several surveys of the entire RMHF complex, including Building 4034, during its operation. The results of these surveys are summarized in the 4021 site summary.
- Routine quarterly radiation surveys are conducted in this office building to verify that it has not become contaminated.<sup>4</sup>

**Status:**

- This facility is active.

**References:**

- 1- SSFL Area IV, ETEC Industrial Planning Maps, 1962-1992.
- 2- Historical Site Photographs from Boeing Database.
- 3- Review of Radiation Safety Records Management System, 2003.
- 4- Personnel Interview, Phil Rutherford, February 2004.

Photograph – Building 4034

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## Site Summary – Building 4044

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### Site Identification:

Building 4044  
RMDF Clean Shop  
RMDF Support Lab  
RMHF Support Lab

### Operational Use/History:

- Constructed in the middle 1960s.
- Building 4044 has served various purposes throughout the life of the RMDF/RMHF including as a clean shop, health physics offices and as a break room.
- The facility is active and contains the break room and health physics offices for RMHF.

### Site Description:

- Building 4044 is approximately 1,000 square feet, and is located along the east border of the RMHF complex.<sup>1, 2</sup>

### Relevant Site Information:

- The health physics offices in this building have been used as counting areas for removable contamination measurements and storage and use of calibration sources. No other regulated radiological materials were managed specifically in this building.

### Radiological Surveys:

- There have been several surveys of the entire RMHF complex, including Building 4044, during its operation. The results of these surveys are summarized in the 4021 site summary.
- Routine daily and monthly radiological surveys are conducted in Building 4044 to verify that it has not become contaminated.<sup>3</sup>

### Status:

- This facility is active, containing the break room and health physics offices for RMHF.

### References:

- 1- Physical inspection, conducted September 2003.
- 2- Rockwell International Document, RMDF-AN-0001, "ETEC RMDF Decontamination and Decommissioning (D&D) Project Management Plan," February 10, 1993.

## Group I

- 3- Personnel Interview, Phil Rutherford, February 2004.
- 4- SSFL Area IV, ETEC Industrial Planning Maps, 1962-1992.
- 5- Historical Site Photographs from Boeing Database.
- 6- Review of Radiation Safety Records Management System, 2003.

Photograph – Building 4044

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## Site Summary – Building 4075

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### Site Identification:

Building 4075  
RMDF Contaminated Equipment Storage Building  
RMHF Contaminated Equipment Storage Building

### Operational Use/History:

- Constructed in 1971.
- Building 4075 served as a storage area for radioactive waste prior to shipment to disposal sites.<sup>1</sup>
- In approximately 2001, the building ceased to be used as a storage area and has since remained unused.

### Site Description:

- Building 4075 is a 2,160-square-foot steel building located on the northwest end of the RMHF complex.<sup>1,2</sup>

### Relevant Site Information:

- Radioactive waste was stored in this building. Possible contaminants include: uranium, thorium, plutonium isotopes and mixed fission products.
- The following is an incident which may have involved a release of contamination to the environment:
  - On August 15, 1988, a forklift driver punctured a drum of radioactive sand. The sand spilled out onto the floor of Building 4075; however, surveys indicated that no detectable contamination occurred as a result (A0188).

### Radiological Surveys:

- There have been several surveys of the entire RMHF complex, including Building 4075, during its operation. The results of these surveys are summarized in the 4021 site summary.
- Routine quarterly radiological surveys are conducted to verify that Building 4075 has not become contaminated above the limits established by 10 CFR 835.<sup>3</sup>

### Status:

- Building 4075 is inactive.

## Group I

### References:

- 1- Rockwell International Document, RMDF-AN-0001, "ETEC RMDF Decontamination and Decommissioning (D&D) Project Management Plan," February 10, 1993.
- 2- Physical inspection, conducted September 2003.
- 3- Personnel Interview, Phil Rutherford, February 2004.
- 4- Historical Site Photographs from Boeing Database.
- 5- SSFL Area IV, ETEC Industrial Planning Maps, 1962-1992.
- 6- Review of Radiation Safety Records Management System, 2003.

Photograph – Building 4075

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## Site Summary – Building 4563

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### Site Identification:

Site 4563  
Building 4633 Storage Yard  
Covered Storage Area Neighboring Building 4075

### Operational Use/History:

- Constructed in 1958.
- Site 4563 was a paved storage area at RMHF. <sup>1,2</sup>
- The area is still in use as a storage area today, but no longer is designated as Building 4563. Instead, it is referred to as the “covered storage area neighboring Building 4075.”

### Site Description:

- Site 4563 is the paved area located along the northern border of RMHF, just east of Building 4075. <sup>1,2</sup>

### Relevant Site Information:

- Radioactive waste was stored here pending shipment to a disposal facility. <sup>3</sup>
- The most probable contaminants of concern are uranium, plutonium, thorium isotopes and mixed fission products.
- There are no Incident Reports associated with Building 4563. <sup>4</sup>

### Radiological Surveys:

- There have been several surveys of the entire RMHF complex, including Building 4563, during its operation. The results of these surveys are summarized in the 4021 site summary.
- Routine quarterly radiological surveys are conducted in the area to verify that Building 4563 has not become contaminated above the limits established by 10 CFR 835. <sup>5</sup>

### Status:

- This area is active as a covered storage area neighboring Building 4075, but it is no longer designated as Building 4563.

### References:

- 1- SSFL Area IV, ETEC Industrial Planning Maps, 1962-1992.
- 2- Historical Site Photographs from Boeing Database.

## Group I

- 3- Physical inspection, conducted September 2003.
- 4- Review of Radiation Safety Records Management System, 2003.
- 5- Personnel Interview, Phil Rutherford, February 2004.

Photograph – Building 4563

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## Site Summary – Site 4614

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### Site Identification:

Site 4614  
RMDF Drainage Sump  
RMHF Drainage Sump  
RMHF Holdup Pond

### Operational Use/History:

- Constructed in the middle 1960s.
- Site 4614 served as a holdup pond for surface runoff from the RMDF/RMHF facility.<sup>1</sup>
- Site 4614 is active.

### Site Description:

- Site 4614 is a holdup pond located at the base of the drainage channel west of the RMDF complex. The bottom and sides of the pond are lined with asphalt material.<sup>1</sup>

### Relevant Site Information:

- Radioactive contamination exists in the pond as a result of known spills that have occurred at the RMDF/RMHF.
- There have been two notable radiological incidents associated with Site 4614:
  - On January 17, 1979, leakage from the flocculation tower associated with Building 4021 contaminated the drainage ditch and the pond itself with less than 0.4 mCi of Sr-90 and Cs-137 (A0077).
  - On January 9, 1980, a water hose broke, causing the Building 4021 tank to overflow, which then drained to the pond. This incident resulted in the released of about 100 gallons of liquid containing  $1 \times 10^{-2}$  mCi of mixed fission products (A0080).

### Radiological Surveys:

- There have been several surveys of the entire RMHF complex, including Site 4614, during its operation. The results of these surveys are summarized in the 4021 site summary.
- Due to operational history, Site 4614 is likely contaminated.
- Site 4614 is monitored and alarmed by a NaI gamma exposure meter. Any alarms result in immediate sampling of the water. All alarms in the past 14 years have been false alarms caused by power supply and telephone line problems during wet weather. No activity has been detected in the water. Water pumped from this pond into the Santa Susana Field Laboratory (SSFL) water reclamation system is ultimately sampled according to the National Pollutant Discharge Elimination System (NPDES) permit.<sup>2</sup>

## Group I

- During the dry season when the pond dries up, the sediment is removed from the lined pond and analyzed for contamination prior to being disposed of as radioactive waste. Low levels of Cs-137 are frequently found (e.g. 34 pCi/g in 2003).<sup>4</sup>

### Status:

- Site 4614 is active.

### References:

- 1- Rockwell International Document, RMDF-AN-0001, "ETEC RMDF Decontamination and Decommissioning (D&D) Project Management Plan," February 10, 1993.
- 2- Personnel Interview, Phil Rutherford, February 2004.
- 3- Historical Site Photographs from Boeing Database.
- 4- SSFL Area IV, ETEC Industrial Planning Maps, 1962-1992.

Photograph – Site 4614

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## Site Summary – Building 4621

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### Site Identification:

Building 4621  
RMDF Equipment  
RMHF Equipment

### Operational Use/History:

- Constructed in the middle 1960s.
- Building 4621 was used to store contaminated equipment and materials for the RMDF (which later referred to as RMHF).<sup>1</sup>
- Building 4621 is active.

### Site Description:

- Building 4621 is a small (approximately 500 square feet) metal structure located along the south border of the RMHF complex.<sup>2</sup>

### Relevant Site Information:

- Radioactive material was stored in this facility, primarily in the form of mixed fission products from various site wastes.
- Use Authorization Series 107 authorized the storage of two Krypton-85 Aerosol Neutralizers at this location. One is specified to contain one  $\mu\text{Ci}$  and the other two  $\mu\text{Ci}$ . Both are gaseous and sealed in a Thermo-Systems Model 3012 Neutralizer.<sup>3</sup>
- An incident occurred at this facility which may have involved a release to the environment:
  - On September 4, 1975, a 132 mCi Ra-266 source was discovered lying on the ground outside Building 4621. The source was not labeled, nor was in it a shielded container. Following its discovery, the source was properly marked and stored in a secure condition (A0053).

### Radiological Surveys:

- There have been several surveys of the entire RMHF complex, including Building 4621, during its operation. The results of these surveys are summarized in the 4021 site summary.
- Routine radiological surveys are conducted in Building 4621 to verify that the building has not become contaminated above the limits established by 10 CFR 835.<sup>4</sup>

### Status:

- This facility is active.

## Group I

### References:

- 1- Rockwell International Document, RMDF-AN-0001, "ETEC RMDF Decontamination and Decommissioning (D&D) Project Management Plan," February 10, 1993.
- 2- SSFL Area IV, ETEC Industrial Planning Maps, 1962-1992.
- 3- Rockwell International, Internal Letter, "Application for Use of Radioactive Materials," Use Authorization Series 107, D. Stelman to R.J. Tuttle, April 15, 1977.
- 4- Review of Radiation Safety Records Management System, 2003.
- 5- Historical Site Photographs from Boeing Database.

Photograph – Building 4621



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## Site Summary – Building 4622

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### Site Identification:

Building 4622  
RMDF Counting Building

### Operational Use/History:

- Constructed prior to 1962.<sup>1</sup>
- Building 4622 was used as a health physics counting area.<sup>2</sup>
- Demolished in approximately 1976.

### Site Description:

- Building 4622 was a small (approximately 500 square feet) structure located on the southeast corner of the RMHF complex (near the current location of Building 4658, the RMHF Guard Shack).<sup>2</sup>

### Relevant Site Information:

- Health physics samples of waste contained at the RMDF/RMHF facility were counted for radioactivity in this building.
- There are no Incident Reports associated with Building 4622.<sup>3</sup>

### Radiological Surveys:

- There have been several surveys of the entire RMHF complex, including Building 4622, during its operation. The results of these surveys are summarized in the 4021 site summary.
- During its use, routine radiological surveys were conducted in Building 4622 to verify that the building had not become contaminated above the limits established by DOE Order 5480.11.<sup>3</sup>

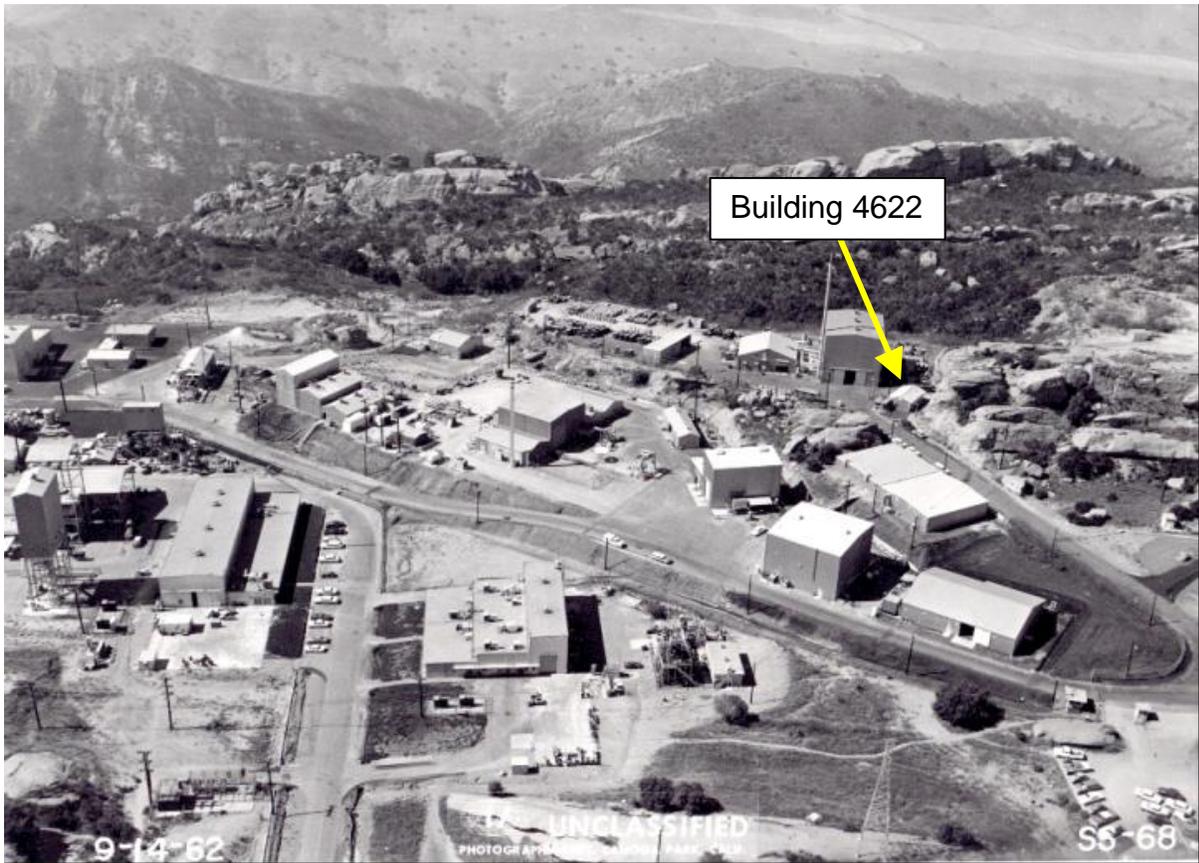
### Status:

- Building 4622 was demolished in approximately 1976.

### References:

- 1- SSFL Area IV, ETEC Industrial Planning Maps, 1962-1992.
- 2- Physical inspection, conducted September 2003.
- 3- Review of Radiation Safety Records Management System, 2003.
- 4- Historical Site Photographs from Boeing Database.

Photograph – Building 4622



## Site Summary – Building 4658

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### Site Identification:

Building 4658  
RMDF Guard Shack  
RMHF Guard Shack

### Operational Use/History:

- Constructed in the early 1980s.
- This building served as a guard shack for the RMDF. The facility's name was later changed to the RMHF.
- Throughout most of the 1980s, this facility was used as the main entrance point into the RMDF/RMHF facility.<sup>1</sup>
- In the late 1980s, security measures no longer required the use of the guard shack as an entrance to the facility. The building still remains as an inactive structure.<sup>1</sup>

### Site Description:

- Building 4658 is a small structure (approximately 100 square feet) located at the east end of the RMHF, adjacent to the vehicle entrance gate. During its use as a secure entrance to the facility, it was connected to a mantrap that limited personnel entrance into the facility pending security approval.<sup>2,3</sup>

### Relevant Site Information:

- Radioactive materials were not managed specifically in this building, although fuels and wastes were managed at the RMDF/RMHF facility.
- There are no Incident Reports associated with Building 4658.<sup>4</sup>

### Radiological Surveys:

- There have been several surveys of the entire RMHF complex, including Building 4658, during its operation. The results of these surveys are summarized in the 4021 site summary.
- During its use, routine radiological surveys were conducted in Building 4658 to verify that the building had not become contaminated.<sup>2</sup>

### Status:

- This facility is currently inactive.

## Group I

### References:

- 1- Personnel Interview, Paul Waite, August 2003.
- 2- Rockwell International Document, RMDF-AN-0001, "ETEC RMDF Decontamination and Decommissioning (D&D) Project Management Plan," February 10, 1993.
- 3- SSFL Area IV, ETEC Industrial Planning Maps, 1962-1992.
- 4- Review of Radiation Safety Records Management System, 2003.
- 5- Historical Site Photographs from Boeing Database.

Photograph – Building 4658

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## Site Summary – Building 4663

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### Site Identification:

- Building 4663
- RMDF Storage Area
- RMHF Storage Area

### Operational Use/History:

- Constructed in the late 1950s or early 1960s.
- Building 4663 was used for storage of materials.<sup>1,2</sup>
- Demolished in the early 1970s; however, the remaining concrete pad serves as a storage area for non-radioactive material.

### Site Description:

- Building 4663 was located on the southern border of RMHF, just east of Building 4621. The remaining concrete pad is approximately 1,300 square feet.<sup>1,2</sup>

### Relevant Site Information:

- Radioactive waste may have been stored at this facility. The most probable contaminants of concern are uranium, plutonium, thorium isotopes and mixed fission products.
- There are no Incident Reports associated with Building 4663.<sup>3</sup>

### Radiological Surveys:

- There have been several surveys of the entire RMHF complex, including Building 4663, during its operation. The results of these surveys are summarized in the 4021 site summary.
- During its use, routine radiological surveys were conducted in Building 4663 to verify that the building had not become contaminated above the limits established by DOE Order 5480.11.

### Status:

- The building was demolished in the early 1970s. The remaining concrete pad is active as a storage area for non-radioactive material.

### References:

- 1- SSFL Area IV, ETEC Industrial Planning Maps, 1962-1992.
- 2- Historical Site Photographs from Boeing Database.
- 3- Review of Radiation Safety Records Management System, 2003.

Photograph – Building 4663

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## Site Summary – Building 4664

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### Site Identification:

Building 4664  
RMDF Low Level Waste Processing

### Operational Use/History:

- Constructed in the middle 1960s.
- Building 4664 was used as a processing facility for low-level radioactive waste at the RMDF (which was later named RMHF).<sup>1</sup>
- Demolished in the early 1980s.

### Site Description:

- Building 4664 was located on the northern border of RMHF, west of Building 4665, and was approximately 1,200 square feet.<sup>1</sup>

### Relevant Site Information:

- Radioactive waste and material were most likely stored or handled at this facility. The most probable contaminants of concern are uranium, plutonium, thorium isotopes and mixed fission products.
- The following is an incident which may have involved a release of contamination to the environment:<sup>2</sup>
  - On February 10, 1965, the evaporator system backed up and a flexible hose was blown from its connection, releasing approximately five gallons of radioactive contaminated liquid onto the asphalt. Decontamination of this area was performed immediately (A0362).

### Radiological Surveys:

- There have been several surveys of the entire RMHF complex, including Building 4664, during its operation. The results of these surveys are summarized in the 4021 site summary.
- During its use, routine radiological surveys were conducted in Building 4664 to verify that the building had not become contaminated above the limits established by DOE Order 5480.11.

### Status:

- Demolished in the early 1980s.

## Group I

### References:

- 1- SSFL Area IV, ETEC Industrial Planning Maps, 1962-1992.
- 2- Review of Radiation Safety Records Management System, 2003.

## Site Summary – Building 4665

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### Site Identification:

Building 4665  
RMDF Oxidation Facility  
RMHF Equipment Storage

### Operational Use/History:

- Constructed in the middle 1960s.
- Building 4665 was used as an oxidation facility for the RMDF (later renamed the RMHF).<sup>1,2</sup>
- Building 4665 is still active as a non-radioactive storage area.<sup>1,2</sup>

### Site Description:

- Building 4665 was a small (less than 600 square feet) building located on the northern border of RMHF, north of Building 4022.<sup>1</sup>

### Relevant Site Information:

- Radioactive waste and material may have been stored or handled at this facility. The most probable contaminants of concern are uranium, plutonium, thorium isotopes, and mixed fission products.
- There are no Incident Reports associated with Building 4665.<sup>3</sup>

### Radiological Surveys:

- There have been several surveys of the entire RMHF complex, including Building 4665, during its operation. The results of these surveys are summarized in the 4021 site summary.
- Routine quarterly radiological surveys are conducted in Building 4665 to verify that it has not become contaminated.<sup>3</sup>

### Status:

- Building 4665 is still standing and is used as a storage area for non-radioactive equipment and materials.

### References:

- 1- SSFL Area IV, ETEC Industrial Planning Maps, 1962-1992.
- 2- Historical Site Photographs from Boeing Database.
- 3- Review of Radiation Safety Records Management System, 2003.

Photograph – Building 4665

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## Site Summary – Building 4688

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### Site Identification:

Building 4688  
Auxiliary Skid Shack  
RMDF Storage  
RMHF Storage

### Operational Use/History:

- Constructed in approximately 1962.
- Building 4688 was located northeast of the SRE complex.<sup>1</sup>
  - After 1962, Building 4688 no longer appears in this location. In 1967, a structure referred to as Building 4688 appears on an Industrial Planning Map in the RMHF complex. It is unclear whether the original structure was transferred to the second location or a new structure was built.
- Although no documentation exists on the building, its location indicates that it was likely used to support sodium cleaning activities at Building 4723.
- In the middle 1960s, this structure was moved to the RMHF complex and began use as a storage area, possibly for radioactive materials.
- This structure is currently active as a non-radioactive storage area.

### Site Description:

- Building 4688 is a small (less than 500 square feet) structure located on the east border of RMHF, just north of Building 4044. It is a shed-type storage structure with no walls, and is used primarily as protection against rain and sun.<sup>2</sup>

### Relevant Site Information:

- Radioactive material may have been stored under this structure.
- There are no Use Authorizations and no Incident Reports associated with Building 4688.<sup>3</sup>

### Radiological Surveys:

- There have been several surveys of the entire RMHF complex, including Building 4688, during its operation. The results of these surveys are summarized in the 4021 site summary.
- Building 4688 is included in routine quarterly radiological surveys of the RMHF.<sup>3</sup>

### Status:

- This facility is currently active as a non-radioactive storage area.

## Group I

### References:

- 1- SSFL Area IV, ETEC Industrial Planning Maps, 1962-1992.
- 2- Physical inspection, conducted September 2003.
- 3- Review of Radiation Safety Records Management System, 2003.
- 4- Historical Site Photographs from Boeing Database.

Photograph – Building 4688



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## Group J

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Group H Map

Building 4023

*Includes Building 4742, Substation*

Building 4024

*Includes Building 4928, Cooling Tower*

*Includes Building 4725, Substation*

Building 4025

*Includes Building 4924, Substation*

*Includes Building 4925, Mechanical Equipment Slab*

*Includes Building 4926, Sodium Reactor Experiment (SRE) Mock-up Equipment Area*

*Includes Building 4725, Substation for 4024 and 4025*

Building 4027

*Includes Building 4727, Substation*

Building 4032

*Includes Building 4727, Substation*

Building 4036/4037

*Includes Building 4727, Substation*

Building 4042

*Includes Building 4742, Substation*

Site 4524

Site 4536

*Includes Building 4836, Time Clock*

*Includes Building 4636, Guard Shack*

Site 4537

Building 4625

Building 4927

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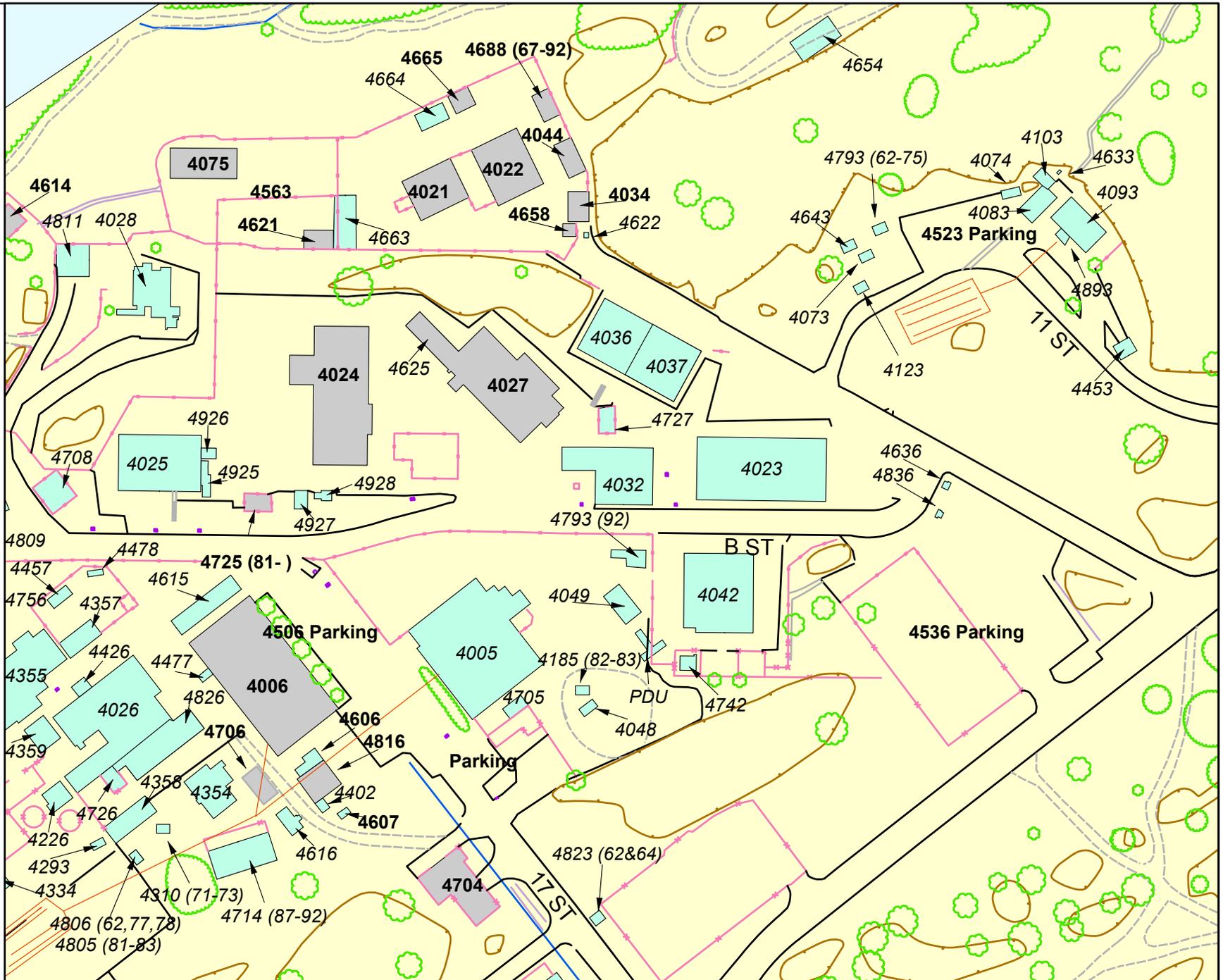
### Legend

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

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

**Unlabeled Features:**

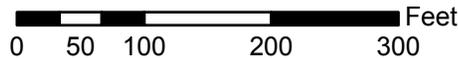
-  Leachfield (Removed)
-  Tree
-  Rock
-  Concrete Curb
-  Gutter
-  Asphalt/Concrete Berm & Paving
-  Sidewalk
-  Dirt Road
-  Fence
-  Stream/Pond
-  Drain
-  Area IV Boundary



DRAWN BY:



1 inch equals 150 feet



DATE:

May 2005

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

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## Site Summary – Building 4023

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### Site Identification:

Building 4023  
Liquid Metals Component Test Building  
Corrosion Test Loop  
Includes Building 4742, Substation

### Operational Use/History:

- The first section of Building 4023, constructed in 1962 (known as 023), housed a small sodium loop to conduct studies of radioactive contamination transport. The second section, constructed in 1976 (known as 23A), served as a storage and setup room as well as an analytical chemistry laboratory.<sup>1</sup>
- In 1982, an Alnor Dew-Point Meter containing a 6.25  $\mu\text{Ci}$  Ra-226 source was brought to the facility to be disassembled, but the disassembly was never authorized or attempted and the instrument was removed intact in 1986.<sup>2</sup>
- A 10  $\mu\text{Ci}$  Mn-54 sealed source, which was checked annually to ensure that no leaks had occurred, was stored in the building from 1983 to 1986.<sup>2</sup>
- Sodium loop tests stopped in 1982 and the loop was dismantled and removed in 1986. At this point the connections to the tank were sealed and sinks were removed.<sup>1</sup>
- In 1990 the high-efficiency particulate air (HEPA) filtration system and fume hoods were removed.<sup>2</sup>
- The remainder of the radioactive liquid waste system (pipes, drains, tank) was removed in 1993.<sup>2</sup>

### Site Description:

- Building 4023 was a single story structure with galvanized steel walls and roof and a concrete slab floor. The sodium test loop was located in the western, or “old,” portion of the building. The “new” building section held an analytical chemistry laboratory and a storage set-up room.<sup>3</sup>
- The facility was approximately 20 feet below the general grade of the adjacent 12<sup>th</sup> Street.<sup>1</sup>
- The waste holdup tank was located in an exterior sub-grade open-top concrete vault (7.5 feet x 10 feet x 6 feet) at the east end of Building 4023.<sup>2</sup>
- Serviced by Substation 4742.

### Relevant Site Information:

- The majority of the contamination of Building 4023 was associated with drain lines and associated vent pipes, the holdup tank, the open top holdup tank pit, and a laboratory fume hood.<sup>4</sup>

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- The contaminants of concern associated with the activities at Building 4023 include: Co-60, Mn-54, Ni-63, Fe-55, Ta-182 and tritium. Limited amounts of Cs-137 and Sr-90 were also found.<sup>5</sup>
- Use Authorization 105 was issued in 1976. It allowed the use of a small section of activated stainless steel Experimental Boilers Reactor fuel cladding in a small sodium test loop to gather data on transport characteristics of radiological contamination in sodium loops.<sup>1</sup>
- There have been two incidents associated with Building 4023 that could have resulted in a release to the environment:<sup>2</sup>
  - On December 18, 1980, water reacted with non-neutralized sodium and surged out of the loop. The water leak resulted in contamination of the ceiling, walls and floor with maximum contamination levels of 1,000 dpm/100 cm<sup>2</sup> of Mn-54 (A0084).
  - On April 28, 1981, there was a minor sodium leak and fire, with Cs-137, Mn-54 and Co-60 as the principal radioactive isotopes contained in the loop at the time. The fire was extinguished with calcium carbonate. Smears of the loop and the floor showed no radioactive contamination (A0257).
- All drain lines in Building 4023 were connected to the waste holdup tank system. The lines were both above and below ground.<sup>2</sup>

### Radiological Surveys:

- In 1993, Rockwell/Rocketdyne conducted a final radiological survey to ensure compliance with acceptable contamination limits for activation products and mixed fission products and for ambient exposure rate.<sup>6</sup>
  - The scope of the survey included only the interior rooms of the building.
  - Contamination limit criteria are as follows:
    - For alpha and beta contamination:
      - Average contamination of  $\leq 5,000$  dpm/100 cm<sup>2</sup>.
      - Maximum of contamination  $\leq 15,000$  dpm/100 cm<sup>2</sup>.
      - Removable contamination of  $\leq 1,000$  dpm/100 cm<sup>2</sup>.
    - For gamma contamination:
      - $\leq 5$   $\mu$ R/hr above background at 1 meter interior and exterior.
  - Initial surface scans indicated an area within Building 4023 with elevated levels of Cs-137 requiring additional decontamination.
    - These locations were decontaminated and post-remedial action scans found surface activity to be below release limits.
  - Observed detection limit ranges are as follows:
    - Removable alpha: 2 dpm/100 cm<sup>2</sup> to 9 dpm/100 cm<sup>2</sup>.
    - Total beta: 252 dpm/100 cm<sup>2</sup> to 373 dpm/100 cm<sup>2</sup>.
    - Removable beta: 6 dpm/100 cm<sup>2</sup> to 23 dpm/cm<sup>2</sup>.
    - Net ambient gamma exposure rate: 0.49  $\mu$ R/hr to 0.66  $\mu$ R/hr.

- In 1994, ORISE conducted a verification survey using surface scans to confirm that remedial actions have been effective in meeting established guidelines. No soil samples were taken, because the entire area around Building 4023 was paved.<sup>3</sup>
  - Scans inside the Building 4023 Control Room identified elevated direct radiation in two areas that required additional investigation.
    - Rocketdyne personnel decontaminated the two areas and Environmental Survey and Site Assessment Program (ESSAP) personnel performed additional scans after the decontamination. Scans showed the beta surface activity was comparable to background levels.
  - Final survey results for total surface activity levels inside Building 4023 were less than 66 to 400 dpm/100 cm<sup>2</sup> for alpha and less than 1,400 to 6,700 dpm/100 cm<sup>2</sup> for beta.
  - Final survey results for activity levels on exterior surfaces, including the holdup waste tank vault, were less than 66 dpm/100 cm<sup>2</sup> to 120 dpm/100 cm<sup>2</sup> for alpha and less than 1,500 dpm/100 cm<sup>2</sup> to 1,600 dpm/cm<sup>2</sup> for beta.
- On August 28, 1997, the Radiological Health Branch (RHB) and the California Department of Health Services (DHS) conducted a confirmatory survey of Building 4023. A complete qualitative gamma scan of the facility and surrounding area was performed. Selected measurements of total and removable beta surface activity and local gamma exposure rates were also conducted.<sup>7</sup>
  - The survey results and laboratory analysis results confirmed the results of the final radiological survey in 1993 and the Oak Ridge Institute for Science and Education (ORISE) verification survey in 1994.<sup>8</sup>

#### Status:

- DOE formally released Building 4023 on April 21, 1997.<sup>9</sup>
- DHS concurred with release of Building 4023 on February 19, 1998.<sup>8</sup>
- Building 4023 was demolished in October 1999.

#### References:

- 1- DOE Document, Docket No. DOE/CD-EETEC-023, "Certification Docket for the Release of Building 023 at ETEC," February 1997.
- 2- Rocketdyne Report, 023-AR-0002 Rev. A., "Building 023 D&D Operations Final Report," March 7, 1996.
- 3- ORISE Report, 94/K-14, "Verification Survey of Buildings 005, 023, and 064, Santa Susana Field Laboratory, Rockwell International, Ventura County, California," October 1994.
- 4- Rocketdyne, Internal Letter, "Assessment Plan for Building 023 D&D, from P. Waite to R. Meyer", January 12, 1993.
- 5- Rocketdyne, Internal Letter, "Potential Contaminants at T023," from R. J. Tuttle to P. Rutherford, January 20, 1993.
- 6- Rocketdyne Report, 023-ZR-0001, "Final Radiological Survey Report of Building 023," March 1, 1994.

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- 7- Rocketdyne, E-mail, “State DHS/RHB Inspection of T023,” from R. Tuttle to P. Rutherford, et al, August 29, 1997.
- 8- DHS/RHB, Letter, “Boeing’s Request for Concurrence in Release for Use Without Radiological Restriction, Rocketdyne Santa Susana Field Laboratory Building T023,” from Gerard Wong (DHS/RHB) to Phil Rutherford, February 19, 1998.
- 9- DOE/OAK, Letter, “Release of Facilities for Unrestricted Non-Radiological Use,” from Roger Liddle (DOE/OAK) to Mark Gabler, April 21, 1997.
- 10- Historical Site Photographs from Boeing Database.
- 11- SSFL Area IV, ETEC Industrial Planning Maps, 1962-1992.

Photograph – Building 4023

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## Site Summary – Building 4024

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### Site Identification:

Building 4024  
Development Test Laboratory  
Systems for Nuclear Auxiliary Power (SNAP) Environmental Test Facility (SETF)  
Includes Building 4928, Cooling Tower  
Includes Building 4725, Substation

### Operational Use/History:

- Constructed in 1960.
- Building 4024 was used for testing SNAP reactors in a simulated operational environment. It was enlarged in 1962 to provide a second control room and increased operating equipment area.<sup>1</sup>
- Prototype reactor SNAP 2 Demonstration Reactor (S2DR) operated for 5,000 hours at 30 and 50 kWt in the east cell between April 1961 and December 1962.<sup>1</sup>
- Prototype SNAP 10 Flight System (S10FS-3) reactor operated for 10,000 hours at about 40 kWt in the west cell between January 1965 and March 1966.<sup>1</sup>
- SNAP Critical Assembly 4B, operated in the east cell for a short time at low power.<sup>1</sup>
- SNAP Transient Test (SNAPTRAN-1) support reactor, also critical, operated in the east cell for a short time. Typically SNAPTRAN-1 was operated at low power, except for some pulsed operation. This reactor last operated in 1971. It was the last reactor to be tested in Building 4024.<sup>1</sup>

### Site Description:

- Building 4024 consists of two levels, one at ground level and a sub-grade basement.<sup>2</sup>
  - The areas within (and associated with) Building 4024 included: a high bay, including cell complex and operating gallery, a general support and operating area, a mechanical/electrical support area, and a yard.
- Building 4024 is constructed of aluminum siding, steel framing, some flooring and concrete.<sup>2</sup>
- The basement consists of a cell complex with two power test cells and a cell-transfer lock. This complex is constructed of shielded concrete walls ranging from two feet to nine feet thick, penetrated by various through-tubes, conduits and cooling pipes.<sup>1</sup>
- Below-ground radioactive waste storage facilities are located under asphalt in the yard.<sup>1</sup> The buried tanks include:
  - Three radioactive gas holdup tanks 6 feet in diameter and 40 feet long.
  - Eight solid radioactive waste storage vaults 3 feet in diameter and 4 feet deep.

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- Two 500-gallon liquid radioactive waste holdup tanks.
  - The tanks were placed on top of a concrete box filled with gravel designed to contain any accidental leakage.
- All non-radioactive sewage wastes are collected by a sanitary sewer system.<sup>1</sup>
- All wash-down water and emergency releases from the cooling systems are routed to the underground liquid waste holdup tanks via floor sinks and buried drain lines.<sup>1</sup>
- Serviced by Substation 4725.
- Serviced by Cooling Tower 4928.

### Relevant Site Information:

- Potential radiological hazards are limited to the high bay area (including cell complex), electrical/mechanical support and yard areas.<sup>1</sup>
  - Two general areas of concern in the high bay are the cells and the S10FS-3 reactor support equipment room.
  - The electrical/mechanical support area contains systems for gas and exhaust filtering, shield cooling water and a vacuum cleaner, all of which are potentially contaminated.
- As a result of exposure to neutrons escaping from the two operating reactors, the walls, ceiling, floor and remote handling equipment of the test cells were activated.<sup>1</sup>
- There have been several incidents associated with Building 4024 that could have resulted in a release to the environment.
  - On March 6, 1962, a welder was burned with NaK in the high bay (A0535).
  - On February 19, 1970, maintenance workers unknowingly worked on contaminated general mills (A0634).

### Radiological Surveys:

- In September 1978, prior to partial unrestricted release, surveys were conducted to ensure that the facility met unrestricted release criteria.<sup>3</sup>
  - No contamination in excess of 50 dpm/100 cm<sup>2</sup> was found.
  - No alpha activity was detected anywhere in Building 4024.
  - Beta-gamma surface contamination limits were 0.1 mrad/hr, and the maximum beta-gamma surface contamination detected outside of the power vaults was 0.07 mrad/hr with an average background of 0.05 mrad/hr.
  - Inside the power vaults, beta-gamma surface contamination was found to range from 0.5 mrad/hr to 2.5 mrad/hr.
  - Inside the corridor to the power vaults, beta-gamma surface contamination ranged from 0.02 mrad/hr to 1.8 mrad/hr.
  - Soil samples were collected in the yard and all samples were less than 30 pCi/g. Background is 20-30 pCi/g.
  - Concrete cores drilled in the power vault walls and corridor were found to have a maximum specific activity of 818 pCi/g. The average specific activity was 103 pCi/g.

- All water samples from the drain pipe in the operating gallery, the hot waste storage vault, cooling system water waste holdup tanks, ground water during the removal of waste tanks and the vacuum cleaning line to the west power vault were below  $2.2 \times 10^{-7}$   $\mu\text{Ci/ml}$ , which is below the limit of  $3 \times 10^{-7}$   $\mu\text{Ci/ml}$  for Sr-90.
- On March 26, 1981, additional concrete sampling in the power vaults began to determine the amount of concrete they needed to remove to meet unrestricted release criteria.<sup>1</sup>
  - The survey indicated that 12 to 22 inches of concrete would need to be removed for surface radiation to meet the acceptable dose rate of 0.1 mrad/hr.
  - Only two radionuclides, Co-60 and Eu-152, were found to contribute significantly to radiation greater than background.
- In September 1995, ORISE Conducted an independent verification survey.<sup>2</sup>
  - Surface scans were performed over 50 to 100% of accessible floors and lower walls (up to 2 meters) for alpha, beta and gamma activity.
    - In the fan room, elevated direct beta radiation was identified.
    - In all other areas, alpha, beta and gamma radiation were within the range of ambient site background.
  - Surface activity measurements were conducted at 76 floor and wall locations.
    - Excluding the power vaults, surface activity levels were less than 55 dpm/100 cm<sup>2</sup> for alpha and ranged from less than 1,400 to 33,000 dpm/100 cm<sup>2</sup> for beta.
    - Removable alpha: less than 12 dpm/100 cm<sup>2</sup>.
    - Removable beta: less than 16 dpm/100 cm<sup>2</sup>.
    - Maximum beta-gamma total surface activity guideline (15,000 dpm/100 cm<sup>2</sup>) was exceeded in the hot gas compression room of Building 4024.
  - Exposure rate measurements were made at four locations in Building 4024, but none were made in the power vaults.
    - Excluding the power vaults, exposure rates ranged from 11 to 13  $\mu\text{R/hr}$ . Background was 8  $\mu\text{R/hr}$ .
    - Interior exposure rates satisfy Department of Energy (DOE) and Nuclear Regulatory Commission (NRC) exposure rate guidelines.
  - ORISE determined that existing documentation for Building 4024 was inadequate to support the determination that DOE guidelines for unrestricted release were met.
- Additional concrete core data taken in 2003 indicates activation with a maximum of 9.3 pCi/g of Co-60 and a maximum of 105 pCi/g of Eu-152. Measurable activation exists only within the inner 16 inches of concrete of the two power test cells.<sup>4</sup>

**Status:**

- Decontamination and disposition (D&D) of Building 4024 began on August 27, 1977, and concluded sometime before September 1, 1978.<sup>3</sup>

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- Within the vaults, all components such as rails, fixtures, surface mounted conduits and all wires in through-tubes were removed between August 1977 and September 1978.
- The vacuum system, piping and tanks, and concrete seal door with an 18-inch diameter gas exhauster pipe were removed.
- The liquid and gas waste holdup tanks and associated piping were removed.
- All contaminated or activated components throughout the facility were packaged for offsite burial or decontaminated to meet applicable limits.
- All areas of Building 4024 except the two power test vaults were determined by survey to be suitable for release for unrestricted use.<sup>3</sup>
- The power test vaults are restricted and have remained in surveillance and maintenance mode since September 1, 1978.<sup>2</sup>
- Additional decontamination of Building 4024 is planned for FY 2004.

### References:

- 1- Atomics International Document, N704FDP990006 Rev. A., "Building T024 (SETF) Facilities Dismantling Plan," July 31, 1981.
- 2- ORISE Report, 96/C-5, "Verification Survey of Buildings T019 and T024, Santa Susana Field Laboratory, Rockwell International, Ventura County, California," February 1996.
- 3- Rockwell International Document, N704TI990044, "Radiological Survey Results—Release to Unrestricted Use, Building 024, SSFL," November 28, 1978.
- 4- Personnel Interview, Phil Rutherford, September 18, 2003.
- 5- Historical Site Photographs from Boeing Database.
- 6- SSFL Area IV, ETEC Industrial Planning Maps, 1962-1992.

Photograph – Building 4024

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## Site Summary – Building 4025

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### Site Identification:

Building 4025  
Sodium Component Test Installation (SCTI) Maintenance and Storage  
Remote Handling Mock-up Facility  
Includes Building 4924, Substation  
Includes Building 4925, Mechanical Equipment Slab  
Includes Building 4926, Sodium Reactor Experiment (SRE) Mock-up Equipment Area  
Includes Building 4725, Substation for 4024 and 4025

### Operational Use/History:

- Constructed in 1959.
- Building 4025 was used for nuclear reactor remote handling and viewing mock-up work in support of the SNAP 2/10A and SNAP 8 tests.<sup>1</sup>
- Building 4025 was not known to contain radioactive or nuclear materials.
- After support work for SNAP tests ceased, Building 4025 was used as a storage and warehouse facility.<sup>1</sup>
- Demolished in September 1999.

### Site Description:

- Building 4025 had a steel frame with steel sides and a steel roof and consisted of three bays. The low bay had a ceiling height of 9 feet, the middle bay had a ceiling height of 20 feet and the high bay had a ceiling height of 35.5 feet.<sup>1</sup>
- On a 1962 Industrial Planning Map, Building 4925 Mechanical Equipment Slab and Building 4926 SRE Mock-up Equipment Area were identified as separate from but adjacent to Building 4025. In subsequent Industrial Planning Map, the outlines of Buildings 4925 and 4926 remain, but no longer have their own numbers. As such, it is assumed that both 4925 and 4926 are included in Building 4025, and that all three were treated as a single facility.<sup>1,2</sup>
- Serviced by Substations 4725 and 4924.<sup>1</sup>

### Relevant Site Information:

- Building 4025 was located in close proximity to Radioactive Materials Handling Facility (RMHF), and direct radiation and skyshine from RMHF affected ambient radiation conditions in the area.<sup>1</sup>
- An incident occurred on January 16, 1979, in which a radiograph operator's dosimeter read off-scale during radiograph operation, indicating a potential personnel exposure. The radiograph operator's assistant was present at the time, and his dosimeter gave a normal reading. After processing of the off-scale dosimeter, it

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was determined that the operator had not been exposed to an unacceptable dose. No cause for the off-scale reading was determined (A0306).

### Radiological Surveys:

- As part of the Department of Energy (DOE) Santa Susana Field Laboratory (SSFL) Site Survey, Building 4025 was surveyed to determine if any residual activity was accidentally left behind as a result of operations in support of the SNAP program. The inside and outside portions of Building 4025 were surveyed as separate units.<sup>1</sup>
  - Inside:
    - Maximum net gamma: 3.6  $\mu\text{R/hr}$  (corrected for background and statistically tested against an acceptance limit of 5 $\mu\text{R/hr}$ ).
    - Average net gamma: -0.43  $\mu\text{R/hr}$  (corrected for background).
    - Based on the median value of exposure rate measurements in the vicinity of 4025, the inside ambient background value for gross gamma was determined to be 11.8  $\mu\text{R/hr}$ .
    - All beta surface activity measurements made “for indication” showed no detectable activity.
    - Based on the results of the interior survey of Building 4025, the conclusion was made that this area passed the criteria for unrestricted use.
  - Outside:
    - Maximum net gamma: 3.9  $\mu\text{R/hr}$  (corrected for background and statistically tested against an acceptance limit of 5 $\mu\text{R/hr}$ ).
    - Average net gamma: -0.14  $\mu\text{R/hr}$ .
    - Based on the median value of exposure rate measurements in the vicinity of 4025, the outside ambient background value for gross gamma was determined to be 24.0  $\mu\text{R/hr}$ .
    - Based on the results of the exterior survey of Building 4025 and the storage yard, the conclusion was made that this area was not contaminated and passed the criteria for unrestricted use.

### Status:

- Building 4025 was demolished in September 1999.

### References:

- 1- ETEC Document, GEN-ZR-0013, “Radiological Survey of Buildings T049, T042, T027, T032, and T025,” August 26, 1988.
- 2- SSFL Area IV, ETEC Industrial Planning Maps, 1962-1992.
- 3- Historical Site Photographs from Boeing Database.

Photograph – Building 4025

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## Site Summary – Building 4027

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### Site Identification:

Building 4027  
SNAP Engineering Development Laboratory 2  
Former Weld Shop  
SNAP Vibration and Shock Laboratory  
Includes Building 4727, Substation

### Operational Use/History:

- Constructed in 1961.
- Building 4027 was used as a vibration and shock test facility in support of the SNAP program launch schedule.<sup>1</sup>
- Following the end of support work for SNAP tests, Building 4027 was used as a non-radiological storage facility.
- Building 4027 was demolished in 2003.

### Site Description:

- Building 4027 is a 9,240-square-foot structure located south of RMHF.<sup>2</sup> The building has a steel frame, steel sides and a steel roof. It consists of a 37-foot high bay laboratory area, an office and shop support/storage.<sup>1</sup>
- Serviced by Substation 4727.

### Relevant Site Information:

- There are no Use Authorizations associated with Building 4027.<sup>3</sup>
- No incidents occurred in Building 4027 that might have resulted in a release of contamination to the environment.<sup>3</sup>
- Building 4027 may have been used for storing sealed radiography sources, which would have been checked annually to ensure that no leaks had occurred.

### Radiological Surveys:

- As part of the DOE SSFL Site Survey, Building 4027 was surveyed to determine if any residual activity was accidentally left behind as a result of operations in support of the SNAP program. The high bay and storage portions of Building 4027 were surveyed as separate units due to variations in “ambient background.”<sup>1</sup>
  - High Bay
    - Maximum net gamma: 3.8  $\mu\text{R/hr}$  (corrected for background and statistically tested against an acceptance limit of 5  $\mu\text{R/hr}$ ).
    - Average net gamma: 0.46  $\mu\text{R/hr}$ .

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- Based on the median value of exposure rate measurements in the vicinity of Building 4027, the ambient background value for gross gamma was determined to be 9.09  $\mu\text{R/hr}$ .
- All beta surface activity measurements made “for indication” showed no detectable activity.
- Based on the results of the interior survey of Building 4027, the conclusion was made that this area passes the criteria for unrestricted use.
- Storage
  - Maximum net gamma: 2.8  $\mu\text{R/hr}$  (corrected for background and statistically tested against an acceptance limit of 5 $\mu\text{R/hr}$ ).
  - Average net gamma: -1.26  $\mu\text{R/hr}$ .
  - Based on the median value of exposure rate measurements in the vicinity of Building 4027, the ambient background value for gross gamma was determined to be 17.40  $\mu\text{R/hr}$ .
  - All beta surface activity measurements made “for indication” showed no detectable activity.
  - Based on the results of the exterior survey of Building 4027 and the storage yard, the conclusion was made that this area is not contaminated and passes the criteria for unrestricted use.

### Status:

- Building 4027 was demolished in 2003.

### References:

- 1- ETEC Document, GEN-ZR-0013, “Radiological Survey of Buildings T049, T042, T027, T032, and T025,” August 26, 1988.
- 2- SSFL Area IV, ETEC Industrial Planning Maps, 1962-1992.
- 3- Review of Radiation Safety Records Management System, 2003.

## Site Summary – Building 4032

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### Site Identification:

Building 4032  
Liquid Metal Development Lab (LMDL)  
Space Environmental Test Facility  
Includes Building 4727, Substation

### Operational Use/History:

- Constructed in 1962.
- Building 4032 was used as a space environmental test facility for a thermal vacuum system.<sup>1</sup>
- Building 4032 was used for mock-ups using a radiological source to determine the positioning of non-radioactive rods for use in developing the fuel rod control system.<sup>1</sup>
- After support work for SNAP tests ceased, Building 4032 was used as a sodium component and instrumentation test facility.
- Demolished in May 2003.

### Site Description:

- Building 4032 was 4,580 square feet with 32-foot ceilings. The structure had a steel frame, steel sides and a steel roof. It contained 4,200 square feet of laboratory space.<sup>1</sup>
- Serviced by Substation 4727.

### Relevant Site Information:

- From 1978 through 1983, Building 4032 was used for mock-ups using a radiological source to determine the positioning of non-radioactive rods for use in developing the fuel rod control system. During these experiments, under Use Authorization 118, a radiation source was used to determine the location, free fall time and acceleration of the articulated rod assembly of the Self Actuated Shutdown System-Articulated Control Assembly (SASS-ACA) test article. The source was 97.2  $\mu\text{Ci}$  of Co-60. The form was sealed source S/N 43014, which was checked annually to ensure no leakage occurred.<sup>2</sup>

### Radiological Surveys:

- During the 1988 beta survey, a stainless steel catch pan was found to be slightly contaminated with Co-60 at a level of about 25,000 dpm/100 cm<sup>2</sup>. The catchpan was most likely from Building 4059 or related to the SNAP facility and ended up in Building 4032 accidentally. The radioactivity was fixed in the steel and did not spread to surrounding areas. The pan was dispositioned as radioactive waste.<sup>1</sup>

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- As part of the DOE SSFL Site Survey, Building 4032 was surveyed to determine if any residual activity was accidentally left behind as a result of operations in support of the SNAP program.<sup>1</sup>
  - The maximum gamma exposure rate (corrected for background and statistically tested against an acceptance limit of 5  $\mu\text{R/hr}$ ) in Building 4032 was 4.4  $\mu\text{R/hr}$ . The average value was 0.43  $\mu\text{R/hr}$ .
    - Based on the median value of exposure rate measurements in the vicinity of Building 4032, the ambient background value for gamma was determined to be 7.27  $\mu\text{R/hr}$ .
  - All beta surface activity measurements made “for indication” showed no detectable activity, except for the stainless steel catch pan described above.
- Based on the results of the survey of Building 4032, the conclusion was made that this area passes the criteria for unrestricted use.<sup>1</sup>

### Status:

- Building 4032 was demolished in May 2003.

### References:

- 1- ETEC Document, GEN-ZR-0013, “Radiological Survey of Buildings T049, T042, T027, T032, and T025,” August 26, 1988.
- 2- Authorization Series 118, Shutdown Rod Measurement, J. V. Mentee, August 1978.
- 3- Historical Site Photographs from Boeing Database.
- 4- SSFL Area IV, ETEC Industrial Planning Maps, 1962-1992.

Photograph – Building 4032

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## Site Summary – Building 4036/4037

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**Site Identification:**

Building 4036/4037  
SNAP Office Buildings  
Includes Building 4727, Substation

**Operational Use/History:**

- Constructed in approximately 1962.
- Building 4037 appears distinctly only on the 1962 map. Thereafter, it is labeled as part of Building 4036.<sup>1</sup>
- Building 4036/4037 operated as a non-nuclear office building for the SNAP program.
- Demolished in 1999.

**Site Description:**

- Building 4036/4037 consisted of two one-story metal buildings joined together, each with a concrete slab floor and concrete foundation. The support structure consisted of steel beams with corrugated steel siding and roof. The buildings contain numerous internal partition walls with wood framing and drywall surfaces.<sup>2</sup>
- Serviced by Substation 4727.

**Relevant Site Information:**

- There are no Use Authorizations and no Incident Reports associated with Building 4036.<sup>3</sup>
- Building 4036 did not require radiological controls during demolition.<sup>2</sup>

**Radiological Surveys:**

- Radiological surveys specific to Building 4036 have not been conducted.

**Status:**

- Building 4036 was demolished in 1999.

**References:**

- 1- SSFL Area IV, ETEC Industrial Planning Maps, 1962-1992.
- 2- Boeing Document, EID-04366, "Removal of DOE Buildings, Demo Pak A," May 18, 1999.
- 3- Review of Radiation Safety Records Management System, 2003.
- 4- Historical Site Photographs from Boeing Database.

Photograph – Building 4036/4037

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## Site Summary – Building 4042

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### Site Identification:

Building 4042  
Liquid Metal Fast Breeder Reactor (LMFBR) Development Testing  
SNAP Shield Casting Facility  
Includes Building 4742, Substation

### Operational Use/History:

- Constructed in 1963.
- Building 4042 was used as a general test and lithium hybrid shield fabrication building in support of the SNAP program. The facility was also used for sodium-aerosol and related technology tests.<sup>1</sup>
- After support work for SNAP tests ceased, Building 4042 was used for liquid metal technology work.
- Demolished in May 2003.

### Site Description:

- Building 4042 was a 4,269-square-foot structure with steel sides and a steel roof. It had 38-foot ceilings and contained 4,117 square feet of laboratory space.<sup>1</sup>
- Serviced by Substation 4742.

### Relevant Site Information:

- Use Authorization 62 was obtained for a period of one year, from February 6, 1973, to February 6, 1974. The authorization was for 15,000 lbs of uranium in the form of UO<sub>2</sub> powder for the Lower Axial Blanket Shielding Experiment.<sup>1,2</sup> It is unclear whether this experiment was ever conducted.
- In the Site Survey Plan, Building 4042 was incorrectly listed as having a contaminated sodium test loop. This test loop was actually in Building 4023.

### Radiological Surveys:

- As part of the DOE SSFL Site Survey, Building 4042 was surveyed to determine if any residual activity was accidentally left behind as a result of operations in support of the SNAP program. Measurements, including exposure rate measurements, were made in Building 4042.<sup>1</sup>
  - Maximum gamma: 4.4 µR/hr. (corrected for background and statistically tested against an acceptance limit of 5 µR/hr).
  - Average gamma: 0.1 µR/hr.

## Group J

- Based on the median value of exposure rate measurements in the vicinity of 4042, the ambient background value for gamma was determined to be 7.1  $\mu\text{R/hr}$ .
- Maximum total-average alpha: 12.6 dpm/100  $\text{cm}^2$  (statistically tested against an acceptance limit of 5,000 dpm/100  $\text{cm}^2$ ).
- Average total-average alpha: 4.0 dpm/100 $\text{cm}^2$ .
- Maximum removable alpha: 5.9 dpm/100  $\text{cm}^2$  (statistically tested against an acceptance limit of 1,000 dpm/100  $\text{cm}^2$ ).
- Average removable alpha: 0.5 dpm/100 $\text{cm}^2$ .
- Maximum total-average beta: 1,200 dpm/100  $\text{cm}^2$  (statistically tested against an acceptance limit of 5,000 dpm/100  $\text{cm}^2$ ).
- Average total-average beta: 775 dpm/100 $\text{cm}^2$ .
- Maximum removable beta: 15.4 dpm/100  $\text{cm}^2$  (statistically tested against an acceptance limit of 1,000 dpm/100  $\text{cm}^2$ ).
- Average removable beta: 2.8 dpm/100 $\text{cm}^2$ .
- Based on the results of the survey of Building 4042, the conclusion was made that this area passes the criteria for unrestricted use.

### Status:

- Building 4042 was demolished in May 2003.

### References:

- 1- ETEC Document, GEN-ZR-0013, "Radiological Survey of Buildings T049, T042, T027, T032, and T025," August 26, 1988.
- 2- Rockwell International Document, Use Authorization 62, February 6, 1973.
- 3- Historical Site Photographs from Boeing Database.
- 4- SSFL Area IV, ETEC Industrial Planning Maps, 1962-1992.

Photograph – Building 4042



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## Site Summary- Site 4524

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**Site Identification:**

Site 4524  
Parking Lot

**Operational Use/History:**

- Constructed prior to 1962.
- Site 4524 served as a parking lot for personnel working in the SNAP area.
- Demolished in the middle 1960s.<sup>1</sup>

**Site Description:**

- Site 4524 was located near the SNAP area.

**Relevant Site Information:**

- There are no Use Authorizations and no Incident Reports associated with Site 4524.<sup>2</sup>

**Radiological Surveys:**

- Radiological surveys specific to Site 4524 have not been conducted.<sup>2</sup>
- This area was covered as part of the 1994-1995 Area IV Radiological Characterization Survey.<sup>3</sup>
  - Background: 15.6  $\mu$ R/hr.
  - Acceptable Limit: Less than 5  $\mu$ R/hr above background.
  - Survey results were below the acceptable limits.

**Status:**

- Site 4524 was demolished in the middle 1960s.<sup>1</sup>

**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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## Site Summary – Site 4536

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### Site Identification:

Site 4536  
Parking Lot  
Includes Building 4836, Time Clock  
Includes Building 4636, Guard Shack

### Operational Use/History:

- Constructed prior to 1962.
- Site 4536 was a parking lot for personnel working in the SNAP facility.
- Site 4536 is now used for storage of non-radiological equipment.

### Site Description:

- Site 4536 sits on the west corner of 12<sup>th</sup> Street and G Street.<sup>1</sup>
- Serviced by Time Clock 4836.
- Serviced by Guard Shack 4636.

### Relevant Site Information:

- There are no Use Authorizations and no Incident Reports associated with Site 4536.<sup>2</sup>

### Radiological Surveys:

- Radiological surveys specific to Site 4536 have not been conducted.
- This site was included in the Area IV Radiological Characterization Survey, conducted in 1994 through 1995.<sup>3</sup>
  - Scope/Purpose: Designed to locate and characterize any previously unknown areas of elevated radioactivity in Area IV.
  - Background: 15.6  $\mu\text{R/hr}$ .
  - Acceptable Limit: Less than 5  $\mu\text{R/hr}$  above background.
  - The survey found the area to be below acceptable limits.

### Status:

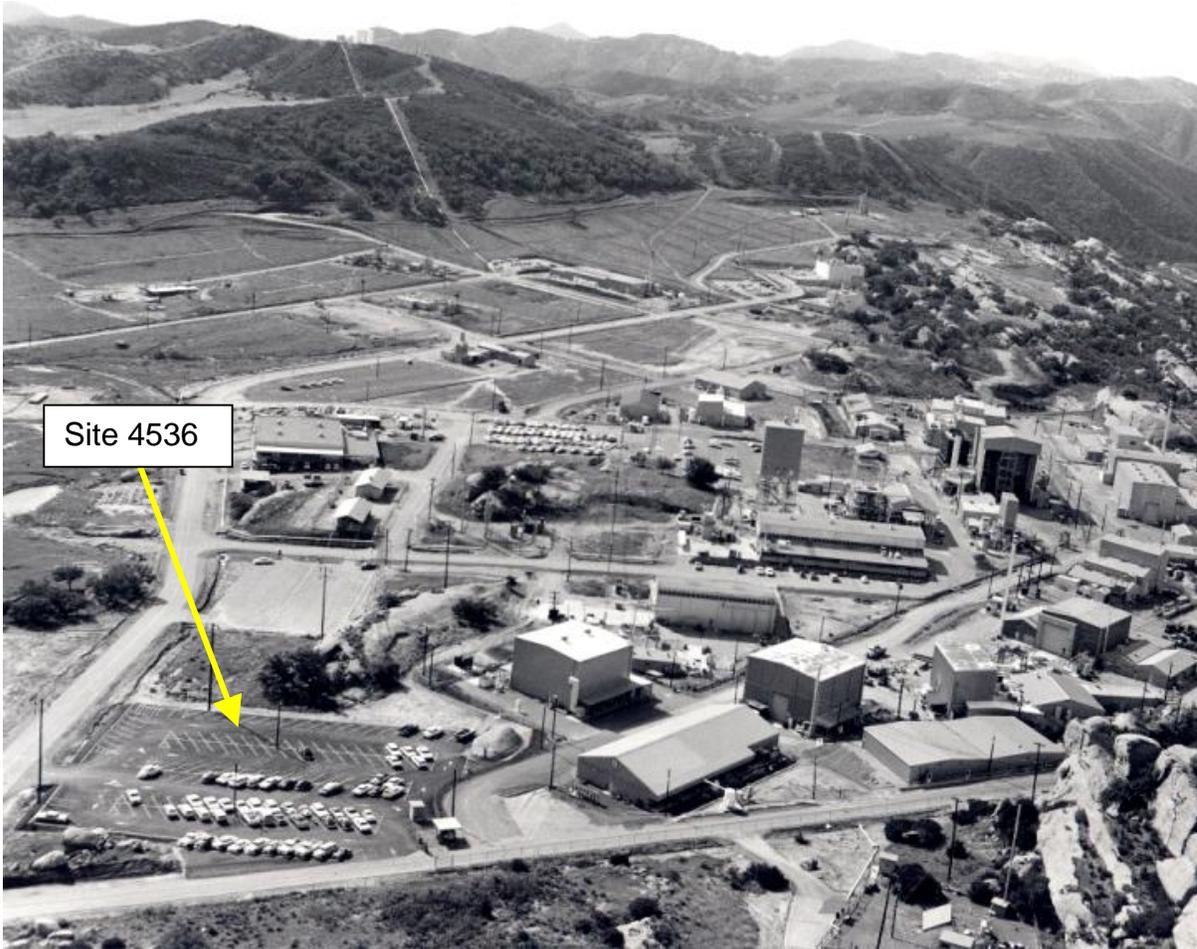
- Site 4536 is now used for storage of non-radiological equipment.

## Group J

### 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.
- 4- Historical Site Photographs from Boeing Database.

Photograph – Site 4536



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## Site Summary –Site 4537

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### Site Identification:

Site 4537  
Parking Lot

### Operational Use/History:

- Constructed prior to 1962.
- Site 4537 served as a parking lot for personnel working in the SNAP facility.
- Site 4537 is now used for storage of non-radiological equipment.

### Site Description:

- Site 4537 sits adjacent to the SNAP facility.<sup>1</sup>

### Relevant Site Information:

- There are no Use Authorizations and no Incident Reports associated with Site 4537.<sup>2</sup>

### Radiological Surveys:

- Radiological surveys specific to Site 4537 have not been conducted.
- This site was included in the Area IV Radiological Characterization Survey, conducted in 1994 through 1995.<sup>3</sup>
  - Scope/Purpose: Designed to locate and characterize any previously unknown areas of elevated radioactivity in Area IV.
  - Background: 15.6  $\mu\text{R/hr}$ .
  - Acceptable Limit: Less than 5  $\mu\text{R/hr}$  above background.
  - The survey found the area to be below acceptable limits.

### Status:

- Site 4537 is now used for storage of non-radiological equipment.

### 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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## Site Summary – Building 4625

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### Site Identification:

Building 4625  
Non-Nuclear Component Storage Building

### Operational Use/History:

- Constructed in approximately 1961.
- Building 4625 operated as a Non-Nuclear Component Storage Building.
- In 1964, an addition was built onto the adjacent Building 4027, filling the gap between Building 4027 and Building 4625. From that point on, Building 4625 was considered part of Building 4027 and no longer referred to separately.<sup>1</sup>
  - Building 4027 was built in 1961, and was used as a vibration and shock test facility in support of the SNAP program launch schedule.<sup>2</sup>
  - There is no record of any activities conducted in Building 4027 involving radioactive or nuclear materials, although Building 4027 may have been used for storing completely sealed radiography sources.<sup>2</sup>
  - After support work for SNAP tests ceased, Building 4027 was used as storage facility.
- Building 4625 was demolished in 2003.<sup>3</sup>

### Site Description:

- Building 4625 sat directly northwest of Building 4027.<sup>4</sup>
- Building 4625 measures 61 feet 9 inches x 20 feet. In 1963-1964, an addition, measuring 57 feet 9 inches x 49 feet was made to the adjacent Building 4027, filling the space between Buildings 4027 and 4625.<sup>2</sup>

### Relevant Site Information:

- Building 4625/4027 is located in close proximity to RMHF; therefore, direct radiation and skyshine from RMHF affects ambient radiation conditions in the area.<sup>2</sup>
- There are no Use Authorizations and no Incident Reports associated with Building 4625/4027.<sup>5</sup>

### Radiological Surveys:

- As part of the DOE SSFL Site Survey, Building 4625/4027 was surveyed to determine if any residual activity was accidentally left behind as a result of operations in support of the SNAP program. The high bay and storage portions of Building 4625/4027 were surveyed as separate units due to variations in ambient background.<sup>2</sup>

## Group J

- High Bay:
  - Maximum net gamma: 3.8  $\mu\text{R/hr}$  (corrected for background and statistically tested against an acceptance limit of 5  $\mu\text{R/hr}$ ).
  - Average net gamma: 0.46  $\mu\text{R/hr}$ .
  - Based on the median value of exposure rate measurements in the vicinity of 4625/4027, the ambient background value for gross gamma was determined to be 9.09  $\mu\text{R/hr}$ .
  - All beta surface activity measurements made “for indication” showed no detectable activity.
  - Based on the results of the interior survey of Building 4625/4027, the conclusion was made that this area passes the criteria for unrestricted use.
- Storage
  - Maximum net gamma: 2.8  $\mu\text{R/hr}$  (corrected for background and statistically tested against an acceptance limit of 5 $\mu\text{R/hr}$ ).
  - Average net gamma: -1.26  $\mu\text{R/hr}$ .
  - Based on the median value of exposure rate measurements in the vicinity of 4625/4027, the ambient background value for gross gamma was determined to be 17.40  $\mu\text{R/hr}$ .
  - All beta surface activity measurements made “for indication” showed no detectable activity.
  - Based on the results of the exterior survey of Building 4625/4027 and the storage yard, the conclusion was made that this area is not contaminated and passes the criteria for unrestricted use.

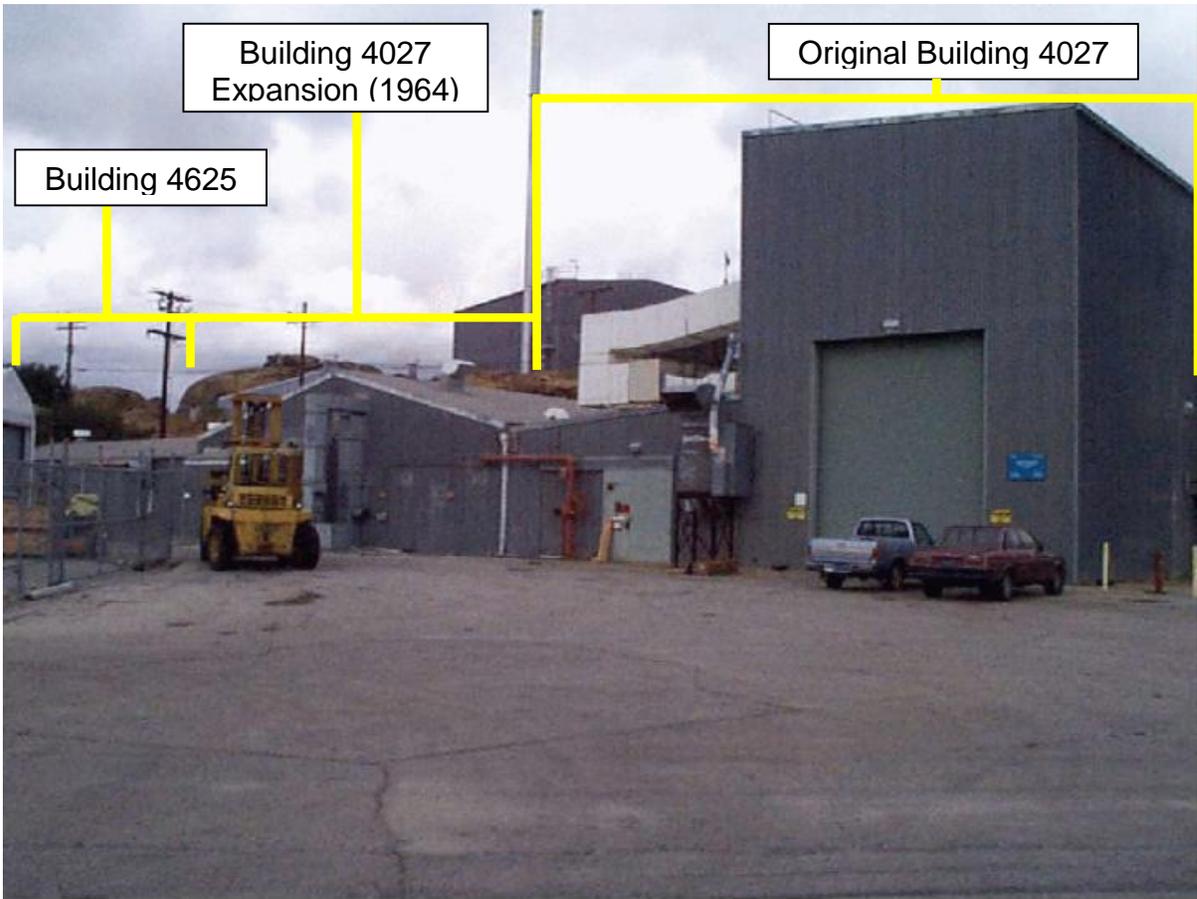
### Status:

- Building 4625/4027 was demolished in 2003.<sup>3</sup>

### References:

- 1- Drawing 303-027-A4, “Expansion of Non-Nuclear Mechanical Vibration and Shock Testing, Building 027 Expansion, Floor Plan, as built,” 1964.
- 2- ETEC Document, GEN-ZR-0013, “Radiological Survey of Buildings T049, T042, T027, T032, and T025,” August 26, 1988.
- 3- Personnel Interview, Dan Trippeda, September 23, 2003.
- 4- SSFL Area IV, ETEC Industrial Planning Maps, 1962-1992.
- 5- Review of Radiation Safety Records Management System, 2003.
- 6- Historical Site Photographs from Boeing Database.

Photograph – Building 4625 as part of 4027



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## Site Summary – Building 4927

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### Site Identification:

Building 4927  
Nitrogen Storage Tank

### Operational Use/History:

- Constructed prior to 1962.<sup>1</sup>
- Building 4927 was most likely demolished in the 1970s, when the site began using a high-pressure nitrogen system. This involved piping in nitrogen from Area III, eliminating the need for most Area IV nitrogen storage tanks.<sup>2</sup>

### Site Description:

- Building 4927 was located southeast of Building 4025, between Building 4924 on the east and Building 4928 on the west.<sup>1</sup>

### Relevant Site Information:

- Building 4927 was used to store nitrogen. Documents outlining which buildings the storage tank serviced could not be located; however, the Facility Area Plan of inert gas shows that the adjacent Building 4025 was serviced by high-pressure nitrogen system. Before the system was installed, Building 4927 most likely serviced Building 4025.<sup>3</sup>
- There are no Use Authorizations and no Incident Reports associated with Building 4927.<sup>4</sup>

### Radiological Surveys:

- Radiological surveys specific to Building 4927 have not been conducted.
- This site was included in the Area IV Radiological Characterization Survey, conducted in 1994 through 1995.<sup>5</sup>
  - Scope/Purpose: Designed to locate and characterize any previously unknown areas of elevated radioactivity in Area IV.
  - Background: 15.6  $\mu$ R/hr.
  - Acceptable Limit: Less than 5  $\mu$ R/hr above background.
  - The survey found the area to be below acceptable limits.

### Status:

- Building 4927 was demolished in the 1970s.

## Group J

### References:

- 1- SSFL Area IV, ETEC Industrial Planning Maps, 1962-1992.
- 2- Personnel Interview, Randy Ingersoll, September 23, 2003.
- 3- Drawing, 303-GEN-C254, "Santa Susana Facility Area Plan Inert Gas Master East," As Built to Date, February 22, 1991, Ref # PEWR 75184.
- 4- Review of Radiation Safety Records Management System, 2003.
- 5- Rocketdyne Document, A4CM-ZR-0011, Rev. A, Area IV Radiological Characterization Survey, August 15, 1996.

## Group K

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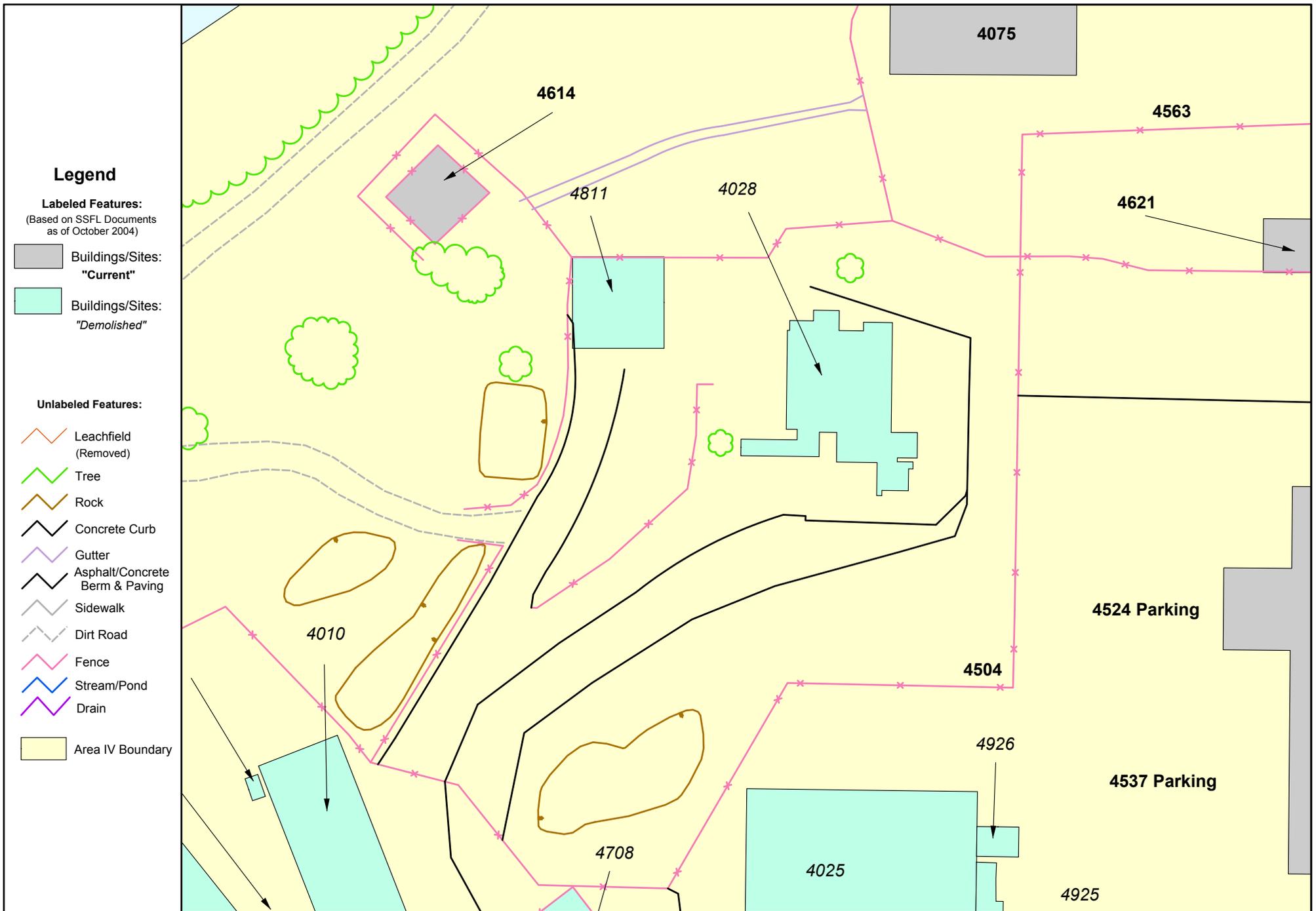
Group K Map

Building 4028

*Includes Site 4811, Electrical and Mechanical Equipment Pad*

Building 4504

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**Legend**

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

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

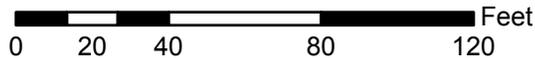
**Unlabeled Features:**

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

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1 inch equals 50 feet



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May 2005

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

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## Site Summary – Building 4028

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### Site Identification:

Building 4028  
Shield Test Irradiation Reactor (STIR) Facility  
Shield Test Reactor  
Liquid Metal Fast Breeder Reactor (LMFBR) Fuel Safety Building  
Includes Site 4811, Electrical and Mechanical Equipment Pad

### Operational Use/History:

- Constructed in 1960.
- Building 4028 was constructed to perform tests on space reactor shields.<sup>1</sup>
- The original reactor was the Shield Test Reactor, a 50 kW swimming pool type reactor that operated from 1961 to 1964.<sup>1</sup>
- The reactor was modified in 1964 to become the STIR; a 1 MW reactor that operated from 1964 to 1972.<sup>1</sup>
- Site 4811, which was located adjacent to Building 4028, became part of Building 4028 between 1962 and 1967. Site 4811 was a mechanical and electrical pad that held equipment directly supporting the STIR facility reactor.
- In March of 1976, STIR was decommissioned and removed from Building 4028.<sup>1</sup>
- From 1977 to 1981, Building 4028 was used to conduct research on the behavior of molten UO<sub>2</sub>, causing the building to again become contaminated.<sup>1</sup>
- Operations were terminated in 1984, and the building remained inactive until 1988 when cleanout and decontamination began.<sup>1</sup>
- Decommissioning and demolition (D&D) was conducted in 1988. Activities included the removal of surplus uranium oxide, decontamination and removal of equipment and electrical components, removal of the radioactive ducting system, decontamination of the building surfaces, miscellaneous cleanup operations and the final radiological survey of the facility.<sup>1</sup>
- The above-ground structures were removed in 1989 and the below-ground structures were removed in 1998.<sup>1,2</sup>

### Site Description:

- Building 4028 was a 14-foot tall steel-framed structure covered with steel siding and roofing built on top of a concrete test vault. The test vault was 60 square meters with a 6 foot ceiling.<sup>1,3</sup>
- Site 4811 was a concrete electrical and mechanical pad. It housed a cooling tower, heat exchanger, ventilation equipment and an air-cooled condenser, which supported the STIR facility.<sup>1,3</sup>
- Building 4028 had a high-efficiency particulate air (HEPA) exhaust system and stack.<sup>1,3</sup>

## Group K

- Records do not indicate there was a radiological waste holdup tank associated with Building 4028. Given the building's location, it is likely that waste water was discharged to the 4614 Drainage Sump.<sup>2</sup>
- Serviced by Site 4811, Electrical and Mechanical Equipment Pad.

### Relevant Site Information:

- There have been five incidents associated with Building 4028 that could have resulted in a release to the environment:
  - On July 17, 1963, an unmarked irradiated fission foil was moved in a private car to a clean office (A0447).
  - On June 17, 1965, an employee received an extremity beta exposure resulting from the handling of a plastic bag sealed with green tape containing chemical samples which were irradiated for 1000 seconds at 1 Mw (A0279).
  - On January 10, 1978, there was a small Uranium fire in the arc-melting furnace (A0065).
  - On January 30, 1979, increased radioactivity was found in runoff water from Radioactive Materials Disposal Facility. The estimated total activity released to the pond was approximately 0.36 mCi of gross beta activity (A0232).
  - On July 24, 1981, a contaminated crucible stored outside was exposed to elements (A0087).

### Radiological Surveys:

- On September 15, 1988, a site water runoff analysis was conducted as part of the D&D effort. It determined that there was no detectable activity.<sup>4</sup>
- In 1988, a final survey of the total facility was conducted after the completion of D&D to verify that the radiation levels of the facility had been reduced to <0.1 mrad/hr. The survey consisted of an ambient contamination detection scan inside the building and throughout the fenced in area (based on Industrial Planning Maps and the survey map the fenced in area includes Building 4504 – Classified Scrap and S.S. Materials Storage).<sup>3,5</sup>
  - The survey concluded that the facility beta-gamma surface contamination levels were all <0.1 mrad/hr.
  - Measured beta-gamma surface contamination ranged from 0.02 to 0.07 mrad/hr (limit is 1.0 mrad/hr).
- Rockwell International conducted a D&D survey in 1989. The survey covered the interior (above and below grade portions) and the surrounding area of Building 4028 through direct radiation sampling, exposure rates and surface sampling.<sup>1</sup>
  - Indication surveys for contamination conducted in the non-radiological controlled areas of the building found no detectable activity.
  - Alpha and beta measurements were made in the radiological controlled areas.
    - Total alpha: 12.3 dpm/100cm<sup>2</sup> average.
    - Maximum alpha: 72.8 dpm/100cm<sup>2</sup>.

- Alpha acceptable limit: 5,000 dpm/100cm<sup>2</sup>).
    - Total beta: 523 dpm/100cm<sup>2</sup> average and 1,303 dpm/100cm<sup>2</sup> maximum.
    - Beta acceptable limit: 5,000 dpm/100cm<sup>2</sup>.
    - Removable alpha: 5.1 dpm/100cm<sup>2</sup> average and 109 dpm/100cm<sup>2</sup> maximum.
    - Removable alpha acceptable limit: 1,000 dpm/100cm<sup>2</sup>.
    - Removable beta: 14.7 dpm/100cm<sup>2</sup> average and 307 dpm/100cm<sup>2</sup> maximum.
    - Removable beta acceptable limit: 1,000 dpm/100cm<sup>2</sup>.
  - Ambient gamma in the above grade levels: 0.2 µR/hr average and 1.0 µR/hr maximum (adjusted for background).
  - Ambient gamma in the below grade levels: -0.7 µR/hr average and 2.3 µR/hr maximum (adjusted for background).
  - Acceptable limit: 5 µR/hr above background.
  - The survey concluded that the facility met the release criteria for unrestricted use.
- Oak Ridge Institute for Science and Education conducted a survey to verify the results of the final radiation survey performed by Rockwell in 1989. The survey covered the Old Conservation Yard, Building 4064 and Building 4028. Surface scans and surface activity levels were measured for Building 4028.<sup>6</sup>
    - The survey concluded that Building 4028 met the release criteria for unrestricted use.
    - Surface scans for alpha, beta and gamma activity of the above-ground concrete slab, below-grade vault, and the stairway did not identify any areas of elevated direct radiation.
    - Surface activity measurements for alpha contamination in a grid block were <83 dpm/100cm<sup>2</sup> average and individual direct measurements ranged from <83 to 89 dpm/100cm<sup>2</sup> (limit is 5,000 dpm/100cm<sup>2</sup> average and 15,000 dpm/100cm<sup>2</sup>). Beta contamination measurements in a grid block were between <860 and 1,200 dpm/100cm<sup>2</sup> average and individual direct measurements ranged from <860 to 1,400 dpm/100cm<sup>2</sup> (limit is 5,000 dpm/100cm<sup>2</sup> average and 15,000 dpm/100cm<sup>2</sup>).
    - Removable gross alpha contamination was <12 dpm/100cm<sup>2</sup> (limit is 1,000 dpm/100cm<sup>2</sup>). Removable gross beta contamination ranged from <15 to 25 dpm/100cm<sup>2</sup> (limit is 1,000 dpm/100cm<sup>2</sup>).
  - DHS performed verification sampling in 1992.

**Status:**

- The California Department of Health Services (DHS) concurred with release of Building 4028 for unrestricted use in December 1995.<sup>7</sup>
- The Department of Energy (DOE) released Building 4028 without radiological restrictions in April 1997.<sup>8</sup>

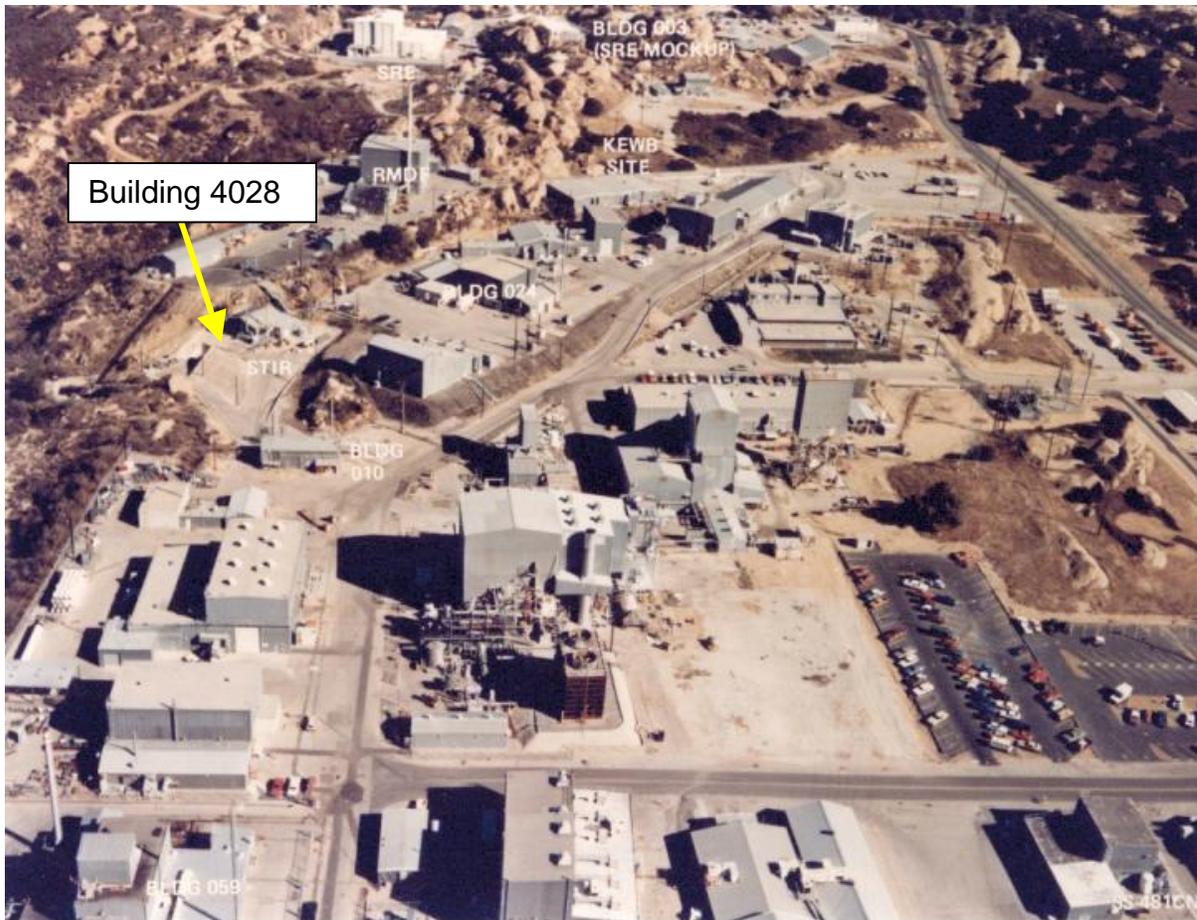
## Group K

- The above grade portion of the building was demolished in 1989, and the concrete slab floor, test vault and stairway were demolished in 1998.<sup>2</sup>

### References:

- 1- Rockwell International Report, N704SRR990033, "Final Decontamination and Radiological Survey of Building T028," February 27, 1991.
- 2- Personnel Interview, Rod Meyer, September 25, 2003.
- 3- Rockwell International Report, AI-ERDA-13168, "STIR Facility Decontamination and Disposition Final Report," August 26, 1976.
- 4- Rockwell International Report, N001TI000322, "Building T028 Decontamination and Demolition Final Report," June 6, 1990.
- 5- SSFL Area IV, ETEC Industrial Planning Maps, 1962-1992.
- 6- ORISE Report, 93/J-107, "Verification Survey of the Old Conservation Yard, Building T064 Side Yard, and Building T028, Santa Susana Field Laboratory, Rockwell International, Ventura County, California," October, 1993.
- 7- DHS/RHB, Letter, "Rocketdyne's letter dated July 6, 1995 with attachments concerning the release of Buildings T029, T028 and OCY," from Gerard Wong (DHS/RHB) to Phil Rutherford, December 21, 1995.
- 8- DOE-ER, Letter, "Release of Decontaminated Building 028 without Radiological Restrictions at ETEC," from Sally Robinson (DOE-ER) to Roger Liddle, April 2, 1997.
- 9- Historical Site Photographs from Boeing Database.

Photograph – Building 4028



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## Site Summary – Building 4504

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### Site Identification:

Building 4504  
Classified Scrap and Salvageable Steel (S.S.) Material Storage Area

### Operational Use/History:

- Constructed prior to 1964.<sup>1</sup>
- Building 4504 was used to store classified scrap and S.S.
- The site was no longer in use as of the STIR facility D&D effort in 1988.<sup>2</sup>
- DHS concurred that Building 4504 met the approved standards for unrestricted release in December 1995.<sup>3</sup>
- DOE released the facility without radiological restrictions April 1997.<sup>4</sup>

### Site Description:

- The classified scrap and S.S. material storage area was part of the STIR facility (based on Industrial Planning Maps and survey maps of STIR facility), it is a fenced in area at the southeast corner of the STIR facility fence.<sup>1</sup>

### Relevant Site Information:

- There are no incidents that could have resulted in releases to the environment associated with Building 4504.<sup>5</sup>

### Radiological Surveys:

- A final survey of the total facility was conducted in 1988 after the completion of D&D to verify that the beta-gamma surface contamination levels of the STIR facility had been reduced to <0.1 mrad/hr. The survey consisted of an ambient contamination detection scan inside the building and throughout the fenced in area (based on Industrial Planning Maps and the survey map the fenced in area includes Building 4504 – Classified Scrap and S.S. Material Storage).<sup>1,2</sup>
  - The survey concluded that the STIR facility beta-gamma surface contamination levels were all <0.1 mrad/hr.
  - Measured beta-gamma surface contamination ranged from 0.02 to 0.07 mrad/hr (limit is 1.0 mrad/hr).

### Status:

- DHS concurred that Building 4504 met the approved standards for unrestricted release in December 1995.<sup>3</sup>
- DOE released the site without radiological restrictions in April 1997.<sup>4</sup>

## Group K

- The classified scrap and S.S. material storage area is no longer in service and is currently an empty lot.

### References:

- 1- SSFL Area IV, ETEC Industrial Planning Maps, 1962-1992.
- 2- Rockwell International Report, AI-ERDA-13168, "STIR Facility Decontamination and Disposition Final Report," August 26, 1976.
- 3- DHS/RHB, Letter, "Rocketdyne's letter dated July 6, 1995 with attachments concerning the release of Buildings T029, T028 and OCY," from Gerard Wong (DHS/RHB) to Phil Rutherford, December 21, 1995.
- 4- DOE-ER, Letter, "Release of Decontaminated Building 028 without Radiological Restrictions at ETEC," from Sally Robinson (DOE-ER) to Roger Liddle, April 2, 1997.
- 5- Review of Radiation Safety Records Management System, 2003.
- 6- Historical Site Photographs from Boeing Database.

Photograph – Building 4504



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## Group L

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### Group L Map

#### Building 4010

*Includes Site 4807, Electrical Equipment Pad*

*Includes Site 4808, Electrical Equipment Pad*

*Includes Site 4809, Air Blast Heat Exchanger Pad*

#### Building 4012

*Includes Building 4713, Substation*

#### Building 4013

*Includes Building 4713, Substation*

*Includes Building 4823, Time Clock*

*Includes Building 4413, Uninterruptible Power Supply (UPS)*

#### Building 4019

*Includes Building 4719, Substation*

#### Building 4228

*Includes Building 4708, Substation for Inbound Power*

*Includes Site 4807, Electrical Equipment Pads*

*Includes Site 4808, Electrical Equipment Pads*

*Includes Site 4809, Air Blast Heat Exchanger Pad*

*Includes Building 4710, SCTI Power Pak Cooling Tower*

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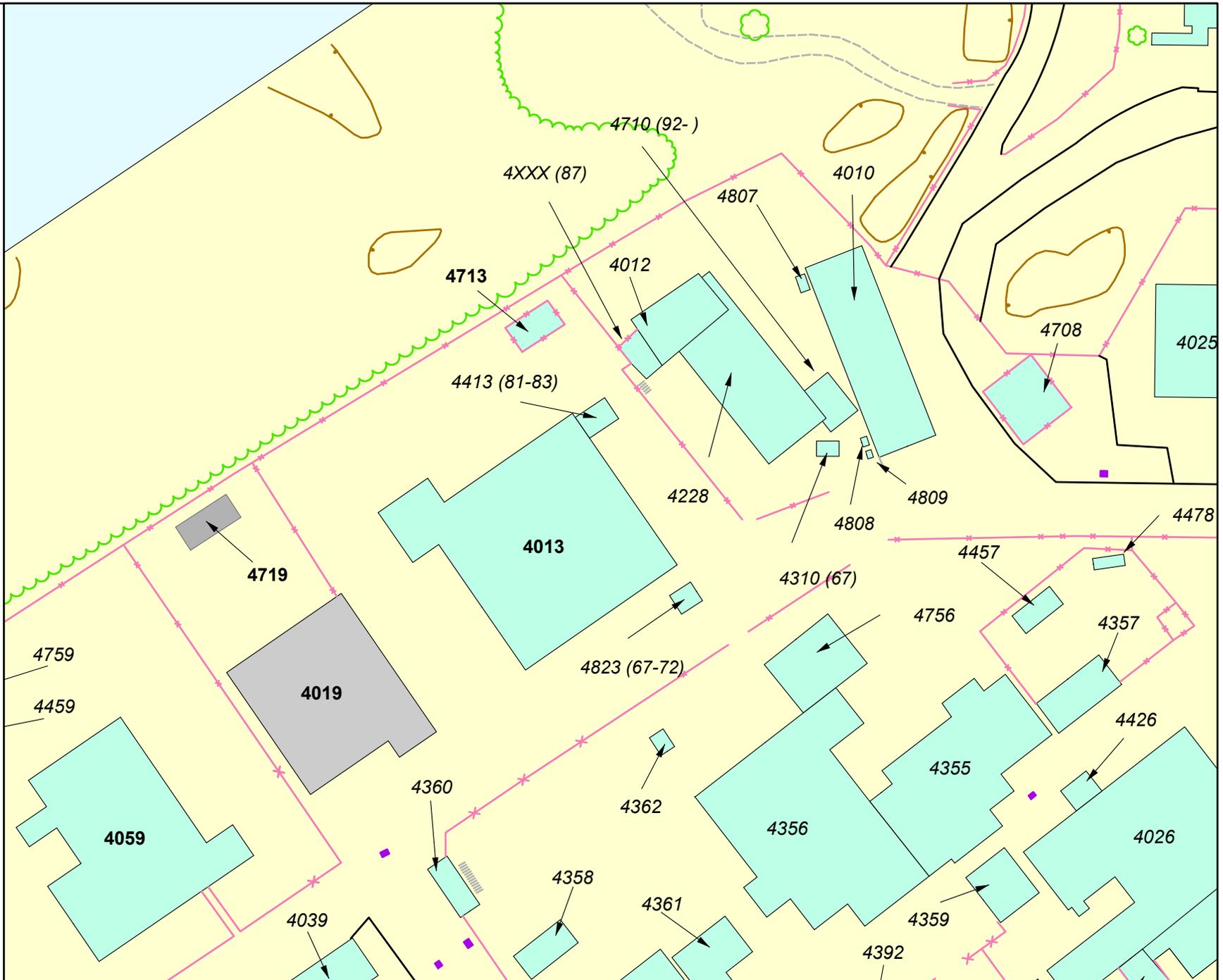
### Legend

**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



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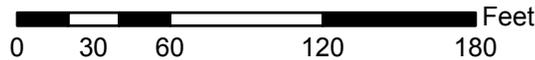


DATE:

May 2005



1 inch equals 75 feet



Site Summary Group L

AREA IV  
Santa Susana Field Laboratory, CA

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## Site Summary – Building 4010

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### Site Identification:

Building 4010

Systems for Nuclear Auxiliary Power (SNAP) 8 Experimental Reactor (S8ER)  
Facility

Includes Site 4807, Electrical Equipment Pad

Includes Site 4808, Electrical Equipment Pad

Includes Site 4809, Air Blast Heat Exchanger Pad

### Operational Use/History:

- Constructed in 1959.
- Building 4010 was used for the 50 kWt SNAP 2 Experimental Reactor test. After completion of the SNAP 2 test on November 19, 1960, the reactor and associated test equipment were removed from the building.<sup>1</sup>
- In 1961, modifications were made to allow the safe operation of the facility with the S8ER. Tests of the S8ER began in 1963 and following completion of the SNAP 8 tests on April 15, 1965, the reactor and associated test equipment were removed from the building.<sup>1</sup>
- In 1974, the S8ER was declared excess to the government's needs.<sup>2</sup>
- In September 1977, removal of all radioactive materials began. Activities included removing the reactor containment vessel and razing the building.<sup>2</sup>
- Demolished in 1978 after decontamination.<sup>3</sup>

### Site Description:

- Building 4010 was a rigid, steel-framed structure with corrugated metal siding and roofing. It was 60 feet long by 24 feet wide, with 17-foot ceilings.<sup>2</sup>
- The subsurface structure of Building 4010 was at least 14 feet below grade. This structure contained three steel reinforced concrete vaults, two of which were lined with steel.<sup>2</sup>
  - The primary containment vessel consisted of a 38-inch diameter by 15.5-foot high carbon steel pressure vessel embedded in concrete ranging from 18 to 27 inches thick.<sup>4</sup>
  - The primary system vault consisted of a carbon steel vault liner embedded in concrete. Removable shield plugs covered the top.<sup>2</sup>
  - The secondary equipment pit was a small, unlined concrete vault. All passageways to the primary vault were welded shut to prevent exposure.<sup>2</sup>
- The amount of radioactive waste produced by test reactor operations was minimal, so major waste collection and processing systems were not included in Building 4010.<sup>2</sup>

## Group L

- The building was surrounded by several small concrete pads (Site 4807, Site 4808 and Site 4809) that were initially labeled separately, but were absorbed by the 4010 footprint by 1964.

### Relevant Site Information:

- The change room was connected to a septic tank and leach field located west of Building 4010 until 1961, when the central sanitary sewer system became available.<sup>1</sup>
- Building 4010 was eventually abandoned in place; it was later removed.<sup>5</sup>
- The entire vault complex was provided with a sub-foundation drainage system consisting of circuits of perforated metal pipe surrounded by gravel fill. The system drained into a pipe well sump at the east end of the building. From the sump, water was pumped into a tank for controlled disposal if contaminated, or released to the surface drainage system if it tested clean.<sup>1</sup>
- Three incidents occurred in Building 4010 that could have resulted in a release to the environment:
  - On April 30, 1961, it is known that an incident occurred, however, no details of the incident could be found. Incident Report A0598, dated June 27, 1961 referenced the April incident, but only indicated that the processing of samples from the April incident would be delayed (A0598).
  - On January 1, 1964, fission product was released to the cover gas and NaK coolant as a result of cladding failure of SNAP-8 reactor fuel (A0277).
  - On October 19, 1965, cutting of the control drum drive rods resulted in Co-60, Mn-54 and Fe-59 contamination in the high bay area. The level of contamination was found to be 200 mrad/hr, including 100 mR/hr due to gamma. The contamination was cleaned and no workers received an unacceptable exposure (A0349).

### Radiological Surveys:

- Guide limits for the cleanup were as follows:<sup>6</sup>
  - Beta-gamma emitters:
    - 0.1 mrad/hr at 1 cm total.
    - 1000 dpm/100 cm<sup>2</sup> removable.
  - Alpha emitters:
    - 100 dpm/100 cm<sup>2</sup> total.
    - 20 dpm/100 cm<sup>2</sup> removable.
  - Activated soil:
    - As close to background as practicable, but not greater than 100 pCi/g gross detectable beta activity.
- Prior to demolition, Atomics International personnel conducted a survey to determine the level of radioactivity in activated structures within Building 4010.<sup>4</sup>

- The principal nuclides in the reactor containment vessel and cooling coils were Mn-54 and Fe-55. The total specific activity of these contaminants was  $5.1 \times 10^1$   $\mu\text{Ci/gm}$  and the total activity was  $3.6 \times 10^7$   $\mu\text{Ci}$ .
- The principal nuclides in the reinforcing rods were Mn-54 and Fe-55. The total specific activity of these contaminants was  $5.1 \times 10^2$   $\mu\text{Ci/gm}$  and the total activity was  $3.1 \times 10^7$   $\mu\text{Ci}$ .
- The principal nuclides in ordinary concrete were tritium, Ar-39, Ca-41, Fe-55, Co-60 and C-14. The total specific activity of these contaminants was  $8.7 \times 10^2$   $\mu\text{Ci/gm}$  and the total activity was  $3.8 \times 10^8$   $\mu\text{Ci}$ .
- The principal nuclide in high-density concrete was Fe-55. The maximum specific activity of this contaminant was  $2.2 \times 10^2$   $\mu\text{Ci/gm}$ .
- The principal nuclide in the thermobestos insulation was Ca-41. The specific activity of this contaminant was  $5.5 \times 10^{-1}$   $\mu\text{Ci/gm}$  of insulation.
- The principal nuclide in silver braze of the shielding was Ag-108. The maximum specific activity of this contaminant was  $1.4 \times 10^4$   $\mu\text{Ci/gm}$ .
- The principal nuclides in stainless steel of the shield were Mn-54 with specific activity level of  $1.9 \times 10^{-1}$   $\mu\text{Ci/gm}$ , Fe-55 with a specific activity level of  $3.2 \times 10^1$   $\mu\text{Ci/gm}$ , Ni-63 with a specific activity level of  $1.7 \times 10^1$   $\mu\text{Ci/gm}$  and Co-60 with a specific activity level  $5.6 \times 10^1$   $\mu\text{Ci/gm}$ .
- The principal nuclides in stainless steel of the instruments in the reactor vessel thimbles were Mn-54 with a specific activity level of  $6.8 \times 10^{-2}$   $\mu\text{Ci/gm}$ , Fe-55 with a specific activity level of  $1.1 \times 10^1$   $\mu\text{Ci/gm}$ , Ni-63 with a specific activity level of  $6.1 \times 10^0$   $\mu\text{Ci/gm}$  and Co-60 with a specific activity level of  $2.1 \times 10^1$   $\mu\text{Ci/gm}$ .
  - A radiation measurement taken in the reactor vault indicated maximum radiation levels of 120 R/hr. The activated stainless steel in the thimbles was thought to be the source of this reading.
- During dismantlement and excavation activities, water and air samples were collected to assure the safety of workers and to monitor the discharge of effluents.<sup>2</sup>
  - None of the water samples indicated concentrations greater than  $4.5 \times 10^{-8}$   $\mu\text{Ci/ml}$  beta—well below the limit of  $3 \times 10^{-7}$   $\mu\text{Ci/ml}$  for Sr-90.
  - None of the air samples indicated radioactive particulate concentrations exceeding  $10^{-11}$   $\mu\text{Ci/ml}$  beta, other than naturally occurring airborne radioactivity. The limit for Co-60 is  $3 \times 10^{-10}$   $\mu\text{Ci/ml}$ .
- Following demolition in 1977-1978, Atomics International personnel conducted a radiological survey to verify that remediation attained accepted cleanup levels to support unrestricted release.<sup>5</sup>
  - Approximately 200 smears for removable contamination were taken on concrete, piping and steel.
    - No smears were found to exceed 50 dpm/100  $\text{cm}^2$  for beta.
    - Alpha contamination was not expected in this area, and none was detected.

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- In a complete walk-through survey, the maximum surface contamination detected was 0.05 mrad/hr. Average background is 0.04 mrad/hr. All readings were below the 0.1 mrad/hr limit.
- Prior to backfilling, concrete samples were taken from a portion of a vault wall. All samples were less than 50 pCi/g gross beta. [All clean concrete was used as backfill for ditch repair between Area 1 and Area 2.]
- Soil samples were collected in the area after the excavation was filled with clean backfill. All samples were less than 50 pCi/g gross beta.
- During the dismantling of the sump drain system and vessel pit, water samples were collected and no samples exceeded  $4.5 \times 10^{-8}$   $\mu\text{Ci/cc}$ , below the limit of  $3 \times 10^{-7}$   $\mu\text{Ci/cc}$  for Sr-90.
- In September of 1979, the Formerly Utilized Sites Remedial Action Program (FUSRAP) Survey Group from Argonne National Laboratory conducted a certification survey to ensure that the facility met unrestricted release criteria. At the time of the survey, the building had already been demolished and the asphalt parking area was already in place.<sup>6</sup>
  - The survey included a walkover, soil borings through the asphalt and soil coring.
    - The walkover survey indicated some elevated reading on the asphalt pad, ranging from 15-30  $\mu\text{R/hr}$  (natural background is 9-15  $\mu\text{R/hr}$ ).
      - Further investigation revealed that elevated reading were most likely a result of radioactive materials stored on the hill to the east (Radioactive Material Handling Facility (RMHF)).
    - The soil borings indicated that no U-235 or U-238 were present. Other nuclides were found in the following ranges:
      - Cs-137 from  $0.00 \pm 0.00$  pCi/g to  $0.42 \pm 0.03$  pCi/g;
      - Th-232 from  $0.147 \pm 0.23$  pCi/g to  $2.27 \pm 0.16$  pCi/g;
      - Ra-226 from  $0.358 \pm 0.081$  pCi/g to  $3.46 \pm 0.24$  pCi/g;
      - Co-60 from  $<0.03$  pCi/g to  $7.32 \pm 0.07$  pCi/g.
- In November of 1979 and October of 1981, the FUSRAP Survey Group from Argonne National Laboratory revisited Building 4010 to conduct a certification survey to ensure that the facility continued to meet unrestricted release criteria. At the time of the survey, the building had already been demolished and the asphalt parking area was already in place.<sup>7</sup>
  - The survey confirmed the results of the previous Argonne survey, and the following conclusions were developed:
    - The Co-60 found in soil was well below the criteria set by the Department of Energy (DOE) for the site.
    - Gamma background readings at the surface were influenced by shine from the RMHF. The Co-60 found in soil was not believed to contribute to the total background readings.
    - The site met the criteria for an unrestricted release.

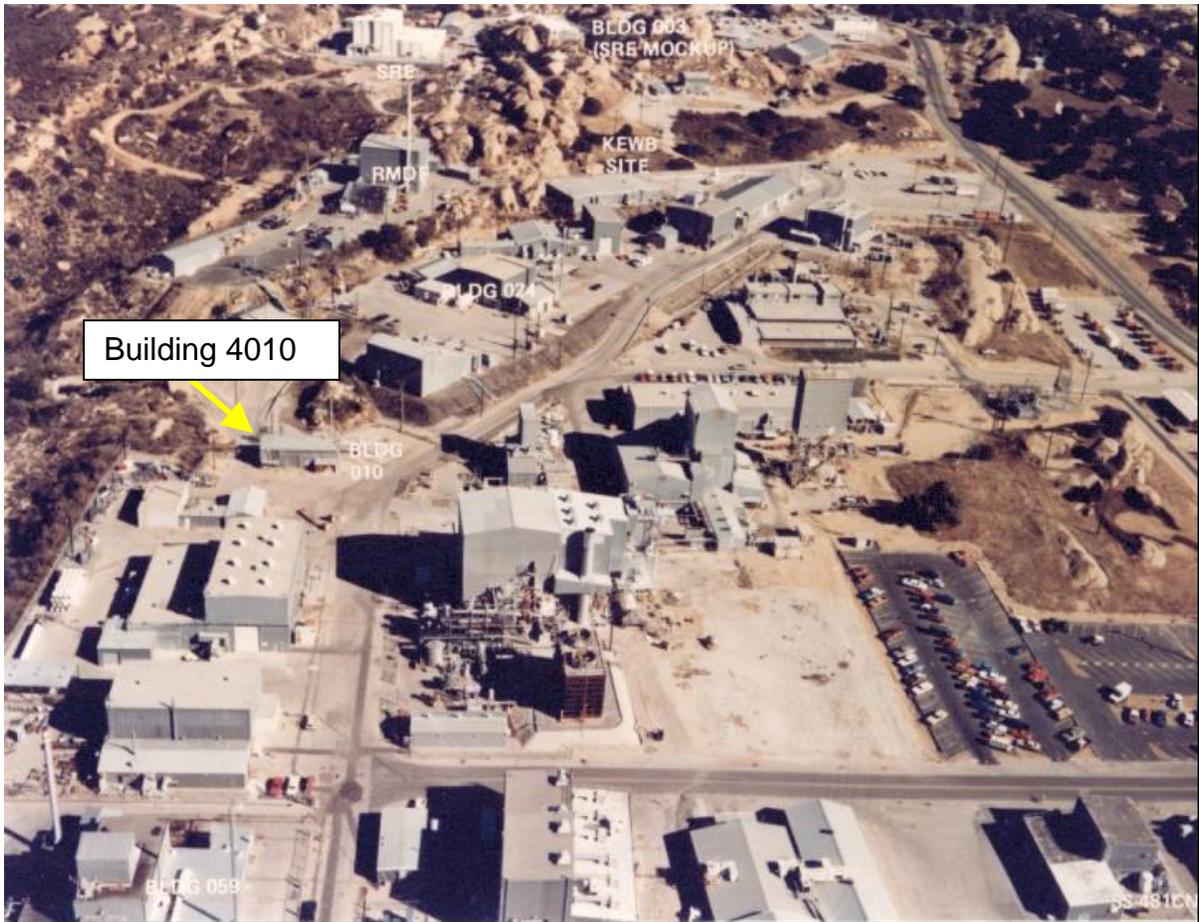
**Status:**

- DOE released Building 4010 for unrestricted use December 12, 1982.<sup>8</sup>
- Building 4010 was decontaminated and demolished in 1977-1978.
- Following demolition, an asphalt parking lot was built where the Building 4010 once stood.<sup>2</sup>

**References:**

- 1- Rockwell International Document, N704FDP990005, "Facilities Dismantling Plan for Building 010 (S8ER)," December 10, 1976.
- 2- Rockwell International Document, ESG-DOE-13237, "S8ER Facilities Decommissioning Final Report," February 28, 1979.
- 3- Rockwell International Document, Use Authorization No. 111, "Decontamination and Disposition of Building 010," January 16, 1978.
- 4- Atomics International Document, SA-652-130-002, "Determination of Levels of Radioactivity and Significant Radionuclides Present in Neutron-Activated Structures in Building T010," June 28, 1973.
- 5- Rockwell International Document, N704TI990041, "Radiological Survey Results—Release to Unrestricted Use, Building 010 at SSFL," August 28, 1978.
- 6- Argonne National Laboratory Report, no document number, "Certification Survey of the SNAP 8 Experimental Reactor (S8ER) Facility in Building 10, Santa Susana Field Laboratories of the Energy Systems Group of Rockwell International at Santa Susana, California," September 1979.
- 7- Argonne National Laboratory Report, no document number, "Interim Post Remedial Action Survey Report for Systems for Nuclear Auxiliary Power-8 (SNAP-8) Experimental Reactor Facility (Building 010), Santa Susana Field Laboratory, Rockwell International, Canoga Park, California," May 1983.
- 8- Rockwell International, Letter #2726, "S8ER Facilities Decommissioning Final Report Number ESG-DOE-13237," from Len Lanni (DOE) to C. C. Connors (Atomics International), December 15, 1982.
- 9- Historical Site Photographs from Boeing Database.
- 10- SSFL Area IV, ETEC Industrial Planning Maps, 1962-1992.

Photograph – Building 4010



## Site Summary – Building 4012

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### Site Identification:

Building 4012  
SNAP Critical Test Facility Number 2  
Heavy Metal Reflected Fast Spectrum Reactor Critical Test Facility  
Energy Technology Engineering Center (ETEC) X-Ray Facility/Storage  
Includes Building 4713, Substation

### Operational Use/History:

- Constructed prior to 1962.<sup>10</sup>
- Building 4012 Operated with SNAP critical assemblies intermittently between 1962 and 1968.<sup>1</sup>
- In 1969 and 1970, the critical assembly machine was modified for use in the Heavy Metal Reflected Fast Spectrum Reactor (HMRFSR) project and operated for the HMRFSR project from 1970 to 1972.<sup>1</sup>
- In 1979, the concrete portion of Building 4012 was modified for use as an x-ray and source radiography facility.<sup>1</sup>
- Building 4012 operated as ETEC X-Ray Facility and Storage from 1979 to 1992.<sup>1</sup>
- Demolished in 2003.

### Site Description:

- Building 4012 had 1,292 square feet of floor space. In 1986, the passageway and metal portion containing the operations and control rooms of Building 4012 were demolished in order to build the ETEC Sodium Component Test Installation (SCTI) Power Pak section of the Cogeneration Project.<sup>1</sup>
- The remaining concrete vault consisted of two rooms, Room 109 (fuel storage/equipment room) and Room 110 (critical cell). A 20-inch borated concrete wall containing fuel storage tubes divided Room 109. An air conditioning duct ran the length of the room over the fuel storage area.
- The critical cell (Room 110) was a concrete chamber with 4-foot thick concrete walls lined with steel and was secured by a heavy shield (vault-type) door.<sup>1</sup>
- Serviced by Substation 4713.

### Relevant Site Information:

- Radioactive material was managed at Building 4012. The potential contaminants of concern are primarily Cs, Sr, U, Th and Pu.<sup>1</sup>
- There are no Incident Reports associated with Building 4012.<sup>2</sup>

### Radiological Surveys:

- In 1985, a comprehensive radiological survey of Building 4012 and surrounding areas was performed.<sup>3</sup>
  - Allowable limits: Ambient exposure of rate  $<5 \mu\text{R/hr}$  above background at 1 meter.
  - Radiological contamination was not detected in the radiography room, radiographer's office and dark room.
  - Contamination levels (maximum dpm was 6,500 dpm alpha/100 cm<sup>2</sup>) in rooms 109 and 110 were found to require radiological monitoring and control of waste disposal.
- Initial demolition efforts in Building 4012 were completed in 1986 to accommodate the construction of the Power Pack section of the SCTI Cogeneration Project.<sup>4</sup>
- Final decontamination and decommissioning (D&D) of the remaining portion of Building 4012 was performed in 1995.<sup>1</sup>
- Following D&D efforts, a comprehensive final radiological survey was completed.<sup>4</sup>
  - Allowable limits:  $<5 \mu\text{R/hr}$  above background at 1 meter; and 1,000 dpm/100 cm<sup>2</sup> removable alpha and beta and 5,000 dpm/100 cm<sup>2</sup> total alpha and beta.
  - The results of the final survey indicated that the facility was suitable for release without radiological restrictions.
- A verification survey was conducted by the Oak Ridge Institute of Science and Education (ORISE) in October 1996.<sup>5</sup> The total alpha surface activity ranged from less than 34 dpm to 170 dpm in 100 cm<sup>2</sup> of soil. The total beta surface activity ranged from 230 dpm to 480 dpm in 100 cm<sup>2</sup> of soil. The exposure rates were as follows:
  - Limit:  $5 \mu\text{R/hr}$  above background.
  - Average background:  $14 \mu\text{R/hr}$
  - Observed Rates:  $12 \mu\text{R/hr}$  to  $15 \mu\text{R/hr}$ .
  - ORISE concluded that Building 4012 met DOE guidelines for unrestricted release.
- The California Department of Health Services (DHS) performed a confirmation survey of Building 4012 on July 31, 1996.<sup>6</sup>
- The Environmental Protection Agency (EPA) conducted an oversight verification survey in 2001.<sup>7</sup> The surveys included scans and fixed point measurements for alpha and beta. The contaminants of concern (COCs) for Building 4012 were mixed fission products, uranium and activation products on the floors and walls.
  - Acceptable limits for the survey were consistent with NRC regulatory guide 1.86 and the proposed site-wide release criteria.<sup>6</sup>
  - 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.

- Immediately following building demolition in 2003, 24 soil samples were taken in a MARSSIM grid pattern over the original building footprint. Gamma spectroscopy did not detect any man-made gamma emitting radionuclides. Subsequent analysis by an outside laboratory did not detect any man-made radionuclides.<sup>8,9</sup>

**Status:**

- DOE released the facility for unrestricted use in October 1997.<sup>10,11</sup>
- DHS concurred with release the release of the facility in November 1997.<sup>6</sup>
- Building 4012 was demolished in 2003.

**References:**

- 1- Rocketdyne Report, 012-AR-0001, "Decontamination and Decommissioning of Building T012," May 8, 1997.
- 2- Review of Radiation Safety Records Management System, 2003.
- 3- Rocketdyne Report, 355-ZR-0012, "Radiation Survey of Building T012, SCTI Cogeneration Project, Rev. A," June 26, 1985.
- 4- Rocketdyne Report, 012-AR-0002, "Final Radiological Survey Report for Building T012," June 14, 1996.
- 5- ORISE Report, 96-0869, "Verification Survey of Building T012, SSFL, Rockwell International, Ventura County, California," October 1996.
- 6- DHS/RHB, Letter, "Boeing's Request for Concurrence in Release for Use Without Radiological Restriction, Rocketdyne Santa Susana Field Laboratory Building T012," from Gerard Wong (DHS/RHB) to James Barnes, November 26, 1997.
- 7- U.S. EPA Report, Contract Number 68-W-02-021, "Final Oversight Verification and Confirmation Radiological Survey Report for Buildings T-012, T-029, and T-363," December 20, 2002.
- 8- Personnel Interview, Phil Rutherford, April 2004 (Area IV Database for Onsite and Offsite Surveys).
- 9- Boeing Document, RD04-170, "Site Environmental Report for Calendar Year 2003 DOE Operations at The Boeing Company, Rocketdyne Propulsion & Power," September 2004.
- 10- Federal Resister Vol. 62 N0. 195 pg. 52528-52530, "Certification of the Radiological Condition of Building T012 at ETEC near Chatsworth, California," October 8, 1997.
- 11- DOE/CD-ETEC-012, "Certification Docket for the Release of Building T012 at ETEC," November 1997.
- 12- Historical Site Photographs from Boeing Database.
- 13- SSFL Area IV, ETEC Industrial Planning Maps, 1962-1992.

Photograph – Building 4012

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## Site Summary – Building 4013

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### Site Identification:

Building 4013  
Thermal Transient Test Facility  
Non-Nuclear Component Assembly and Packaging Building  
SNAP System Assembly and Checkout Building  
Includes Building 4713, Substation  
Includes Building 4823, Time Clock  
Includes Building 4413, Uninterruptible Power Supply (UPS)

### Operational Use/History:

- Constructed in 1962.<sup>1</sup>
- Building 4013 was used to assemble non-nuclear SNAP 10A and SNAP 2 ground test and flight test systems and was subsequently used for thermal transient testing.<sup>2</sup>
- In addition, in Building 4013 thermal and mechanical testing was combined in order to simulate seismic events for the purpose of stress testing.<sup>2</sup>
- Building 4013 was demolished in 2003.

### Site Description:

- Building 4013 is a single story multi-room, Butler-type building. The ceiling is split, with a height of 15 feet in one portion and 33 feet in the other. The steel frame is anchored to a concrete slab floor with corrugated metal siding. The roof is constructed from composition and galvanized materials. There is a 5-ton bridge crane.
- Building 4013 is attached to the site sewer system.<sup>2</sup>
- Serviced by Substation 4713.
- Serviced by Time Clock 4823.
- Service by UPS 4413

### Relevant Site Information:

- No incidents occurred in Building 4013 that might have resulted in a release of contamination to the environment.<sup>3</sup>

### Radiological Surveys:

- In August 1988, a radiological survey was conducted on the interior of Building 4013.<sup>4</sup>
  - Average ambient gamma radiation: 6.8  $\mu$ R/hr.
  - Background: between 14  $\mu$ R/hr to 16  $\mu$ R/hr.
  - Survey results were below the acceptable limits.

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### Status:

- Building 4013 was demolished in 2003.

### References:

- 1- DOE Document, Site Development and Facility Utilization Planning, SSFL.
- 2- Rocketdyne Internal Document, no document number, "Assessment of Department of Energy Buildings within the SSFL," September 30, 1996.
- 3- Review of Radiation Safety Records Management System, 2003.
- 4- Boeing Document, EID-04374, "Final Report, Decontamination and Dismantlement Operations at SSFL Building 4019 for Release Without Radiological Restrictions," September 11, 1999.
- 5- SSFL Area IV, ETEC Industrial Planning Maps, 1962-1992.
- 6- Historical Site Photographs from Boeing Database.

Photograph – Building 4013



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## Site Summary – Building 4019

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### Site Identification:

Building 4019  
SNAP Flight System Critical Facility  
Acceptance Test Facility  
ETEC Construction Staging and Computer Facility  
Includes Building 4719, Substation

### Operational Use/History:

- Constructed in 1962.
- Building 4019 was built to perform criticality acceptance tests of SNAP reactors before they were delivered for launch.<sup>1</sup>
- Three reactors (FS-1, FS-4 and FS-5) were assembled and tested from 1964 to 1965.<sup>2</sup>
- In 1965, all nuclear materials were removed from Building 4019 when the last SNAP reactor was removed.<sup>1</sup>
- Building 4019 was reassigned for non-nuclear use in the 1970s and 1980s.<sup>2</sup>
- In 1998, the small area identified in the 1996 ORISE survey was decontaminated.<sup>2</sup>
- Building 4019 is now inactive.<sup>3</sup>

### Site Description:

- Building 4019 is a steel-framed building with a built-up roof on a concrete slab. The 10-foot tall low bay section is 60 x 28 feet and contains offices, conference room, restrooms and an equipment room. The 36-foot tall high bay section is 60 x 45 feet and contains a cinder block storage room and a below-grade vacuum test vault.<sup>3</sup>
- Serviced by Substation 4719.

### Relevant Site Information:

- All radioactive and nuclear material handled at the facility was fully encapsulated.<sup>3</sup>
- One incident was reported that could have resulted in a release to the environment.
  - On April 10, 1976, a quality assurance inspection personnel was unable to return a source material to the safe directly after use. It was later discovered that the source had detached from its travel cable and the source was reattached and returned to the safe. Release of contamination to the environment as a result of this incident was unlikely (A0304).

### Radiological Surveys:

- In 1988, Rocketdyne performed a radiological survey to determine if any radioactive material had been accidentally left behind to such an extent that further radiological inspection and/or decontamination was warranted.

## Group L

- The survey covered Building 4019 along with one other building and two adjacent areas through ambient gamma exposure rate surveys.<sup>4</sup>
  - Ambient gamma exposure rates corrected for background measured in Building 4019 varied from 0.04  $\mu\text{R/hr} \pm 1.09 \mu\text{R/hr}$  (limit is 5.0  $\mu\text{R/hr}$  above background).
  - The survey concluded that none of the areas were contaminated with residual radioactivity and that all areas meet the unrestricted use criteria for release.
  - One anomalous measurement was recorded in the high bay but 21 subsequent measurements and a survey for beta activity in the area proved that it was an anomaly.
- ORISE performed a verification survey in 1996 to validate the cleanup procedures and survey methods used by Rockwell/Rocketdyne. The survey conducted surface scans, surface activity level measurements and exposure rate measurements.<sup>5</sup>
  - The survey concluded that the unrestricted use release criteria were exceeded in a small area of Building 4019, the documentation of previous surveys was not adequate, and the vault of Building 4019 was not accessible for survey.
  - The document review found that the documentation did not provide a clear description of the sequence of events necessary for demonstrating that the subject areas meet the requirements for release to unrestricted use.
  - Surface scans found one area of elevated beta radiation in the high bay portion of Building 4019. No other areas had elevated levels of alpha, beta or gamma radiation.
    - Total surface alpha:  $<55 \text{ dpm}/100\text{cm}^2$  (limit is  $5,000 \text{ dpm}/100\text{cm}^2$ ).
    - Total surface beta:  $<1,400 - 11,000 \text{ dpm}/100\text{cm}^2$  (limit is  $5,000 \text{ dpm}/100\text{cm}^2$ ).
    - Removable alpha:  $<12 \text{ dpm}/100\text{cm}^2$  (limit is  $1,000 \text{ dpm}/100\text{cm}^2$ ).
    - Removable beta:  $<16 \text{ dpm}/100\text{cm}^2$  (limit is  $1,000 \text{ dpm}/100\text{cm}^2$ ).
    - Ambient gamma: between 10 and 11  $\mu\text{R/hr}$  compared to a background rate of 8  $\mu\text{R/hr}$  (limit is 5.0  $\mu\text{R/hr}$  above background).
- In 1998, Boeing performed a final status survey. The survey covered the entire facility through direct radiation measurements, removable contamination swipes and an ambient gamma exposure survey.<sup>3</sup>
  - Maximum direct alpha radiation:  $11 \text{ dpm}/100\text{cm}^2$  (limit is  $5,000 \text{ dpm}/100\text{cm}^2$ ). Maximum direct beta radiation:  $961 \text{ dpm}/100\text{cm}^2$  (limit is  $5,000 \text{ dpm}/100\text{cm}^2$ ).
  - Maximum removable alpha:  $5 \text{ dpm}/100\text{cm}^2$  (limit is  $1,000 \text{ dpm}/100\text{cm}^2$ ).
  - Maximum removable beta:  $25 \text{ dpm}/100\text{cm}^2$  (limit is  $1,000 \text{ dpm}/100\text{cm}^2$ ).
  - Maximum ambient gamma: 15.7  $\mu\text{R/hr}$ .
  - Background: 13.3  $\mu\text{R/hr}$ .
  - Acceptable limit: 5.0  $\mu\text{R/hr}$  above background.
  - The survey concluded that Building 4019 met the unrestricted use criteria approved by DOE and DHS.

- In 1998, ORISE performed a supplementary verification survey to evaluate the shortcomings found in 1996. The survey covered Buildings 4019 and 4024 through surface scans, surface activity level measurements, and exposure rate measurements.<sup>6</sup>
  - Total surface activity levels ranged from 14 to 43 dpm/100cm<sup>2</sup> alpha (limit is 5,000 dpm/100cm<sup>2</sup>) and -190 to 550 dpm/100cm<sup>2</sup> beta (limit is 5,000 dpm/100cm<sup>2</sup>).
  - Removable activity levels were all less than the minimum detection concentration levels of 9 dpm/100cm<sup>2</sup> alpha and 12 beta dpm/100cm<sup>2</sup>.
  - The ambient gamma exposure rate measured within the vault was 12 µR/hr compared to a background level of 8 µR/hr (limit is 5.0 µR/hr above background).
  - The survey concluded that the facilities met the criteria for release to unrestricted use.
- DHS performed verification sampling in 1998.
- In 2001, EPA conducted an oversight verification survey for alpha, beta, beta-gamma radiation (total and removable) and gamma radiation.<sup>7</sup> 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 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.
  - Acceptable limits for the survey were consistent with NRC regulatory guide 1.86 and the proposed site-wide release criteria as defined in the 1996 Area IV survey.<sup>8</sup>
  - 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.

**Status:**

- In February, 2005 DOE provided a letter to Boeing declaring that Boeing and ORISE surveys had confirmed that DOE and DHS approved cleanup limits had been met, and that Building 4019 was suitable for release for unrestricted use.<sup>9</sup>
- Building 4019 is now inactive.<sup>3</sup>

**References:**

- 1- Phil Rutherford Website, <http://rdweb/shea/radiationsafety/>, accessed August 2003.
- 2- Boeing Document, EID-04374 "Final Report, Decontamination and Dismantlement Operations at SSFL Building 4019 for Release Without Radiological Restrictions," September 11, 1999.
- 3- Boeing Report, RS-00009, "Building 4019, Final Status Survey Report," June 10, 1999.

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- 4- Rocketdyne Report, GEN-ZR-0010, "Radiological Survey of Buildings T019 and T013; an Area Northwest of T059, T019, T013, and T012; and a Storage Yard West of Buildings T626 and T038," August 26, 1988.
- 5- ORISE Report, 96/C-5, "Verification Survey of Buildings T019 and T024, Santa Susana Field Laboratory, Rockwell International, Ventura County, California," February 1996.
- 6- ORISE Letter, "Addendum to the Verification Survey Report for Buildings T019 and T024, Santa Susana Field Laboratory, Ventura County, California," February 16, 1999.
- 7- U.S. EPA, Contract Number 68-W-02-021, "Final Oversight Verification and Confirmation Radiological Survey Report for Buildings T-011, T-019, T-055, and T-100," December 20, 2002.
- 8- Rocketdyne Document, A4CM-ZR-0011, Rev. A, Area IV Radiological Characterization Survey, August 15, 1996.
- 9- DOE Letter, "Release of Building 4019," from M. Lopez (DOE) to M. Lee (Boeing), February 1, 2005.
- 10- Historical Site Photographs from Boeing Database.
- 11- SSFL Area IV, ETEC Industrial Planning Maps, 1962-1992.

Photograph – Building 4019



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## Site Summary – Building 4228

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### Site Identification:

Building 4228  
Power Pak Facility  
SCTI Co-Generation Plant  
Includes Building 4708, Substation for Inbound Power  
Includes Site 4807, Electrical Equipment Pads  
Includes Site 4808, Electrical Equipment Pads  
Includes Site 4809, Air Blast Heat Exchanger Pad  
Includes Building 4710, SCTI Power Pak Cooling Tower

### Operational Use/History:

- Constructed in the early 1980s.<sup>1</sup>
- The SCTI Power Pak facility was designed to harness the steam produced through SCTI's sodium experiments and generate commercial electric power. The system operated from 1988 through 1993. The power generated was sold onto the grid through Edison Power.<sup>2</sup>
- Demolished in 2003.

### Site Description:

- Building 4228 was located east of Building 4013. The northwest end of Building 4228 was built on top of Building 4012.
- Serviced by Substation 4708.
- Serviced by Electrical Equipment Pad 4807.
- Serviced by Electrical Equipment Pad 4808.
- Serviced by Air Blast Heat Exchanger Pad 4809.
- Serviced by Cooling Tower 4710.

### Relevant Site Information:

- There are no Use Authorizations and no Incident Reports associated with Building 4228.<sup>3</sup>

### Radiological Surveys:

- When Building 4228 was demolished, Building 4012 had been released by DOE. The SHEA Impact Review Checklist found the demolition of Building 4228 neither involved radioactive materials nor was conducted in a radiological area. This conclusion was confirmed by the release and demolition of Building 4012.
- Further radiological surveys specific to Building 4228 have not been conducted.

## Group L

### Status:

- Building 4228 was demolished in 2003.<sup>4</sup>

### References:

- 1- SSFL Area IV, ETEC Industrial Planning Maps, 1962-1992.
- 2- Personnel Interview, Sandy Samuels, September 16, 2003.
- 3- Review of Radiation Safety Records Management System, 2003.
- 4- Boeing Internal Document, no document number, "Demolition Binder: Power Pak Buildings 4428 & 4710."
- 5- Historical Site Photographs from Boeing Database.

Photograph – Building 4228



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## Group M

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Group M Map

Building 4059

*Includes Building 4759, Substation*

Building 4459

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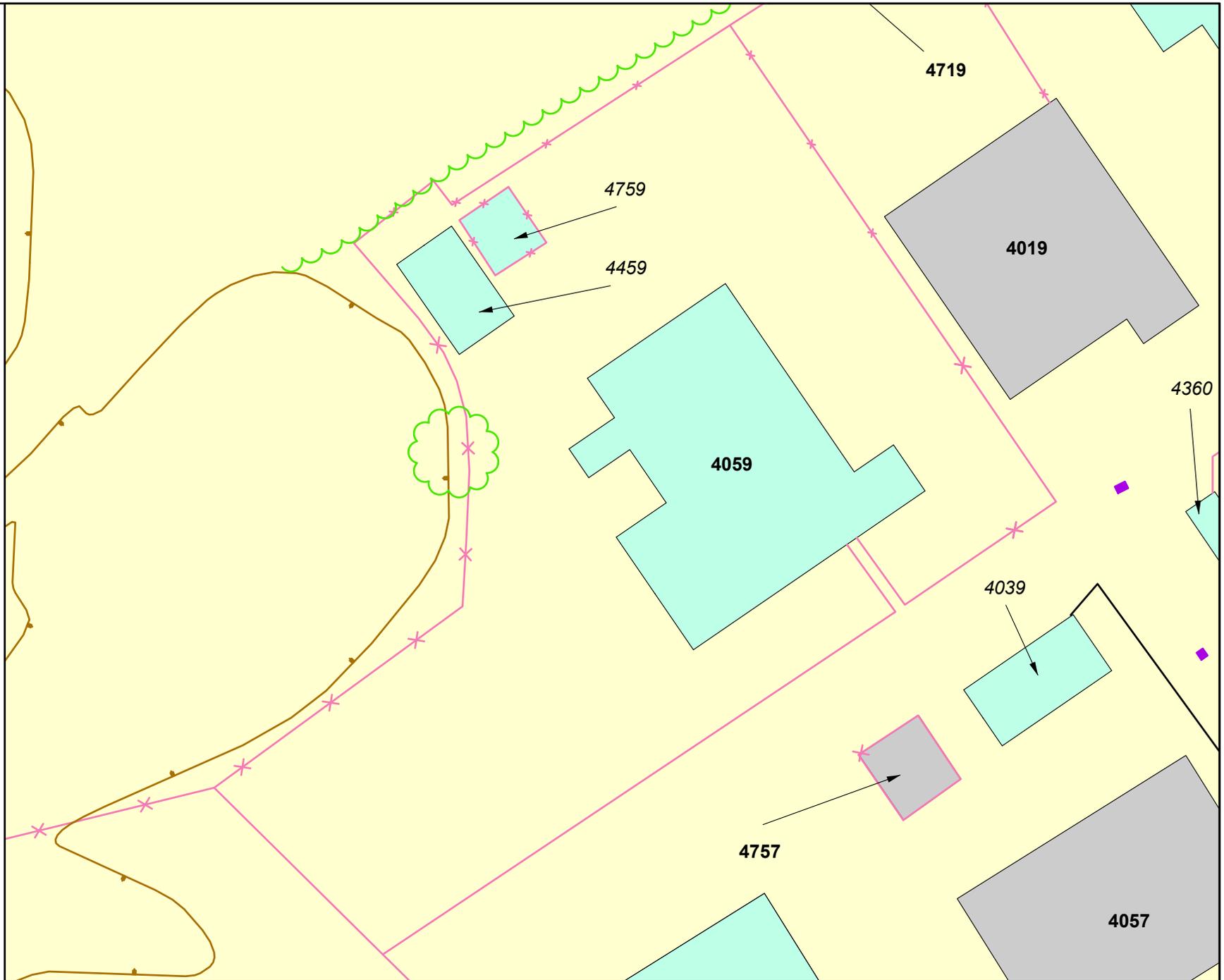
### Legend

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

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

**Unlabeled Features:**

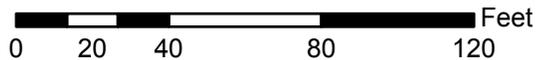
-  Leachfield  
(Removed)
-  Tree
-  Rock
-  Concrete Curb
-  Gutter
-  Asphalt/Concrete  
Berm & Paving
-  Sidewalk
-  Dirt Road
-  Fence
-  Stream/Pond
-  Drain
-  Area IV Boundary



DRAWN BY:



1 inch equals 50 feet



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

DATE:

May 2005

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## Site Summary – Building 4059

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### Site Identification:

Building 4059  
Systems for Nuclear Auxiliary Power (SNAP) 8 Development Reactor (S8DR)  
Large Leak Test Rig  
Ground Prototype Test Facility  
Includes Building 4759, Substation

### Operational Use/History:

- Construction of Building 4059 began in 1961 and was completed in 1963.<sup>1</sup> As soon as the facility was finished, the facility was modified to accommodate the addition of a vacuum system. The installation of this system was completed in 1965.<sup>2</sup>
- Building 4059 was constructed to test the S8DR in vacuum conditions that simulated outer space.<sup>1</sup>
- Testing of the S8DR began in 1968 and continued through 1969 when the program was terminated.<sup>3</sup>
- After termination, the reactor core and associated NaK systems were removed, the reactor cell pit was sealed, and the associated vacuum systems were mothballed.<sup>3</sup>
- In 1978, a decontamination and decommissioning (D&D) program was conducted to remove all contaminated or activated liquid and gas holdup tanks, associated piping, equipment from ground-level equipment rooms, all vacuum equipment components, and some of the ducting and sand shielding in the pipe chase room.<sup>3</sup>
- From 1987 to 1989, a D&D program was conducted to remove contamination from the below-ground vaults to prevent contamination from water leaking into the vault. Activities included scabbling the first layer of reinforcing concrete.<sup>4</sup>
- Following DOE approval, the above ground portions of Building 4059, as well as the remaining activated vault cells, were demolished in 2004.

### Site Description:

- The S8DR facility is a 31-foot tall concrete and Butler-type structure with approximately 10,764 square feet of floor space. The below-ground test vault is 28 feet x 39 feet and 32 feet deep. Two test cells (north and south) are located at the west end of the vault.<sup>4</sup>
- Building 4059 was serviced by Substation 4759, which was removed in 2003.<sup>5</sup>

### Relevant Site Information:

- There have been a number of incidents associated with Building 4059 involving activities that could have resulted in a release to the environment:
  - In 1969, S8DR fuel elements were found to be leaking hydrogen and fission products within the reactor core. A panel of experts was assembled to identify

## Group M

the cause of the leak in order to correct the cause and to improve reactor design.<sup>6</sup>

- On February 12, 1970, an absolute filter on vacuum cleaner ruptured, contaminating the area (A0633).
- On February 19, 1970, while an employee was cutting a NaK pipe, a NaK fire broke out in the Pipe Chase Room. When employees smothered the fire with calcium carbonate, a dense cloud of white smoke filled the room. To prevent the spread of smoke, the room was sealed and inspections of the exhaust duct filters indicated that no airborne activity was released (A0576).
- On August 12, 1988, torch cutting in Pipe Chase Room resulted in contamination of employees. All employees and the Pipe Chase Room were successfully decontaminated (A0187).
- On April 6, 1989, an employee dropped an open box of filters while changing the exhaust system filters. This resulted in a cloud of contaminated dust, causing high airborne activity (A0197).
- On January 17, 1991, during a routine spot-check survey in the electrical room, chips of contaminated soil were found on the floor. It appeared that the soil had become contaminated when battery liquid had leaked on the floor. The soil was removed and disposed of as radioactive waste (A0212).
- On February 25, 1991, torching operation generated high airborne activity in adjoining high bay. All activities were halted until activity dropped to a safe level (A0214).
- On December 3, 1992, an employee dosimeter went off scale during D&D operations. Further investigation indicated that the employee had not actually received an unacceptable exposure (A0307).
- On December 22, 1998, it was found that contamination of fork truck and gloves was due to naturally occurring radon daughters (A0692).

### Radiological Surveys:

- The facility was broken into two sections for surveys and release. Phase I consisted of the above-ground portion of the building, down to the basement level. Phase II consisted of the below-ground test vaults.
- In 1978, Rockwell International performed a radiological survey to provide an interim status of the D&D effort. The survey covered the building (except for the reactor chamber pit) and soil around excavations through soil samples, water samples, removable contamination smears and direct radiation measurements.<sup>3</sup>
  - The survey concluded that with the exception of the reactor chamber pit, pipe chase room and vacuum equipment room, the facility met the release criteria for unrestricted use.
  - Smear surveys conducted in the equipment rooms, support areas and the vacuum equipment room measured removable beta gamma contamination levels of <math><50 \text{ dpm}/100\text{cm}^2</math> (limit is

- removable beta-gamma contamination levels from 50 dpm/100cm<sup>2</sup> to 2,454 dpm/100cm<sup>2</sup> (limit is 1,000 dpm/100cm<sup>2</sup>).
- Total surface contamination measurements taken in the pipe chase room showed levels ranging from 125 mrad/hr to 5 rad/hr (limit is 0.1 mrad/hr). An earlier survey conducted in the reactor chamber pit found levels ranging from 25 mrad/hr to 168,000 mrad/hr (limit is 0.1 mrad/hr). All other areas of the facility had total surface contamination measurements of 0.05 mrad/hr compared to a background level of 0.03 mrad/hr (limit is 0.1 mrad/hr).
  - Water samples from the sand in the pipe chase room showed low levels of beta activity with a maximum of  $1.1 \times 10^{-6}$   $\mu$ Ci/ml. Groundwater samples showed less than  $10^{-9}$   $\mu$ Ci/ml.
  - Soil samples collected during the excavation activities showed a maximum activity of 23 pCi/g compared to a natural activity of 20 pCi/g.
  - Concrete samples from the vacuum equipment room shield wall found activity less than 25 pCi/g.
- Oak Ridge Institute for Science and Education (ORISE) performed a radiological survey in 1995 to verify that Rockwell had adequately analyzed the radiological condition of the reactor vault. The survey covered only the vault through surface scans, surface activity levels, exposure rates, concrete samples and water samples.<sup>4</sup>
    - Surface scans identified areas of elevated gamma radioactivity on the floors and walls. Maximum areas were marked for further investigation.
    - Total surface activity ranged from 9,000 dpm/100cm<sup>2</sup> to 4,400,000 dpm/100cm<sup>2</sup> most likely as a result of activation products within the concrete matrix.
    - Exposure rates ranged from 0.7 mrad/hr to 5.5 mrad/hr.
    - Radionuclide concentrations in the concrete samples were:
      - Co-60, 0.4 to 3,580 pCi/g;
      - Co-58, <0.3 to 157 pCi/g;
      - Ba-133, <0.4 to 323 pCi/g;
      - Eu-152, <0.9 to 42,700 pCi/g;
      - Eu-154, <1.3 to 3,340 pCi/g; and
      - Eu-155, <0.5 to 35 pCi/g.
    - Radionuclide concentrations in water samples were: gross alpha, 3.6 to 28.3 pCi/L; gross beta, 8.4 to 21.5 pCi/L; and tritium, <750 to 924 pCi/L.
    - The survey concluded that Rockwell had accurately assessed the radiological condition of the vault if the residual contamination present in the pipe chase room was accounted for in the residual radioactivity (RESRAD) pathway analysis.
  - Boeing performed a final status survey of the Building 4059 Phase I area in 1999 to verify that the area met the release criteria for unrestricted use. The survey covered the Phase I area of Building 4059 through surface scans, a removable contamination survey and an ambient radiation survey.<sup>7</sup>
    - The maximum total activity found was 783 dpm/100cm<sup>2</sup> beta (limit is 5,000 dpm/100cm<sup>2</sup>).

## Group M

- The maximum removable contamination found was 5.4 dpm/100cm<sup>2</sup> alpha (limit is 1,000 dpm/100cm<sup>2</sup>) and 54 dpm/100cm<sup>2</sup> beta (limit is 1,000 dpm/100cm<sup>2</sup>).
- The maximum adjusted ambient gamma exposure rate found was 4 µR/hr (limit is 5.0 µR/hr above background).
- The survey concluded that the Phase I area of Building 4059 met the release criteria for unrestricted use with no radiological restrictions.
- ORISE conducted a verification survey of Phase I of 4059 on October 26 through 28, 1999. The survey confirmed that the Phase I portion of the building met the release criteria for unrestricted use.<sup>8</sup>
- DHS conducted a verification survey of Phase I of 4059 in 1999. The survey confirmed that the Phase I portion of the building met the release criteria for unrestricted use.<sup>9</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.<sup>10</sup> Surveys were performed to a quality level equal to a final status survey as defined by Multi-Agency Radiation Survey and Site Investigation Manual (MARSSIM). The contaminants of concern (COCs) for 4059 were mixed fission products, uranium, transuranic compounds and activation products on the floors walls and ceilings. EPA also collected 10 concrete core samples and four steel plate samples, which were analyzed for photon-emitting isotopes.
  - Three steel plate samples collected near the reactor cells showed the presence of activated Co-60.
  - Acceptable limits for the survey were consistent with Nuclear Regulatory Commission Regulatory Guide 1.86 and the proposed sitewide release criteria in the 1996 Boeing Area IV survey.
  - 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 2002, to prepare for the demolition of the building, samples were collected in the yard surrounding the building below the asphalt.<sup>11</sup> A total of 17 samples were collected and analyzed for gamma emitting radionuclides. No samples had any detection of man-made radionuclides.
- In 2003, after excavation of the asphalt surrounding Building 4059, 15 soil samples were collected and analyzed for the complete suite of radionuclides.<sup>12</sup> All levels are below the site DCGLs.
  - One sample had detectable H-3 at 11.8 pCi/g; all others were non-detect.
  - One sample had detectable Cs-137 at 0.44 pCi/g; all others were non-detect.
  - One sample had detectable Eu-152 at 0.84 pCi/g; all others were non-detect.
  - All other man-made radionuclides, including Fe-55, Co-60, Ni-63, Sr-90, Eu-154, Pu-238, Pu-239, Pu-241 and Am-241 were non-detect.
  - Uranium and Thorium isotopes were at background levels.

- In September 2004, Boeing conducted a MARSSIM based survey and sampling project in the excavation at Site 4059 following removal of the building basement and foundations.<sup>13</sup>
  - Thirty-four samples were taken. None of the field measurements indicated the presence of radionuclides above acceptable limits (derived concentration guideline levels (DCGLs)).
    - Co-60, Eu-152, Cs-137 and Sr-90 were all non-detect.
    - Uranium and thorium were at background levels.
    - About half the samples had detectable Ni-63 that was less than the DCGLs and EPA  $10^{-6}$  PRG levels.
    - Several samples had detectable quantities of H-3, Am-241, and Pu-239 that were less than DCGLs and EPA  $10^{-6}$  PRG levels.
- In October 2004, ORISE conducted an independent verification survey of the 4059 excavation.<sup>14</sup>
  - Ba-133 is reported at -0.01 to 0.02 pCi/g.
  - Co-60 is reported at -0.02 to 0.05 pCi/g.
  - Cs-137 is reported at -0.03 to 0.00 pCi/g. Eu-152 is reported at -0.04 to 0.06 pCi/g.
  - Eu-154 is reported at -0.07 to 0.08 pCi/g.
  - H-3 is reported at -0.7 to 5.1 pCi/g.
  - Exposure rate ranged from 9 to 16  $\mu$ R/hr.
- In October 2004, DHS conducted verification sampling of the 4059 excavation. Results were not yet available as of February 2005.

#### **Status:**

- Following DOE approval, the above ground portions of Building 4059, as well as the remaining activated vault cells, were demolished in 2004.

#### **References:**

- 1- Boeing Internal Website, <http://rdweb/shea/radiationsafety/>, accessed August 2003.
- 2- Atomics International Internal Report, no document number, "Ground Prototype Test facility: Building 059 Facility Handbook," no date given.
- 3- Rockwell International Document, N704TI990043, "Radiological Survey Results – Interim Status, Building 059, SSFL," November 28, 1978.
- 4- ORISE Report, "Radiological Survey of the Building 059 Reactor Vault, Santa Susana Field Laboratory, Rockwell International, Ventura County, California," June 1995.
- 5- U.S. EPA Report, "Final Oversight Verification and Confirmation Radiological Survey Report for Building T-059," December 20, 2002.
- 6- United States Atomic Energy Commission, Untitled letter, from M. Klein (AEC) to J. J. Flaherty (Atomics International). October 29, 1969.
- 7- Boeing Report, RS-00008, "Building 4059, Final Status Survey Report (Phase I)," September 11, 1999.

## Group M

- 8- SSFL Area IV, ETEC Industrial Planning Maps, 1962-1992.
- 9- ORISE Report, 2000-1523, "Verification Survey of Building 4059 (Phase I), Santa Susana Field Laboratory. The Boeing Company. Ventura County, California," December 2000.
- 10- Personnel Interview, Dan Trippeda, September 12, 2003.
- 11- Boeing Document, RD02-148-01, "Site Environmental Report for Calendar Year 2002 DOE Operations at The Boeing Company, Rocketdyne Propulsion & Power," September 2003.
- 12- Boeing Document, RD04-170, "Site Environmental Report for Calendar Year 2003 DOE Operations at The Boeing Company, Rocketdyne Propulsion & Power," September 2004.
- 13- Personal Interview, Phil Rutherford, January 2005.
- 14- Draft ORISE Report. "Verification Survey of the Building 4059 Excavation, Santa Susana Field Laboratory, The Boeing Company, Ventura County, California." January 2005.
- 15- Historical Site Photographs from Boeing Database.

Photograph – Building 4059

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## Site Summary – Building 4459

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### Site Identification:

Building 4459  
Building 4459 Uninterruptible Power Supply (UPS)  
Energy Technology Engineering Center (ETEC) Storage

### Operational Use/History:

- Constructed in 1963.
- Building 4459 was listed as a UPS.<sup>1</sup>
- Building 4459 contained a large diesel generator and flywheel, which, in combination, were designed to function as a fail-proof back-up power source.<sup>2</sup>
- By 1992, Building 4459 was being used for non-radiological storage.<sup>3</sup>
- Demolished in 2003.

### Site Description:

- Building 4459 was an 800-square-foot storage building. The frame, siding and roof were constructed of steel.<sup>1</sup>
- Building 4459 was located directly northwest of 4059, at the western edge of Area IV.

### Relevant Site Information:

- There are no Use Authorizations and no Incident Reports associated with Building 4459.<sup>4</sup>

### Radiological Surveys:

- Boeing, ORISE and DHS each performed radiological surveys of Building 4459 in conjunction with their surveys of Building 4059. The surveys confirmed that Building 4459 met the release criteria for unrestricted use.<sup>5,6</sup>

### Status:

- Building 4459 was demolished in 2003.

### References:

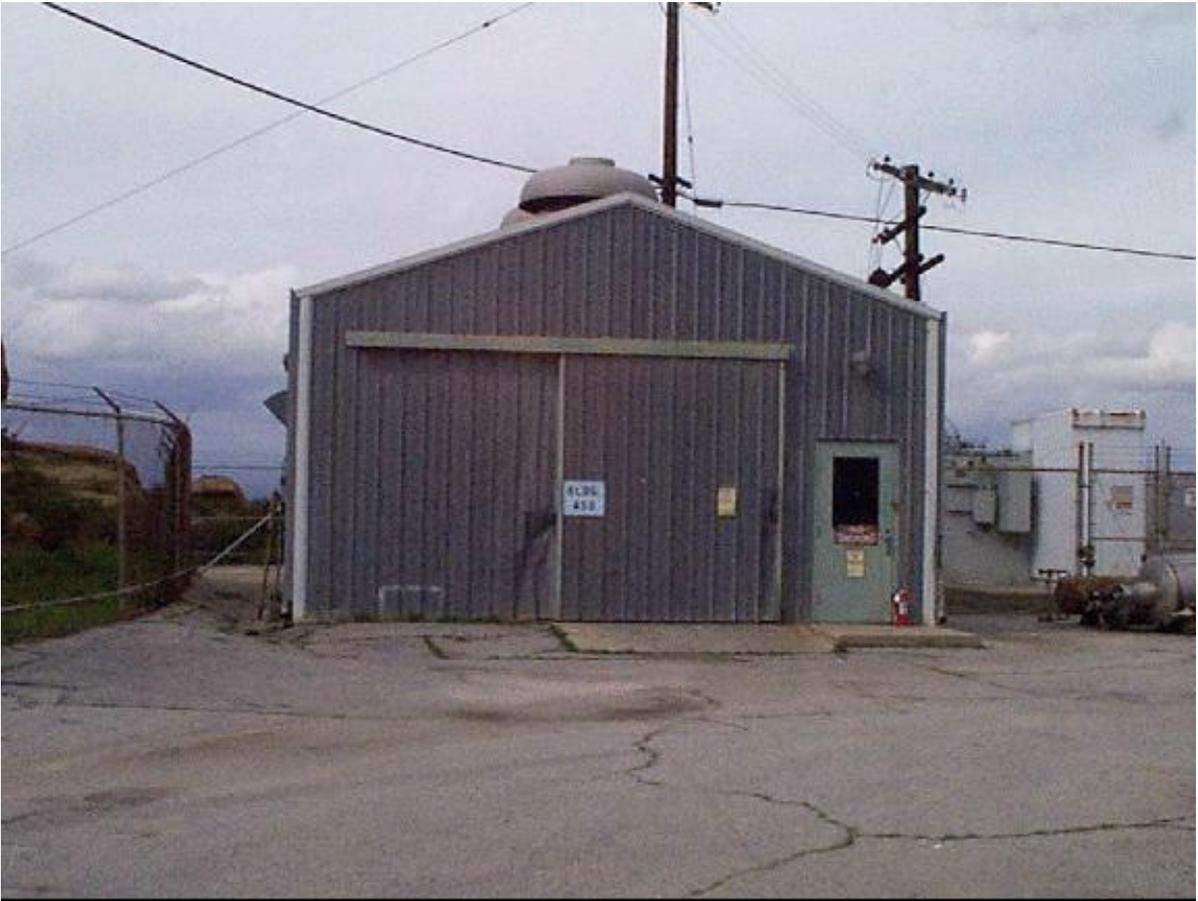
- 1- U.S. Energy Research and Development Administration Liquid Metal Engineer Center Document, LR-03026, Part 1, "Site Development Plan 1977-1981, Volume 1," June 1975.
- 2- Personnel Interview, Randy Ingersoll, September 23, 2003.
- 3- SSFL Area IV, ETEC Industrial Planning Maps, 1962-1992.

## Group M

- 4- Historical Site Photographs from Boeing Database.
- 5- Review of Radiation Safety Records Management System, 2003.
- 6- Boeing Report, RS-00008, "Building 4059, Final Status Survey Report (Phase I)," September 1999.
- 7- ORISE Report, 2000-1523, "Verification Survey of Building 4059 (Phase I), Santa Susana Field Laboratory. The Boeing Company. Ventura County, California," December 2000.

Photograph – Building 4459

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## Group N

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Group N Map

Building 4048

Building 4049

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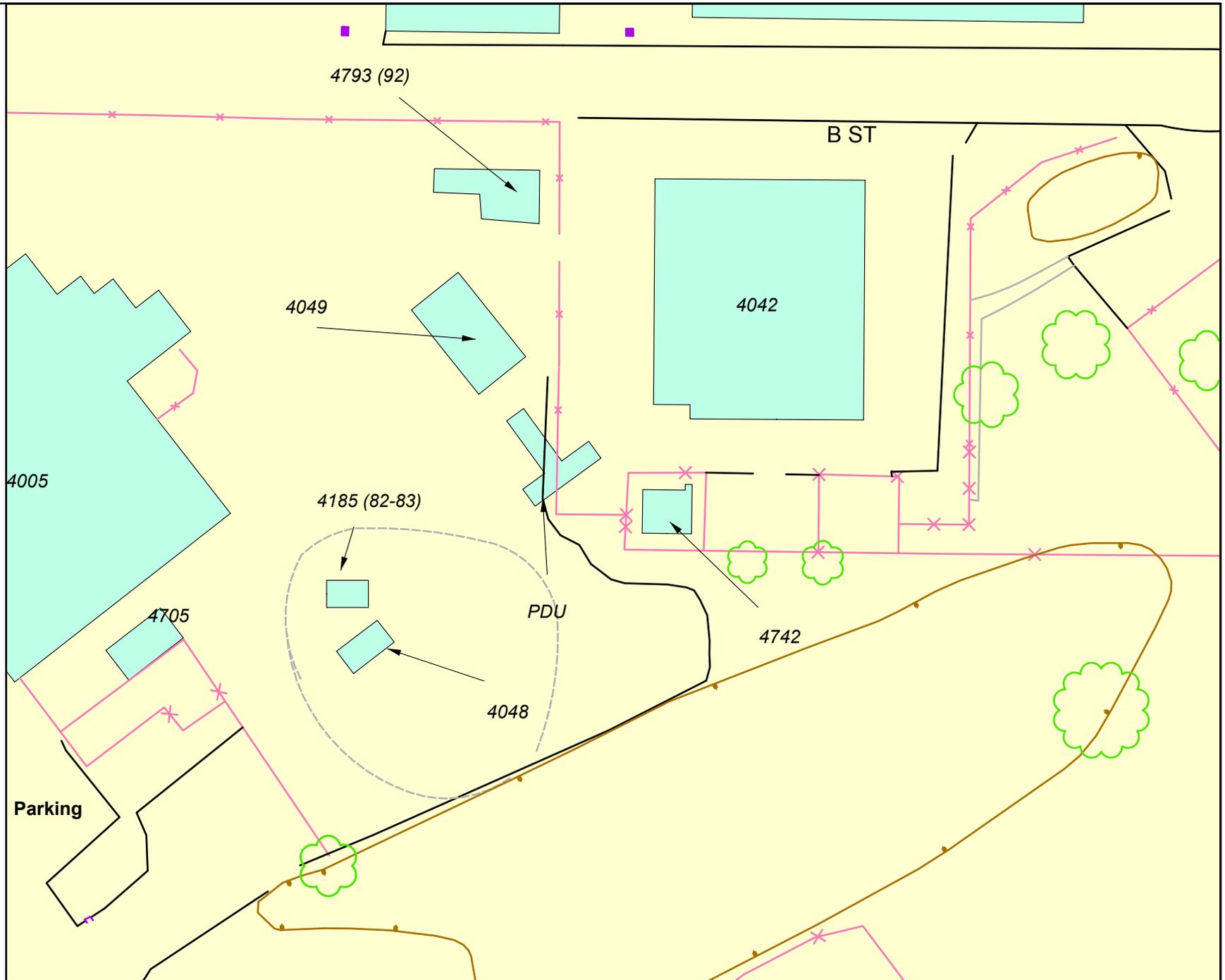
**Legend**

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

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

**Unlabeled Features:**

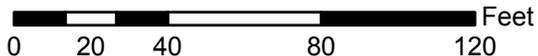
-  Leachfield  
(Removed)
-  Tree
-  Rock
-  Concrete Curb
-  Gutter
-  Asphalt/Concrete  
Berm & Paving
-  Sidewalk
-  Dirt Road
-  Fence
-  Stream/Pond
-  Drain
-  Area IV Boundary



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1 inch equals 50 feet



DATE:

May 2005

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

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## Site Summary – Building 4048

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### Site Identification:

Building 4048  
Plant Development Unit (PDU) Instrumentation

### Operational Use/History:

- Constructed in approximately 1978.<sup>1</sup>
- Building 4048 served the instrumentation building for the PDU facility.
- Demolished in the middle 1990s.<sup>1</sup>

### Site Description:

- Building 4048 was a small structure located southeast of Building 4005.<sup>1</sup>

### Relevant Site Information:

- There are no Use Authorizations and no Incident Reports associated with Building 4048.<sup>2</sup>

### Radiological Surveys:

- Radiological surveys specific to Building 4048 have not been conducted.

### Status:

- Building 4048 was demolished in the middle 1990s.<sup>1</sup>

### References:

- 1- SSFL Area IV, ETEC Industrial Planning Maps, 1962-1992.
- 2- Review of Radiation Safety Records Management System, 2003.

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## Site Summary – Building 4049

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### Site Identification:

Building 4049  
Organic Moderated Reactor (OMR) Piqua Prototype Experiment  
Hydraulic Test Building  
Liquid Metal Fast Breeder Reactor (LMFBR) Test  
Process Development Unit (PDU) Control Room

### Operational Use/History:

- Constructed in 1959.
- Building 4049 was used as a control center in the 1950s and 1960s to support the Systems for Nuclear Auxiliary Power (SNAP) Program.<sup>1</sup>
- Beginning in 1960, Building 4049 was used as a hydraulic test facility control center. The outside test stand was used for tests with terphenyl organics and finned sintered-aluminum-product cladding materials, sodium-water reaction tests and a variety of sodium and NaK hydraulic tests.<sup>1</sup>
- From 1968 to 1977, Building 4049 was used as a control center for Piqua Test Loops.
- In 1977, Building 4049 was designated as a control and test center for the PDU coal gasification process.<sup>1</sup>
- By 1988, Building 4049 was secured and inactive.<sup>1</sup>
- Demolished in 1999.<sup>2</sup>

### Site Description:

- Building 4049 was an 800-square-foot structure with concrete walls, a concrete slab floor and a concrete foundation. The roof was tar and gravel and supported by steel trusses.<sup>2</sup>

### Relevant Site Information:

- Several incidents occurred in Building 4049 which could have resulted in a release to the environment.
  - On March 31, 1960, a pipe containing High Boiler Residue (HBR) was opened, with HBR spilling onto someone's shoes and pant legs. Activated corrosion product (ACP) contamination levels were recorded at 500 dpm/100cm<sup>2</sup> (A0425).
  - An incident occurred on April 1, 1960, during which an employee came in contact with a pipe containing a residue of HBR. It was not considered necessary to measure ACP contamination levels (A0479).

## Group N

### Radiological Surveys:

- Building 4049 was included as part of the 1988 DOE SSFL Site Survey to determine whether any residual activity remained as a result of the SNAP program.<sup>3</sup> Building 4049 was located within the fence-line boundary of Building 4005, which was known to be contaminated in certain locations.
- The radiological survey of Building 4049 concluded:<sup>1</sup>
  - The inside ambient exposure rate was 9.3 +/- 1.02  $\mu\text{R/hr}$  (gross). This is much less than the average local outside background of 15.3  $\mu\text{R/hr}$  (gross). Therefore the acceptable gamma exposure limit of 5  $\mu\text{R/hr}$  (net) is met.
  - Maximum total alpha contamination is 17.5 dpm/100  $\text{cm}^2$
  - Total alpha contamination limit is 5,000 dpm/100  $\text{cm}^2$
  - Maximum total beta contamination is 1080 dpm/100  $\text{cm}^2$
  - Total beta contamination limit is 5,000 dpm/100  $\text{cm}^2$
  - Maximum removable alpha contamination is 1.7 dpm/100  $\text{cm}^2$
  - Removable alpha contamination limit is 1,000 dpm/100  $\text{cm}^2$
  - Maximum removable beta contamination is 7.1 dpm/100  $\text{cm}^2$
  - Removable beta contamination limit is 1,000 dpm/100  $\text{cm}^2$
- Based on the results the Building 4049 was judged to be uncontaminated.<sup>1</sup>

### Status:

- Building 4049 was demolished in 1999.

### References:

- 1- ETEC Document, GEN-ZR-0013, "Radiological Survey of Buildings T049, T042, T027, T032, and T025," August 26, 1988.
- 2- Boeing Document EID-04366, "Removal of DOE Buildings, Demo Pak A," May 18, 1999, pg. 5.
- 3- Rockwell International Report, 154SRR000001, "Radiological Survey Plan for SSFL," September 25, 1985.
- 4- Historical Site Photographs from Boeing Database.
- 5- SSFL Area IV, ETEC Industrial Planning Maps, 1962-1992.

Photograph – Building 4049

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