
FINAL
SUBAREA 8 ROUND 2 ADDENDUM
TO THE FINAL FSP FOR SOIL SAMPLING
SANTA SUSANA FIELD LABORATORY
AREA IV RADIOLOGICAL STUDY

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DATE: July 13, 2012
SUBJECT: Subarea 8 Round 2 Addendum to the Final Field Sampling Plan for Soil Sampling

CONTRACT NO: EP-S7-05-05
TASK ORDER NO: 0038

INTRODUCTION

HydroGeoLogic, Inc. (HGL) has been tasked by the U.S. Environmental Protection Agency (USEPA) to conduct a radiological characterization study of Area IV and the Northern Buffer Zone (NBZ) at the Santa Susana Field Laboratory (SSFL) site in Ventura County, California. This work is being executed under USEPA Region 7 Architect and Engineering Services Contract EP-S7-05-05, Task Order 0038, Amendment 3. The technical lead on the project is USEPA Region 9.

This document supports the field implementation of the overall soil sampling program and is an addendum to the Final Field Sampling Plan (FSP) for Soil Sampling (HGL, 2012a). A description of the overall project goals, data quality objectives, sampling strategy, laboratory analytical suites, sample depth interval selection, data quality control, and data evaluation are described in the FSP.

PURPOSE

This addendum documents the rationale used to determine the location and depth of soil samples to be collected during round 2 soil sampling within Subarea 8. Sample locations are summarized in Table 1 (Attachment 1) and illustrated on the figures provided in Attachment 2. This addendum also documents the laboratory analyses that will be performed for each soil sample.

Specific sample locations presented herein were discussed during a technical review meeting held on April 18, 2012, with members of USEPA's SSFL Technical Stakeholder group consisting of representatives of U.S. Department of Energy (DOE), the State of California Department of Toxic Substances Control (DTSC), The Boeing Company, USEPA, and the community members. Recommendations and action items identified at the technical review meeting, including those on the topic of Likely Chemical Remediation Zones (LCRZ) have been incorporated into this FSP Addendum. USEPA understands that soil may be excavated and removed from areas identified as LCRZs. Therefore, USEPA collected step-out samples around the zone's perimeter to better define the potential extent of contamination associated with such zones but did not place step-out locations around exceedances detected within the LCRZ, as in the case of Location 137. In accordance with the USEPA's role under the Administrative Order on Consent (AOC) for Remedial Action (DTSC, 2010) agreement between DTSC and DOE for the SSFL site, and subject to additional external funding, USEPA will conduct verification soil sampling post Decontamination and Decommissioning activities to verify that site remediation goals have been achieved at all such remediation zones.

ROUND 1 ANALYTICAL SUMMARY

During round 1 sampling Subarea 8 was divided into two smaller subareas, Subarea 8-North and Subarea 8-South. Subarea 8 will be treated as one subarea during the round 2 sampling effort and in this FSP addendum. A total of 283 soil samples (135 surface, 131 subsurface, and 17 drainage) were collected during round 1 sampling in Subarea 8. Analysis of the 283 round 1 soil samples identified 26 locations where radionuclide activities exceeding RTLs developed for the Area IV Santa Susana Field Laboratory Radiological Study. The process used to derive the RTLs is presented in the Technical Memorandum, Radiological Trigger Levels (HGL, 2011a). A total of 27 samples were collected from these locations. Results of the samples show there were 28 radionuclides that exceeded their respective RTLs. Radionuclide concentrations exceeding RTLs were identified in round 1 samples collected from the following areas within Subarea 8:

- 56 Landfill Area
- Building 4009
- Former Sodium Disposal Facility (FSDF)
- Empire State Atomic Development Authority (ESADA)
- Subarea 8-South

Table 2 summarizes the RTL exceedances identified during round 1 sampling by number of locations, samples, and radionuclides exceeding the RTLs.

Table 2
Round 1 Location, Samples and Radionuclides with Exceedances

Area of RTL Exceedance	Locations	Samples	Radionuclides Exceeding RTLs
56 Landfill	2	2	2
Building 4009	5	5	5
FSDF	5	5	6
ESADA	9	9	9
8-South	5	6	6
Total	26	27	28

Table 3 summarizes the radionuclides and the range of activity detected at each of these areas. Figure 1 provides an overview map showing the location of each round 1 sample with radionuclide activities exceeding RTLs (Attachment 2). Round 1 soil sample results will be presented in the Technical Memorandum Subarea 8 Round 1 Soil Sample Results (HGL, 2012b).

Table 3
Round 1 Radiological Trigger Level Exceedances

Area of RTL Exceedance	Analyte	Number of Exceedances	Range of Concentration	RTL
56 Landfill	Cs-137	1	0.878	0.207
	Pu-239/240	1	0.0713	0.0404
Building 4009	Sr-90	5	0.534 - 1.39	0.485
FSDF	Am-241	2	0.0484 - 0.0514	0.0454
	Pu-239/240	1	0.0873	0.0404
	Sr-90	3	0.855 - 2.71	0.485
ESADA	Sr-90	9	0.51 - 2.51	0.485
8-South	Cs-137	2	0.212 - 0.266	0.207
	Sr-90	4	0.873 - 1.53	0.485

Notes:
All units measured in picocuries per gram
Am - americium
Cs - cesium
Pu - plutonium
Sr - strontium

ROUND 2 PROPOSED SAMPLING LOCATIONS

Lines of evidence presented in the round 1 Subarea 8 North FSP Addendum (HGL, 2011b) and Subarea 8-South FSP Addendum, (HGL, 2011c), such as gamma scanning survey results, aerial photographic interpretation, and historical process knowledge were evaluated to assist

with the placement of round 2 sampling locations. In addition to these lines of evidence, analytical results from the round 1 soil sampling event were also evaluated. A total of 106 soil samples (99 step-out locations) are proposed for round 2 soil sampling. Exceedances within the LCRZ do not require step-out locations, as the soil within these zones may be remediated or removed. Table 4 summarizes the number of samples proposed to be collected within each area where radionuclide activity was detected above the RTLs in round 1 soil samples.

Table 4
Round 2 Samples by Area

Area of Round 1 RTL Exceedances	Surface	Subsurface	Total
56 Landfill Area	0	4	4
Building 4009	8	11	19
FSDF	6	12	18
ESADA	23	18	41
8-South	16	8	24
Total	53	53	106

SCHEDULE

Round 2 soil sampling within Subarea 8 will commence in May and is anticipated to be completed by June 2012. USEPA will provide periodic updates to SSFL Stakeholders regarding the status of the soil sampling program as well as the laboratory analysis and data interpretation.

REFERENCES

Department of Toxic Substances Control, 2010. Administrative Order On Consent For Remedial Action, Santa Susana Field Laboratory, Simi Hills, Ventura County, California. December.

HydroGeoLogic, Inc., 2011a. Technical Memorandum, Radiological Trigger Levels, Santa Susana Field Laboratory, Area IV Radiological Study. December.

HydroGeoLogic, Inc., 2011b. Subarea 8 North FSP Addendum, Area IV Radiological Study, Santa Susana Field Laboratory Ventura County, California. March.

HydroGeoLogic, Inc., 2011c. Subarea 8-South FSP Addendum, Area IV Radiological Study, Santa Susana Field Laboratory Ventura County, California. September.

HydroGeoLogic, Inc., 2012a. Final Field Sampling Plan for Soil Sampling, Area IV Radiological Study, Santa Susana Field Laboratory Ventura County, California. January.

HydroGeoLogic, Inc., 2012b. Draft Technical Memorandum, Subarea 8 Round 1 Soil Sample Results, Santa Susana Field Laboratory Area IV Radiological Study. May.

LIST OF ATTACHMENTS

Attachment 1 Table 1
Attachment 2 Figures 1-6
Attachment 3 Support Figures

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ATTACHMENT 1

Table 1 Summary of Soil Sample Locations

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Table 1
Summary of Soil Sample Locations
Subarea 8, Round 2

Sample Location	Sample Type	Location Description	Technical Justification	Analytical Suite
8N-00143	Subsurface	Approximately 15 feet north of Location 120 in Subarea 8-North.	Pu-239/240 was detected at a concentration of 0.0713 pCi/g in subsurface soils at sample Location 120, and potential leaching of radioactive contaminants from Building 4056 Landfill into drainage.	Pu Default, Np-237, Pu-236, Pu-241, Pu-244
8N-00144	Subsurface	Approximately 15 feet west of Location 120 in Subarea 8-North.	Pu-239/240 was detected at a concentration of 0.0713 pCi/g in subsurface soils at sample Location 120, and potential leaching of radioactive contaminants from Building 4056 Landfill into drainage.	Pu Default, Np-237, Pu-236, Pu-241, Pu-244
8N-00145	Subsurface	Approximately 15 feet south of Location 120 in Subarea 8-North.	Pu-239/240 was detected at a concentration of 0.0713 pCi/g in subsurface soils at sample Location 120, and potential leaching of radioactive contaminants from Building 4056 Landfill into drainage.	Pu Default, Np-237, Pu-236, Pu-241, Pu-244
8N-00146	Subsurface	Approximately 15 feet east of Location 120 in Subarea 8-North.	Pu-239/240 was detected at a concentration of 0.0713 pCi/g in subsurface soils at sample Location 120, and potential leaching of radioactive contaminants from Building 4056 Landfill into drainage.	Pu Default, Np-237, Pu-236, Pu-241, Pu-244
8N-00147	Surface	Approximately 15 feet northeast of Location 96 in Subarea 8-North.	Sr-90 was detected at a concentration of 1.26 pCi/g in surface soils at sample Location 96, and the presence of a geophysical anomaly "Conductivity" and an aerial photo feature "Fill Area".	Sr-90
8N-00148	Surface	Approximately 15 feet west of Location 96 in Subarea 8-North.	Sr-90 was detected at a concentration of 1.26 pCi/g in surface soils at sample Location 96, and the presence of a geophysical anomaly "Conductivity" and an aerial photo feature "Fill Area".	Sr-90
8N-00149	Surface	Approximately 25 feet southwest of Location 96 and 25 feet north of Location 97 in Subarea 8-North.	Sr-90 was detected at a concentration of 1.26 pCi/g and 0.64 pCi/g in surface soils at sample Locations 96 and 97 (respectively), and the presence of a geophysical anomaly "Conductivity" and an aerial photo feature "Fill Area".	Sr-90
8N-00150	Surface	Approximately 15 feet northwest of Location 97 in Subarea 8-North.	Sr-90 was detected at a concentration of 0.64 pCi/g in surface soils at sample Location 97, and the presence of a geophysical anomaly "Conductivity" and an aerial photo feature "Fill Area".	Sr-90
8N-00151	Surface	Approximately 15 feet southwest of Location 97 in Subarea 8-North.	Sr-90 was detected at a concentration of 0.64 pCi/g in surface soils at sample Location 97, and the presence of a geophysical anomaly "Conductivity" and an aerial photo feature "Fill Area".	Sr-90
8N-00152	Surface	Approximately 15 feet east of Location 97 in Subarea 8-North.	Sr-90 was detected at a concentration of 0.64 pCi/g in surface soils at sample Location 97, and the presence of a geophysical anomaly "Conductivity" and an aerial photo feature "Fill Area".	Sr-90
8N-00153	Surface	Approximately 25 feet northeast of Location 97 and 25 feet south of Location 96 in Subarea 8-North.	Sr-90 was detected at a concentration of 1.26 pCi/g and 0.64 pCi/g in surface soils at sample Locations 96 and 97 (respectively), and the presence of a geophysical anomaly "Conductivity" and an aerial photo feature "Fill Area".	Sr-90
8N-00154	Surface	Approximately 15 feet southeast of Location 96 in Subarea 8-North.	Sr-90 was detected at a concentration of 1.26 pCi/g in surface soils at sample Location 96, and the presence of a geophysical anomaly "Conductivity" and an aerial photo feature "Fill Area".	Sr-90
8N-00155	Subsurface	Approximately 15 feet north of Location 100 in Subarea 8-North.	Sr-90 was detected at a concentration of 1.26 pCi/g in subsurface soils at sample Location 100, in the vicinity of a former leach field north of Building 4009.	Sr-90
8N-00156	Subsurface	Approximately 15 feet west of Location 100 in Subarea 8-North.	Sr-90 was detected at a concentration of 1.26 pCi/g in subsurface soils at sample Location 100, in the vicinity of a former leach field north of Building 4009.	Sr-90
8N-00157	Subsurface	Approximately 15 feet south of Location 100 in Subarea 8-North.	Sr-90 was detected at a concentration of 1.26 pCi/g in subsurface soils at sample Location 100, in the vicinity of a former leach field north of Building 4009.	Sr-90
8N-00158	Subsurface	Approximately 15 feet east of Location 100 in Subarea 8-North.	Sr-90 was detected at a concentration of 1.26 pCi/g in subsurface soils at sample Location 100, in the vicinity of a former leach field north of Building 4009.	Sr-90
8N-00159	Subsurface	Approximately 15 feet north of Location 129 in Subarea 8-North.	Sr-90 was detected at a concentration of 0.534 pCi/g in subsurface soils at sample Location 129, and possible surface water run-off from Building 4009 into Outfall 7.	Sr-90
8N-00160	Subsurface	Approximately 15 feet west of Location 129 in Subarea 8-North.	Sr-90 was detected at a concentration of 0.534 pCi/g in subsurface soils at sample Location 129, and possible surface water run-off from Building 4009 into Outfall 7.	Sr-90
8N-00161	Subsurface	Approximately 15 feet south of Location 129 in Subarea 8-North.	Sr-90 was detected at a concentration of 0.534 pCi/g in subsurface soils at sample Location 129, and possible surface water run-off from Building 4009 into Outfall 7.	Sr-90
8N-00162	Subsurface	Approximately 15 feet east of Location 129 in Subarea 8-North.	Sr-90 was detected at a concentration of 0.534 pCi/g in subsurface soils at sample Location 129, and possible surface water run-off from Building 4009 into Outfall 7.	Sr-90

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Table 1
Summary of Soil Sample Locations
Subarea 8, Round 2

Sample Location	Sample Type	Location Description	Technical Justification	Analytical Suite
8N-00163	Subsurface	Approximately 15 feet northeast of Location 105 in Subarea 8-North.	Sr-90 was detected at a concentration of 1.39 pCi/g in subsurface soils at sample Location 105, and potential radiological contamination from holdup tank on the east side of Building 4009.	Sr-90
8N-00164	Subsurface	Approximately 15 feet northwest of Location 105 in Subarea 8-North.	Sr-90 was detected at a concentration of 1.39 pCi/g in subsurface soils at sample Location 105, and potential radiological contamination from holdup tank on the east side of Building 4009.	Sr-90
8N-00165	Subsurface	Approximately 15 feet southeast of Location 105 in Subarea 8-North.	Sr-90 was detected at a concentration of 1.39 pCi/g in subsurface soils at sample Location 105, and potential radiological contamination from holdup tank on the east side of Building 4009.	Sr-90
8N-00166	Surface	Approximately 10 feet northeast of Location 122 in Subarea 8-North.	Sr-90 was detected at a concentration of 0.855 pCi/g in surface soils at sample Location 122.	Sr-90
8N-00167	Surface	Approximately 10 feet east of Location 122 in Subarea 8-North.	Sr-90 was detected at a concentration of 0.855 pCi/g in surface soils at sample Location 122.	Sr-90
8N-00168	Surface	Approximately 10 feet south of Location 122 in Subarea 8-North.	Sr-90 was detected at a concentration of 0.855 pCi/g in surface soils at sample Location 122.	Sr-90
8N-00169	Surface	Approximately 10 feet north of Location 85 in Subarea 8-North.	Am-241 was detected at a concentration of 0.0514 pCi/g in surface soils at sample Location 85 and past environmental data.	Am-241
8N-00170	Surface	Approximately 10 feet west of Location 85 in Subarea 8-North.	Am-241 was detected at a concentration of 0.0514 pCi/g in surface soils at sample Location 85 and past environmental data.	Am-241
8N-00171	Surface	Approximately 10 feet south of Location 85 in Subarea 8-North.	Am-241 was detected at a concentration of 0.0514 pCi/g in surface soils at sample Location 85 and past environmental data.	Am-241
8N-00172	Subsurface	Approximately 15 feet north of Location 59 in Subarea 8-North.	Am-241 and Pu-239/240 were detected at concentrations of 0.0484 pCi/g and 0.0873 pCi/g (respectively) in subsurface soils at sample Location 59, and an aerial photo feature "Surface Water Diversion Trench".	Am-241, Np-237, Pu Default, Pu-236, Pu-241, Pu-244, Sr-90
8N-00173	Subsurface	Approximately 15 feet west of Location 59 in Subarea 8-North.	Am-241 and Pu-239/240 were detected at concentrations of 0.0484 pCi/g and 0.0873 pCi/g (respectively) in subsurface soils at sample Location 59, and an aerial photo feature "Surface Water Diversion Trench".	Am-241, Np-237, Pu Default, Pu-236, Pu-241, Pu-244
8N-00174	Subsurface	Approximately 15 feet south of Location 59 in Subarea 8-North.	Am-241 and Pu-239/240 were detected at concentrations of 0.0484 pCi/g and 0.0873 pCi/g (respectively) in subsurface soils at sample Location 59, and an aerial photo feature "Surface Water Diversion Trench".	Am-241, Np-237, Pu Default, Pu-236, Pu-241, Pu-244
8N-00175	Subsurface	Approximately 15 feet southeast of Location 59 and 20 feet southwest of Location 84 in Subarea 8-North.	Am-241 and Pu-239/240 were detected at concentrations of 0.0484 pCi/g and 0.0873 pCi/g (respectively) in subsurface soils at sample Location 59, Sr-90 was detected at a concentration of 0.995 pCi/g in subsurface soils at sample Location 84, and aerial photo features "Surface Water Diversion Trench" and excavation at Lower Pond.	Am-241, Np-237, Pu Default, Pu-236, Pu-241, Pu-244, Sr-90
8N-00176	Subsurface	Approximately 15 feet south of Location 84 in Subarea 8-North.	Sr-90 was detected at a concentration of 0.995 pCi/g in subsurface soils at sample Location 84, and an aerial photo of an excavation at the Lower Pond.	Sr-90
8N-00177	Subsurface	Approximately 15 feet east of Location 84 in Subarea 8-North.	Sr-90 was detected at a concentration of 0.995 pCi/g in subsurface soils at sample Location 84, and an aerial photo of an excavation at the Lower Pond.	Sr-90
8N-00178	Subsurface	Approximately 15 feet north of Location 84 in Subarea 8-North.	Sr-90 was detected at a concentration of 0.995 pCi/g in subsurface soils at sample Location 84, and an aerial photo of an excavation at the Lower Pond.	Sr-90
8N-00179	Subsurface	Approximately 15 feet northeast of Location 59 and 20 feet northwest of Location 84 in Subarea 8-North.	Am-241 and Pu-239/240 were detected at concentrations of 0.0484 pCi/g and 0.0873 pCi/g (respectively) in subsurface soils at sample Location 59, Sr-90 was detected at a concentration of 0.995 pCi/g in subsurface soils at sample Location 84, and aerial photo features "Surface Water Diversion Trench" and excavation at Lower Pond.	Am-241, Np-237, Pu Default, Pu-236, Pu-241, Pu-244, Sr-90
8N-00180	Subsurface	Approximately 15 feet north of Location 55 in Subarea 8-North.	Sr-90 was detected at a concentration of 2.71 pCi/g in subsurface soils at sample Location 55, and at the low point of the former Upper Pond.	Sr-90
8N-00181	Subsurface	Approximately 15 feet west of Location 55 in Subarea 8-North.	Sr-90 was detected at a concentration of 2.71 pCi/g in subsurface soils at sample Location 55, and at the low point of the former Upper Pond.	Sr-90
8N-00182	Subsurface	Approximately 15 feet south of Location 55 in Subarea 8-North.	Sr-90 was detected at a concentration of 2.71 pCi/g in subsurface soils at sample Location 55, and at the low point of the former Upper Pond.	Sr-90

Table 1
Summary of Soil Sample Locations
Subarea 8, Round 2

Sample Location	Sample Type	Location Description	Technical Justification	Analytical Suite
8N-00183	Subsurface	Approximately 15 feet east of Location 55 in Subarea 8-North.	Sr-90 was detected at a concentration of 2.71 pCi/g in subsurface soils at sample Location 55, and at the low point of the former Upper Pond.	Sr-90
8N-00184	Subsurface	Approximately 15 feet north of Location 15 in Subarea 8-North.	Sr-90 was detected at a concentration of 0.51 pCi/g in subsurface soils at sample Location 15, and the location of an aerial photo feature "Trench".	Sr-90
8N-00185	Subsurface	Approximately 15 feet west of Location 15 in Subarea 8-North.	Sr-90 was detected at a concentration of 0.51 pCi/g in subsurface soils at sample Location 15, and the location of an aerial photo feature "Trench".	Sr-90
8N-00186	Subsurface	Approximately 15 feet south of Location 15 in Subarea 8-North.	Sr-90 was detected at a concentration of 0.51 pCi/g in subsurface soils at sample Location 15, and the location of an aerial photo feature "Trench".	Sr-90
8N-00187	Subsurface	Approximately 15 feet east of Location 15 in Subarea 8-North.	Sr-90 was detected at a concentration of 0.51 pCi/g in subsurface soils at sample Location 15, and the location of an aerial photo feature "Trench".	Sr-90
8N-00188	Surface	Approximately 15 feet north of Location 14 in Subarea 8-North.	Sr-90 was detected at a concentration of 0.957 pCi/g in surface soils at sample Location 14, and the location of an aerial photo feature "Trench".	Sr-90
8N-00189	Surface	Approximately 15 feet west of Location 14 in Subarea 8-North.	Sr-90 was detected at a concentration of 0.957 pCi/g in surface soils at sample Location 14, and the location of an aerial photo feature "Trench".	Sr-90
8N-00190	Surface	Approximately 15 feet south of Location 14 in Subarea 8-North.	Sr-90 was detected at a concentration of 0.957 pCi/g in surface soils at sample Location 14, and the location of an aerial photo feature "Trench".	Sr-90
8N-00191	Surface	Approximately 15 feet east of Location 14 in Subarea 8-North.	Sr-90 was detected at a concentration of 0.957 pCi/g in surface soils at sample Location 14, and the location of an aerial photo feature "Trench".	Sr-90
8N-00192	Subsurface	Approximately 15 feet north of Location 50 in Subarea 8-North.	Sr-90 was detected at a concentration of 1.01 pCi/g in subsurface soils at sample Location 50, near underground piping that transported waste sodium from Building 4814 to the Former Sodium Disposal Facility.	Sr-90
8N-00193	Subsurface	Approximately 15 feet west of Location 50 in Subarea 8-North.	Sr-90 was detected at a concentration of 1.01 pCi/g in subsurface soils at sample Location 50, near underground piping that transported waste sodium from Building 4814 to the Former Sodium Disposal Facility.	Sr-90
8N-00194	Subsurface	Approximately 15 feet south of Location 50 in Subarea 8-North.	Sr-90 was detected at a concentration of 1.01 pCi/g in subsurface soils at sample Location 50, near underground piping that transported waste sodium from Building 4814 to the Former Sodium Disposal Facility.	Sr-90
8N-00195	Subsurface	Approximately 15 feet east of Location 50 in Subarea 8-North.	Sr-90 was detected at a concentration of 1.01 pCi/g in subsurface soils at sample Location 50, near underground piping that transported waste sodium from Building 4814 to the Former Sodium Disposal Facility.	Sr-90
8N-00196	Surface	Approximately 15 feet north of Location 6 in Subarea 8-North.	Sr-90 was detected at a concentration of 0.535 pCi/g in surface soils at sample Location 6, and possible uranium contamination from zirconium-hydride fuel pellets used in impact testing.	Sr-90
8N-00197	Surface	Approximately 15 feet west of Location 6 in Subarea 8-North.	Sr-90 was detected at a concentration of 0.535 pCi/g in surface soils at sample Location 6, and possible uranium contamination from zirconium-hydride fuel pellets used in impact testing.	Sr-90
8N-00198	Surface	Approximately 15 feet south of Location 6 in Subarea 8-North.	Sr-90 was detected at a concentration of 0.535 pCi/g in surface soils at sample Location 6, and possible uranium contamination from zirconium-hydride fuel pellets used in impact testing.	Sr-90
8N-00199	Surface	Approximately 15 feet east of Location 6 in Subarea 8-North.	Sr-90 was detected at a concentration of 0.535 pCi/g in surface soils at sample Location 6, and possible uranium contamination from zirconium-hydride fuel pellets used in impact testing.	Sr-90
8N-00200	Subsurface	Approximately 15 feet north of Location 3 in Subarea 8-North.	Sr-90 was detected at a concentration of 0.584 pCi/g in subsurface soils at sample Location 3, and possible uranium contamination from zirconium-hydride fuel pellets used in impact testing.	Sr-90
8N-00201	Subsurface	Approximately 15 feet west of Location 3 in Subarea 8-North.	Sr-90 was detected at a concentration of 0.584 pCi/g in subsurface soils at sample Location 3, and possible uranium contamination from zirconium-hydride fuel pellets used in impact testing.	Sr-90
8N-00202	Subsurface	Approximately 15 feet south of Location 3 in Subarea 8-North.	Sr-90 was detected at a concentration of 0.584 pCi/g in subsurface soils at sample Location 3, and possible uranium contamination from zirconium-hydride fuel pellets used in impact testing.	Sr-90

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Table 1
Summary of Soil Sample Locations
Subarea 8, Round 2

Sample Location	Sample Type	Location Description	Technical Justification	Analytical Suite
8N-00203	Subsurface	Approximately 15 feet east of Location 3 in Subarea 8-North.	Sr-90 was detected at a concentration of 0.584 pCi/g in subsurface soils at sample Location 3, and possible uranium contamination from zirconium-hydride fuel pellets used in impact testing.	Sr-90
8N-00204	Subsurface	Approximately 15 feet west of Location 28 in Subarea 8-North.	Sr-90 was detected at a concentration of 2.51 pCi/g in subsurface soils at sample Location 28, and the presence of geophysical anomalies "Magnetometer and Conductivity".	Sr-90
8N-00205	Subsurface	Approximately 15 feet north of Location 28 in Subarea 8-North.	Sr-90 was detected at a concentration of 2.51 pCi/g in subsurface soils at sample Location 28, and the presence of geophysical anomalies "Magnetometer and Conductivity".	Sr-90
8N-00206	Subsurface	Approximately 15 feet east of Location 28 in Subarea 8-North.	Sr-90 was detected at a concentration of 2.51 pCi/g in subsurface soils at sample Location 28, and the presence of geophysical anomalies "Magnetometer and Conductivity".	Sr-90
8N-00207	Surface	Approximately 15 feet north of Location 29 in Subarea 8-North.	Sr-90 was detected at a concentration of 1.41 pCi/g in surface soils at sample Location 29, and the presence of a geophysical anomaly "Magnetometer".	Sr-90
8N-00208	Surface	Approximately 15 feet west of Location 29 in Subarea 8-North.	Sr-90 was detected at a concentration of 1.41 pCi/g in surface soils at sample Location 29, and the presence of a geophysical anomaly "Magnetometer".	Sr-90
8N-00209	Surface	Approximately 15 feet south of Location 29 in Subarea 8-North.	Sr-90 was detected at a concentration of 1.41 pCi/g in surface soils at sample Location 29, and the presence of a geophysical anomaly "Magnetometer".	Sr-90
8N-00210	Surface	Approximately 15 feet east of Location 29 in Subarea 8-North.	Sr-90 was detected at a concentration of 1.41 pCi/g in surface soils at sample Location 29, and the presence of a geophysical anomaly "Magnetometer".	Sr-90
8N-00211	Surface	Approximately 15 feet north of Location 35 in Subarea 8-North.	Sr-90 was detected at a concentration of 1.08 pCi/g in surface soils at sample Location 35, and the presence of a geophysical anomaly "Magnetometer".	Sr-90
8N-00212	Surface	Approximately 15 feet west of Location 35 in Subarea 8-North.	Sr-90 was detected at a concentration of 1.08 pCi/g in surface soils at sample Location 35, and the presence of a geophysical anomaly "Magnetometer".	Sr-90
8N-00213	Surface	Approximately 15 feet south of Location 35 in Subarea 8-North.	Sr-90 was detected at a concentration of 1.08 pCi/g in surface soils at sample Location 35, and the presence of a geophysical anomaly "Magnetometer".	Sr-90
8N-00214	Surface	Approximately 15 feet east of Location 35 in Subarea 8-North.	Sr-90 was detected at a concentration of 1.08 pCi/g in surface soils at sample Location 35, and the presence of a geophysical anomaly "Magnetometer".	Sr-90
8N-00215	Surface	Approximately 15 feet north of Location 39 in Subarea 8-North.	Sr-90 was detected at a concentration of 2.34 pCi/g in surface soils at sample Location 39, and the presence of a geophysical anomaly "Conductivity" and elevated gamma readings.	Sr-90
8N-00216	Surface	Approximately 15 feet west of Location 39 in Subarea 8-North.	Sr-90 was detected at a concentration of 2.34 pCi/g in surface soils at sample Location 39, and the presence of a geophysical anomaly "Conductivity" and elevated gamma readings.	Sr-90
8N-00217	Surface	Approximately 15 feet south of Location 39 in Subarea 8-North.	Sr-90 was detected at a concentration of 2.34 pCi/g in surface soils at sample Location 39, and the presence of a geophysical anomaly "Conductivity" and elevated gamma readings.	Sr-90
8N-00218	Surface	Approximately 15 feet east of Location 39 in Subarea 8-North.	Sr-90 was detected at a concentration of 2.34 pCi/g in surface soils at sample Location 39, and the presence of a geophysical anomaly "Conductivity" and elevated gamma readings.	Sr-90
8N-00219	Surface	In the middle of slope west of the ESADA firing range in Subarea 8-North.	Location added at Stakeholder's request.	Sr-90
8N-00219	Subsurface	In the middle of slope west of the ESADA firing range in Subarea 8-North.	Location added at Stakeholder's request.	Sr-90
8N-00220	Surface	In the middle of slope west of the ESADA firing range in Subarea 8-North.	Location added at Stakeholder's request.	Sr-90
8N-00220	Subsurface	In the middle of slope west of the ESADA firing range in Subarea 8-North.	Location added at Stakeholder's request.	Sr-90

U.S. EPA Region 9

Page 4 of 6

Table 1
Summary of Soil Sample Locations
Subarea 8, Round 2

Sample Location	Sample Type	Location Description	Technical Justification	Analytical Suite
8N-00221	Surface	In the middle of slope west of the ESADA firing range in Subarea 8-North.	Location added at Stakeholder's request.	Sr-90
8N-00221	Subsurface	In the middle of slope west of the ESADA firing range in Subarea 8-North.	Location added at Stakeholder's request.	Sr-90
8S-00025	Surface	Approximately 15 feet north of Location 10 in Subarea 8-South.	Cs-137 was detected at a concentration of 0.266 pCi/g in surface soils at sample Location 10, and an aerial photo feature "Disturbed Soil".	Gamma Spec
8S-00026	Surface	Approximately 15 feet west of Location 10 in Subarea 8-South.	Cs-137 was detected at a concentration of 0.266 pCi/g in surface soils at sample Location 10, and an aerial photo feature "Disturbed Soil".	Gamma Spec
8S-00027	Surface	Approximately 15 feet south of Location 10 in Subarea 8-South.	Cs-137 was detected at a concentration of 0.266 pCi/g in surface soils at sample Location 10, and an aerial photo feature "Disturbed Soil".	Gamma Spec
8S-00028	Surface	Approximately 15 feet east of Location 10 in Subarea 8-South.	Cs-137 was detected at a concentration of 0.266 pCi/g in surface soils at sample Location 10, and an aerial photo feature "Disturbed Soil".	Gamma Spec
8S-00029	Surface	Approximately 15 feet north of Location 22 in Subarea 8-South.	Sr-90 was detected at a concentration of 1.53 pCi/g in surface soils at sample Location 22, and an aerial photo feature "Disturbed Soil".	Sr-90
8S-00030	Surface	Approximately 15 feet west of Location 22 in Subarea 8-South.	Sr-90 was detected at a concentration of 1.53 pCi/g in surface soils at sample Location 22, and an aerial photo feature "Disturbed Soil".	Sr-90
8S-00031	Surface	Approximately 15 feet south of Location 22 in Subarea 8-South.	Sr-90 was detected at a concentration of 1.53 pCi/g in surface soils at sample Location 22, and an aerial photo feature "Disturbed Soil".	Sr-90
8S-00032	Surface	Approximately 15 feet east of Location 22 in Subarea 8-South.	Sr-90 was detected at a concentration of 1.53 pCi/g in surface soils at sample Location 22, and an aerial photo feature "Disturbed Soil".	Sr-90
8S-00033	Subsurface	Approximately 15 feet north of Location 23 in Subarea 8-South.	Sr-90 was detected at a concentration of 0.873 pCi/g in subsurface soils at sample Location 23, and an aerial photo feature "Disturbed Soil".	Sr-90
8S-00034	Subsurface	Approximately 15 feet west of Location 23 in Subarea 8-South.	Sr-90 was detected at a concentration of 0.873 pCi/g in subsurface soils at sample Location 23, and an aerial photo feature "Disturbed Soil".	Sr-90
8S-00035	Subsurface	Approximately 15 feet south of Location 23 in Subarea 8-South.	Sr-90 was detected at a concentration of 0.873 pCi/g in subsurface soils at sample Location 23, and an aerial photo feature "Disturbed Soil".	Sr-90
8S-00036	Subsurface	Approximately 15 feet east of Location 23 in Subarea 8-South.	Sr-90 was detected at a concentration of 0.873 pCi/g in subsurface soils at sample Location 23, and an aerial photo feature "Disturbed Soil".	Sr-90
8S-00037	Surface	Approximately 15 feet north of Location 11 in Subarea 8-South.	Cs-137 was detected at a concentration of 0.212 pCi/g in surface soils and Sr-90 was detected at a concentration of 1.50 pCi/g in subsurface soils at sample Location 11, and an aerial photo feature "Disturbed Soil".	Sr-90, Gamma Spec
8S-00037	Subsurface	Approximately 15 feet north of Location 11 in Subarea 8-South.	Cs-137 was detected at a concentration of 0.212 pCi/g in surface soils and Sr-90 was detected at a concentration of 1.50 pCi/g in subsurface soils at sample Location 11, and an aerial photo feature "Disturbed Soil".	Sr-90, Gamma Spec
8S-00038	Surface	Approximately 15 feet west of Location 11 in Subarea 8-South.	Cs-137 was detected at a concentration of 0.212 pCi/g in surface soils and Sr-90 was detected at a concentration of 1.50 pCi/g in subsurface soils at sample Location 11, and an aerial photo feature "Disturbed Soil".	Sr-90, Gamma Spec
8S-00038	Subsurface	Approximately 15 feet west of Location 11 in Subarea 8-South.	Cs-137 was detected at a concentration of 0.212 pCi/g in surface soils and Sr-90 was detected at a concentration of 1.50 pCi/g in subsurface soils at sample Location 11, and an aerial photo feature "Disturbed Soil".	Sr-90, Gamma Spec
8S-00039	Surface	Approximately 15 feet south of Location 11 in Subarea 8-South.	Cs-137 was detected at a concentration of 0.212 pCi/g in surface soils and Sr-90 was detected at a concentration of 1.50 pCi/g in subsurface soils at sample Location 11, and an aerial photo feature "Disturbed Soil".	Sr-90, Gamma Spec
8S-00039	Subsurface	Approximately 15 feet south of Location 11 in Subarea 8-South.	Cs-137 was detected at a concentration of 0.212 pCi/g in surface soils and Sr-90 was detected at a concentration of 1.50 pCi/g in subsurface soils at sample Location 11, and an aerial photo feature "Disturbed Soil".	Sr-90, Gamma Spec

U.S. EPA Region 9

Page 5 of 6

Table 1
Summary of Soil Sample Locations
Subarea 8, Round 2

Sample Location	Sample Type	Location Description	Technical Justification	Analytical Suite
8S-00040	Surface	Approximately 15 feet east of Location 11 in Subarea 8-South.	Cs-137 was detected at a concentration of 0.212 pCi/g in surface soils and Sr-90 was detected at a concentration of 1.50 pCi/g in subsurface soils at sample Location 11, and an aerial photo feature "Disturbed Soil".	Sr-90, Gamma Spec
8S-00040	Subsurface	Approximately 15 feet east of Location 11 in Subarea 8-South.	Cs-137 was detected at a concentration of 0.212 pCi/g in surface soils and Sr-90 was detected at a concentration of 1.50 pCi/g in subsurface soils at sample Location 11, and an aerial photo feature "Disturbed Soil".	Sr-90, Gamma Spec
8S-00041	Surface	Approximately 15 feet north of Location 12 in Subarea 8-South.	Sr-90 was detected at a concentration of 0.903 pCi/g in surface soils at sample Location 12, and an aerial photo feature "Disturbed Soil".	Sr-90
8S-00042	Surface	Approximately 15 feet west of Location 12 in Subarea 8-South.	Sr-90 was detected at a concentration of 0.903 pCi/g in surface soils at sample Location 12, and an aerial photo feature "Disturbed Soil".	Sr-90
8S-00043	Surface	Approximately 15 feet south of Location 12 in Subarea 8-South.	Sr-90 was detected at a concentration of 0.903 pCi/g in surface soils at sample Location 12, and an aerial photo feature "Disturbed Soil".	Sr-90
8S-00044	Surface	Approximately 15 feet east of Location 12 in Subarea 8-South.	Sr-90 was detected at a concentration of 0.903 pCi/g in surface soils at sample Location 12, and an aerial photo feature "Disturbed Soil".	Sr-90

Notes:

Refer to Table 2.1 of the Final Field Sampling Plan for Soil Sampling (HGL, 2012a) for a definition of radionuclide symbols.

ESADA - Empire State Atomic Development

pCi/g - picocuries per gram

ATTACHMENT 2

Figure 1	Round 1 Sample Locations
Figure 2	56 Landfill Step-out Plan
Figure 3	Building 4009 Step-out Plan
Figure 4	Former Sodium Disposal Facility Step-out Plan
Figure 5	Empire State Atomic Development Authority Step-out Plan
Figure 6	Subarea 8-South Step-out Plan

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Figure 1
Round 1 Sample Locations
Subarea 8, Round 2
Santa Susana Field Laboratory

U.S. EPA Region 9



Legend

- Samples above RTLs
- Round 1 Soil Sample Locations**
- Drainage
- Subsurface
- Surface Subsurface
- Figure Inset
- Subareas

Notes:
RTL - Radiological trigger level

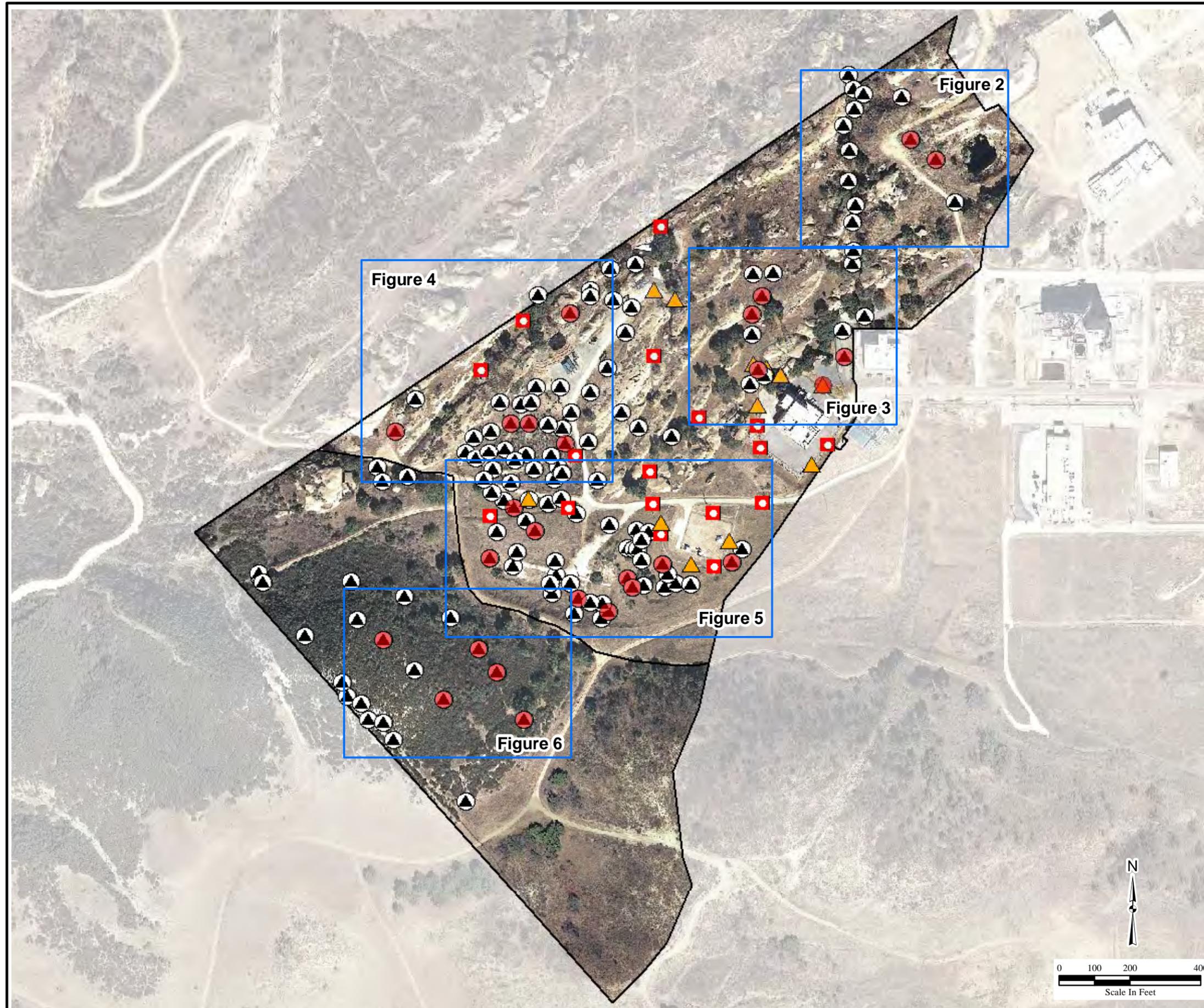


Figure 2
56 Landfill Step-out Plan
Subarea 8, Round 2
Santa Susana Field Laboratory

U.S. EPA Region 9



Legend

- Samples above RTLs
- Round 2 Proposed Step-out Locations**
- ▲ Subsurface
- Round 1 Soil Sample Locations**
- ▲ Surface Subsurface
- Geophysical Anomalies**
- Ground Penetrating Radar
- Magnetometer
- Terrain Conductivity
- Subareas
- Chemical Likely Remediation Zones
- 145 Location ID
- Standard Deviations Above the Mean Total Count Rate
- 0 2 4 6

Notes:
 RTL - Radiological trigger level
 ID - Identification
 ft - Feet
 Pu - Plutonium
 Cs - Cesium
 All data reported in picocuries per gram

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 Fig2_Landfill.mxd
 5/1/2012 pbillcock
 Source:HGL 2010, CIRGIS 2007

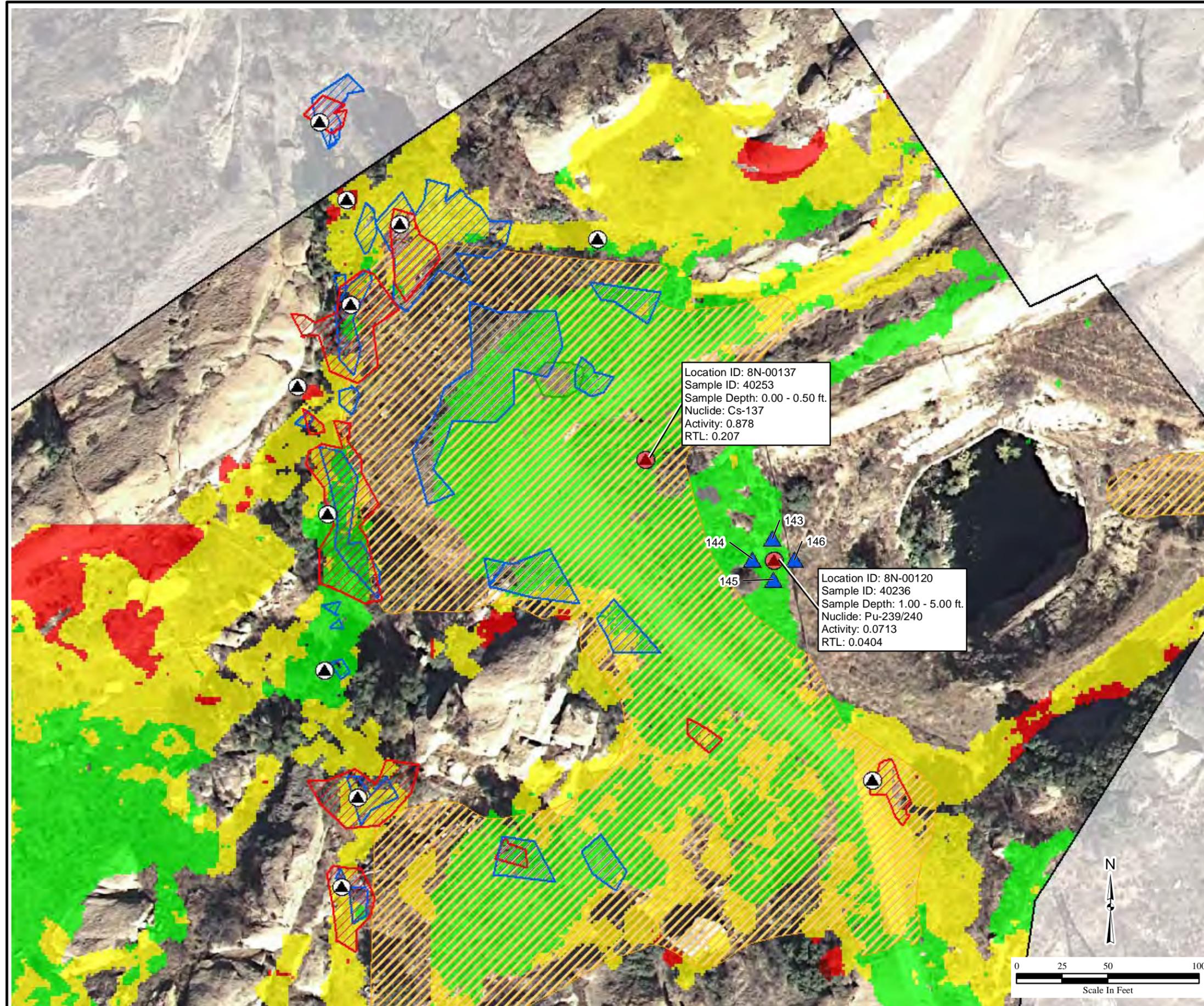


Figure 3
Building 4009 Step-out Plan
Subarea 8, Round 2
Santa Susana Field Laboratory

U.S. EPA Region 9



Legend

- Samples above RTLs
- Round 2 Proposed Step-out Locations**
- ▲ Subsurface
- ⊕ Surface
- Round 1 Soil Sample Locations**
- Drainage
- ▲ Subsurface
- ▲ Surface Subsurface
- Geophysical Anomalies**
- Magnetometer
- Terrain Conductivity
- ▨ Magnetometer
- ▨ Terrain Conductivity
- Terrain Conductivity Fill
- Subareas
- ▨ Chemical Likely Remediation Zones
- ▨ D & D Likely Remediation Zones
- 145 Location ID
- Standard Deviations Above the Mean Total Count Rate
- 0 2 4 6

Notes:
 RTL - Radiological trigger level
 D & D - Decontamination and decommissioning
 ID - Identification
 ft - Feet
 Sr - Strontium
 All data reported in picocuries per gram

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 4/30/2012 pbillock
 Source:HGL 2010, CIRGIS 2007

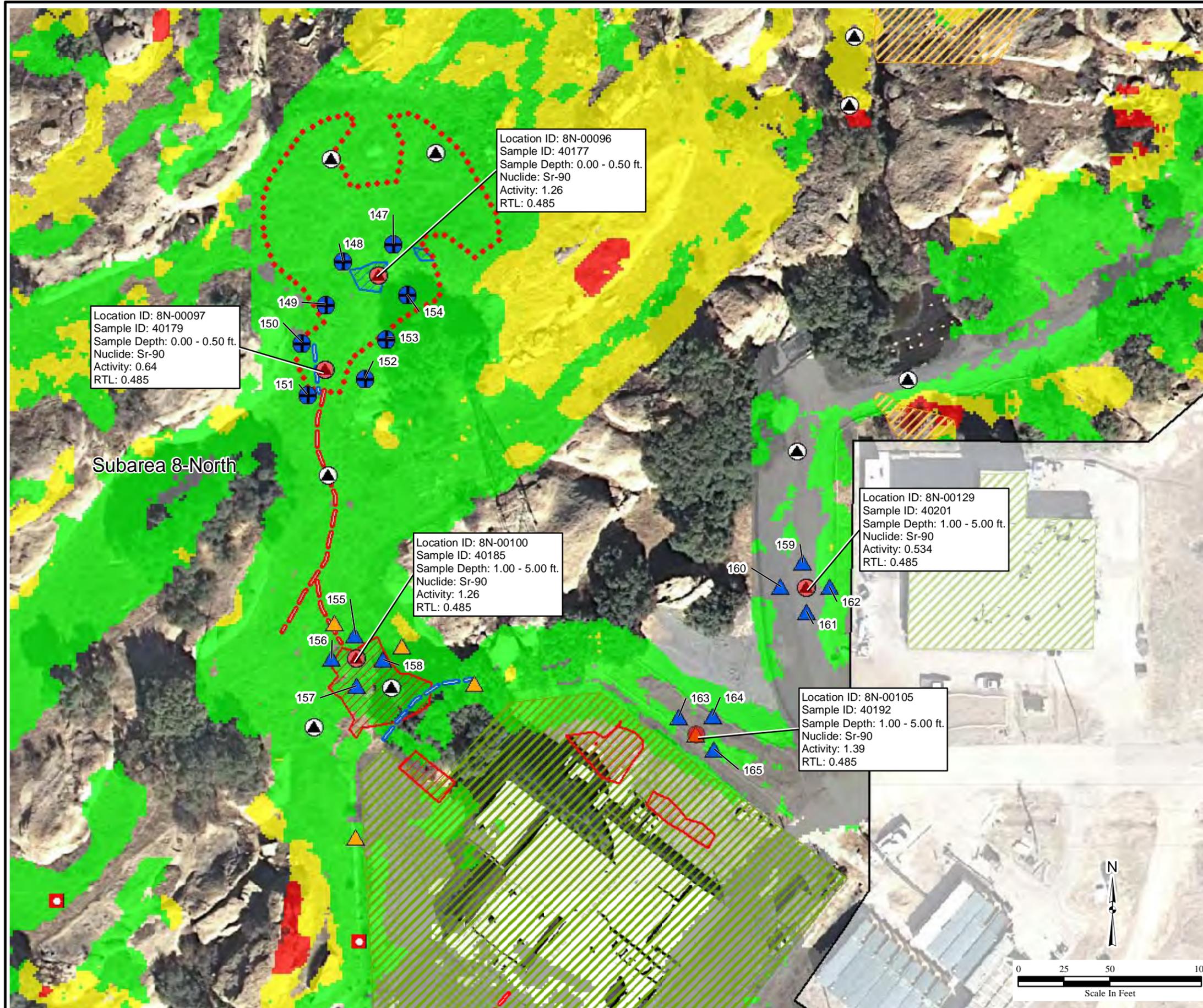


Figure 4
Former Sodium Disposal Facility Step-out Plan
Subarea 8, Round 2
Santa Susana Field Laboratory

U.S. EPA Region 9



Legend

- Samples above RTLs
- Round 2 Proposed Step-out Locations**
- ▲ Subsurface
- + Surface
- Round 1 Soil Sample Locations**
- Drainage
- ▲ Subsurface
- ▲ Surface Subsurface
- Geophysical Anomalies**
- Magnetometer
- Terrain Conductivity
- ▨ Magnetometer
- ▨ Terrain Conductivity
- Subareas
- ▨ Chemical Likely Remediation Zones
- 145 Location ID
- Standard Deviations Above the Mean Total Count Rate
- 0 2 4 6

Notes:

RTL - Radiological trigger level
 ID - Identification
 ft - Feet
 Pu - Plutonium
 Sr - Strontium
 Am - Americium
 All data reported in picocuries per gram

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 Source:HGL 2010, CIRGIS 2007

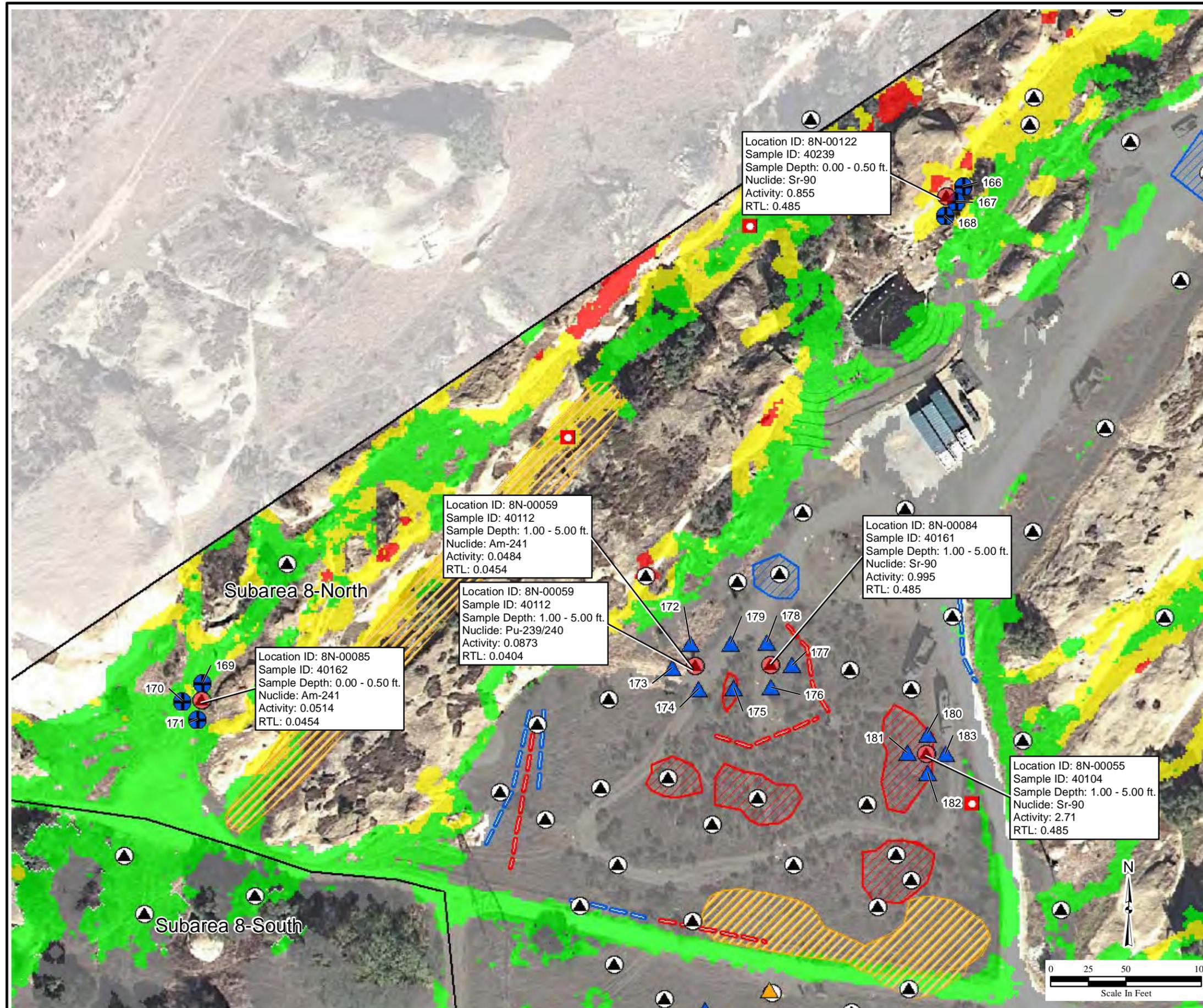


Figure 5
Empire State Atomic Development Authority Step-out Plan
Subarea 8, Round 2
Santa Susana Field Laboratory

U.S. EPA Region 9

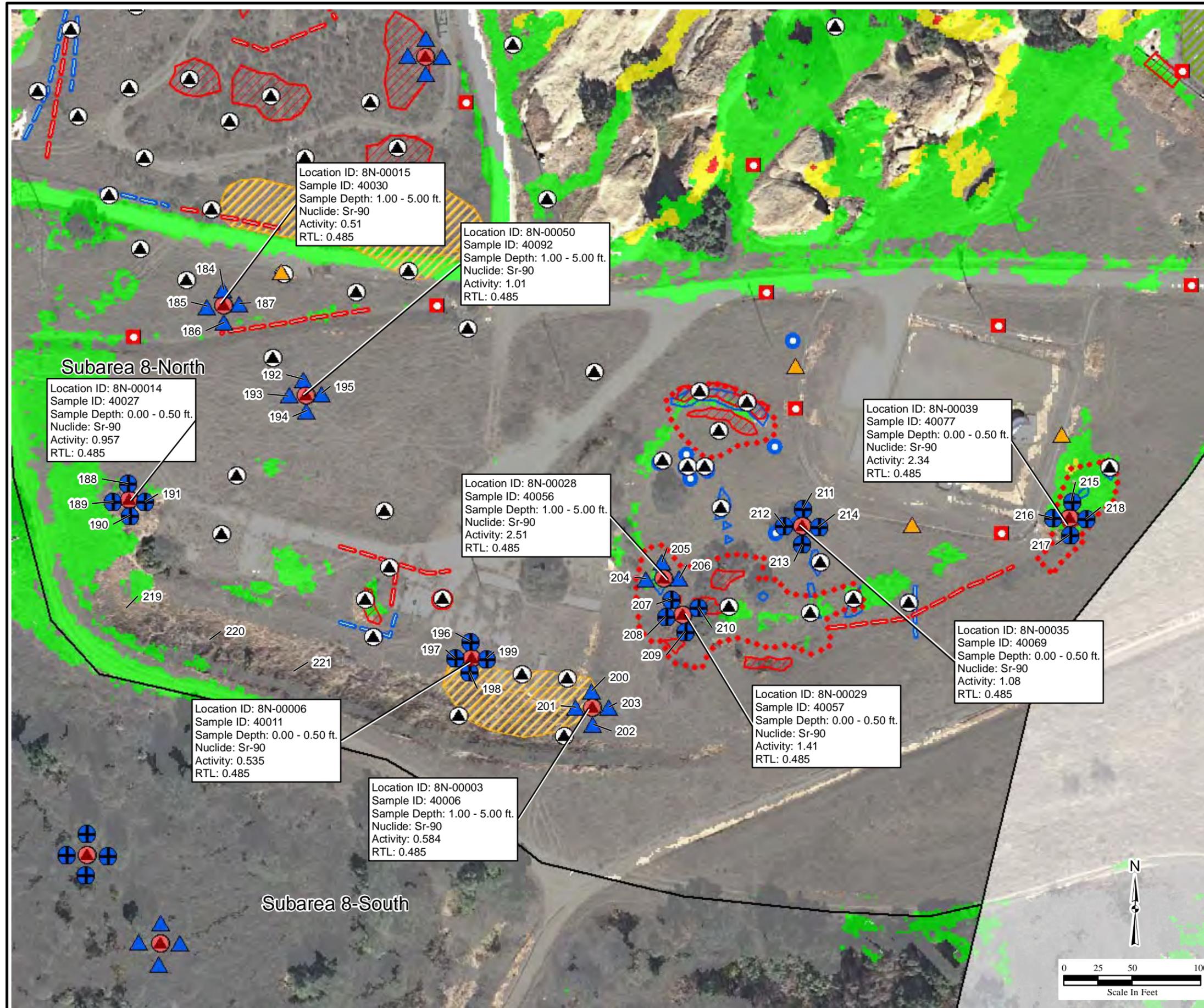


Legend

- Samples above RTLs
 - Round 2 Proposed Step-out Locations**
 - ▲ Subsurface
 - ⊕ Surface
 - Round 1 Soil Sample Locations**
 - Drainage
 - ▲ Subsurface
 - ▲ Surface Subsurface
 - Geophysical Anomalies**
 - Magnetometer
 - Magnetometer
 - Terrain Conductivity
 - ▨ Magnetometer
 - ▨ Terrain Conductivity
 - Terrain Conductivity Fill
 - Subareas
 - Chemical Likely Remediation Zones
 - D&D Likely Remediation Zones
 - 145 Location ID
- Standard Deviations Above the Mean Total Count Rate
- | | | | | |
|---|---|---|---|--|
| | | | | |
| 0 | 2 | 4 | 6 | |

Notes:
 RTL - Radiological trigger level
 D & D - Decontamination and decommissioning
 ID - Identification
 ft - Feet
 Sr - Strontium
 All data reported in picocuries per gram

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 Fig5_ESADA.mxd
 4/30/2012 pbillock
 Source:HGL 2010, CIRGIS 2007



Subarea 8-North

Subarea 8-South

Location ID: 8N-00015
 Sample ID: 40030
 Sample Depth: 1.00 - 5.00 ft.
 Nuclide: Sr-90
 Activity: 0.51
 RTL: 0.485

Location ID: 8N-00050
 Sample ID: 40092
 Sample Depth: 1.00 - 5.00 ft.
 Nuclide: Sr-90
 Activity: 1.01
 RTL: 0.485

Location ID: 8N-00014
 Sample ID: 40027
 Sample Depth: 0.00 - 0.50 ft.
 Nuclide: Sr-90
 Activity: 0.957
 RTL: 0.485

Location ID: 8N-00039
 Sample ID: 40077
 Sample Depth: 0.00 - 0.50 ft.
 Nuclide: Sr-90
 Activity: 2.34
 RTL: 0.485

Location ID: 8N-00028
 Sample ID: 40056
 Sample Depth: 1.00 - 5.00 ft.
 Nuclide: Sr-90
 Activity: 2.51
 RTL: 0.485

Location ID: 8N-00035
 Sample ID: 40069
 Sample Depth: 0.00 - 0.50 ft.
 Nuclide: Sr-90
 Activity: 1.08
 RTL: 0.485

Location ID: 8N-00006
 Sample ID: 40011
 Sample Depth: 0.00 - 0.50 ft.
 Nuclide: Sr-90
 Activity: 0.535
 RTL: 0.485

Location ID: 8N-00029
 Sample ID: 40057
 Sample Depth: 0.00 - 0.50 ft.
 Nuclide: Sr-90
 Activity: 1.41
 RTL: 0.485

Location ID: 8N-00003
 Sample ID: 40006
 Sample Depth: 1.00 - 5.00 ft.
 Nuclide: Sr-90
 Activity: 0.584
 RTL: 0.485

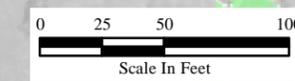


Figure 6
Subarea 8-South Step-out Plan
Subarea 8, Round 2
Santa Susana Field Laboratory

U.S. EPA Region 9



Legend

- Samples above RTLs
- Round 2 Proposed Step-out Locations**
- ▲ Subsurface
- ⊕ Surface
- ▲ Surface Subsurface
- Round 1 Soil Sample Locations**
- ▲ Surface Subsurface
- Subareas

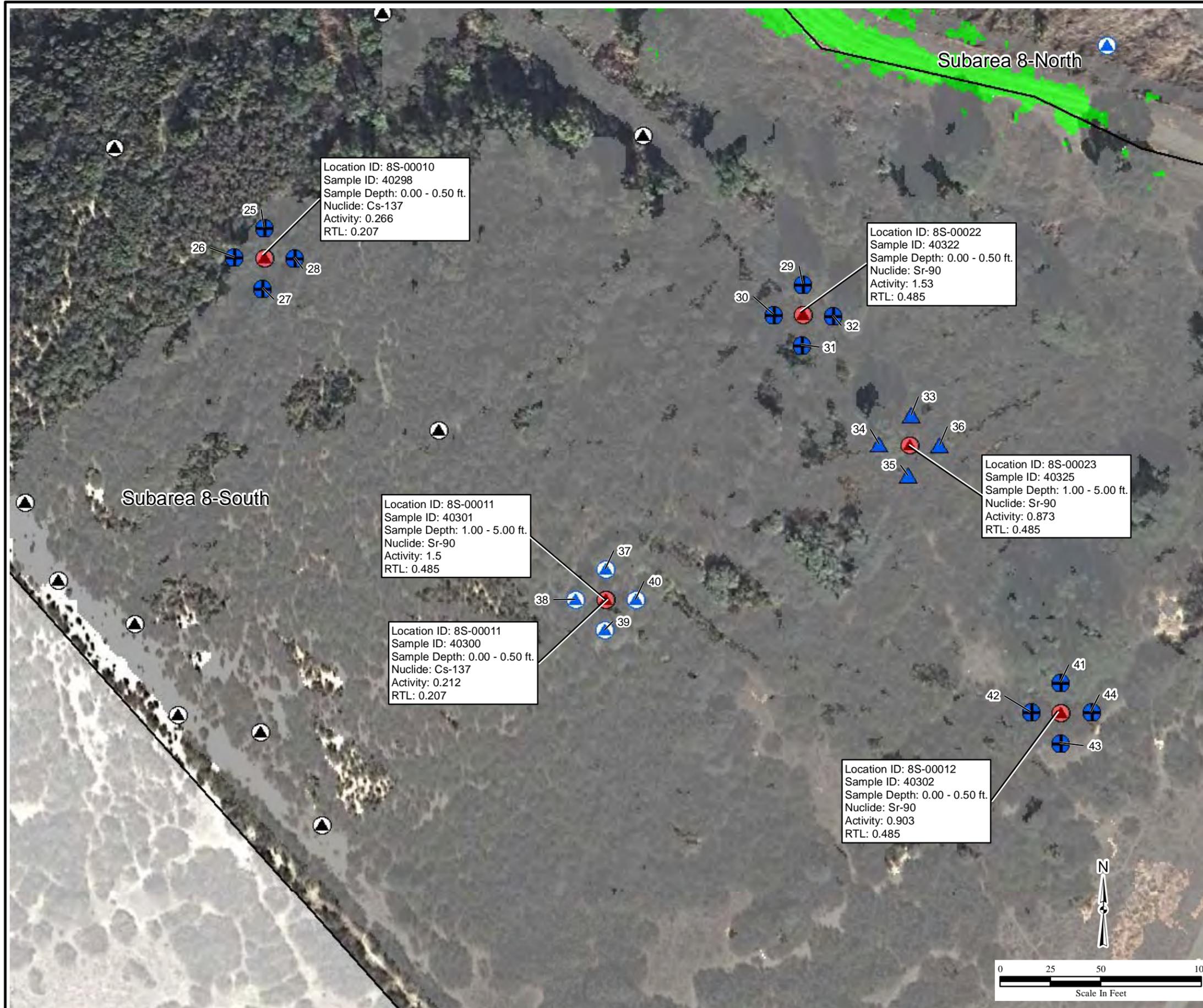
145 Location ID

Standard Deviations Above the Mean Total Count Rate



Notes:

- RTL - Radiological trigger level
- ID - Identification
- ft - Feet
- Cs - Cesium
- Sr - Strontium
- All data reported in picocuries per gram



ATTACHMENT 3

Static Count Subarea 8 North
Geophysical Anomalies Subarea 8
Past Radiological Soil Investigations Subarea 8 North – Map 1
Past Radiological Soil Investigations Subarea 8 North – Map 2
Subarea 8 Aerial Photo Features
Excavation Areas Subarea HSA-8
Process Knowledge Subarea 8
Gamma Anomalies Static Count Subarea 5D South and 8 South
Past Radiological Soil Investigations Subarea 8 South
Plate 1 Subarea HSA-8



Legend

Subarea 8 North Groups

Centerline Roads
 Primary Roads
 Secondary Roads
 Tertiary Roads

Buildings
 Demolished
 Existing

Geophysical Anomalies

- Terrain Conductivity
- Magnetometer
- Ground Penetrating Radar
- Cut and Fill Boundaries
- Magnetometer Anomaly Linear
- Terrian Conductivity Anomaly Linear
- Buried Metals

Surface Water

- Intermittent Stream
- Permanent Stream
- Surface Water
- Lined Channel

Surface Water Flow

Surface Water Flow (From Boeing Database, 2008)

Surface Features

- Channel
- Drain
- Drainage Divide
- Gutter
- Tank
- Tank
- Vault
- Well

Utilities

- Gas
- Storm Drain
- Sanitary Sewer
- Water
- Water (Removed)
- Water (Removed)
- Pipes (Unknown Type)
- Pipes (Unknown Type)

**Geophysical Anomalies
 Subarea 8
 Santa Susana Field Laboratory**

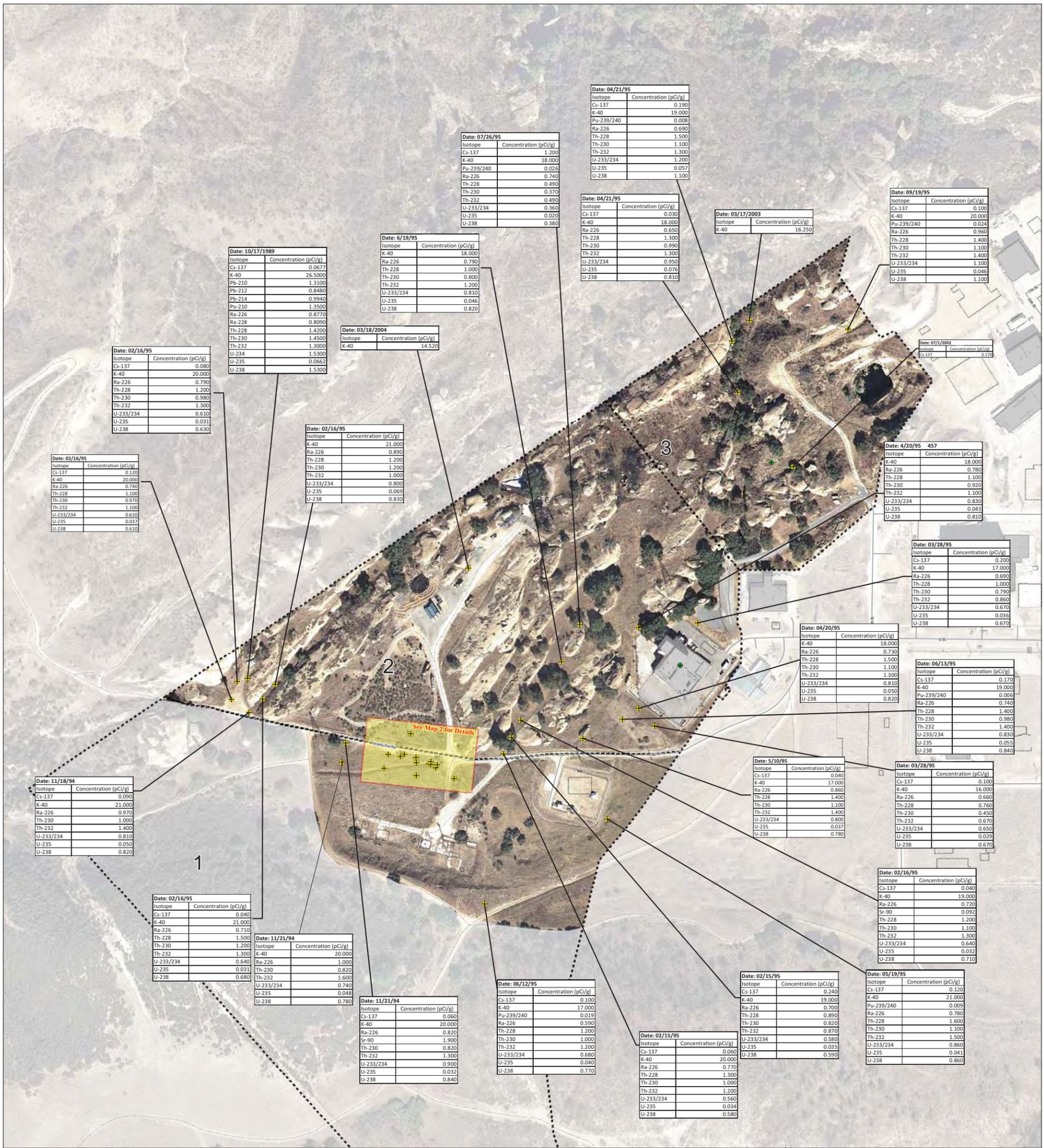
U.S. EPA Region 9



0 37.5 75 150
 Scale In Feet

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 3/16/2011 10:41:00 AM
 Source: HGL 2010, CIRGIS 2007
 Coordinate System: NAD83 CA State Plane V





Legend

- RAD Soil Location**
- + Above NDA
 - + Below NDA
 - Primary Roads
 - Secondary Roads
 - Tertiary Roads
 - Map 2 Area
 - Subarea 8 Groups
 - Demolished
 - Existing
 - ScreenLayer

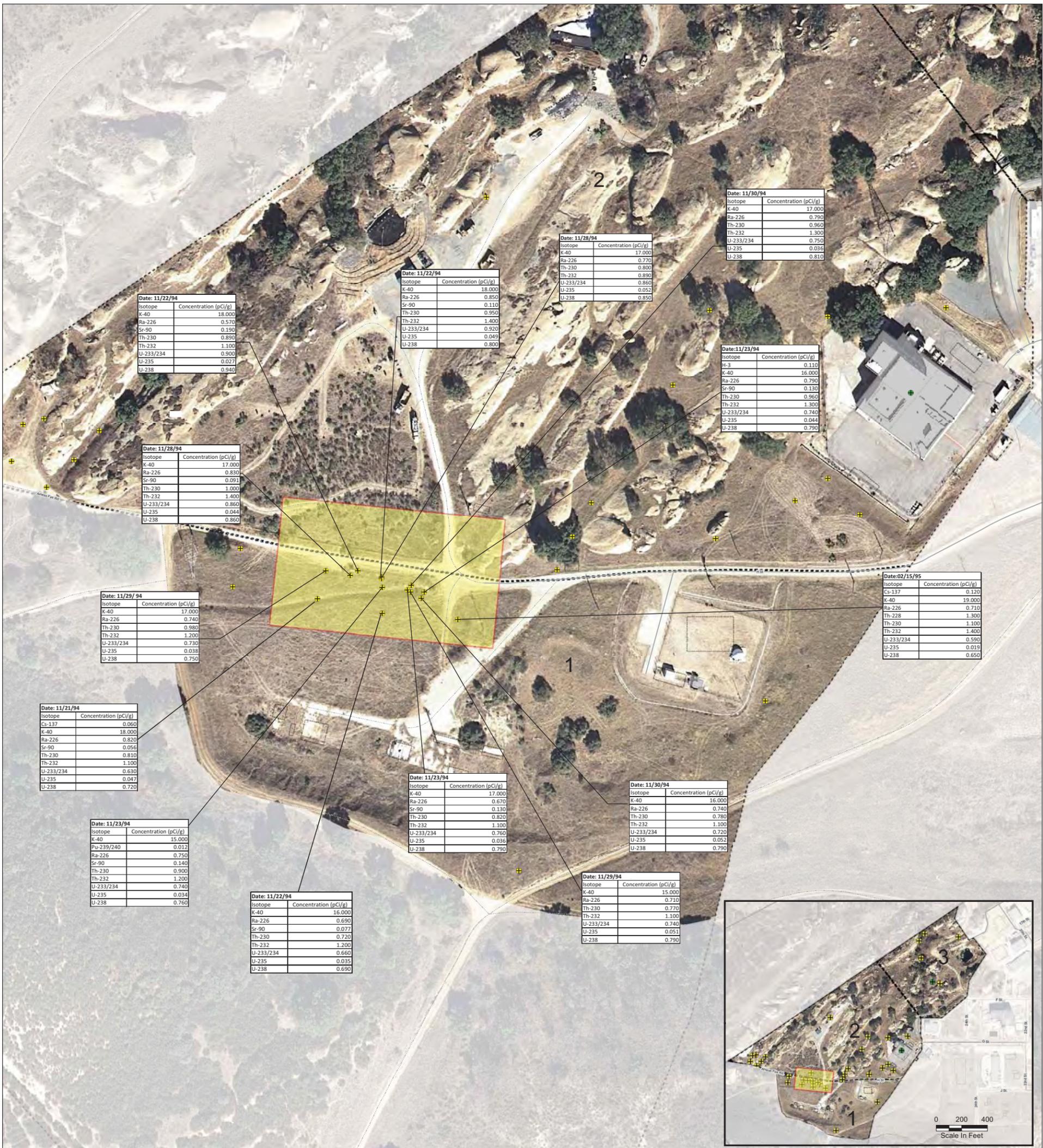
**Past Radiological Soil Investigations
Subarea 8 North - Map 1
Santa Susana Field Laboratory**

U.S. EPA Region 9



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3/15/2011 adullon-kopec
Source: HGL 2010, CHGIS 2007
Coordinate System: NAD83 State Plane Zone V





Date: 11/22/94

Isotope	Concentration (pCi/g)
K-40	18.000
Ra-226	0.570
Sr-90	0.190
Th-230	0.890
Th-232	1.100
U-233/234	0.900
U-235	0.027
U-238	0.940

Date: 11/22/94

Isotope	Concentration (pCi/g)
K-40	18.000
Ra-226	0.850
Sr-90	0.110
Th-230	0.950
Th-232	1.400
U-233/234	0.920
U-235	0.049
U-238	0.800

Date: 11/28/94

Isotope	Concentration (pCi/g)
K-40	17.000
Ra-226	0.720
Th-230	0.800
Th-232	0.890
U-233/234	0.860
U-235	0.052
U-238	0.850

Date: 11/30/94

Isotope	Concentration (pCi/g)
K-40	17.000
Ra-226	0.790
Th-230	0.960
Th-232	1.300
U-233/234	0.750
U-235	0.036
U-238	0.810

Date: 11/23/94

Isotope	Concentration (pCi/g)
H-3	0.110
K-40	16.000
Ra-226	0.790
Sr-90	0.130
Th-230	0.960
Th-232	1.300
U-233/234	0.740
U-235	0.044
U-238	0.790

Date: 11/28/94

Isotope	Concentration (pCi/g)
K-40	17.000
Ra-226	0.830
Sr-90	0.093
Th-230	1.000
Th-232	1.400
U-233/234	0.860
U-235	0.044
U-238	0.860

Date: 11/29/94

Isotope	Concentration (pCi/g)
K-40	17.000
Ra-226	0.740
Th-230	0.980
Th-232	1.200
U-233/234	0.730
U-235	0.038
U-238	0.750

Date: 02/15/95

Isotope	Concentration (pCi/g)
Cs-137	0.120
K-40	19.000
Ra-226	0.710
Th-230	1.300
Th-232	1.100
U-233/234	0.590
U-235	0.019
U-238	0.650

Date: 11/21/94

Isotope	Concentration (pCi/g)
Cs-137	0.060
K-40	18.000
Ra-226	0.820
Sr-90	0.056
Th-230	0.810
Th-232	1.100
U-233/234	0.630
U-235	0.047
U-238	0.720

Date: 11/23/94

Isotope	Concentration (pCi/g)
K-40	17.000
Ra-226	0.670
Sr-90	0.130
Th-230	0.820
Th-232	1.100
U-233/234	0.760
U-235	0.036
U-238	0.790

Date: 11/30/94

Isotope	Concentration (pCi/g)
K-40	16.000
Ra-226	0.740
Th-230	0.780
Th-232	1.100
U-233/234	0.720
U-235	0.052
U-238	0.790

Date: 11/23/94

Isotope	Concentration (pCi/g)
K-40	15.000
Pu-239/240	0.012
Ra-226	0.750
Sr-90	0.140
Th-230	0.900
Th-232	1.200
U-233/234	0.740
U-235	0.034
U-238	0.760

Date: 11/22/94

Isotope	Concentration (pCi/g)
K-40	16.000
Ra-226	0.690
Sr-90	0.077
Th-230	0.720
Th-232	1.200
U-233/234	0.660
U-235	0.035
U-238	0.690

Date: 11/29/94

Isotope	Concentration (pCi/g)
K-40	15.000
Ra-226	0.710
Th-230	0.770
Th-232	1.100
U-233/234	0.740
U-235	0.051
U-238	0.790

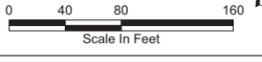


- RAD Soil Location**
- NDA Level**
- ⊕ Above NDA
 - ⊙ Below NDA
 - Primary Roads
 - Secondary Roads
 - Tertiary Roads
 - ScreenLayer
 - Map 2 Area
 - Subarea 8 Groups
 - Demolished
 - Existing

Legend

**Past Radiological Soil Investigations
Subarea 8 North - Map 2
Santa Susana Field Laboratory**

U.S. EPA Region 9



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Subarea8North RadSoil_Map2.mxd
3/15/2011 sdhallow-kapczyk
Source:HGL 2010, CIRGIS 2007





Legend

- Subarea 8 Groups
- Centerline Roads**
 - Primary Roads
 - Secondary Roads
 - Tertiary Roads
- Buildings**
 - Demolished
 - Existing
 - Parking Lots
- Surface Water**
 - Intermittent Stream
 - Permanent Stream
 - Surface Water
 - Lined Channel

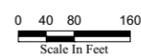
- Tanks**
 - Above ground Storage Tank
 - Underground Storage Tank
 - Unknown Tank Type
 - French Drain Holding Tank
 - Sump
 - Dry Well
 - Tank Footprint
 - Drain
 - Well
 - French Drain
 - Drainage
 - Leach Field
 - Septic System

- Aerial Photography Data**
 - Aerial Photography Features
 - Septic Tank
 - Leach Field
 - Cooling Fan
 - Other
- Utilities**
 - Gas
 - Storm Drain
 - Sanitary Sewer
 - Sanitary Waste
 - Water
 - Water (Removed)

- Surface Features**
 - Channel
 - Drain
 - Drain
 - Drainage Divide
 - Gutter
 - Tank
 - Tank
 - Vault
 - Well
 - Surface Water Flow (From Boeing Database, 2008)

- Aerial Photography Descriptors**

Type	Description
B	Building
CONT	Container
CR	Crales
DB	Debris
DG	Disturbed Ground
DTM	Dark Tone Material
EX	Excavation
FA	Fill Area
GS	Ground Scar
HT	Horizontal Tank
IM	Impoundment
LTMM	Light Toned Mounded Material
MTMM	Medium Toned Mounded Material
OS	Open Storage
PA	Processing Area
PL	Pipeline
POSS	Possible
PROB	Probable
SS	Smoke Stack
ST	Stain
S-T	Storage Tank
UO	Unidentified Object
VT	Vertical Tank
WDA	Waste Disposal Area



Historical Site Assessment
Draft Technical Memorandum - HSA-8

**Subarea 8
Aerial Photo Features
Santa Susana Field Laboratory**

U.S. EPA Region 9



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8/15/2011 phlilock
Source: HGL 2010, CIRGIS 2007
Coordinate System: CA SFW NAD83





Legend

- Subarea 8 Groups
- Centerline Roads**
 - Primary Roads
 - Secondary Roads
 - Tertiary Roads
- Buildings**
 - Demolished
 - Existing
 - Parking Lots
- Surface Water**
 - Intermittent Stream
 - Permanent Stream
 - Surface Water
 - Lined Channel

Excavation Areas

*Historical Site Assessment
Draft Technical Memorandum - HSA-8*

**Excavation Areas
Subarea HSA-8
Santa Susana Field Laboratory**

U.S. EPA Region 9



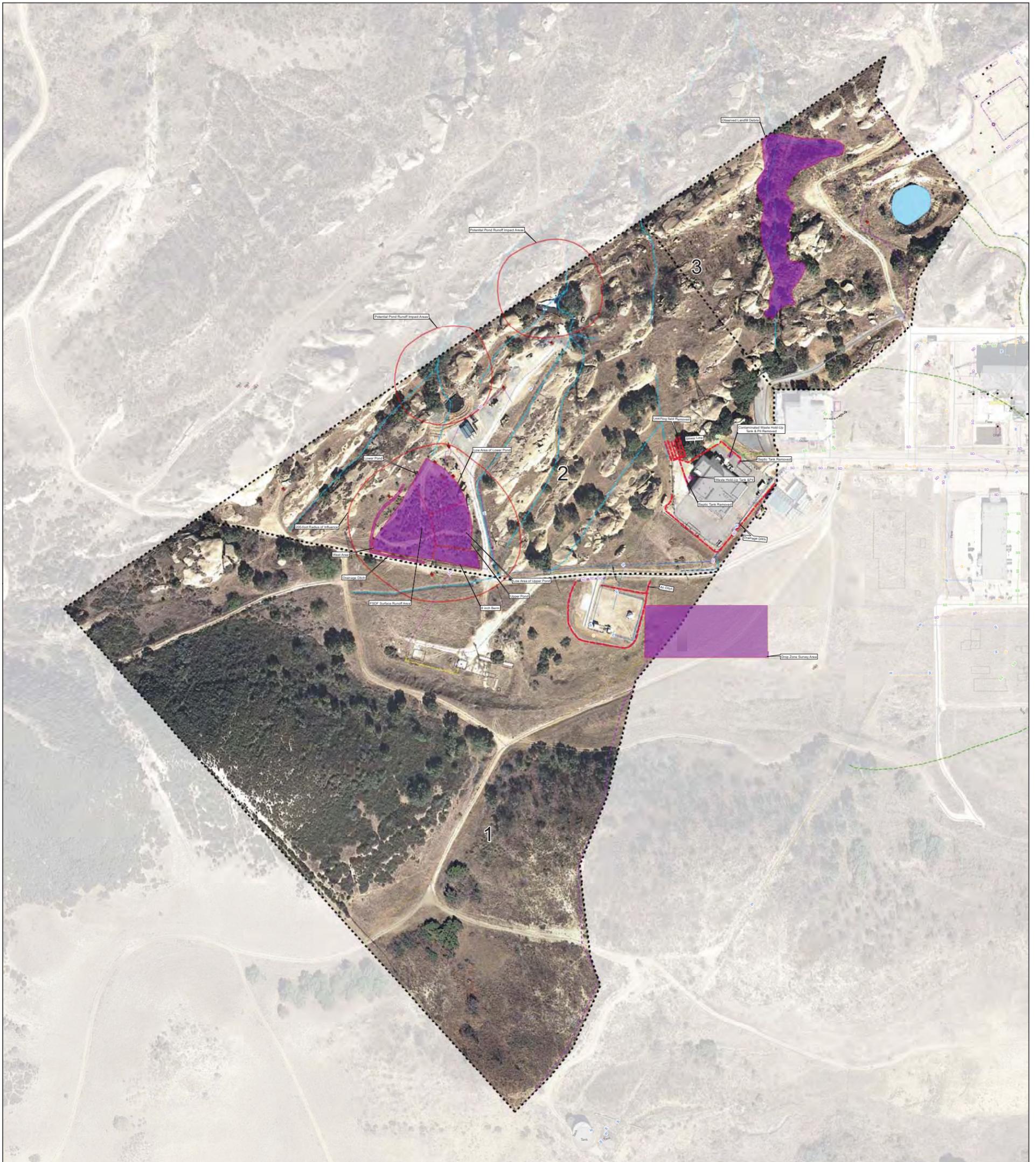




Scale In Feet

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 Source: HGL 2010 CBIGS 2007
 Coordinate System: NAD83 State Plane Zone V





Legend

Subarea 8 Groups

Centerline Roads
 Primary Roads
 Secondary Roads
 Tertiary Roads

Buildings
 Demolished
 Existing
 Parking Lots

Surface Water
 Intermittent Stream
 Permanent Stream
 Surface Water
 Lined Channel

Tanks

- Above ground Storage Tank
- Underground Storage Tank
- Unknown Tank Type
- French Drain Holding Tank
- + Sump
- Dry Well
- Tank Footprint
- Drain
- Well
- French Drain
- Drainage
- Leach Field
- Septic System

Process Knowledge

- Process Knowledge
 - Process Knowledge
- Utilities**
- Gas
 - Storm Drain
 - Sanitary Sewer
 - Sanitary Waste
 - Water
 - Water (Removed)

Surface Features

- Channel
- Drain
- Drain
- Drainage Divide
- Gutter
- Tank
- Tank
- Vault
- Well
- Surface Water Flow (From Boeing Database, 2008)

Aerial Photography Descriptors

- | Type | Description |
|------|-------------------------------|
| B | Building |
| CONT | Container |
| CR | Crates |
| DB | Debris |
| DG | Disturbed Ground |
| DTM | Dark Tone Material |
| EX | Excavation |
| FA | Fill Area |
| GS | Ground Scar |
| HT | Horizontal Tank |
| IM | Impoundment |
| LTMM | Light Toned Mounded Material |
| MTMM | Medium Toned Mounded Material |
| OS | Open Storage |
| PA | Processing Area |
| PL | Pipeline |
| POSS | Possible |
| PROB | Probable |
| SS | Smoke Stack |
| ST | Stain |
| S-T | Storage Tank |
| UO | Unidentified Object |
| VT | Vertical Tank |
| WDA | Waste Disposal Area |

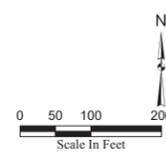
Historical Site Assessment
 Draft Technical Memorandum - HSA-8

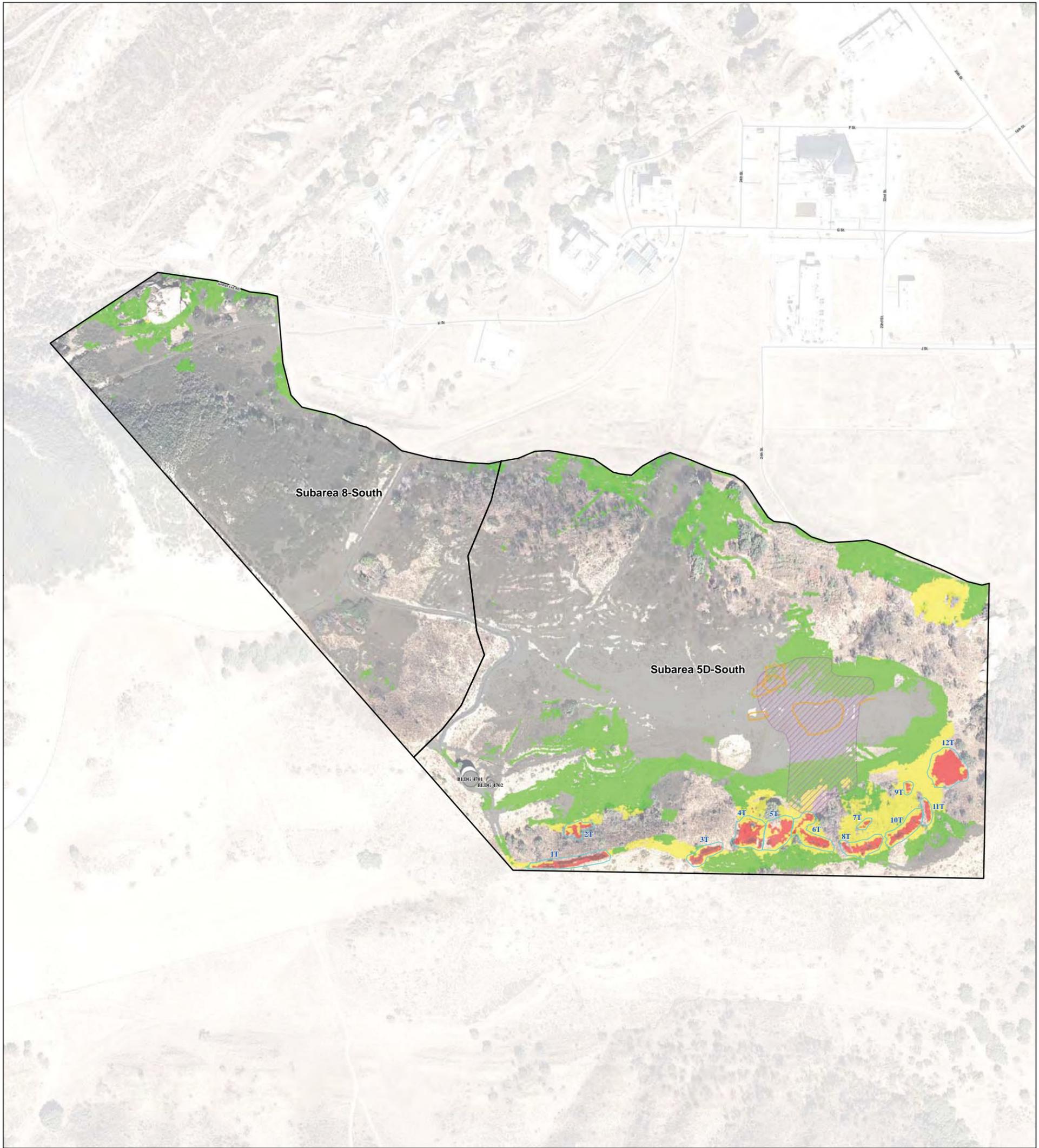
**Process Knowledge
 Subarea 8
 Santa Susana Field Laboratory**

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Legend

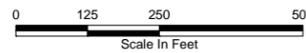
- PGRAY Boundary
- SubArea 5D South and 8 South Boundary
- Geophysical Anomalies
- HSA

Buildings

- DEMOLISHED
- EXISTING

Centerline Roads

- PRIMARY ROADS
- SECONDARY ROADS
- TERTIARY ROADS



**Gamma Anomalies
Static Count
Subarea 5D South and 8 South
Santa Susana Field Laboratory**

U.S. EPA Region 9



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Project: EP909S
Edited: 05/18/11 PL
Source: Boeing Company, 2008
CIRGIS, 2007





Legend

RAD Soil Location

- + Above NDA
- Below NDA
- Subareas_polygon
- Subarea 8 Groups
- Primary Roads
- Secondary Roads
- Tertiary Roads
- ScreenLayer
- Demolished
- Existing

**Past Radiological Soil Investigations
Subarea 8 South
Santa Susana Field Laboratory**

U.S. EPA Region 9



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7/14/2011 adrallos-kopecsky
Source: HGL 2010, CIRGIS 2007





Legend

- Subarea 8 Groups
- Centerline Roads**
 - Primary Roads
 - Secondary Roads
 - Tertiary Roads
- Buildings**
 - Demolished
 - Existing
 - Parking Lots
- Surface Water**
 - Intermittent Stream
 - Permanent Stream
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- Tanks**
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 - Underground Storage Tank
 - Unknown Tank Type
 - French Drain Holding Tank
 - Sump
 - Dry Well
 - Tank Footprint
 - Drain
 - Well
 - French Drain
 - Drainage
 - Leach Field
 - Septic System

- Aerial Photography Data**
 - Aerial Photography Features
 - Septic Tank
 - Leach Field
 - Cooling Fan
 - Other
- Utilities**
 - Gas
 - Storm Drain
 - Sanitary Sewer
 - Sanitary Waste
 - Water
 - Water (Removed)

- Surface Features**
 - Channel
 - Drain
 - Drain
 - Drainage Divide
 - Gutter
 - Tank
 - Vault
 - Well
 - Surface Water Flow (From Boeing Database, 2008)

- Aerial Photography Descriptors**

Type	Description
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OS	Open Storage
PA	Processing Area
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POSS	Possible
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SS	Smoke Stack
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S-T	Storage Tank
UO	Unidentified Object
VT	Vertical Tank
WDA	Waste Disposal Area

Historical Site Assessment
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Plate 1
Subarea HSA-8
Santa Susana Field Laboratory

U.S. EPA Region 9



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