Lockheed Martin Corporation

Supplemental Soil Investigation Sampling and Analysis Plan

Beaumont Site 1

Historical Operational Areas D, E, F, G, H, and I

Beaumont, California

December 2006

Prepared for
Lockheed Martin Corporation
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Acronyms

1,1-DCE	1,1-dichloroethene
1,1,1-TCA	1,1,1-trichloroethane
bgs	below ground surface
DHS	California Department of Health Services
DTSC	California Department of Toxic Substances Control
EPA	U.S. Environmental Protection Agency
ESA	Environmental Site Assessment
FIT	Field Investigation Team
GPR	Ground penetrating radar
HA	Hand Auger
HASP	Health and Safety Plan
HSA	Hollow Stem Auger
LMC	Lockheed Martin Corporation
LPC	Lockheed Propulsion Company
mg/kg	milligrams/kilogram (parts per million)
µg/kg	micrograms per kilogram (parts per billion)
PAH	polyaromatic hydrocarbon
PCB	polychlorinated biphenyl
PCE	tetrachloroethene
QAPP	Quality Assurance Project Plan
REC	Recognized Environmental Concern
SAP	Sampling and Analysis Plan
SVOC	semivolatile organic compound
TCDD	tetrachlorodibenzo-p-dioxin
TCE	trichloroethene
TEF	toxicity equivalent factor
TNT	trinitrotoluene
TPH	total petroleum hydrocarbons
VOC	volatile organic compound

Section 1
Introduction

On behalf of Lockheed Martin Corporation (LMC), Tetra Tech, Inc. has prepared the following Sampling and Analysis Plan (SAP) to perform a supplemental subsurface site investigation in six (6) Historical Operational Areas at LMC's Beaumont Site 1: Area D (Lockheed Propulsion Company [LPC] Ballistics Test Range), Area E (Radioactive Waste Disposal Site), Area F (LPC Test Services Area), Area G (Helicopter Weapons Test Area), Area H (Sanitary Landfill), and Area I (Western Aerojet Range). In general, Beaumont Site 1 (also known as Potrero Creek) consists of approximately 9,100 acres and is located approximately 70 miles east of Los Angeles in the City of Beaumont, California. Historically, the facility was used primarily for the assembly and testing of rocket motors and ancillary testing.

These subsurface soil investigations in Historical Operational Areas D through I at Beaumont Site 1 are follow-on activities to the site investigation conducted by Tetra Tech in 2004. These proposed supplemental investigations will be conducted through a combined soil boring and soil gas program. This SAP presents an overview of historical chemical usage and previous investigations conducted in Areas D through I as defined in the Phase I Environmental Site Assessment (Tetra Tech, 2003a) and the Soil Investigation Report for the six Historical Operational Areas (Tetra Tech, 2005). In addition, the SAP provides the proposed soil borings and soil gas locations, sampling intervals, and analytical scheme. The information from this supplemental subsurface soil investigation will serve as a guide to delineate chemically impacted soil in Historical Operational Areas D through I at Beaumont Site 1.

The Volume I, Lockheed Beaumont Facilities, Preliminary Site Investigation Work Plan (Work Plan; Tetra Tech, 2003b) presents a brief site history and summary of the technical approach to site investigations. The Work Plan also includes the Quality Assurance Project Plan (QAPP) and Health and Safety Plan (HASP). The content of the Work Plan, QAPP, and HASP remain appropriate for implementation as part of this SAP, unless amended herein.

This SAP for Historical Operational Areas D through I is organized as follows:

- Section 2 - Site History: This section provides a summary of historical operations and chemical usage at Historical Operational Areas D through I and a summary of previous environmental investigations conducted in these areas.

- Section 3 – Sampling Approach: This section provides a description of the proposed subsurface soil investigation. The information presented includes a list of each assessment feature, the rationale for assessment, and the proposed boring and soil gas sampling locations, sampling intervals, and analytical scheme.

- Section 4 – References: This section lists all the documents referenced for this SAP.

Section 2
Site History

2.1 AREA DESCRIPTION

Historical Operational Areas D through I occupy the central and western portion of Beaumont Site 1 (Figure 2-1). A brief description of each Area is presented below:

- *Historical Operational Area D* – also known as the LPC Ballistics Test Range, was primarily used as a firing range for several types of ammunition.
- *Historical Operational Area E* – also known as the Radioactive Waste Disposal Site, was used as a one time burial site for low-level radioactive waste.
- *Historical Operational Area F* – also known as the LPC Test Services Area, was used for testing the integrity of the solid rocket motor propellant casing.
- *Historical Operational Area G* – also known as the Helicopter Weapons Test Area, was used to develop equipment for handling and testing of helicopter weapons systems.
- *Historical Operational Area H* – also known as the Sanitary Landfill, was a permitted sanitary landfill used for the disposal of trash generated during routine daily operations.
- *Historical Operational Area I* – also known as the Western Aerojet Range, was used to conduct incendiary bomb testing.

2.2 PREVIOUS SITE INVESTIGATIONS

A total of 26 historical features have been identified as potential recognized environmental concerns (RECs) within Historical Operational Areas D through I (Tetra Tech, 2003a). Various soil investigations, soil gas surveys, and remediation activities have been performed in Historical Operational Areas D through I of Beaumont Site 1 since 1984. Various reports were reviewed to identify areas of known or suspected chemical usage and/or storage. A summary of the identified features with cross-referencing to previous investigations, and report text sections, figures, and tables is presented in Table 2-1. A summary of each document reviewed is presented in Table 2-2.

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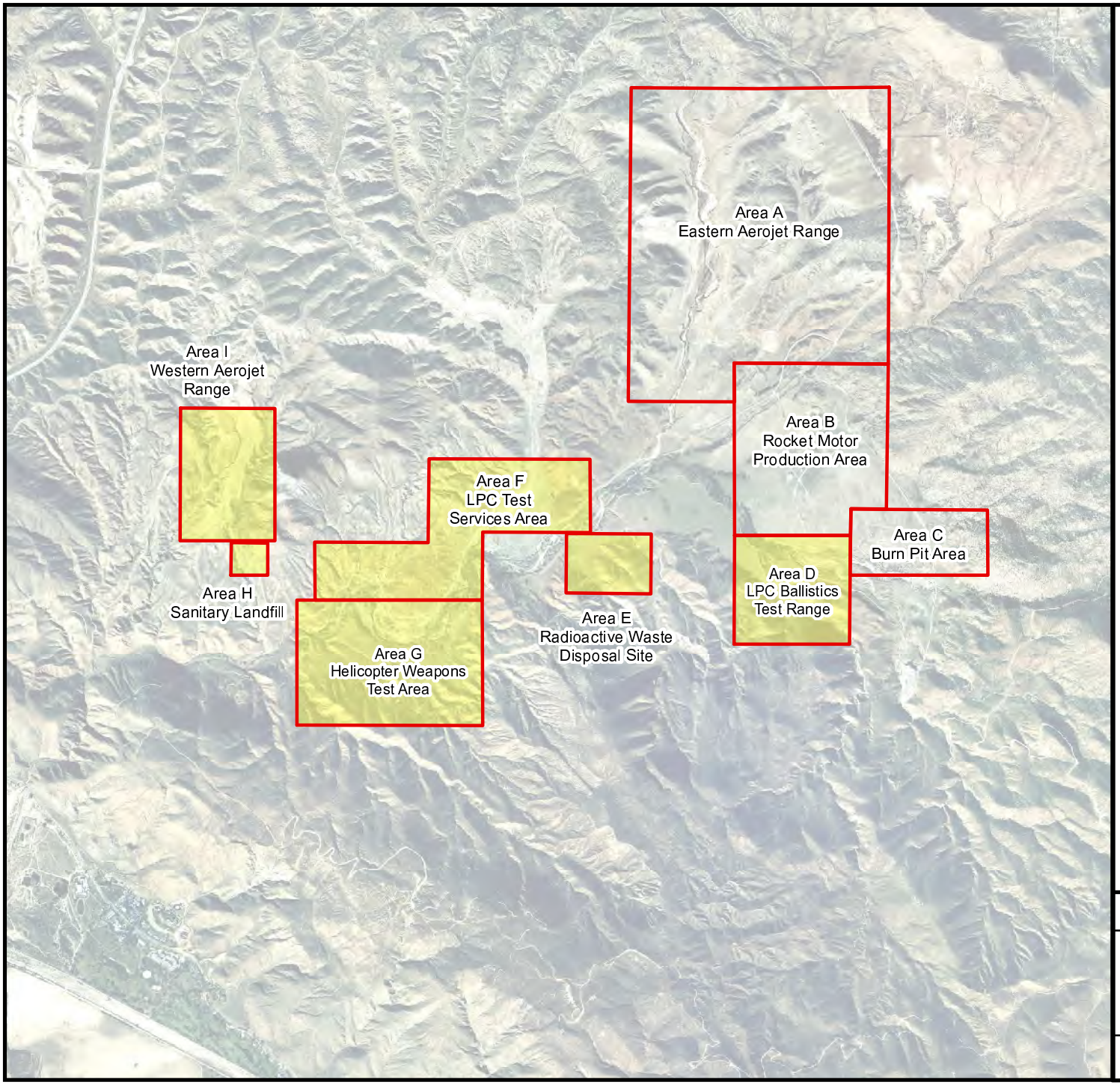

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Adapted from:

2003 aerial photograph.

LEGEND

- Beaumont Site 1 Property Boundary
- Historical Operational Area Boundary
- Investigation Area

Beaumont Site 1

Figure 2-1

Historical Operational Area Map

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December 2006

Table 2-1

Historical Feature Summary Information
Historical Operational Areas D Through I

Historical Operational Area	Historical Feature No.	Historical Feature	Previous Investigations	Sampling and Analysis Plan Sections	Sampling and Analysis Plan Figures and Tables	Additional Investigation Proposed
Historical Operational Area D	26	**Small Test Area For Incendiary Bombs:** This location was used for testing 500-pound incendiary bombs. Drums containing various fuels were placed within the test area to observe if shrapnel would penetrate the drums and ignite the fuel. Chemicals of concern at this feature included fuels (i.e., jet fuel, gasoline, and diesel) and explosive residue.	Tetra Tech, 2003a Tetra Tech, 2005	Section 2.2.1	Figure 2-2, Table 2-2, and Table 2-3	No
	27	**Former Class A Storage Area:** This area consisted of three 10-foot by 10-foot buildings that were used for the storage of Class A explosives.	Tetra Tech, 2003a Tetra Tech, 2005	Section 2.2.1	Figure 2-2, Table 2-2, and Table 2-3	No
	28	**Former Dissolved Trinitrotoluene (TNT) Disposal Area:** Acetone was used to dissolve TNT and remove it from the interior of the incendiary bombshells.	Tetra Tech, 2003a Tetra Tech, 2005	Section 2.2.1	Figure 2-2, Table 2-2, and Table 2-3	No
	29	**Ballistics Tunnel and Support Facilities:** This area was used for ballistics testing of various weapons.	Tetra Tech, 2003a Tetra Tech, 2005	Section 2.2.1	Figure 2-2, Table 2-2, and Table 2-3	No
	30	**Machine Gun Testing Area:** This area was used for impact testing. A 50-caliber machine gun was fired at rocket motor casings. Ammonium perchlorate and explosives were reported to have been used at this feature.	Tetra Tech, 2003a Tetra Tech, 2005	Section 2.2.1	Figure 2-2, Table 2-2, and Table 2-3	No
	31	**Projectile Landing Zone:** Various weapons were fired at the base of this terraced hill. The projectile landing area was terraced to prevent rounds from ricocheting to higher areas. Live warheads were not reported to have been used.	Tetra Tech, 2003a Tetra Tech, 2005	Section 2.2.1	Figure 2-2, Table 2-2, and Table 2-3	No
	32	**Drums:** Three drums were observed. The former contents of the drums are unknown.	Tetra Tech, 2003a Tetra Tech, 2005	Section 2.2.1	Figure 2-2, Table 2-2, and Table 2-3	No
Historical Operational Area E	No historical features have been identified as potential recognized environmental concerns (RECs) in this area.		Radian, 1986a Radian, 1986b Radian, 1990 Tetra Tech, 2003a	Section 2.2.2	Table 2-2	No

Table 2-1 (Continued)

Historical Operational Area	Historical Feature No.	Historical Feature	Previous Investigations	Sampling and Analysis Plan Sections	Sampling and Analysis Plan Figures and Tables	Additional Investigation Proposed
Historical Operational Area F	33	**Washout Area:** Defective solid rocket propellant was washed out of the motor casings with groundwater supplied by a former groundwater production well. A high-pressure water jet was used to flush propellant. The solid propellant pieces produced from the washout activities were collected in a sieve and later packed into drums and brought to the burn pit area for incineration. Additionally a long trench, leading to an unlined catch basin, caught the over spray. After the water percolated into the soil, the remaining solid pieces of propellant were burned directly in the catch basin. Fuel, ammonium perchlorate, and ferrocene were reported to have been in the propellant products.	Tetra Tech, 2003a Tetra Tech, 2005	Section 2.2.3	Figure 2-3, Table 2-2, and Table 2-4	Yes, See Section 3.2.1, Table 3-1, and Figure 3-1
	34	**Maintenance Shop (Bldg. 306) and Storage Warehouse (Bldg. 314):** The shops were used for general equipment/material storage and possible instrument repair and maintenance. Oils, fuels, solvents, and paints were reported to have been used in this area.	Tetra Tech, 2003a Tetra Tech, 2005	Section 2.2.3	Figure 2-3 Table 2-2, and Table 2-4	Yes, See Section 3.2.1, Table 3-1, and Figure 3-1
	35	**Betatron Building (Bldg. 303):** The building was used for nondestructive testing, housing a 25 Mega-electron volt Betatron radiographic unit. The primary use of the Betatron unit was to X-ray rocket motors for voids or foreign material in the solid propellant. A large transformer was also located outside the building. Solvents, PCB (polychlorinated biphenyl) oil, and penetrants were likely to have been used in this area.	General Electric, 1984 Tetra Tech, 2003a Tetra Tech, 2005	Section 2.2.3	Figure 2-4 Table 2-2, and Table 2-4	Yes, See Section 3.2.1, Table 3-1, and Figure 3-2
	36	**EBES Testing (Facility 313)**: The building contained a pressure vessel, pumps, and environmental chambers. Transformers, hydraulic systems, and mercury gauges/switches may have been present at this feature.	Tetra Tech, 2003a Tetra Tech, 2005	Section 2.2.3	Figure 2-3 Table 2-2, and Table 2-4	Yes, See Section 3.2.1, Table 3-1, and Figure 3-1
	37	**Beryllium Waste Storage Area:** Beryllium scrap was placed in 55-gallon drums at this location. Reportedly the beryllium was disposed of offsite.	Tetra Tech, 2003a Tetra Tech, 2005	Section 2.2.3	Figure 2-3 Table 2-2, and Table 2-4	No
	38	**Environmental Chambers:** This feature formerly consisted of environmental chambers designed to simulate conditions of humidity, rain, immersion, infrared radiation, salt spray, dust, and altitude.	Tetra Tech, 2003a Tetra Tech, 2005	Section 2.2.3	Figure 2-3 Table 2-2, and Table 2-4	No
	39	**Test Bays (Bldgs. 308, 309, & 310):** These structures were used for the firing of large and small rocket motors. Solvents may have been utilized to clean equipment or walls.	Tetra Tech, 2003a Tetra Tech, 2005	Section 2.2.3	Figure 2-3 Table 2-2, and Table 2-4	Yes, See Section 3.2.1, Table 3-1, and Figure 3-1

Table 2-1 (Continued)

Historical Operational Area	Historical Feature No.	Historical Feature	Previous Investigations	Sampling and Analysis Plan Sections	Sampling and Analysis Plan Figures and Tables	Additional Investigation Proposed
	40	**Electrical Enclosure:** This structure possibly housed an electrical transformer. PCBs may have been used at this feature.	Tetra Tech, 2003a Tetra Tech, 2005	Section 2.2.3	Figure 2-3 Table 2-2, and Table 2-4	Yes, See Section 3.2.1, Table 3-1, and Figure 3-1
	41	**Storage Areas (Facilities T-3 & T-4):** These two structures were used to temporarily store rocket motor segments.	Tetra Tech, 2003a Tetra Tech, 2005	Section 2.2.3	Figure 2-4 Table 2-2, and Table 2-4	No
	42	**Storage Bunkers (Bldgs. 311 & 325):** These features were used to store explosives and rocket motors behind earthen revetments.	Tetra Tech, 2003a Tetra Tech, 2005	Section 2.2.3	Figure 2-4 Table 2-2, and Table 2-4	No
	43	**Small Motor Assembly Building (Bldg. 312):** The building was used for assembly of small rocket motors and later used for storage of vehicles, equipment, and for vehicle maintenance. Potential contaminants include solvents, fuels, and oils.	Tetra Tech, 2003a Tetra Tech, 2005	Section 2.2.3	Figure 2-4 Table 2-2, and Table 2-4	No
	44	**Electrical Enclosure, Boneyard, Test Motors Conditioning Oven Complex (Bldgs. 307):** The electrical enclosure is located west of Building 307 and contained electrical transformers. Building 307 is located with six former conditioning ovens. PCBs and other unknown chemicals may have been used at this feature. In addition, a former boneyard existed north of the facility where heavy equipment and steel were formerly located.	Tetra Tech, 2003a Tetra Tech, 2005	Section 2.2.3	Figure 2-4 Table 2-2, and Table 2-4	No
	45	**Test and Instrumentation/Personnel Bunker (Bldgs. 304 & 305):** These bunkers provided protection for personnel during site testing operations. Building 304 was used strictly for protection and had no historical chemical usage, therefore no investigations were conducted. Building 305 was the main personnel and instrumentation bunker for testing. Fuels, solvents, and lubricants may have been stored in a smaller attached structure.	Tetra Tech, 2003a Tetra Tech, 2005	Section 2.2.3	Figure 2-3 Table 2-2, and Table 2-4	No
Historical Operational Area G	46	**Helicopter Landing Pad and Hanger (Bldg. 302):** It is unknown if helicopters were fueled and serviced in this area.	Tetra Tech, 2003a Tetra Tech, 2005	Section 2.2.4	Figure 2-5, Table 2-2, and Table 2-5	Yes, See Section 3.2.2, Table 3-2, and Figure 3-3
	47	**Asphalt Pads:** The asphalt pads are approximately 15 feet by 15 feet and are of unknown function.	Tetra Tech, 2003a Tetra Tech, 2005	Section 2.2.4	Figure 2-5, Table 2-2, and Table 2-5	No

Table 2-1 (Continued)

Historical Operational Area	Historical Feature No.	Historical Feature	Previous Investigations	Sampling and Analysis Plan Sections	Sampling and Analysis Plan Figures and Tables	Additional Investigation Proposed
	48	**Gun Mount Test Area:** This feature consists of two concrete pads that were used as bases for stationary ground-mounted guns.	Tetra Tech, 2003a Tetra Tech, 2005	Section 2.2.4	Figure 2-5, Table 2-2, and Table 2-5	No
Historical Operational Area H	49	**Sanitary Landfill:** The landfill has historically been used as a general refuse area, where paper, scrap metal, concrete, and wood generated during routine daily operations were deposited. The landfill is permitted by the California Department of Forestry. Visible debris fragments are exposed on the ground surface along with empty 55-gallon drums.	Radian, 1990 Tetra Tech, 2003a Tetra Tech, 2005	Section 2.2.5	Figure 2-6, Table 2-2, and Table 2-6	Yes, See Section 3.2.3, Table 3-3, and Figure 3-4
Historical Operational Area I	50	**Incendiary Bomb Test Area:** The area was used to detonate large bombs. Drums of fuel were placed in a circle and a bomb or explosive device was activated to determine blast effectiveness.	Tetra Tech, 2003a Tetra Tech, 2005	Section 2.2.6	Figure 2-7 and Table 2-2	No
	51	**Airstrip Area:** The area consists of a 2,000-foot long runway. Various debris such as tires, fencing, and brake drums are scattered about the airstrip. Historical site use included agricultural grazing.	Tetra Tech, 2003a Tetra Tech, 2005	Section 2.2.6	Figure 2-7 and Table 2-2	No

Table 2-2

Summary of Investigation and Remediation Documents Reviewed for Historical Operational Areas D through I

Document Title, Author and Date	Report Findings
General Electric Engineering Appraisal Report for Lockheed Corporation Beaumont Site (Site No. 2) and Potrero Site (Site No. 1), General Electric Company (P.J. Jelito), July 1984 (General Electric, 1984)	Report recommended remedial actions and repairs in the following areas based on field observations of vandalized equipment. Beaumont Site: 1) remove PCB-contaminated blacktop between the substation and the concrete gutter east of bldg. 250; 2) remove sand and gravel around the concrete pad of the substation; and 3) remove overhead wires and communications cables and wires. Potrero Site: 1) remove soil adjacent to the transformer pad, west of the Betatron Building; 2) remove soil adjacent to the concrete gutter; 3) remove soil from the southern end of the concrete gutter; 4) remove soil around the spot where soil sample #74 was collected; 5) remove soil from the area next to the driveway; 6) dispose of three transformers; 7) dispose of three oil switches; 8) dispose of all vandalized transformers to a commercial disposal site; 9) store or dispose of five oil-fused cut out assemblies; 10) drain and analyze an oil switch for PCB content; and 11) dispose of two abandoned power capacitors. Report also stated that an area adjacent to the Betatron Building transformer was excavated (approximately 5'x 7'x 6" deep) and soil disposed of at a disposal site located in Casmalia, California.
Lockheed Propulsion Company Beaumont Test Facilities Historical Report, Radian Corporation (C. Koerner, J. Billica), September 1986 (Radian, 1986c)	The report identifies eight areas at Beaumont Site No. 1 where additional investigation/activities should be performed (i.e., sampling, debris removal): Propellant Mixing Area, Motor Washout Areas, Burn Pit Area, LPC Test Area, LPC Ballistics Test Range, Aerojet Ballistics Test Areas, Permitted Sanitary Landfill, and the Radioactive Waste Disposal Area.
Radian Corporation, 1986a. Hydrogeologic Study Report, Lockheed Propulsion Company, Beaumont Test Facilities (Radian, 1986b)	A ground penetrating radar survey was conducted in Canyon 1, 2, and 3, south of the Betatron Building, to identify and delineate the potential location of a low-level radioactive waste burial site. Survey results identified two anomalous features resembling former excavation areas within Canyon 1.
CERCLA Site Inspection Lockheed Propulsion Company Beaumont Test Facilities, Ecology and Environment Inc. (C. Lichens, A. Vargas), January 23, 1987 (Ecology and Environment, 1987)	The Field Investigation Team (FIT) for Ecology and Environment recommended the following: 1) a soil vapor survey in the Burn Pit Area to aid in determining locations of future monitoring wells to define the plume of hydrocarbon contamination in groundwater; 2) a soil vapor survey in the washout areas; 3) a soil vapor survey at the sanitary landfill; 4) soil removal from all three radioactive material canyons until the radioactive waste disposal area is located;, and 5) the U.S. Environmental Protection Agency (EPA) monitor the progress of the Lockheed Beaumont investigation and the California Department of Health Services (DHS) maintain the lead in the investigation.
Source and Hydrological Investigation, Lockheed Propulsion Company, Beaumont Test Facilities, Radian Corporation, February 1990 (Radian, 1990)	The source investigation involved removal of low-level radioactive material (within Historical Operational Area E) and locating and sampling suspect areas within the previously identified sanitary landfill (within Historical Operational Area H), burn pit area (within Historical Operational Area C), and rocket motor production area (within Historical Operational Area B) to identify waste materials and contaminant sources. Waste, soil, soil gas, and groundwater samples were collected and analyzed for volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs), and metals during the investigation. The majority of the VOC and SVOC analytical results for soil and soil gas reported were assumed to have been due to laboratory contamination. However, validated reports of 1,1,1-trichloroethane (1,1,1-TCA); 1,1-dichloroethene (1,1-DCE); trichloroethene (TCE); tetrachloroethene (PCE) and iron were detected at low concentrations.
Lockheed Beaumont, Site 1 & 2, Phase 1 Environmental Site Assessment (ESA), Beaumont, California, Tetra Tech, March 2003 (Tetra Tech, 2003a)	The Phase I ESA summarized available documentation regarding historical and current potential recognized environmental concerns (RECs) that may have resulted from past and/or current property usage. The ESA reported: storage, handling, and disposal practices of chemicals and hazardous materials; historical process lines, storage vessels, underground storage tanks and other features that may have served as discharge points for chemicals; and the historical use and operations that may have environmentally impacted the properties during the past 50 years. Fifty-four (54) historical or potential RECs were identified at Beaumont Site 1.

Table 2-2 (Continued)

Document Title, Author and Date	Report Findings
Lockheed Martin Soil Investigation Report, Beaumont Site 1, Historical Operational Areas D, E, F, G, H and I, Beaumont, California, Tetra Tech, Inc., April 2005 (Tetra Tech, 2005)	A total of 293 samples were collected and analyzed from 64 borings at depths ranging from 0.5 to 60 feet below ground surface (bgs). Soil samples were analyzed for one or more of the following constituents: VOCs, SVOCs, 1,4-dioxane, perchlorate, Title 22 metals, PCBs, total petroleum hydrocarbons (TPH), and explosive residues. PCBs, 1,4-dioxane, and explosive residues were not detected at concentrations above their respective reporting limits. VOCs were detected at concentrations ranging from 0.93 to 700 micrograms per kilogram (µg/kg). SVOCs were detected at concentrations ranging from 0.59 to 4.5 milligrams per kilogram (mg/kg). Perchlorate was detected at concentrations ranging from 23.6 to 171,000 µg/kg. Metals were detected with arsenic concentrations ranging from 1.18 to 60.8 mg/kg. In addition, soil gas concentrations above reporting limits were detected for TCE, PCE, 1,1-DCE, Freon-113, and 1,1,1-TCA.
Lockheed Martin Corporation – Beaumont Site, Beaumont, California, Department of Toxic Substances Control, September 2005 (Department of Toxic Substances Control, 2005)	Requested actions by the California Department of Toxic Substances Control (DTSC) included: (1) perform a human and ecological risk evaluation; (2) perform a background assessment to evaluate naturally occurring metals; (3) prepare a conceptual site model and evaluation of potential contaminant pathways specifically the potential migration of contaminants in soil to underlying groundwater; (4) delineate the lateral and vertical extent of perchlorate at Historical Feature No. 33; (5) complete the soil gas survey at Historical Operational Feature No. 34 and further delineate deep VOCs; (6) delineate the lateral and vertical extent of VOCs at Historical Feature No. 39; (7) delineate the lateral and vertical extent of PCBs at Historical Feature No. 40; (8) complete the soil gas survey at Historical Operational Feature No. 46; and (9) delineate the lateral and vertical extent of PCBs and perchlorate at Historical Feature No. 49.
Response to Comments from DTSC for Lockheed Martin Beaumont Site 1 Soil Investigation Report, Historical Operational Areas D, E, F, G. H, and I, Beaumont California, Lockheed Martin Corporation, October 2005 (Lockheed Martin Corporation, 2005)	Letter was prepared in response to comments by the DTSC and concurred that the additional characterization suggested by the DTSC would be performed.

2.2.1 Previous Investigation for Historical Operational Area D

A total of seven (7) historical features (Figure 2-2) were identified as potential RECs within Historical Operational Area D during the Phase I ESA performed by Tetra Tech (Tetra Tech, 2003a). A brief summary of investigations performed at features located within Historical Operation Area D is presented in Table 2-3. No further investigations are proposed for previously identified concerns in Historical Operational Area D.

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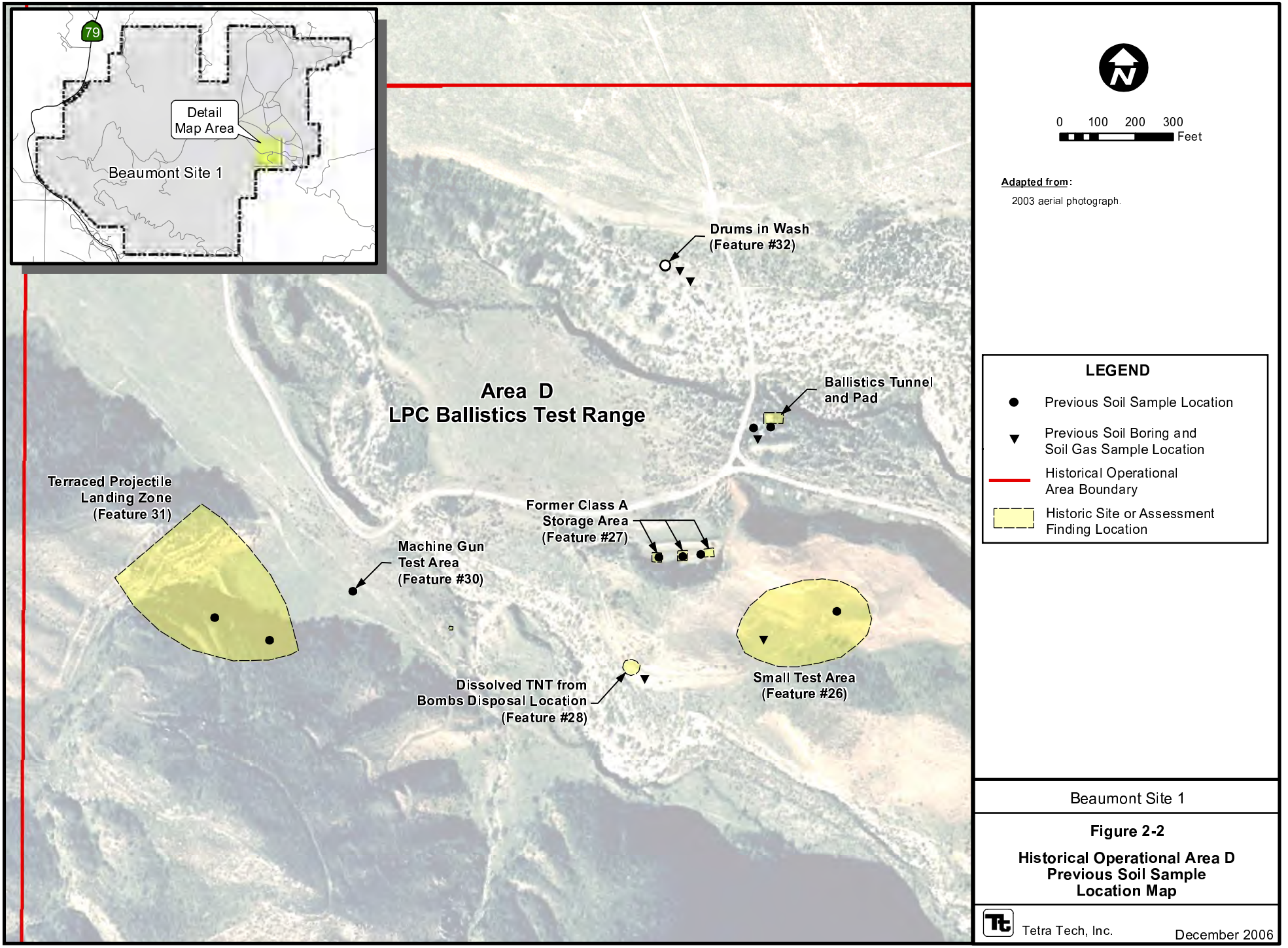

Beaumont Site 1

Figure 2-2

Historical Operational Area D Previous Soil Sample Location Map

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Table 2-3

Summary of Previous Investigations within Historical Operational Area D

Feature No.	Feature Description	Source	Investigation Summary
26	Small Test Area for Incendiary Bombs	Tetra Tech, 2005	Two soil borings were drilled to 5 and 10 feet bgs. Soil samples were analyzed for explosive residue, VOCs, TPH, and Title 22 metals. Explosive residue was not detected at concentrations above its reporting limit. One VOC (i.e., acetone) was detected at concentrations ranging from 25 to 190 µg/kg. Detected concentrations of acetone are associated with laboratory cross-contamination. TPH was detected in one sample at a concentration of 32 mg/kg. Metals were detected at low concentrations. A limited soil gas survey was also performed for VOCs. There were no detected VOCs in soil gas above their respective reporting limits. No further investigations were proposed for Historical Feature 26.
27	Former Class A Storage Area	Tetra Tech, 2005	Three soil borings were drilled to 5 feet bgs. Soil samples were analyzed for explosive residue. Explosive residue was not detected at concentrations above its reporting limit. No further investigations were proposed for Historical Feature 27.
28	Former Dissolved TNT Disposal Area	Tetra Tech, 2005	One soil boring was drilled to 20 bgs at this feature. Soil samples were analyzed for VOCs, 1,4-dioxane, and explosive residue. Explosive residue, VOCs, and 1,4-dioxane were not detected at concentrations above their respective reporting limits. A limited soil gas survey was also performed for VOCs. There were no detected VOCs in soil gas above their respective reporting limits. No further investigations were proposed for Historical Feature 28.
29	Ballistics Tunnel and Support Facilities	Tetra Tech, 2005	Three soil borings were drilled to 5 feet bgs. Soil samples were analyzed for explosive residue and VOCs. Explosive residue was not detected at concentrations above its reporting limit. VOCs (i.e., 2-butanone, acetone, and p-isopropyltoluene) were detected at concentrations ranging from 1.8 to 920 µg/kg. Detected concentrations of acetone are associated with laboratory cross-contamination. A limited soil gas survey was also performed for VOCs. There were no detected VOCs in soil gas above their respective reporting limits. No further investigations were proposed for Historical Feature 29.
30	Machine Gun Testing Area	Tetra Tech, 2005	One soil boring was drilled to 20 bgs at this feature. Soil samples were analyzed for Title 22 metals, perchlorate, and explosive residue. Explosive residue and perchlorate were not detected at concentrations above their respective reporting limits. Metals were detected with arsenic detected at concentrations up to 0.925 mg/kg. No further investigations were proposed for Historical Feature 30.
31	Projectile Landing Zone	Tetra Tech, 2005	Two soil borings were drilled to 5 feet bgs. Soil samples were analyzed for explosive residue and Title 22 metals. Explosive residue was not detected at concentrations above its reporting limit. Metals were detected with arsenic detected at concentrations up to 2.15 mg/kg and vanadium to 86.7 mg/kg. No further investigations were proposed for Historical Feature 31.
32	Drums	Tetra Tech, 2005	Two soil borings were drilled to 5 feet bgs. Soil samples were analyzed for VOCs, SVOCs, perchlorate, 1,4-dioxane, Title 22 metals, and TPH. VOCs, SVOCs, perchlorate, and 1,4-dioxane were not detected at concentrations above their respective reporting limits. TPH was detected in one sample at a concentration of 6.4 mg/kg. Metals were detected with arsenic detected at concentrations up to 2.0 mg/kg. A limited soil gas survey was also performed for VOCs. There were no detected VOCs in soil gas above their respective reporting limits. No further investigations were proposed for Historical Feature 32.
Historical Operational Area D – Area-Wide Investigation	See Above	Tetra Tech, 2005	A human health and ecological risk assessment will be performed for Historical Operational Area D. As part of the risk assessment, a background assessment will be performed to evaluate naturally occurring metals (e.g., arsenic) at Historical Operational Area D.

2.2.2 Previous Investigations for Historical Operational Area E

Based on a review of previous reports and recent visual inspections, no features were identified as potential RECs within Historical Operational Area E. According to the Historical Report (Radian, 1986c), former employees at Beaumont Site 1 reported a one-time burial of low-level radioactive waste. The exact location of the burial site was unknown; however, it was reported to have been buried in one of the canyons south and east of the Betatron Building (Historical Operational Area F).

In 1986, Radian Corporation performed a ground penetrating radar (GPR) survey in three canyons, designated Canyons 1, 2, and 3, south of the Betatron Building to identify and delineate the potential location of the low-level radioactive waste burial site. The data from the survey reported two anomalous features, which resemble former excavation areas, located in Canyon 1 (Radian, 1986b).

During the source and hydrogeologic investigation performed in 1990, Radian conducted remedial activities within Canyon 1 to remove the buried low-level radioactive waste. The waste, found as deep as 4 feet below ground surface (bgs), included broken glass from laboratory jars and vials, metal jar lids, and vials containing solids. Confirmation soil samples from beneath the waste and waste characterization samples were both collected and analyzed for gross alpha, gross beta, and gamma radioactivity. All gamma-emitting radionuclides that were detected in the confirmation soil samples were reported to be within the range of naturally occurring concentrations. Additionally, all waste was reportedly removed from Canyon 1 and disposed of at an appropriate waste disposal facility.

2.2.3 Previous Investigations for Historical Operational Area F

A total of 13 historical features (Figures 2-3 and 2-4) were identified as potential RECs within Historical Operational Area F during the Phase 1 ESA by Tetra Tech (Tetra Tech, 2003a). A brief summary of the previous investigations performed at features located within Historical Operational Area F is presented in Table 2-4. No further investigations are proposed for previously identified concerns in Historical Operational Area F, Features 37, 38, 41, and 42. Proposed investigations for Features 33, 34, 35, 36, 39 and 40 are presented in Section 3.2.1.

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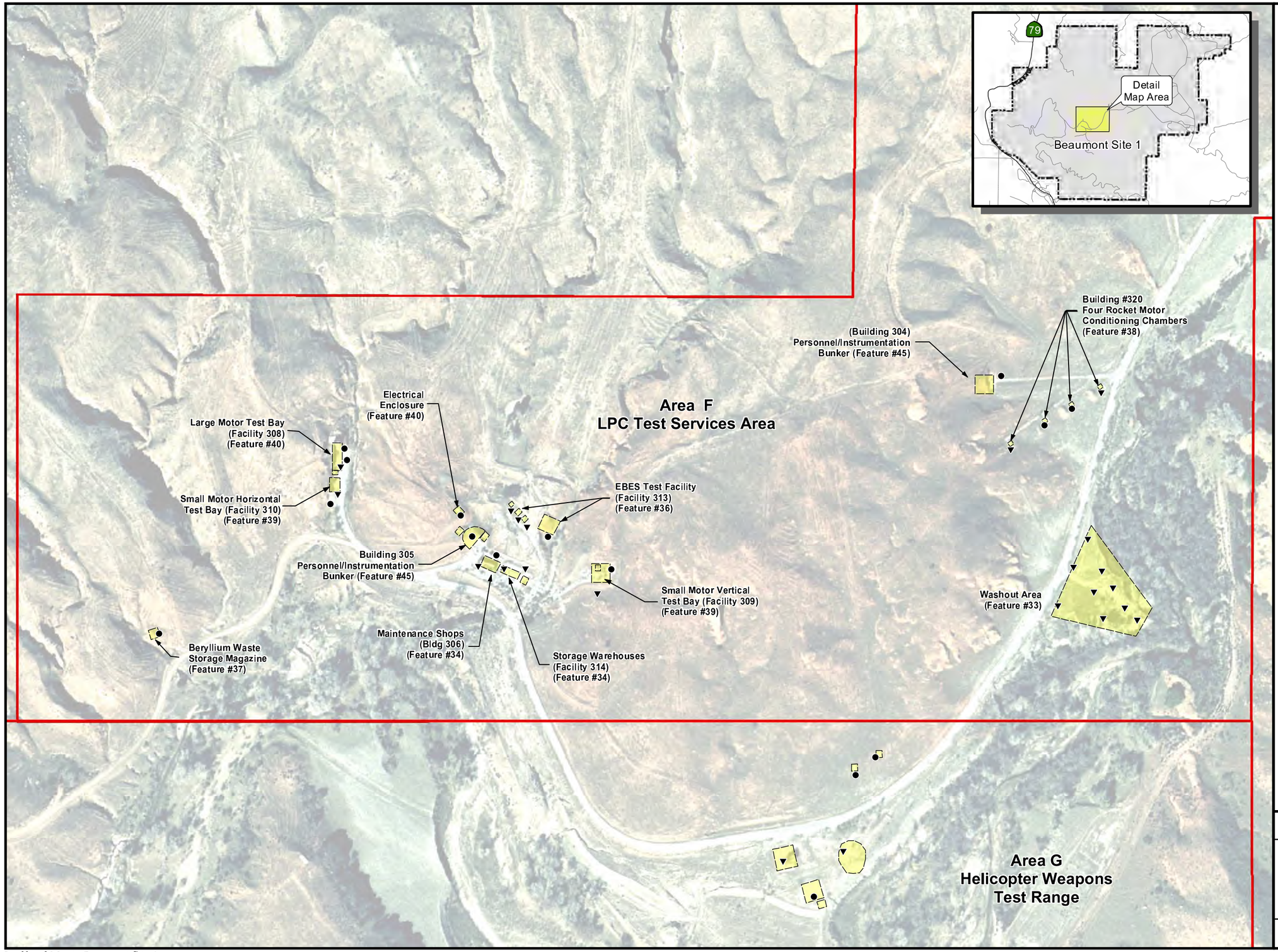

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Adapted from:
2003 aerial photograph.

LEGEND

- Previous Soil Sample Location
- Previous Soil Boring and Soil Gas Sample Location
- Historical Operational Area Boundary
- Historic Site or Assessment Finding Location

Beaumont Site 1

Figure 2-3
Historical Operational Area F
Southern Portion
Previous Soil Sample Locations

Tetra Tech, Inc. December 2006

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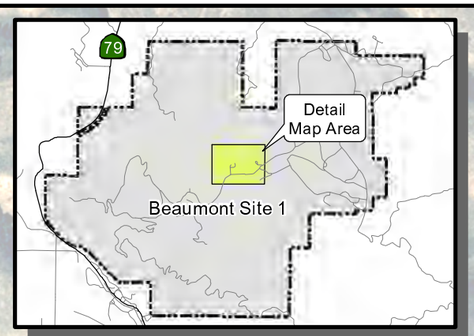

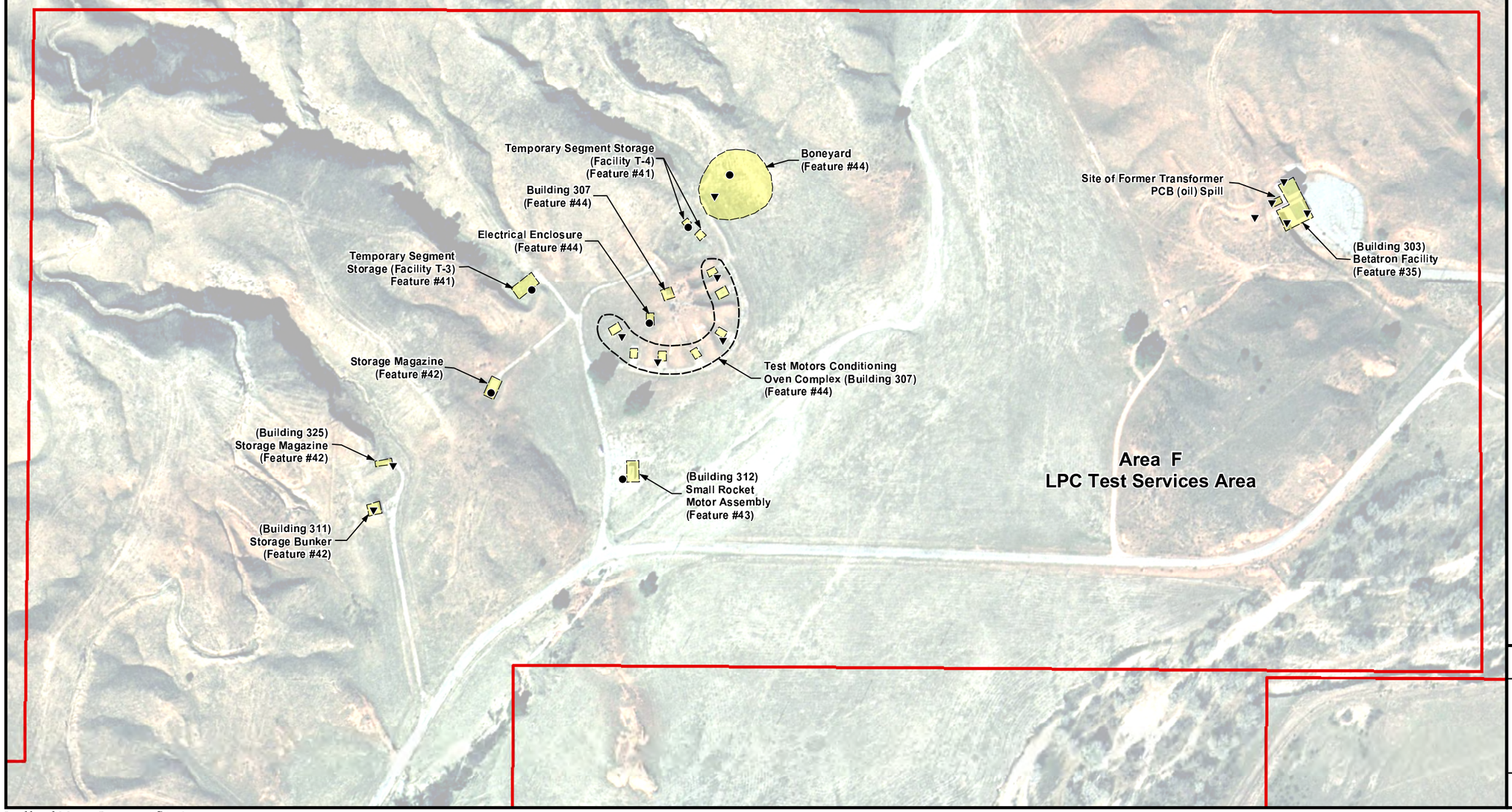

0 100 200 300 400 Feet

Adapted from:
2003 aerial photograph.

LEGEND

- Previous Soil Sample Location
- Previous Soil Boring and Soil Gas Sample Location
- Historical Operational Area Boundary
- Historic Site or Assessment Finding Location

Beaumont Site 1

Figure 2-4
Historical Operational Area F
Northern Portion
Previous Soil Sample Locations

Tetra Tech, Inc. December 2006

Table 2-4

Summary of Previous Investigations within Historical Operational Area F

Feature No.	Feature Description	Source	Investigation Summary
33	Washout Area	Tetra Tech, 2005	Nine boring locations were drilled to depths extending up to 30 feet bgs. Samples were analyzed for TPH, perchlorate, 1,4-dioxane, Title 22 metals, VOCs, and SVOCs. SVOCs and 1,4-dioxane were not detected at concentrations above their respective reporting limits. TPH was detected at concentrations ranging from 6.3 to 45 mg/kg. Perchlorate was detected at concentrations ranging from 0.02 to 57.1 mg/kg. VOCs (i.e., acetone, benzene, toluene, 1,2,4-trichlorobenzene, and bis(2-ethylhexyl)phthalate were detected at concentrations ranging from 0.52 to 124 µg/kg. Acetone, benzene, and toluene concentrations are associated with laboratory cross-contamination. Metals were detected with arsenic detected at concentrations up to 19 mg/kg. Additional characterization was recommended to delineate impacts to soil.
34	Maintenance Shop (Bldg. 306) and Storage Warehouse (Bldg. 314)	Tetra Tech, 2005	Four soil borings were drilled to depths extending up to 20 feet bgs. Samples were analyzed for VOCs, 1,4-dioxane, TPH, and Title 22 metals. VOCs and 1,4-dioxane were not detected at concentrations above their respective reporting limits. A limited soil gas survey was also performed for VOCs. One soil gas sample had a VOC with a concentration (1,1-DCE at 2.9 µg/L) above its reporting limits. Additional characterization was recommended to delineate impacts to soil.
35	Betatron Building (Bldg. 303)	General Electric, 1984	In 1984, an investigation was performed on vandalized transformers. Asphalt and soil contaminated with PCBs were removed at both Beaumont Site 1 and Site 2. Based on the investigation, the vandalized transformers were moved and stored inside the Betatron Building. Soil was excavated adjacent to the transformer pad at the Betatron Building and soil samples were collected; however, the concentrations are not available.
		Tetra Tech, 2005	Two soil borings were drilled to depths extending up to 5 feet bgs. Samples were analyzed for VOCs, SVOCs, 1,4-dioxane, TPH and PCBs. SVOCs and 1,4-dioxane were not detected at concentrations above their respective reporting limits. One VOC (i.e., acetone) was detected at concentrations ranging from 22 to 39 µg/kg. Acetone concentrations are associated with laboratory cross-contamination. TPH was detected at concentrations ranging from 16 to 18 mg/kg. One PCB (Aroclor-1260) was detected at a concentration of 72 µg/kg. A limited soil gas survey was performed for VOCs. There were no detected VOCs in soil gas above their respective reporting limits. Additional characterization is proposed to verify detected PCBs.
36	EBES Testing (Facility 313)	Tetra Tech, 2005	Five soil borings were drilled to depths extending up to 10 feet bgs. Samples were analyzed for VOCs, PCBs, TPH, and perchlorate. One PCB (Aroclor-1254) was detected at a concentration of 130 µg/kg. Perchlorate was detected at a concentration of 45.2 µg/kg and TPH was detected at concentrations ranging from 2.2 to 200 mg/kg. One VOC (acetone) was detected at a concentrations ranging from 28 to 51 µg/kg. Acetone concentrations are associated with laboratory cross-contamination. A limited soil gas survey was also performed for VOCs. There were no detected VOCs in soil gas above their respective reporting limits. Additional characterization is proposed to verify detected PCBs.
37	Beryllium Waste Storage Area	Tetra Tech, 2005	One soil boring was drilled to 5 feet bgs. Soil samples were analyzed for Title 22 metals. Metals were detected at low concentrations. No further investigations were proposed for Historical Feature 37.

Table 2-4 (Continued)

Feature No.	Feature Description	Source	Investigation Summary
38	Environmental Chambers	Tetra Tech, 2005	Four soil borings were drilled to 5 feet bgs. Soil samples were analyzed for VOCs, SVOCs, TPH, 1,4-dioxane, perchlorate, and Title 22 metals. Perchlorate and 1,4-dioxane were not detected at concentrations above their respective reporting limits. One SVOC (i.e., bis[2-ethylhexyl]phthalate) was detected at concentrations ranging from 0.53 to 1.0 mg/kg. TPH (as diesel) was detected at concentrations ranging from 31 to 43 mg/kg. VOCs (i.e., acetone, benzene, ethylbenzene, and toluene) were detected at concentrations ranging from 1.4 to 150 µg/kg. Acetone, benzene, ethylbenzene, and toluene concentrations are associated with laboratory cross-contamination. Metals were detected with arsenic detected at concentrations up to 5.55 mg/kg. A limited soil gas survey was performed for VOCs. There were no detected VOCs in soil gas above their respective reporting limits. No further investigations were proposed for Historical Feature 38.
39	Test Bays (Bldgs. 308, 309, and 310)	Tetra Tech, 2005	Eight soil borings were drilled to depths extending to 10 feet bgs. Soil samples were analyzed for VOCs, SVOCs, TPH, 1,4-dioxane, and perchlorate. Perchlorate and 1,4-dioxane were not detected at concentrations above their respective reporting limits. One SVOC (bis[2-ethylhexyl]phthalate) was detected at concentrations ranging from 0.57 to 1.6 mg/kg. TPH was detected at concentrations ranging from 1.2 to 270 mg/kg. VOCs (i.e., acetone, benzene, ethylbenzene, toluene, trichloroethene) were detected at concentrations ranging from 1.5 to 38 µg/kg. Acetone, benzene, ethylbenzene, and toluene concentrations are associated with laboratory cross-contamination. A limited soil gas survey was performed for VOCs. Soil gas concentrations were detected at concentrations above reporting limits in two soil borings. TCE was detected at concentrations of 44 and 47 µg/L and Freon-113 was detected at a concentration of 10 µg/L. Additional characterization has been recommended to fully delineate VOC impacts to soil.
40	Electrical Enclosure	Tetra Tech, 2005	One soil sample was collected at a depth of 0.5 feet bgs and analyzed for PCBs. Aroclor-1248 was detected at a concentration of 250 µg/kg. Additional characterization has been recommended to fully delineate PCB impacts to soil.
41	Temporary Storage of Rocket Motor Segments (Facilities T-3 and T-4)	Tetra Tech, 2005	Two borings were drilled to depths extending up to 10 feet bgs. Soil samples were analyzed for VOCs, SVOCs, 1,4-dioxane, perchlorate, and Title 22 metals. SVOCs, 1,4-dioxane, and perchlorate were not detected at concentrations above their respective reporting limits. One VOC (i.e., acetone) was detected at concentrations ranging from 36 to 86 µg/kg. Acetone concentrations are associated with laboratory cross-contamination. Metals were detected at low concentrations. No further investigations were proposed for Historical Feature 41.
42	Storage Bunkers (Bldgs. 311 and 325)	Tetra Tech, 2005	Three soil borings were drilled to depths extending up to 10 feet bgs. Soil samples were analyzed for VOCs, 1,4-dioxane, perchlorate, explosive residue, and Title 22 metals. VOCs, 1,4-dioxane, perchlorate, and explosive residue were not detected at concentrations above their respective reporting limits. Metals were detected at low concentrations. A limited soil gas survey was performed for VOCs. There were no detected VOCs in soil gas above their respective reporting limits. No further investigations were proposed for Historical Feature 42.

Table 2-4 (Continued)

Feature No.	Feature Description	Source	Investigation Summary
43	Small Rocket Motor Assembly Building (Bldg. 312)	Tetra Tech, 2005	One soil boring was drilled to a depth of 5 feet bgs. Soil samples were analyzed for TPH, perchlorate, 1,4-dioxane, and VOCs. TPH, perchlorate, and 1,4-dioxane were not detected at concentrations above their respective reporting limits. VOCs (i.e., benzene, ethylbenzene, and toluene) were detected at concentrations ranging from 1.1 to 2.2 µg/kg. Benzene, ethylbenzene, and toluene concentrations are associated with laboratory cross-contamination. No further investigations were proposed for Historical Feature 43.
44	Electrical Enclosure, Boneyard, Test Motors Conditioning Oven Complex (Bldg. 307)	Tetra Tech, 2005	Seven soil borings were drilled to 5 feet bgs. Soil samples were analyzed for VOCs, SVOCs, TPH, PCBs, perchlorate, 1,4-dioxane, and Title 22 metals. SVOCs, TPH, PCBs, perchlorate, and 1,4-dioxane were not detected at concentrations above their respective reporting limits. One VOC (i.e., acetone) was detected at concentrations ranging from 29 to 47 µg/kg. Acetone concentrations are associated with laboratory cross-contamination. Metals were detected at low concentrations. A limited soil gas survey was performed for VOCs within the oven and boneyard areas. There were no detected VOCs in soil gas above their respective reporting limits. No further investigations were proposed for Historical Feature 44.
45	Testing and Instrumentation / Personnel Bunker (Bldgs. 304 &305)	Tetra Tech, 2005	Seven borings were drilled to 5 feet bgs. Soil samples were analyzed for VOCs and TPH. VOCs and TPH were not detected at concentrations above their respective reporting limits. A limited soil gas survey was performed for VOCs. There were no detected VOCs in soil gas above their respective reporting limits. No further investigations were proposed for Historical Feature 45.
Historical Operational Area F – Area-Wide Investigation	See Above	Tetra Tech, 2005	A human health and ecological risk assessment will be performed for Historical Operational Area F. As part of the risk assessment, a background assessment will be performed to evaluate naturally occurring metals (e.g., arsenic) at Historical Operational Area F.

2.2.4 Previous Investigations for Historical Operational Area G

A total of three (3) historical features (Figure 2-5) were identified as potential RECs within Historical Operational Area G during the Phase I ESA performed by Tetra Tech (Tetra Tech, 2003a). A brief summary of investigations performed at these features is presented in Table 2-5. No further investigations are proposed for previously identified concerns in Historical Operational Area G, Features 47 and 48. Proposed investigations for Feature 46 are presented in Section 3.2.2.

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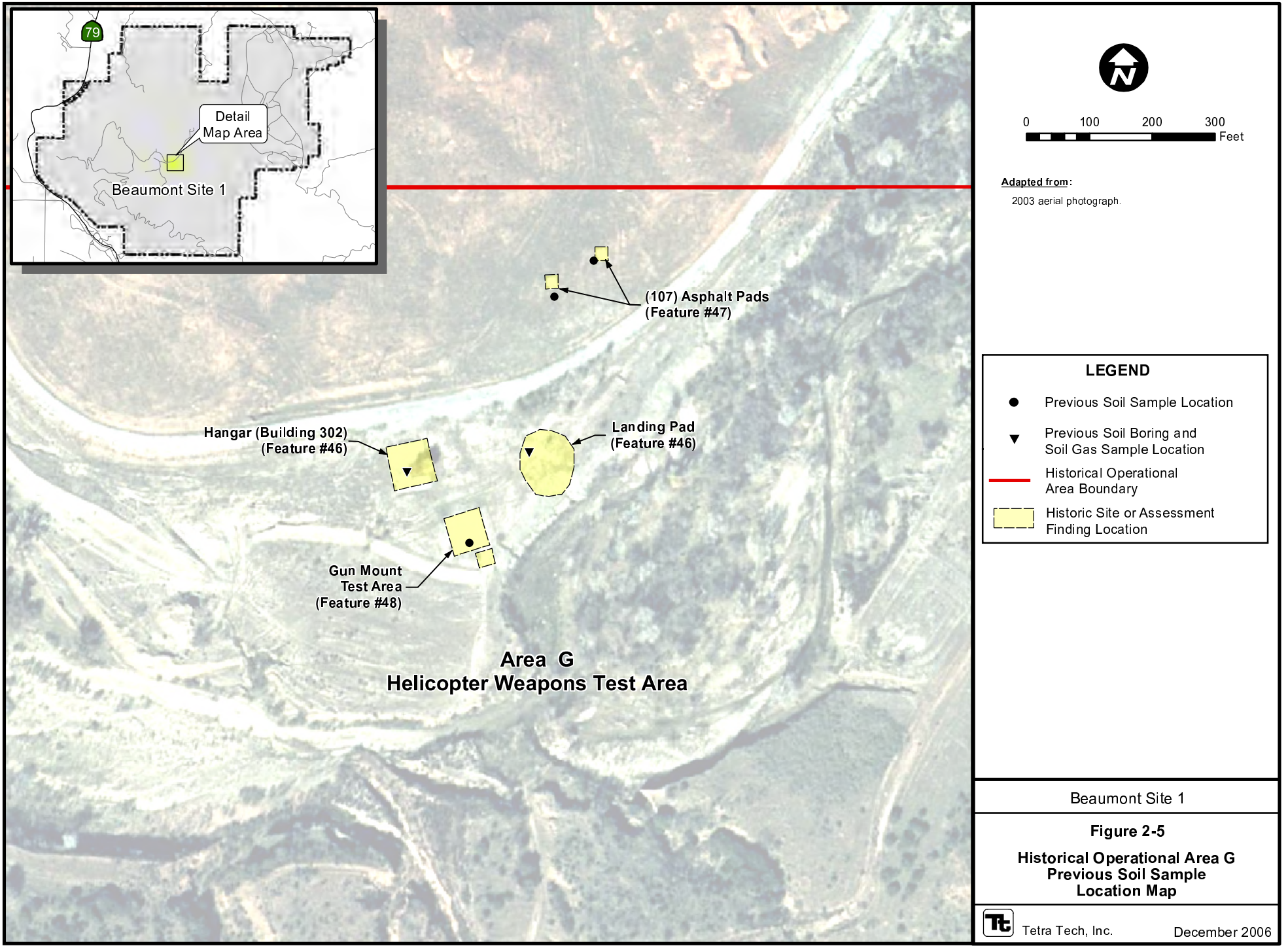

Beaumont Site 1

Figure 2-5

Historical Operational Area G Previous Soil Sample Location Map

Tetra Tech, Inc. December 2006

Table 2-5

Summary of Previous Investigations within Historical Operational Area G

Feature No.	Feature Description	Source	Investigation Summary
46	Helicopter Landing Pad and Hanger (Building 302)	Tetra Tech, 2005	Two soil borings were drill to depths extending up to 5 feet below ground surface. Soil samples were analyzed for VOCs and TPH. VOCs (i.e., acetone, benzene, and toluene) were detected at concentrations ranging from 1.0 to 27 µg/kg. Acetone, benzene, and toluene concentrations are associated with laboratory cross-contamination. A limited soil gas survey is recommended to determine the presence or absence of VOCs in soil gas.
47	Asphalt Pads	Tetra Tech, 2005	Two soil borings were drilled to 5 feet bgs. Soil samples were analyzed for VOCs, TPH, and Title 22 metals. TPH was not detected at concentrations above it reporting limit. One VOC (i.e., acetone) was detected at a concentration of 33 µg/kg. The acetone concentration is associated with laboratory cross-contamination. Metals were detected at low concentrations. No further investigations were proposed for Historical Feature 47.
48	Gun Mount Test Area	Tetra Tech, 2005	One soil boring was drilled to 5 feet bgs. Soil samples were analyzed for explosive residue. Explosive residue was not detected at concentrations above its reporting limit. No further investigations were proposed for Historical Feature 48.
Historical Operational Area G – Area-Wide Investigation	See Above	Tetra Tech, 2005	A human health and ecological risk assessment will be performed for Historical Operational Area G. As part of the risk assessment, a background assessment will be performed to evaluate naturally occurring metals (e.g., arsenic) at Historical Operational Area G.

2.2.5 Previous Investigations for Historical Operational Area H

One historical feature, the permitted landfill (Figure 2-6), was identified as a potential REC within Historical Operational Area H during the Phase 1 ESA performed by Tetra Tech (Tetra Tech, 2003a). A brief summary of the previous investigations performed at this feature is presented in Table 2-6. Proposed investigations for Historical Operational Area H, Feature 49, are presented in Section 3.2.3.

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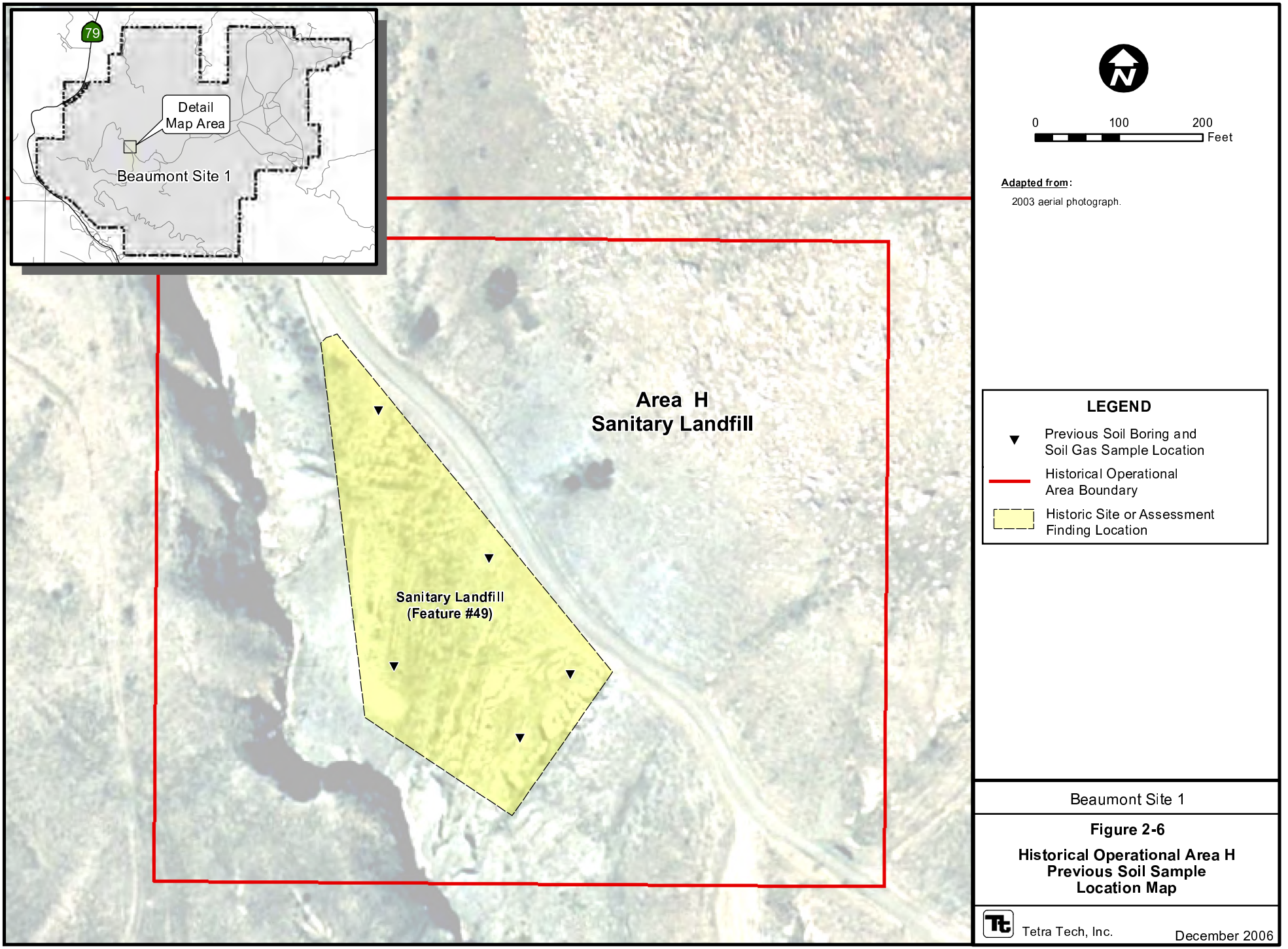

Beaumont Site 1

Figure 2-6

Historical Operational Area H Previous Soil Sample Location Map

Tetra Tech, Inc.

December 2006

Table 2-6

Summary of Previous Investigations within Historical Operational Area H

Feature No.	Feature Description	Source	Investigation Summary
49	Sanitary Landfill	Radian, 1990	In 1990, Radian performed a preliminary remedial investigation at Site 1. During the investigation, exploratory trenching activities were conducted to determine the contents and extents of the sanitary landfill area. The waste was identified as general trash such as wood debris, paper, plastic bags, and rubber. Additionally, a total of four (4) soil samples were collected from beneath the waste and analyzed for VOCs, SVOCs, heavy metals, and nitrates. Both VOCs and SVOCs were detected in the soil samples; however, upon further evaluation they were assumed to be due to either laboratory or field cross contamination.
		Tetra Tech, 2005	Ten borings were drilled to depths up to 40 feet bgs. Soil samples were analyzed for VOCs, TPH, SVOCs, perchlorate, 1,4-dioxane, polyaromatic hydrocarbons (PAHs), dioxins/furans, PCBs, and Title 22 metals. SVOCs, 1,4-dioxane, and PAHs were not detected above their respective reporting limits. TPH was detected at concentrations ranging from 6.8 to 10 mg/kg. Perchlorate was detected at concentrations ranging from 42.1 to 1,520 µg/kg. VOCs (i.e., acetone, benzene, p-isopropyltoluene, and toluene) were detected at concentrations ranging from 0.97 to 72 µg/kg. Detected concentrations of acetone, benzene, and toluene are associated with laboratory cross-contamination. One PCB (i.e., Aroclor-1248) was detected at concentrations of 86, 210, and 910 µg/kg. Detected dioxin/furan concentrations were converted to their 2,3,7,8-tetrachlorodibenzo-p-dioxin (TCDD) equivalent using toxicity equivalent factors (TEFs); TEF values ranged from 0.131 to 0.474 pg/g. Metals were detected with arsenic detected at concentrations up to 1.90 mg/kg. Additional characterization has been recommended to fully delineate perchlorate and PCB impacts to soil.
Historical Operational Area H – Area-Wide Investigation	See Above	Tetra Tech, 2005	A human health and ecological risk assessment will be performed for Historical Operational Area H. As part of the risk assessment, a background assessment will be performed to evaluate naturally occurring metals (e.g., arsenic) at Historical Operational Area H.

2.2.6 Previous Investigations for Historical Operational Area I

Two (2) historical features (Figure 2-7) were identified as potential RECs within Historical Operational Area I during the Phase I ESA performed by Tetra Tech (Tetra Tech, 2003a). A brief summary of the previous investigations performed at features located within Historical Operational Area I is presented in Table 2-7. No further investigations are proposed for previously identified concerns in Historical Operational Area I.

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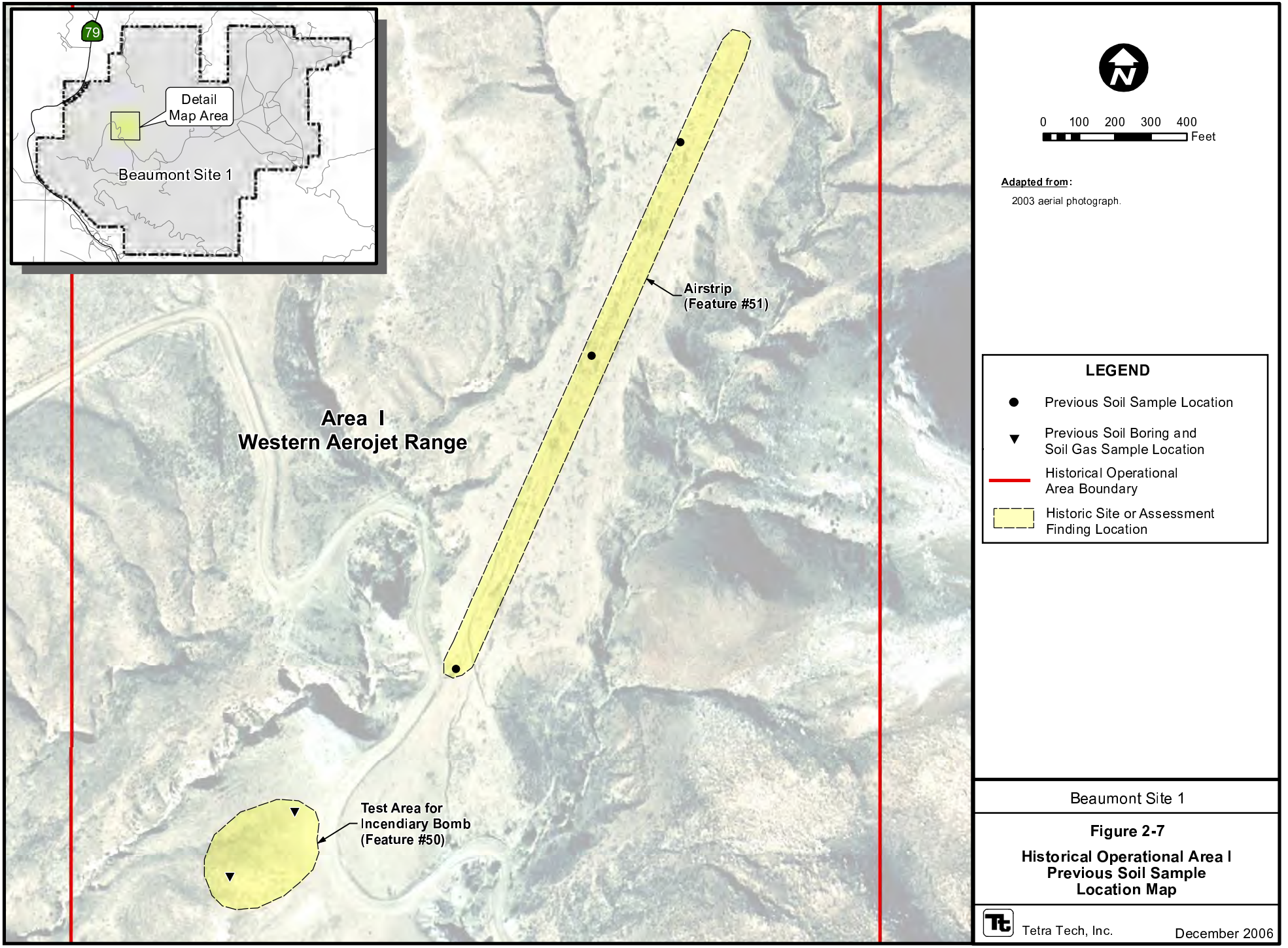

Beaumont Site 1

Figure 2-7

Historical Operational Area I Previous Soil Sample Location Map

Tetra Tech, Inc.

December 2006

Table 2-7

Summary of Previous Investigation within Historical Operational Area I

Feature No.	Feature Description	Source	Investigation Summary
50	Incendiary Bomb Test Area	Tetra Tech, 2005	Soil samples were analyzed for VOCs, TPH, 1,4-dioxane, perchlorate, and explosive residue. Perchlorate, 1,4-dioxane, and explosive residue were not detected at concentrations above their respective reporting limits. TPH was detected at concentrations ranging from 9.4 to 24 mg/kg. One VOC (i.e., acetone) was detected at concentrations ranging from 22 to 96 µg/kg. Acetone concentrations are associated with laboratory cross-contamination. No further investigations were proposed for Historical Feature 50.
51	Airstrip Area	Tetra Tech, 2005	Soil samples were analyzed for herbicides and pesticides. Herbicides and pesticides were not detected at concentrations above their respective reporting limits. No further investigations were proposed for Historical Feature 51.
Historical Operational Area I – Area-Wide Investigation	See Above	Tetra Tech, 2005	A human health and ecological risk assessment will be performed for Historical Operational Area I. As part of the risk assessment, a background assessment will be performed to evaluate naturally occurring metals (e.g., arsenic) at Historical Operational Area I.

Section 3

Investigation Approach

3.1 INTRODUCTION

The subsurface soil investigation program is based on assessing site-specific features (i.e., test areas, storage and test structures, wash out areas, landfill, and subsurface structures, etc.) and completing a general overall assessment of the subsurface soil at Beaumont Site 1. Class 1 or Class 2 soil borings will be completed to provide additional information to delineate areas of impact identified in the Site 1 Investigation for Historical Operation Areas D, E, F, G, H, and I (Tetra Tech, 2005). "Class I" soil borings will address potential deep soil impacts by drilling method. "Class II" soil borings will address areas where impacts are not expected to extend into deep soils and direct push and hand auger techniques can be used to collect samples. ~~Class 1 and Class 2 soil borings are defined in the Soil Investigation Work Plan, Volume I (Tetra Tech, 2003b).~~ Only those features identified in Section 2 as requiring additional characterization are discussed below. Sampling locations were selected to further delineate the affected area. If impacts to soil were not delineated in any specific direction during previous investigations, soil sampling has been proposed to fill the data gap. Additional sampling may be required if this supplemental soil investigation program does not fully delineate impacts to soil from historical operations.

Additional maps are provided in Appendix A for each of the Historical Operational Areas. These maps include an operational area overview of the locations of previous and planned borings, existing monitoring wells; feature maps at a larger scale with locations of previous and planned borings, existing monitoring wells; and maps with graphical representations of perchlorate results from previous borings.

As specified in the Soil Investigation Work Plan I (Tetra Tech, 2003b), the locations of all sampling points will be surveyed in the field using global positioning surveying (GPS) techniques. The surveyed locations will be provided in the investigation report to be completed after the activities described in this supplemental sampling and analysis plan are complete.

3.2 FEATURE-SPECIFIC INVESTIGATION SCHEME

3.2.1 Historical Operational Area F (LPC Test Services Area)

Based on a review of previous investigations, a total of six (6) historical features were identified in Historical Operational Area F as requiring additional investigation. A detailed description of each feature and planned soil and soil gas boring locations are presented in Table 3-1, shown in Figures 3-1 and 3-2, and discussed in this section.

Table 3-1

Summary of Sampling and Analysis Plan for Historical Operational Areas F Through I

Feature No.	Historical Operational Area	Feature	Borehole No.	Borehole Class	Supplemental Soil Investigation Sampling Plan Approach					Number Tested Samples		Analytical Scheme of Tested Soil Samples		
					Number of Soil Borings	Depth	Number of Soil Gas Points	Depth	Sampling Interval	Soil	Soil Gas	Perchlorate Method 314.6	PCBs Method 8021	Explosives Residue Method 8330
33	F	Washout Area	F33-HSAS10 to F33-HSAS15	Class 1	6	40' bgs			Soil borings 0.5', 5', 10', 15', 20', 25', 30', 35' and 40'	18		18		
34	F	Shops (Buildings 306 & 314)	F34-HSAS2, F34-HSAS5, and F34-HSAS6	Class 1			3	30' bgs	Soil gas probes 10', 20' and 30'		9			
35	F	Betatron Building (Bldg. 303)	F35-HAS1 to F35-HAS4	Class 2	4	5' bgs			Soil borings 0.5' and 5'				8	
36	F	EBES Testing (Facility 313)	F36-HSAS1 to F36-HSAS4	Class 1	4	15' bgs			Soil borings 0.5', 5', 10' and 15'	12			12	
39	F	Test Bays (Bldgs. 308, 309 & 310)	F39-HSAS1 to F39-HSAS4	Class 1			4	30' bgs	Soil gas probes 10', 20' and 30'		12			
40	F	Electrical Enclosure	F40-HAS7 to F40-HAS10	Class 2	4	5' bgs			Soil borings 0.5' and 5'	8			8	
46	G	Helicopter Landing Pad and Hanger	G46-HSAS1 and G46-HSAS2	Class 1			2	30' bgs	Soil gas probes 10', 20' and 30'		6			

Table 3-1 (Continued)

Feature No.	Historical Operational Area	Feature	Borehole No.	Borehole Class	Supplemental Soil Investigation Sampling Plan Approach					Number Tested Samples		Analytical Scheme of Tested Soil Samples		
					Number of Soil Borings	Depth	Number of Soil Gas Points	Depth	Sampling Interval	Soil	Soil Gas	Perchlorate Method 314.6	PCBs Method 8021	Explosives Residue Method 8330
49	H	Sanitary Landfill	H49-HSAS6 to H49-HSAS13	Class 1	8	3-60' bgs 5-40' bgs			Soil borings *H49-HSAS6 to H49-HSAS8* 0.5', 5', 10', 15', 20', 25', 30', 35', 40', 45', 50', 55' and 60' *H49-HSAS9 to H49-HSAS13* 0.5', 5', 10', 15', 20', 25', 30', 35' and 40'	24		9	15	
29	D	Near Class A Explosives Storage	D29-HAS11 to D29-HAS13	Class 2	3	5' bgs			Soil borings 0.5' and 5'	6				6
26	D	Near TNT Dissolution Area	D26-HSAS1 to D26-HSAS3	Class 1			3	30' bgs	Soil gas probes 10', 20' and 30'		9			
26	D	Former Storage Area	D26-HAS to D26HAS	Class 2	3	5' bgs			Soil borings 0.5' and 5'	6		6		6 (1)

Notes:

(1) Also test samples for VOCs by Method 8260B

One borehole at Features 33 and 49 will be converted to a groundwater monitoring well.

"Class I" soil borings will address potential deep soil impacts by drilling method.

"Class II" soil borings will address areas where impacts are not expected to extend into deep soils and direct push and hand auger techniques can be used to collect samples.

Soil gas sampling only is proposed in HSA locations at Features 34, 39, 46, and 26.

Proposed sampling in Area D provides data for characterization of potential features identified during interviews with former LPC employees.

bgs = below ground surface

Soil gas probes will be placed within boring of same locational number

The sample label shall consist of:

"F" = Historical Operational Area
Number = Feature Number
"HSA" = Hollow Stem Auger or "HA" = Hand Auger
S= Supplemental Investigation
Number = Activity Number
Sample Depth

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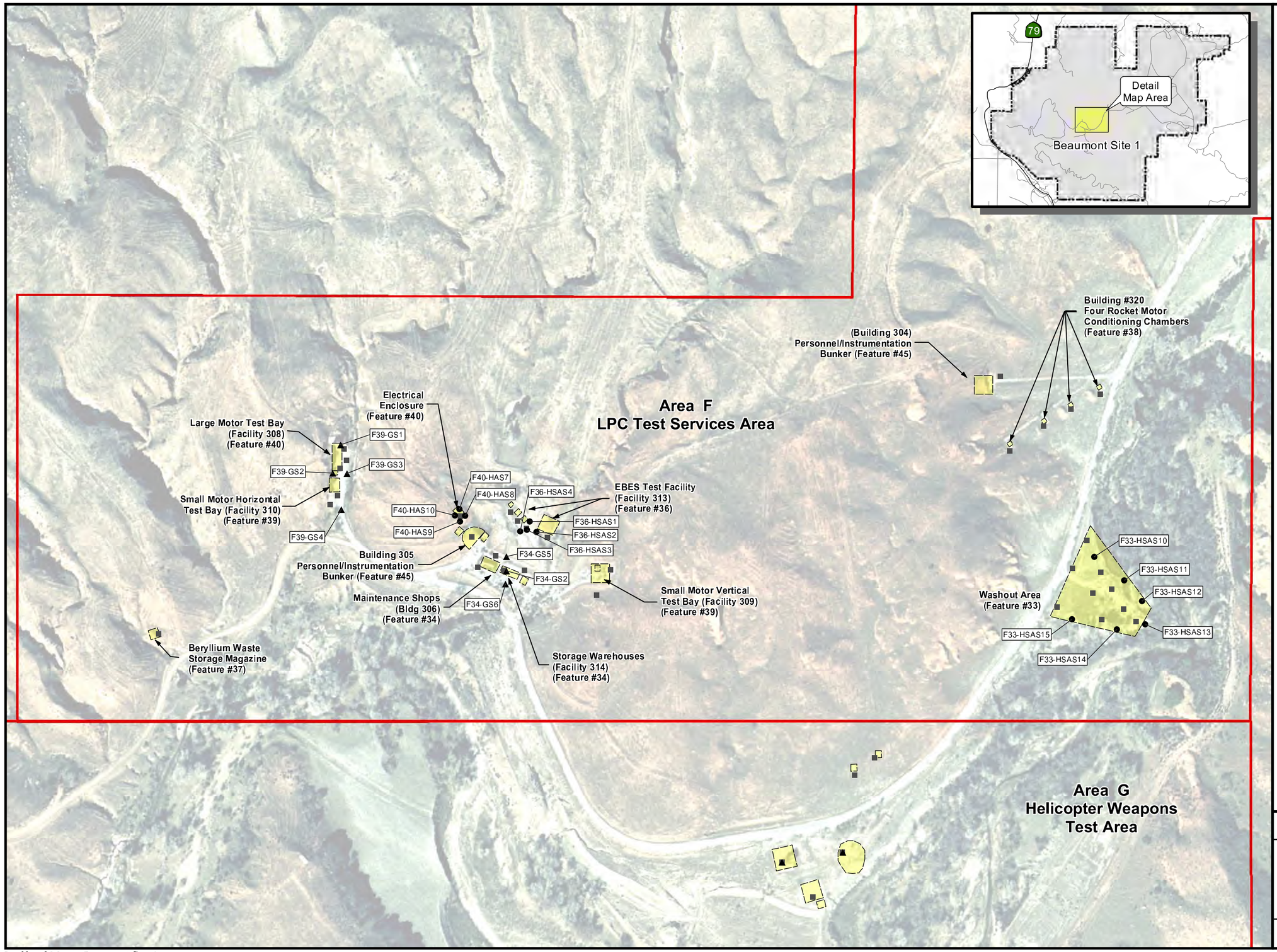

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Adapted from:
2003 aerial photograph.

LEGEND

- Proposed Soil Boring Location
- Proposed Soil Gas Sample Location
- Previous Soil Boring and Soil Gas Sample Location
- F36-HSAS15 Soil Boring ID
- Historical Operational Area Boundary
- Historic Site or Assessment Finding Location

Beaumont Site 1

Figure 3-1
Historical Operational Area F
Southern Portion
Planned Soil Boring and Soil Gas Location Map

Tetra Tech, Inc. December 2006

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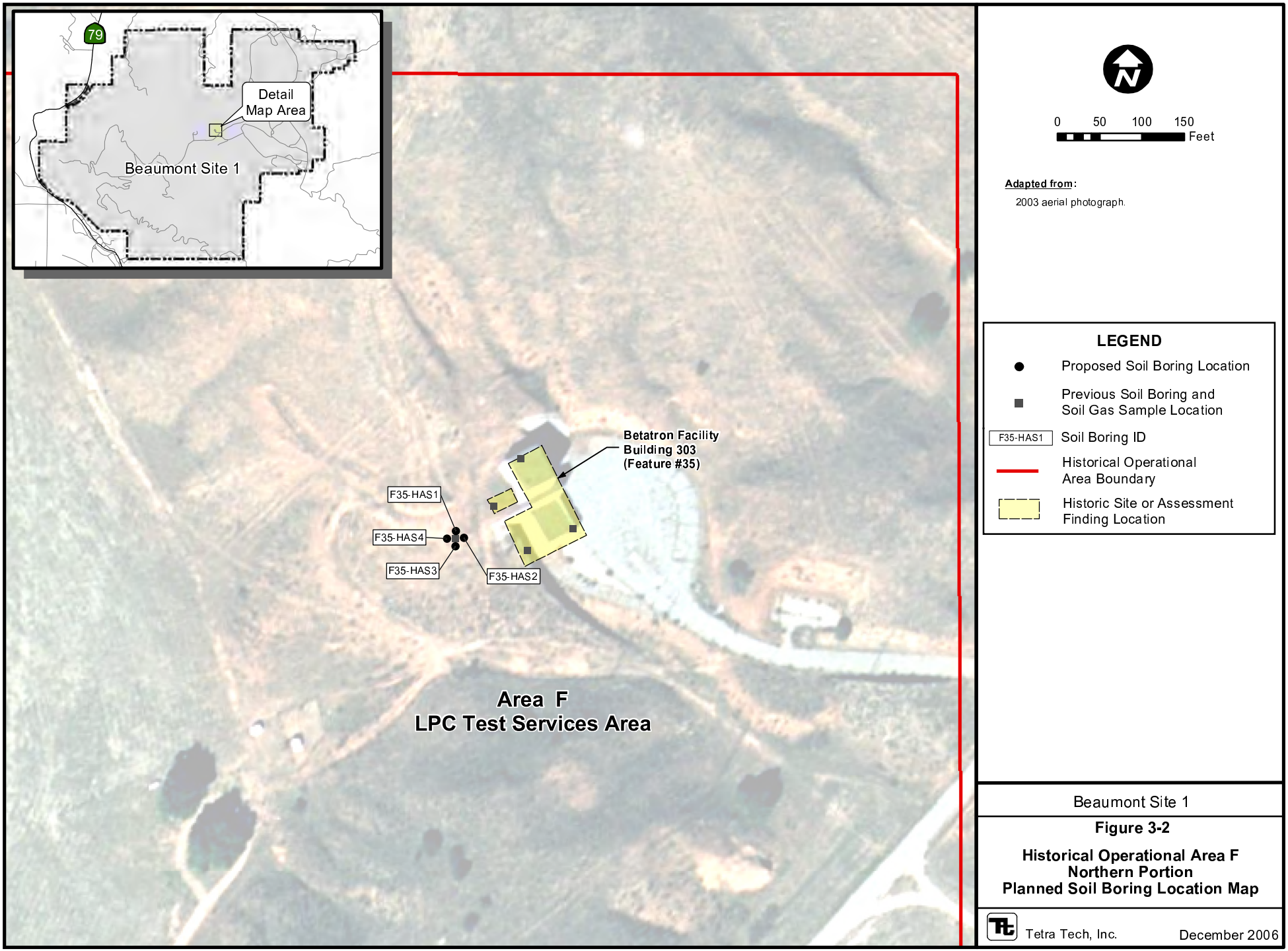

Beaumont Site 1

Figure 3-2

Historical Operational Area F
Northern Portion
Planned Soil Boring Location Map

Tetra Tech, Inc. December 2006

Planned Class 1 Soil Borings and Soil Gas Points

Based on a review of previous soil investigations, a total of 17 Class 1 soil borings including seven (7) soil gas sampling locations have been planned for Historical Operational Area F, as follows:

Feature No. 33 — *Washout Area* is located in the south central portion of Historical Operational Area F. Perchlorate was detected in soil samples collected at this feature (Tetra Tech, 2005). Six (6) additional soil borings are proposed to further delineate perchlorate contamination to the north, east and south of the Washout Area where the limits of soil impact have not been defined. Soil samples collected at this feature will be analyzed for perchlorate.

One groundwater monitoring well is proposed to be installed at Feature No. 33. The monitoring well will be installed in the boring of F33-HSAS6 to the east. This monitoring well will be installed, developed and sampled in accordance with the procedures described in the Final Groundwater Well Installation Work Plan (Tetra Tech, 2004) and the Revised Groundwater Sampling and Analysis Plan (Tetra Tech, 2003c). The well is expected be installed with up to 20 feet of screen. The screen length was selected to be 20 feet because of water level fluctuations exceeding 25 feet have been observed in years of high rainfall. However, the exact depth of the monitoring well and the length of the screen interval will be based on site conditions and will be determined in the field by the geologist. The collected groundwater sample will be analyzed for VOCs, 1,4-dioxane, and perchlorate. If impacted groundwater is detected, further assessment will be performed under the groundwater characterization program.

Feature No. 34 — *Shops (Buildings 306 and 314)* is located in the southeastern portion of Historical Operational Area F. One VOC (1,1-DCE) was detected in a soil gas sample collected at this feature (Tetra Tech, 2005). Two (2) additional soil gas sampling locations (F34-HSA5 and -HSA6) are proposed to further horizontally delineate VOC contamination.

Additionally, another soil gas sample will be collected adjacent to a previous location (F34-HSA2) at a deeper depth to further delineate the vertical VOC impact.

Feature No. 36 — *EBES Testing Facility (Building 313)* is located in the south-central portion of Historical Operational Area F. PCBs were detected in soil samples collected at this feature in boring F36-DP11 (Tetra Tech, 2005). Four (4) additional soil borings are proposed to further delineate PCB contamination at the location of the detected PCBs. One of the borings will be adjacent to the location of F36-DP11 (from a previous investigation) to a depth of 15 feet. The three remaining borings will provide information of the lateral and vertical extent of PCB contamination surrounding F36-DP11 where the limts of soil impact have not been defined. Soil samples collected at this feature will be analyzed for PCBs.

Feature No. 39 — *Test Bays (Buildings 308, 309, and 310)* are located in the southwest and south-central portions of Historical Operational Area F. One VOC (TCE) was detected in soil gas samples collected at this feature (Tetra Tech, 2005). Four (4) soil gas sampling locations are proposed to further delineate the horizontal and vertical VOC contamination. Soil gas samples collected at this feature will be analyzed for VOCs.

Planned Class 2 Soil Borings

Based on a review of previous reports and site inspections, a total of eight (8) Class 2 soil borings are planned for Historical Operational Area F, as follows:

Feature No. 35 — *Betatron (Building 303)* is located in the eastern portion of Historical Operational Area F. PCBs were detected in soil samples collected at this feature (Tetra Tech, 2005). Four (4) additional soil borings are proposed to further delineate PCB contamination. Hand auger samples will be taken a distance of 5 feet to the north, south, east, and west of the

location where the limits of impacts of PCBs to soil were not detined. Soil samples collected at this feature will be analyzed for PCBs.

Feature No. 40 — *Electrical Enclosure* is located in the south central portion of Historical Operational Area F. PCBs were detected in soil samples collected at this feature (Tetra Tech, 2005). Four (4) additional soil borings are proposed to further delineate PCB contamination. Hand auger samples will be taken a distance of 5 feet to the north, south, east, and west of the location where the limits of impacts of PCBs to soil were not detined. Soil samples collected at this feature will be analyzed for PCBs

3.2.2 Historical Operational Area G (Helicopter Weapons Test Area)

Based on a review of previous investigations, one (1) historical feature was identified in Historical Operational Area G as requiring additional investigation. A detailed description of the feature and planned soil gas boring locations is presented in Table 3-1, shown in Figure 3-3, and discussed in this section.

Planned Class 1 Soil Gas Points

Based on a review of previous soil investigations, a total of two (2) Class 1 soil borings have been planned to install soil gas points for Historical Operational Area G, as follows:

Feature No. 46 — *Helicopter Landing Pad and Hanger (Building 302)* is located in the north central portion of Historical Operational Area G. Soil gas samples were not collected during the previous sampling round. Therefore, soil gas sampling is proposed for the supplemental soil investigation will be completed. Soil gas samples collected at this feature will be analyzed for VOCs.

3.2.3 Historical Operational Area H (Sanitary Landfill)

Based on a review of previous investigations, one (1) historical feature was identified in Historical Operational Area H as requiring additional investigation. A detailed description of this

feature and planned soil boring locations are presented in Table 3-1, shown in Figure 3-4, and discussed in this section.

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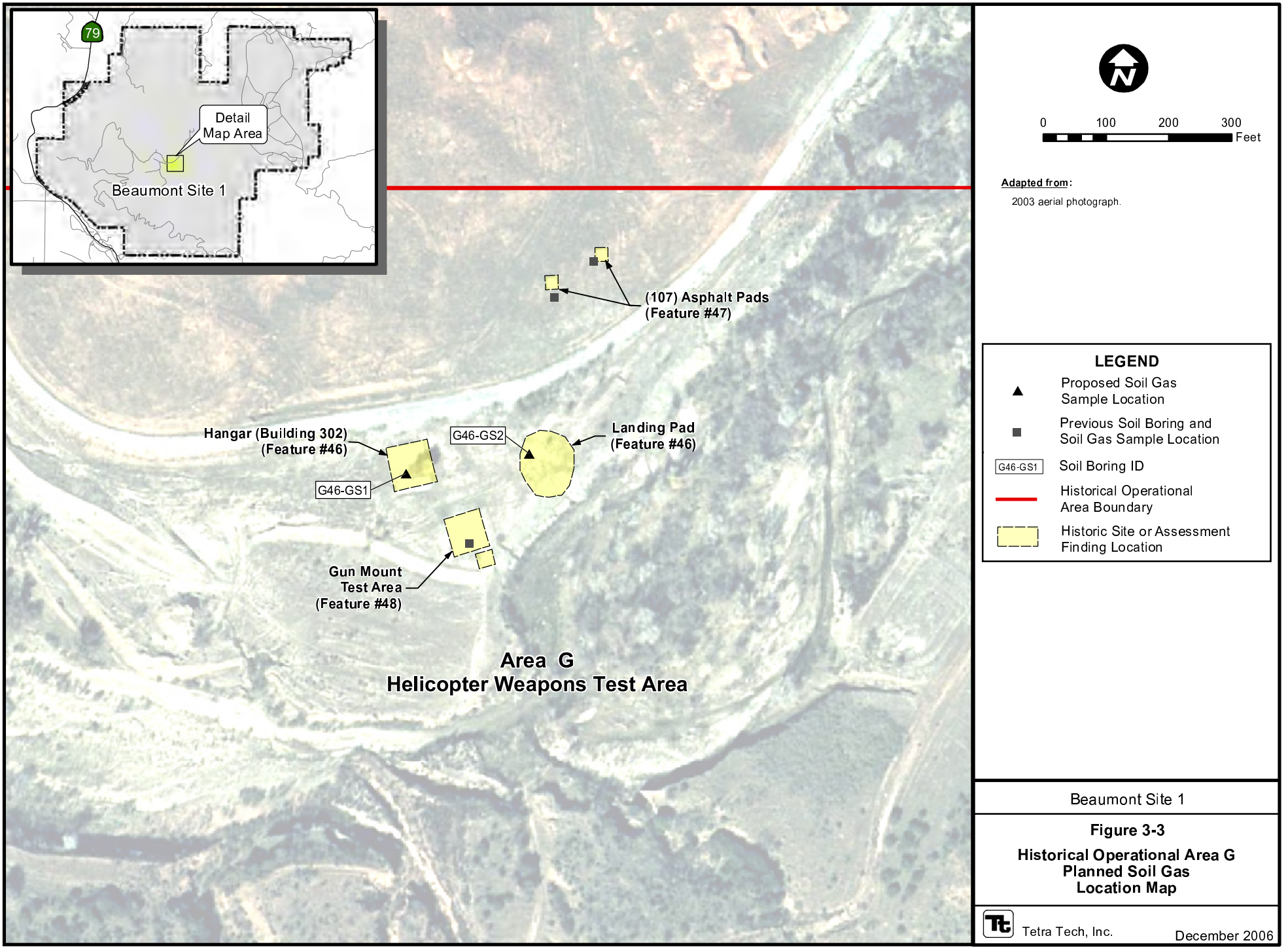

Beaumont Site 1

Figure 3-3

Historical Operational Area G Planned Soil Gas Location Map

Tetra Tech, Inc.

December 2006

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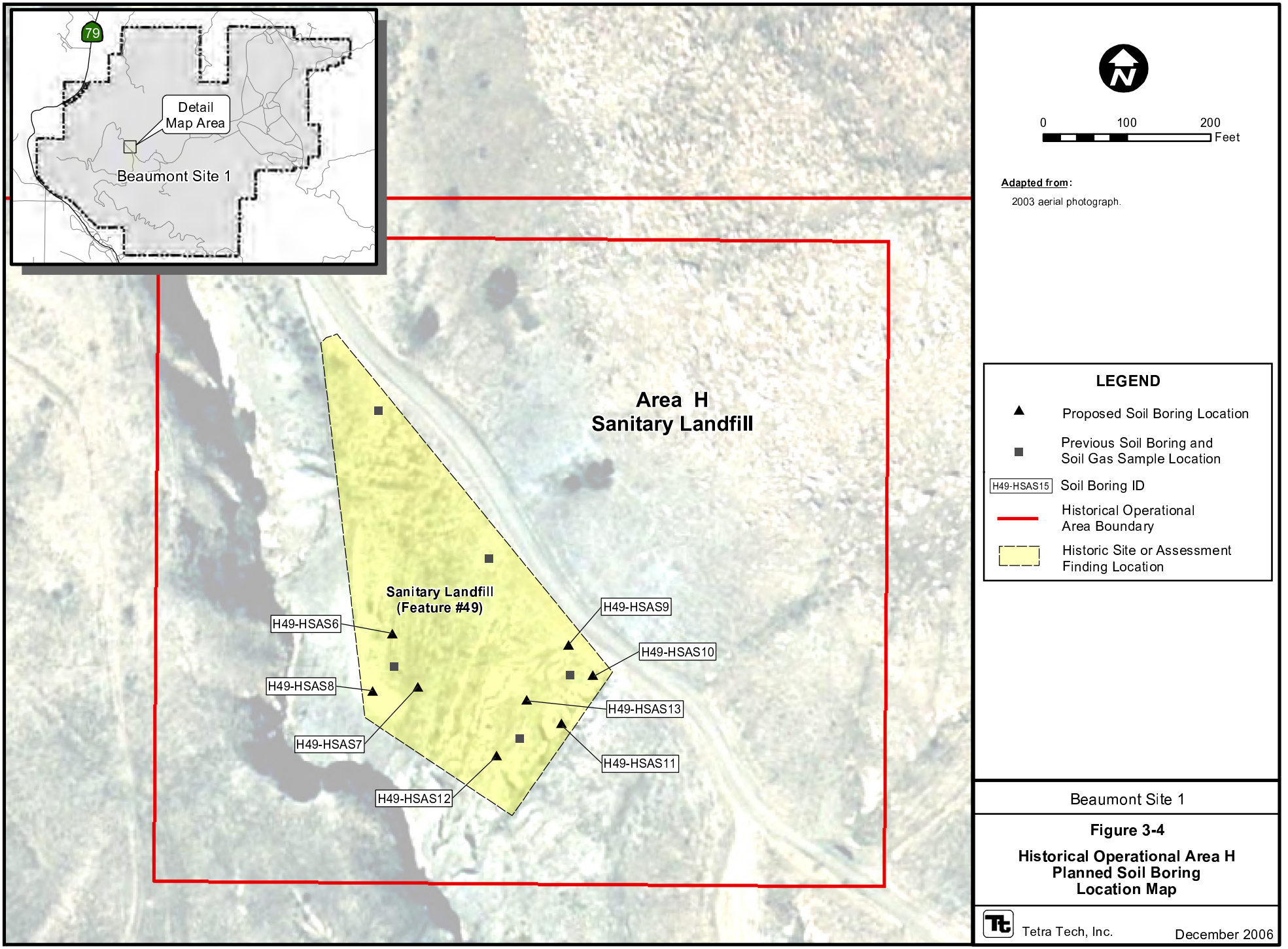

Beaumont Site 1

Figure 3-4

Historical Operational Area H Planned Soil Boring Location Map

Tetra Tech, Inc.

December 2006

Planned Class 1 Soil Borings

Based on a review of previous soil investigations, a total of eight (8) Class 1 soil borings have been planned for Historical Operational Area H, as follows:

Feature No. 49

The Sanitary Landfill is located in the center of Historical Operational Area H. Perchlorate and PCBs were detected in soil samples collected at this feature (Tetra Tech, 2005). Three (3) additional soil borings are proposed to further delineate perchlorate contamination and five (5) additional soil borings are proposed to further delineate PCB contamination where the limits of soil impact have not been defined. Soil samples collected at this feature from the borings in the eastern portion of the landfill will be analyzed for perchlorate and samples from the borings in the southwestern portion of the landfill will be analyzed for PCBs.

One groundwater monitoring well is proposed to be installed at Feature No. 49. The monitoring well will be installed in the boring of H49-HSAS8. This monitoring well will be installed, developed, and sampled as described for the monitoring well at Feature 33. If groundwater is not encountered at the total depth of the boring (60' bgs), the boring will be drilled an additional 10' in depth. If groundwater is not encountered at 70' bgs, the boring will be abandoned without installation of a monitoring well. If impacted groundwater is detected, further assessment will be performed under the groundwater characterization program.

3.2.4 Potentially Uncharacterized Features

During recent interviews with two former LPC employees with personal knowledge of historical activities at Site 1, additional features were tentatively identified. The Class A explosives storage area in Area D was identified as being near Feature 29, Ballistics Tunnel and Pad, rather than near Feature 26, Small Test Area. The location where TNT was dissolved from projectiles was identified as occurring near Feature 26, Small Test Area. No acetone was reportedly discharged to the ground surface. Three storage buildings also previously existed in Area A. Since the stored material in these buildings is unknown, samples will be taken and tested

Soil and soil gas sampling are proposed in the identified areas. ~~Three~~ Six (~~3~~6) hand auger samples to a total depth of 5 feet bgs are proposed south of Feature 29, Ballistics Tunnel and Pad with the samples tested for munitions residue. Samples from the former storage building area will also be tested for VOCs and perchlorate. Three (3) soil gas sampling locations are proposed north of Feature 26, Small Test Area to a total depth of 30 feet bgs with the samples tested for VOCs. A summary of the proposed testing is presented in Table 3-1 and sampling locations are shown in Figure 3-5.

3.3 SOIL INVESTIGATION PROGRAM

The following subsections present the planned drilling and soil gas probe locations along with the sampling depths and analytical scheme in Historical Operational Areas D through I of Beaumont Site 1. No sampling is proposed for Historical Operational Areas E and I. No changes to the soil investigations described in this Sampling and Analysis Plan will be implemented without prior approval from the DTSC.

3.3.1 Soil Boring Investigation

Based on the data from the previous soil investigations, a total of 10 assessment features were identified within Historical Operational Areas D through I as requiring additional delineation of contamination. These features will be assessed by drilling and sampling subsurface soil and soil gas at or near to the source. Figures 3-1 through 3-5 show the locations of the 10 assessment features in Historical Operational Areas D through I. Table 3-1 presents the features identified as requiring further information to delineate soil contamination, number of soil borings, soil gas points, assessment depths, and feature specific analyses. The sampling procedures and analytical protocols for the soil sampling program are presented in the Site Specific Quality Assurance Project Plan (QAPP) in Appendix A of the Site Investigation Work Plan (Tetra Tech, 2003b). Quality assurance samples will include trip blanks for VOC testing, equipment blanks, and replicate samples. Trip blanks for VOC testing and equipment blanks will be taken daily ~~as appropriate to the testing methods~~ and replicate samples will be taken at a frequency of

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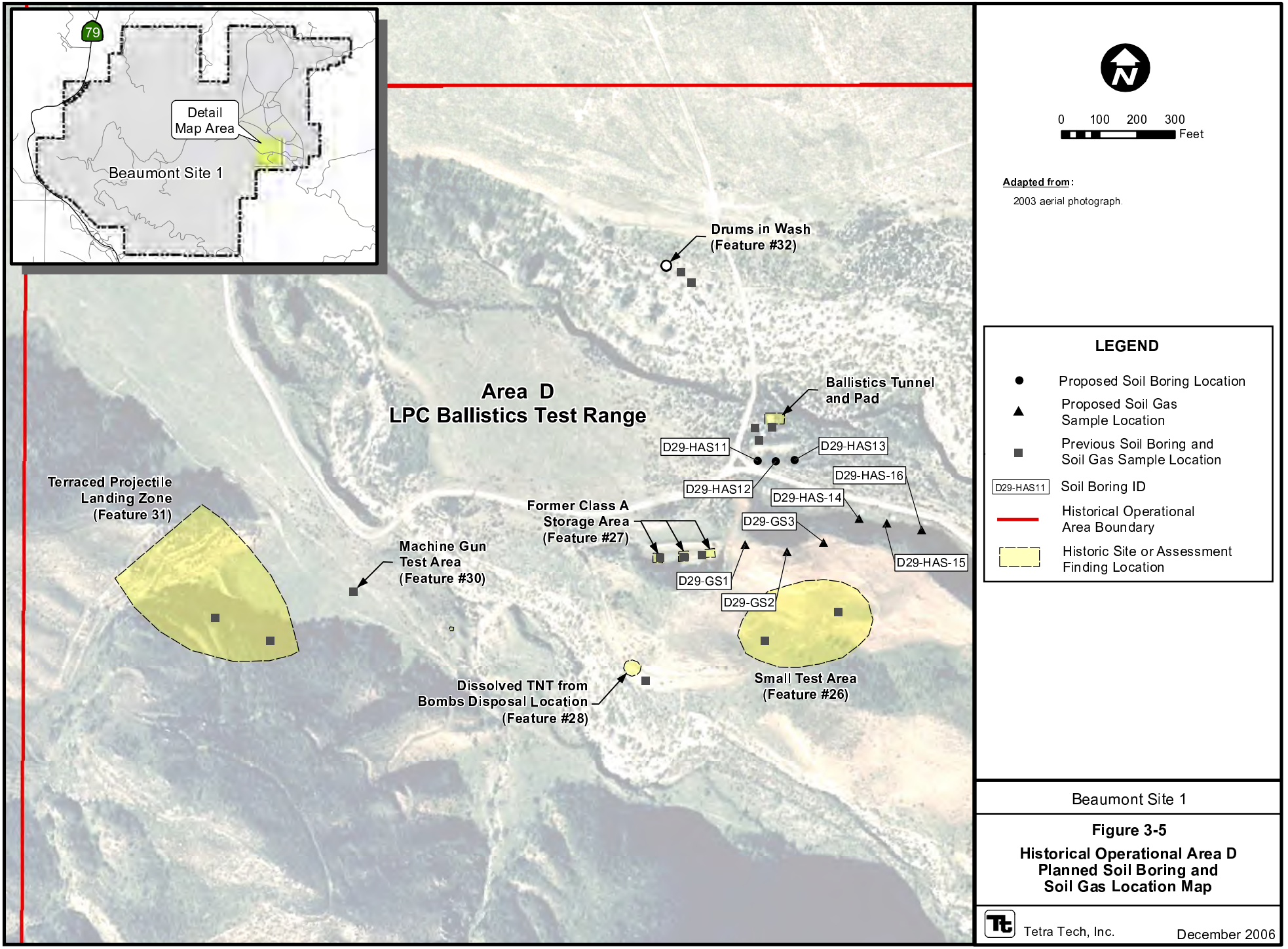

Beaumont Site 1

Figure 3-5

Historical Operational Area D Planned Soil Boring and Soil Gas Location Map

Tetra Tech, Inc.

December 2006

10% of the environmental samples. The data will be validated based on US Environmental Protection Agency standards. An evaluation will be made of laboratory procedures for quality control issues identified during data validation.

Class 1 Soil Borings

Based on previous investigations, a total of eighteen (18) Class 1 soil borings will be drilled within Historical Operational Areas D through H, as shown in Figures 3-1, 3-3, 3-4, and 3-5. Ten (10) borings are within Historical Operational Area F and eight (8) are within Historical Operational Area H. The 18 Class 1 soil borings will consist of drilling 680 linear feet and collecting a total of 154 soil samples. ~~One~~ Two groundwater monitoring wells will be installed in a boring, one each in Historical Operational Areas F and H.

Test Sample Selection Protocol

A minimum of three samples will be selected for testing from each boring. The samples shall be selected based on conditions encountered during drilling and information from previous investigations. Additional samples may also be selected if indicated by field conditions that the minimum three samples per boring are not sufficient to establish the vertical extent and range of impacts to soil in a boring.

For borings deeper than 20 ft bgs, one sample shall be selected from the depth of interval of 0 to 10 ft bgs. For borings away from the likely source of contamination, sample shall be selected for testing such that (in the approximate order of priority):

- If OVA readings of a sample exceed 10 times background, the sample shall be selected for testing;
- If during drilling, staining or odors are noted indicative of a chemical release, soil samples shall be selected for testing at a minimum interval of 10 ft throughout the impacted depths in the boring;
- The test sample selected shall be at a depth equal to or deeper than the shallowest sample in which contamination was found in the nearest boring closer to the likely source;
- The degree of impact with depth in nearby boring shall be considered (e.g. if contamination at 5 feet in depth in the nearby boring is 100 times that of the 0.5 foot sample, the selected sample should be at 5 or 10 feet, depending on field conditions);
- The selected test sample should contain fine-grained materials (e.g. a sample with fine-grained material would be selected over a clean sand); and
- If no contamination was detected in the 0 to10 ft range in the nearby boring, the 10 ft bgs sample shall be selected for testing if the main contaminant of concern is perchlorate and the 5 ft bgs sample shall be selected for testing if the main contaminant of concern is PCBs.

A minimum of two samples shall be selected from the depth interval of 15 ft bgs to total depth based on the following (in the approximate order of priority):

- If OVA readings of a sample exceed 10 times background, the sample shall be selected for testing.
- If during drilling, staining or odors are noted indicative of a chemical release, soil samples shall be selected for testing at a minimum interval of 10 ft throughout the impacted depths in the boring and a sample 10 ft below the impacted interval or the deepest sample in the boring, whichever is shallowest, shall also be selected.
- Depending on soil type as described above, one of the two deepest samples shall be selected for testing;
- The test sample selected shall be at a depth equal to or deeper than the sample with the highest concentration of the contaminant of concern at or below 15 ft bgs in the nearest boring closer to the likely source considering the degree of impact as discussed above; and
- The selected test sample should contain fine-grained materials (e.g. a sample with fine-grained material would be selected over a clean sand).

For borings drilled to 20 feet, two samples shall be selected from the depth of interval of 0 to 15 ft bgs as described above and 20 foot sample shall be selected for testing unless otherwise indicated by field conditions.

Class 2 Soil Borings

Based on previous investigations, a total of ~~eleven~~ fourteen (~~11~~14) Class 2 soil borings will be drilled within Historical Operational Areas D and F, as shown in Figures 3-1, 3-2 and 3-5. ~~Three~~ Six (6~~3~~) borings are within Historical Operational Area D and eight (8) are within Historical Operational Area F. The ~~11~~ 14 Class 2 soil borings will consist of drilling ~~55~~ 70 linear feet and collecting a total of ~~22~~ 28 soil samples.

3.3.2 Soil Gas Survey

In conjunction with the soil boring program, a limited soil gas survey will also be performed to further delineate VOCs in soil pore space. A total of eleven (11) soil gas sampling locations are planned within Historical Operational Areas D, F, and G, as shown in Figures 3-1, 3-3, and 3-5. A total of seven (7) soil gas sampling locations are planned within Historical Operational Area F, two (2) in Historical Operational Area G, and three (3) in Historical Operational Area D. Three soil gas probes will be placed within a soil boring at depths of 30 feet bgs. Overall, a total of 36 soil vapor probes will be installed and sampled for VOCs using modified EPA Test Method 8260B.

The sampling procedure and analytical protocols for the limited soil gas program are presented in the Site Specific QAPP in Appendix A of the Site Investigation Work Plan (Tetra Tech, 2003b).

Section 4
REFERENCES

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Appendix A

Supplemental Information

Previous Soil Boring and Monitoring Well Locations

Previous Soil Boring Perchlorate Results

Appendix A

Supplemental Information

Previous Soil Boring and Monitoring Well Locations

Previous Soil Boring Perchlorate Results

List of Figures

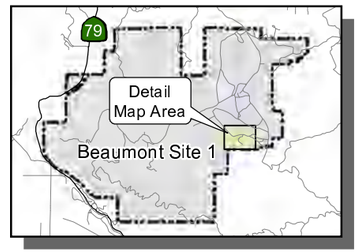
X:\GIS\LOCKHEED 17915\AREA D.MXD

0 100 200 300 Feet

Adapted from: February 2002 aerial photograph.

LEGEND

- Monitoring Well Location
- A-6-HAS1 — Proposed Soil Boring Location
- A-6-HA2 — Proposed Soil Gas Sample Location
- A-3-DP5 — Previous Soil Boring and Soil Gas Sample Location
- Beaumont Site 1 Property Boundary
- Historical Operational Area Boundary



Beaumont Site 1

Figure A-1
Historical Operational Area D
LPC Ballistics Test Range
Previous and Planned Soil Borings, and Existing Monitoring Wells

Tetra Tech, Inc. December 2006

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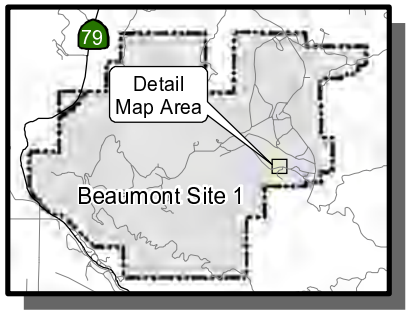

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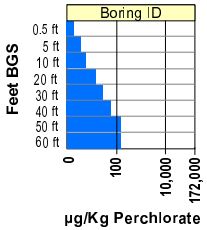

Soil Boring Location

Historical Operational Unit Boundary

Note: Beaumont Site 2 property boundary from Hillwig-Goodrow survey, May 2004.

Adapted from: February 2002 aerial photograph.

Beaumont Site 1

Figure A-2
Historical Operational Area D
LPC Ballistics Test Range
Previous Soil Boring
Perchlorate Results

Tetra Tech, Inc. December 2006

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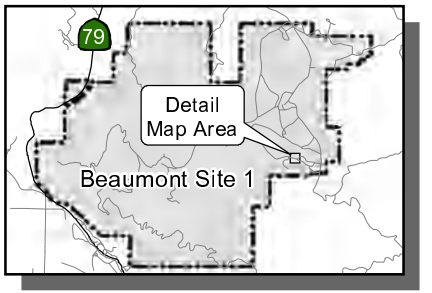
0 50 100 150 Feet

Adapted from: February 2002 aerial photograph.

LEGEND

- Monitoring Well Location
- D29-HAE13 — Supplemental Investigation Soil Gas Sample Location
- A-6-HAS1 — Supplemental Investigation Soil Boring Location
- A-6-HA2 — Previous Soil Boring Location
- A-3-DP5 — Previous Soil Boring and Soil Gas Sample Location
- Beaumont Site 1 Property Boundary



Beaumont Site 1

Figure A-3
Historical Operational Area D
LPC Ballistics Test Range
(East Central Area)
Previous and Planned Soil Borings, and Existing Monitoring Wells

Tetra Tech, Inc. December 2006

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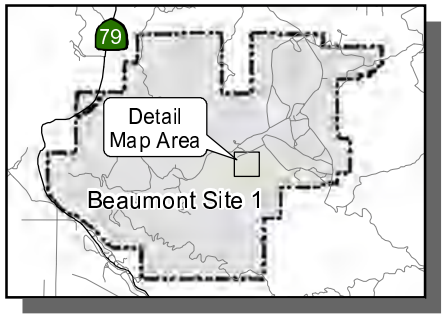
Feet

Adapted from:

2003 aerial photograph.

LEGEND

- Monitoring Well Location
- Beaumont Site 1 Property Boundary
- Historical Operational Area Boundary



Beaumont Site 1

Figure A-4
Historical Operational Area E
Radioactive Waste Disposal Site
Historic Features
and Existing Monitoring Wells

Tetra Tech, Inc. December 2006

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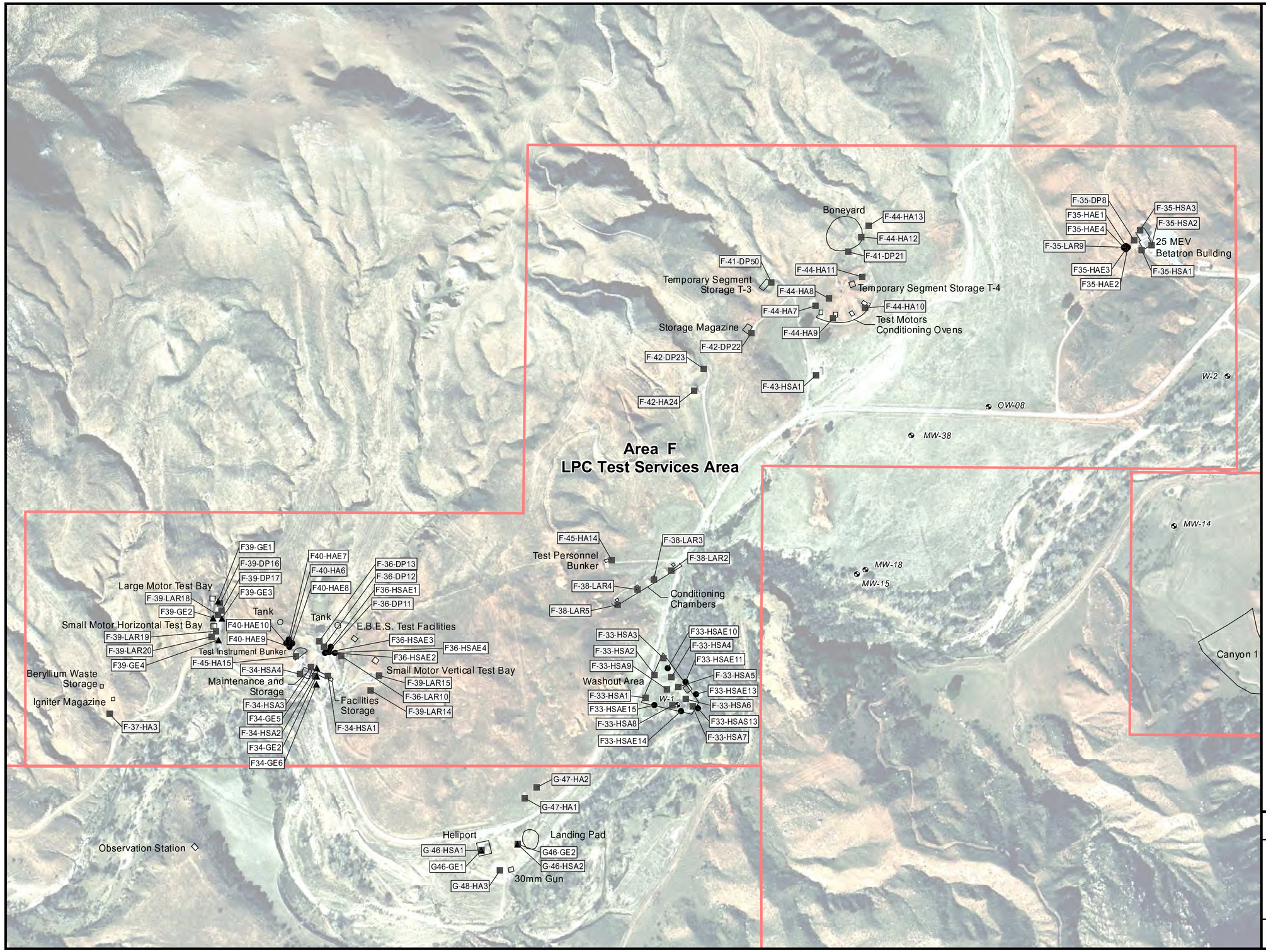

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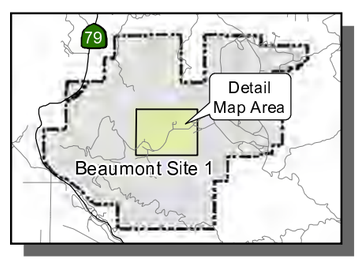
Adapted from: February 2002 aerial photograph.

LEGEND

- Monitoring Well Location
- A-6-HAS1 — Proposed Soil Boring Location
- A-6-HA2 — Proposed Soil Gas Sample Location
- A-3-DP5 — Previous Soil Boring and Soil Gas Sample Location
- Beaumont Site 1 Property Boundary
- Historical Operational Area Boundary



Beaumont Site 1

Figure A-5
Historical Operational Area F
LPC Test Services Area
Previous and Planned Soil Borings, and Existing Monitoring Wells

Tetra Tech, Inc. December 2006

X:\GIS\LOCKHEED 18658-04\SITE 1 AREA F NORTH.MXD

F-44-HA13
ND

F-44-HA12
ND

F-41-DP21
ND

F-44-HA11
ND

F-41-DP50
ND

F-44-HA8
ND

F-44-HA7
ND

F-44-HA10
ND

F-44-HA9
ND

F-42-DP22
ND

F-42-DP23
ND

F-43-HSA1
ND

F-42-HA24
ND

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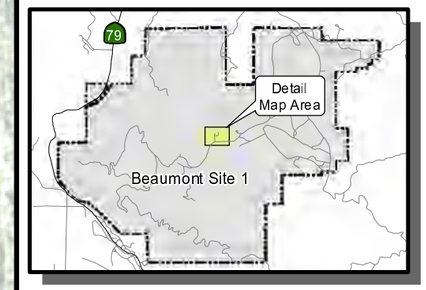

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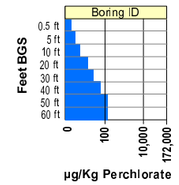

Soil Boring Location

Historical Operational Unit Boundary

Note: Beaumont Site 2 property boundary from Hillwig-Goodrow survey, May 2004.

Adapted from: February 2002 aerial photograph.

Beaumont Site 1

Figure A-6
Historical Operational Area F
LPC Test Services Area
(North Central Portion)
Previous Soil Boring Perchlorate Results

Tetra Tech, Inc. December 2006

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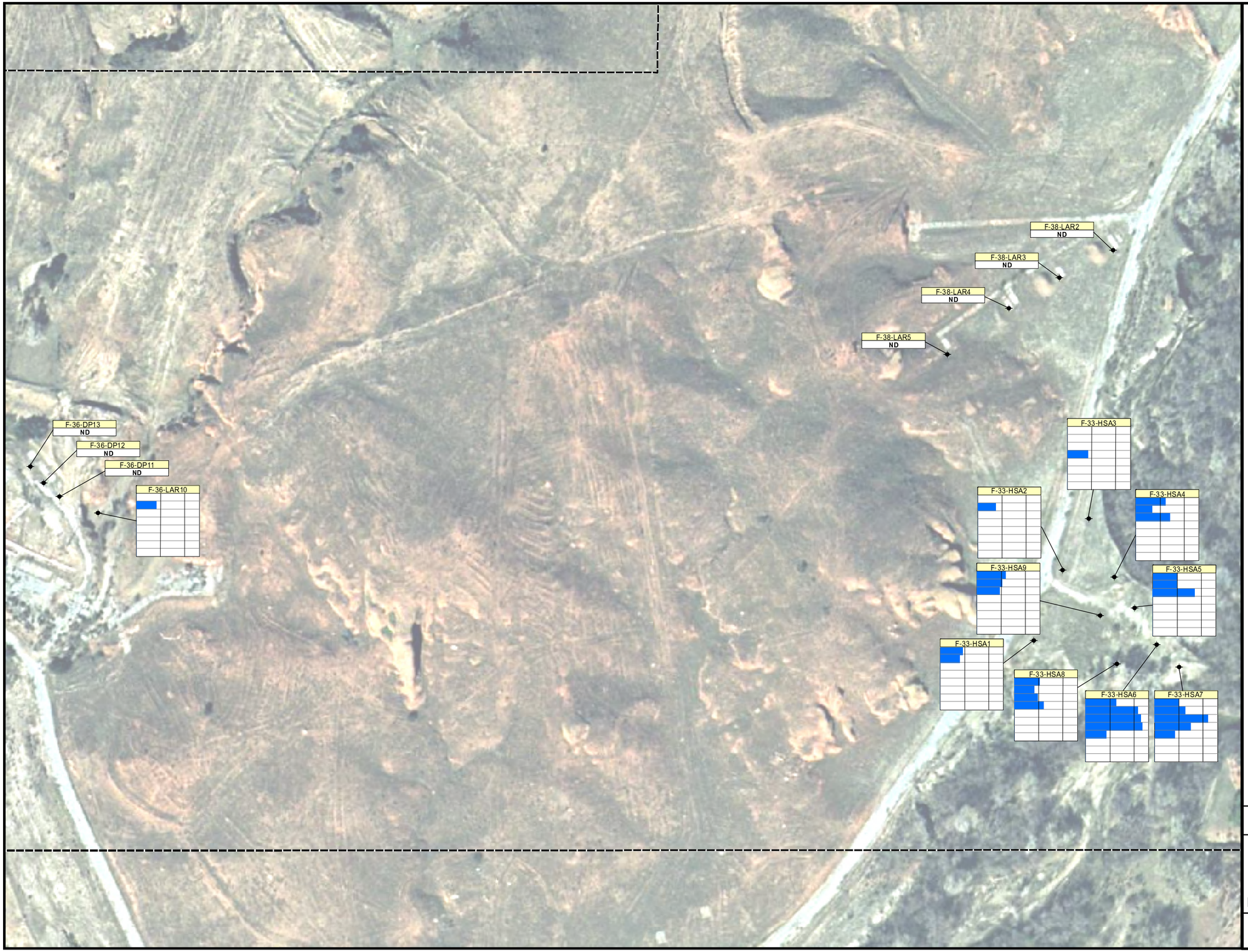

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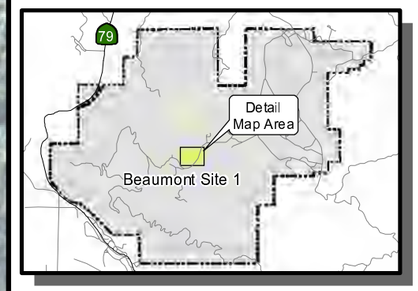

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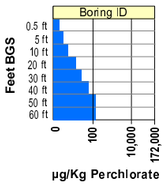

Soil Boring Location

Historical Operational Unit Boundary

Note: Beaumont Site 2 property boundary from Hillwig-Goodrow survey, May 2004.

Adapted from: February 2002 aerial photograph.

Beaumont Site 1

Figure A-7
Historical Operational Area F
LPC Test Services Area
(South Central Portion)
Previous Soil Boring Perchlorate Results

Tetra Tech, Inc. December 2006

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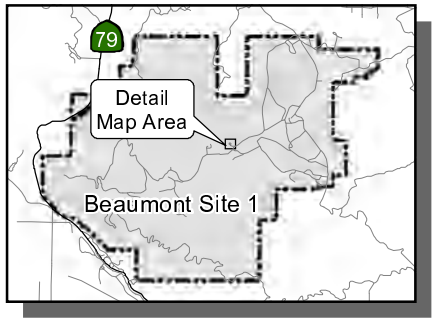
Adapted from: February 2002 aerial photograph.

LEGEND

- Monitoring Well Location
- A-6-HAS1 ▲ Supplemental Investigation Soil Boring Location
- A-6-HA2 ● Previous Soil Boring Location
- A-3-DP5 ■ Previous Soil Boring and Soil Gas Sample Location
- Beaumont Site 1 Property Boundary



Beaumont Site 1

Figure A-8
Historical Operational Area F
LPC Test Services Area
(Northern Portion)
Previous and Planned Soil Borings, and Existing Monitoring Wells

Tetra Tech, Inc. December 2006

X:\GIS\LOCKHEED 17915\AREA F FIG 4.MXD

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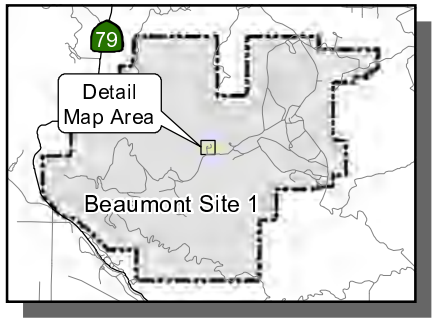
Adapted from: February 2002 aerial photograph.

LEGEND

- Monitoring Well Location
- A-6-HAS1 ▲ Supplemental Investigation Soil Boring Location
- A-6-HA2 ● Previous Soil Boring Location
- A-3-DP5 ■ Previous Soil Boring and Soil Gas Sample Location
- Beaumont Site 1 Property Boundary



Beaumont Site 1

Figure A-9
Historical Operational Area F
LPC Test Services Area
(North Central Portion)
Previous and Planned Soil Borings, and Existing Monitoring Wells

Tetra Tech, Inc. December 2006

X:\GIS\LOCKHEED 17915\AREA F FIG 2.MXD

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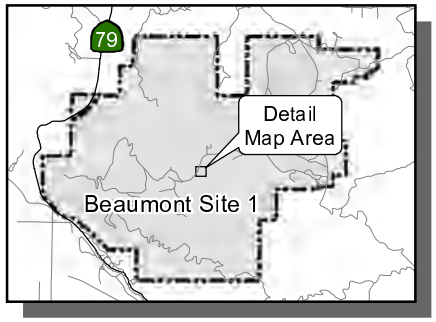
0 50 100 150 Feet

Adapted from: February 2002 aerial photograph.

LEGEND

- Monitoring Well Location
- A-6-HAS1 — Supplemental Investigation Soil Boring Location
- A-6-HA2 — Previous Soil Boring Location
- A-3-DP5 — Previous Soil Boring and Soil Gas Sample Location
- Beaumont Site 1 Property Boundary

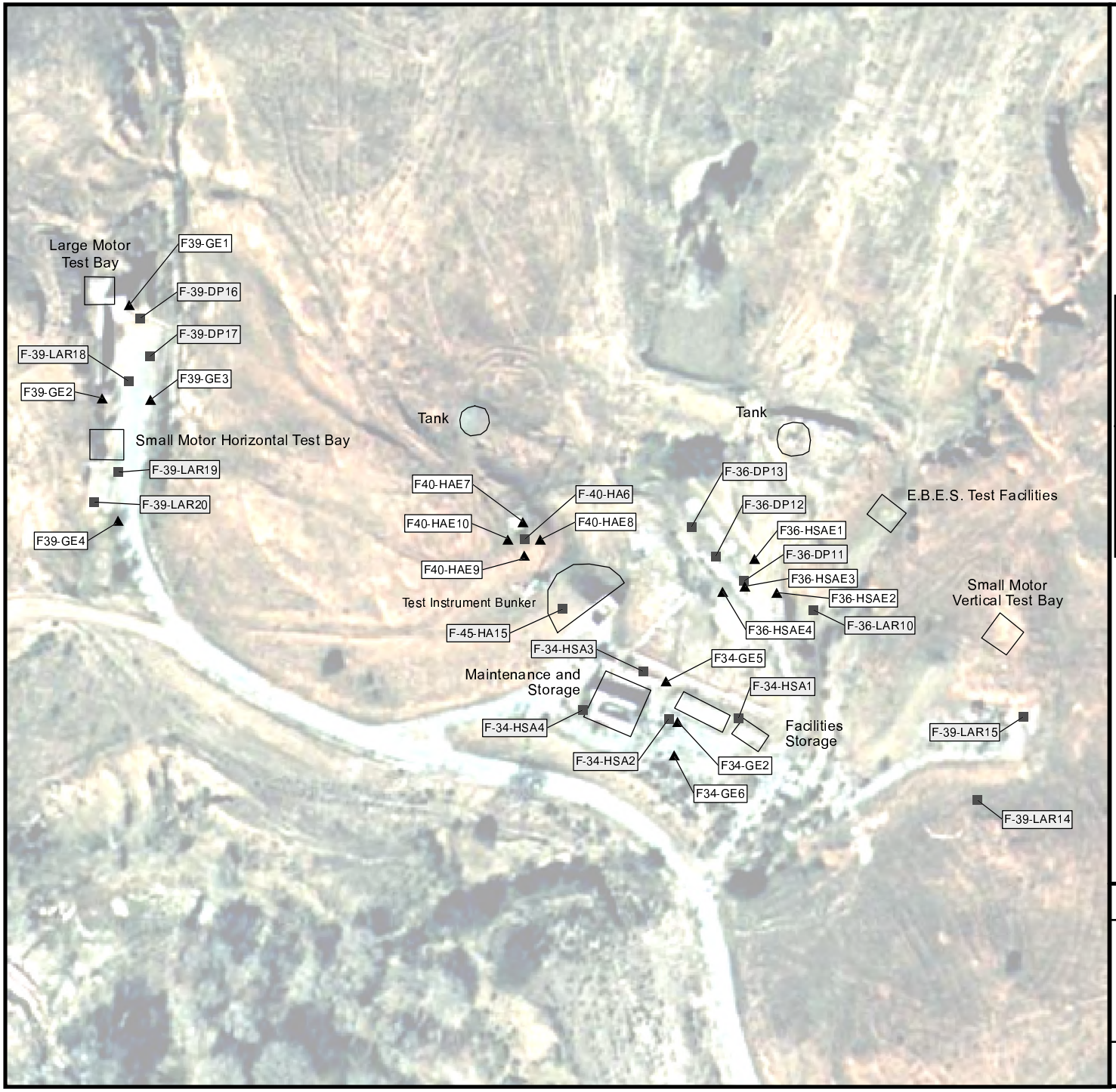


Beaumont Site 1

Figure A-10
Historical Operational Area F
LPC Test Services Area
(South Central Portion)
Previous and Planned Soil Borings, and Existing Monitoring Wells

Tetra Tech, Inc. December 2006

X:\GIS\LOCKHEED 17915\AREA F FIG 1.MXD



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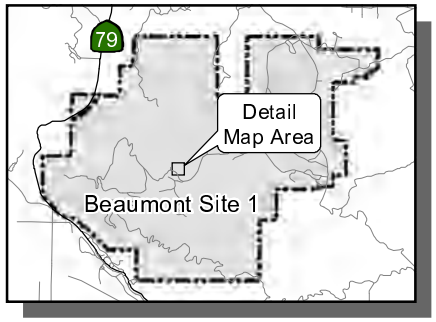
Feet

Adapted from: February 2002 aerial photograph.

LEGEND

- Monitoring Well Location
- A-6-HAS1 — Supplemental Investigation Soil Boring Location
- A-6-HA2 — Previous Soil Boring Location
- A-3-DP5 — Previous Soil Boring and Soil Gas Sample Location
- Beaumont Site 1 Property Boundary

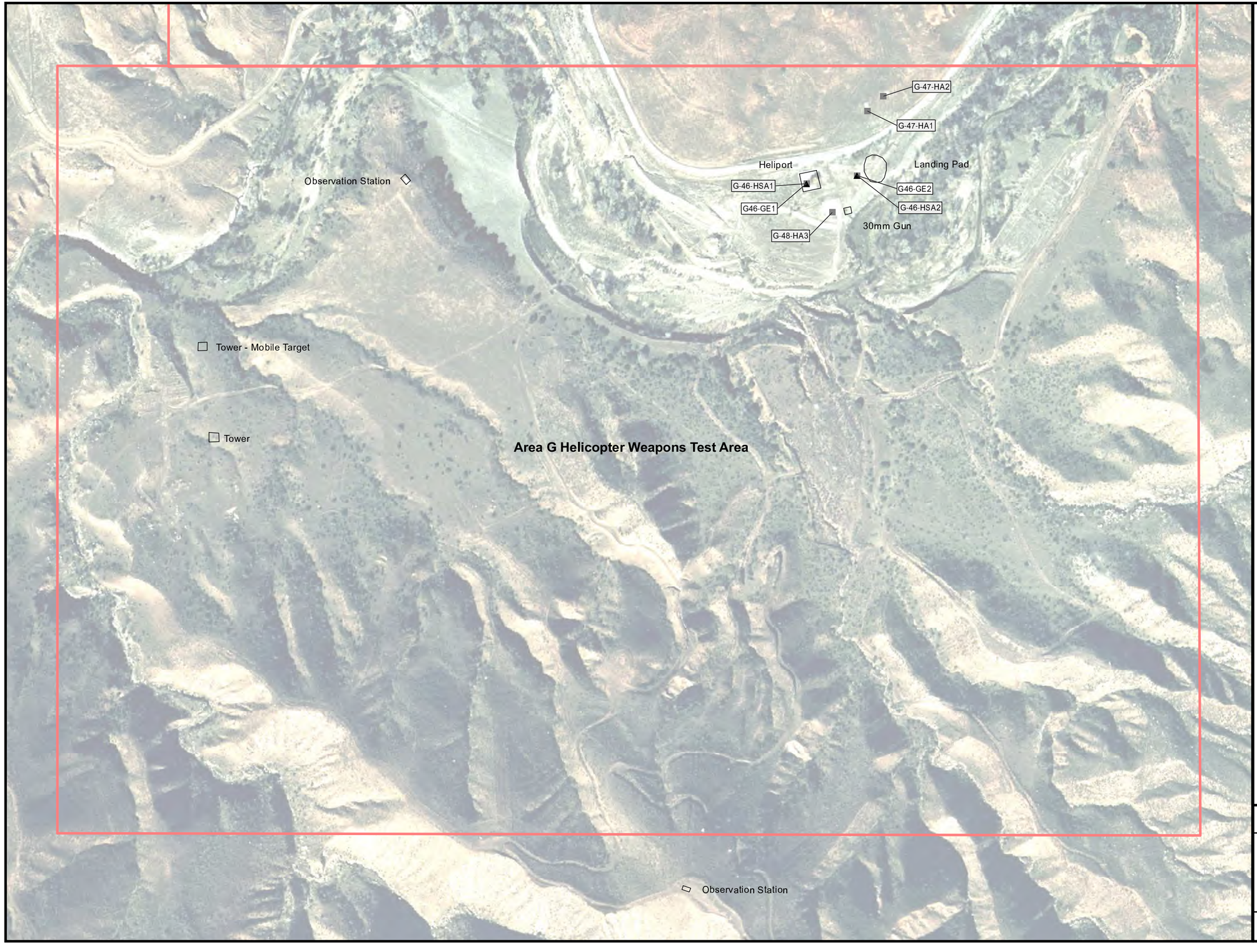


Beaumont Site 1

Figure A-11
Historical Operational Area F
LPC Test Services Area
(West Portion)
Previous and Planned Soil Borings, and Existing Monitoring Wells

Tetra Tech, Inc. December 2006

X:\GIS\LOCKHEED 17915\AREA G.MXD

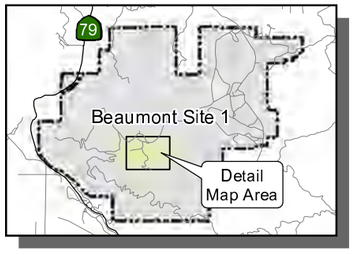


0 200 400 600 Feet

Adapted from: February 2002 aerial photograph.

LEGEND

- Monitoring Well Location
- A-6-HA2 — Proposed Soil Gas Sample Location
- A-3-DP5 — Previous Soil Boring and Soil Gas Sample Location
- Beaumont Site 1 Property Boundary
- Historical Operational Area Boundary



Beaumont Site 1

Figure A-12
Historical Operational Area G Helicopter Weapons Test Area Previous and Planned Soil Borings, and Existing Monitoring Wells

Tetra Tech, Inc. December 2006

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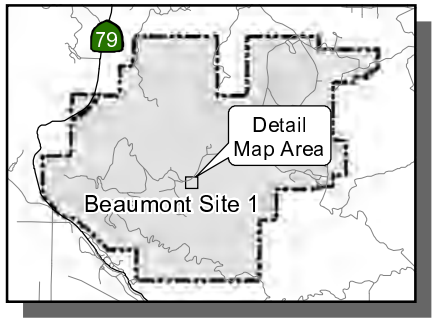
N

0 50 100 150 Feet

Adapted from: February 2002 aerial photograph.

LEGEND

- Monitoring Well Location
- A-6-HAS1 — Supplemental Investigation Soil Boring Location
- A-6-HA2 — Previous Soil Boring Location
- A-3-DP5 — Previous Soil Boring and Soil Gas Sample Location
- Beaumont Site 1 Property Boundary



Beaumont Site 1

Figure A-13
Historical Operational Area G
Helicopter Weapons Test Area
Previous and Planned Soil Borings, and Existing Monitoring Wells

Tetra Tech, Inc. December 2006

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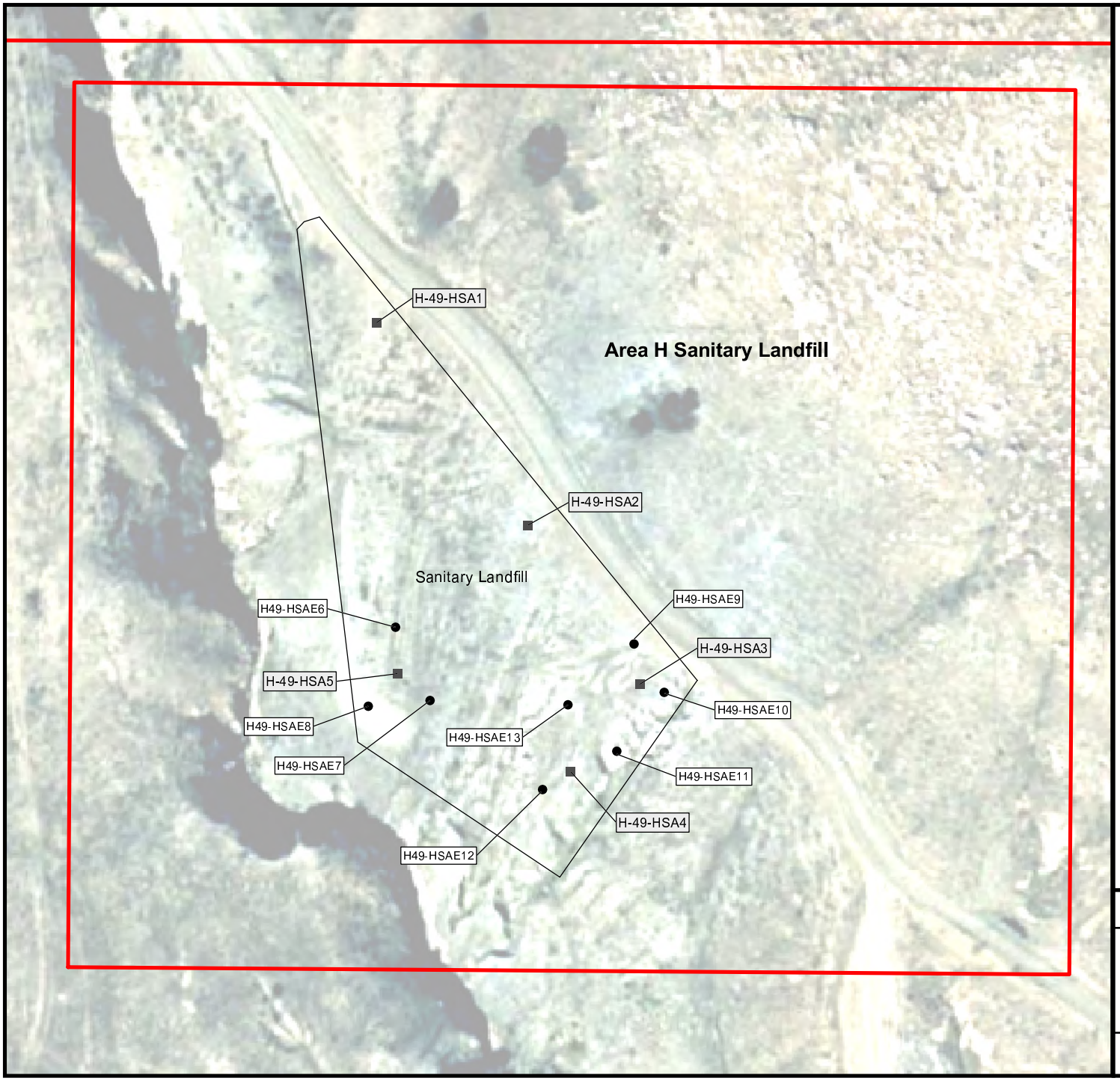


N

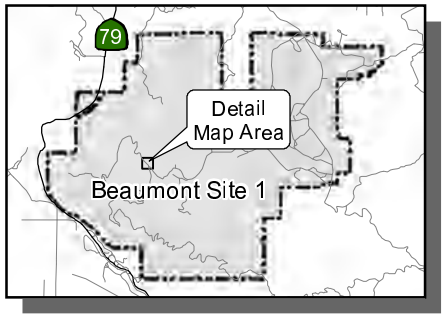
0 50 100 150 Feet

Adapted from:

2003 aerial photograph.

LEGEND

- Monitoring Well Location
- A-6-HAS1 — Proposed Soil Boring Location
- A-3-DP5 — Previous Soil Boring and Soil Gas Sample Location
- Beaumont Site 1 Property Boundary
- Historical Operational Area Boundary

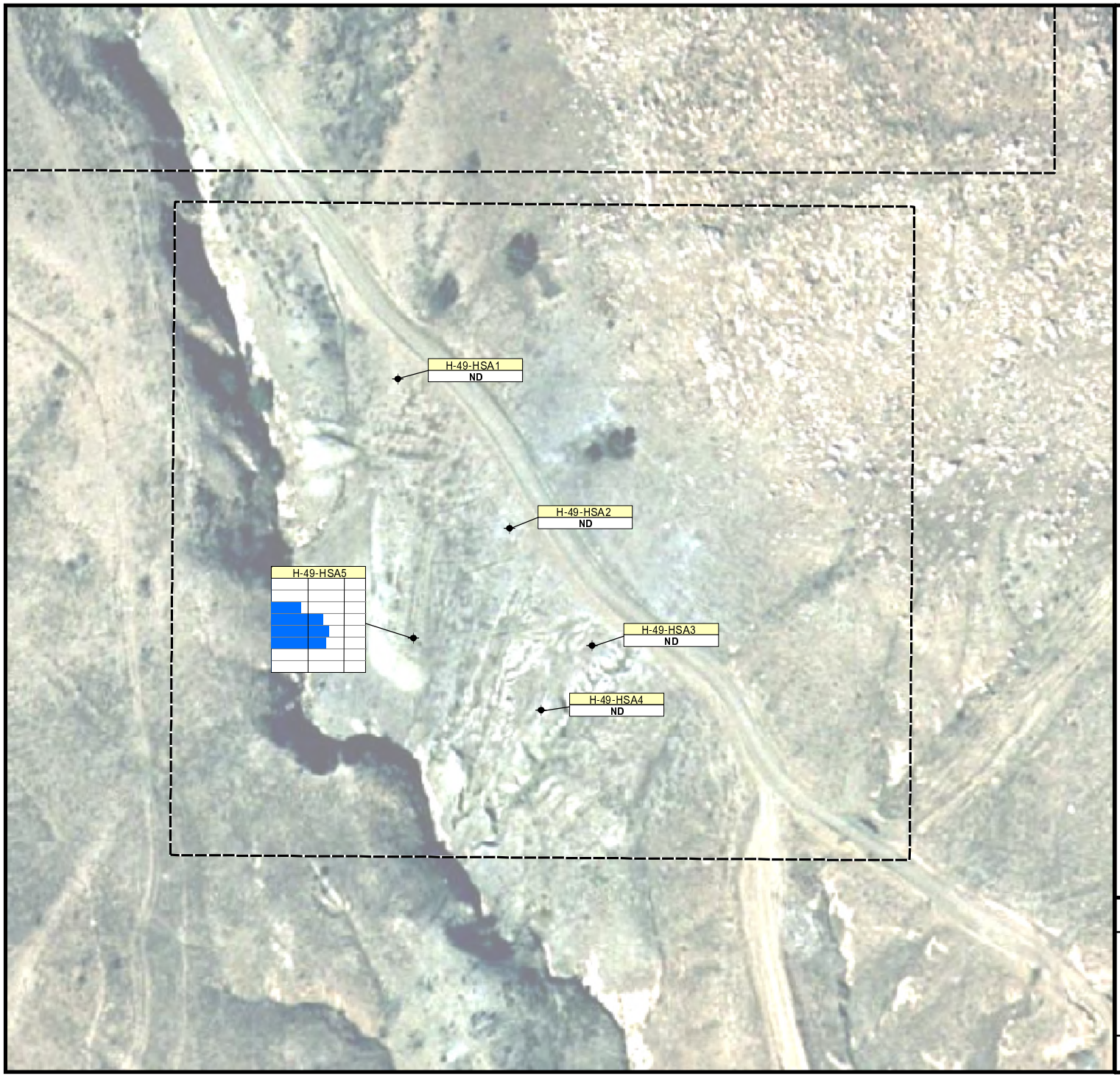


Beaumont Site 1

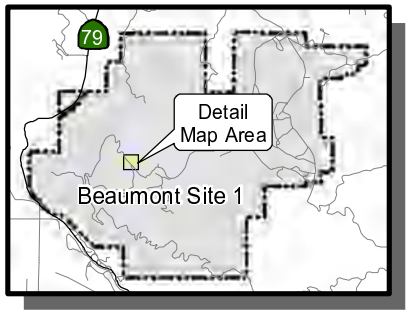
Figure A-14
Historical Operational Area H Sanitary Landfill
Previous and Planned Soil Borings, and Existing Monitoring Wells

Tetra Tech, Inc. December 2006

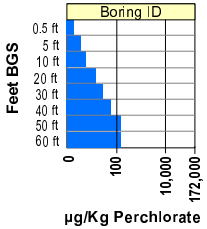
X:\GIS\LOCKHEED 18658-04\SITE 1 AREA H.MXD



0 100 200 Feet



LEGEND



Soil Boring Location

Historical Operational Unit Boundary

Note: Beaumont Site 2 property boundary from Hillwig-Goodrow survey, May 2004.

Adapted from: February 2002 aerial photograph.

Beaumont Site 1

Figure A-15
Historical Operational Area H
Sanitary Landfill
Previous Soil Boring
Perchlorate Results

Tetra Tech, Inc. December 2006

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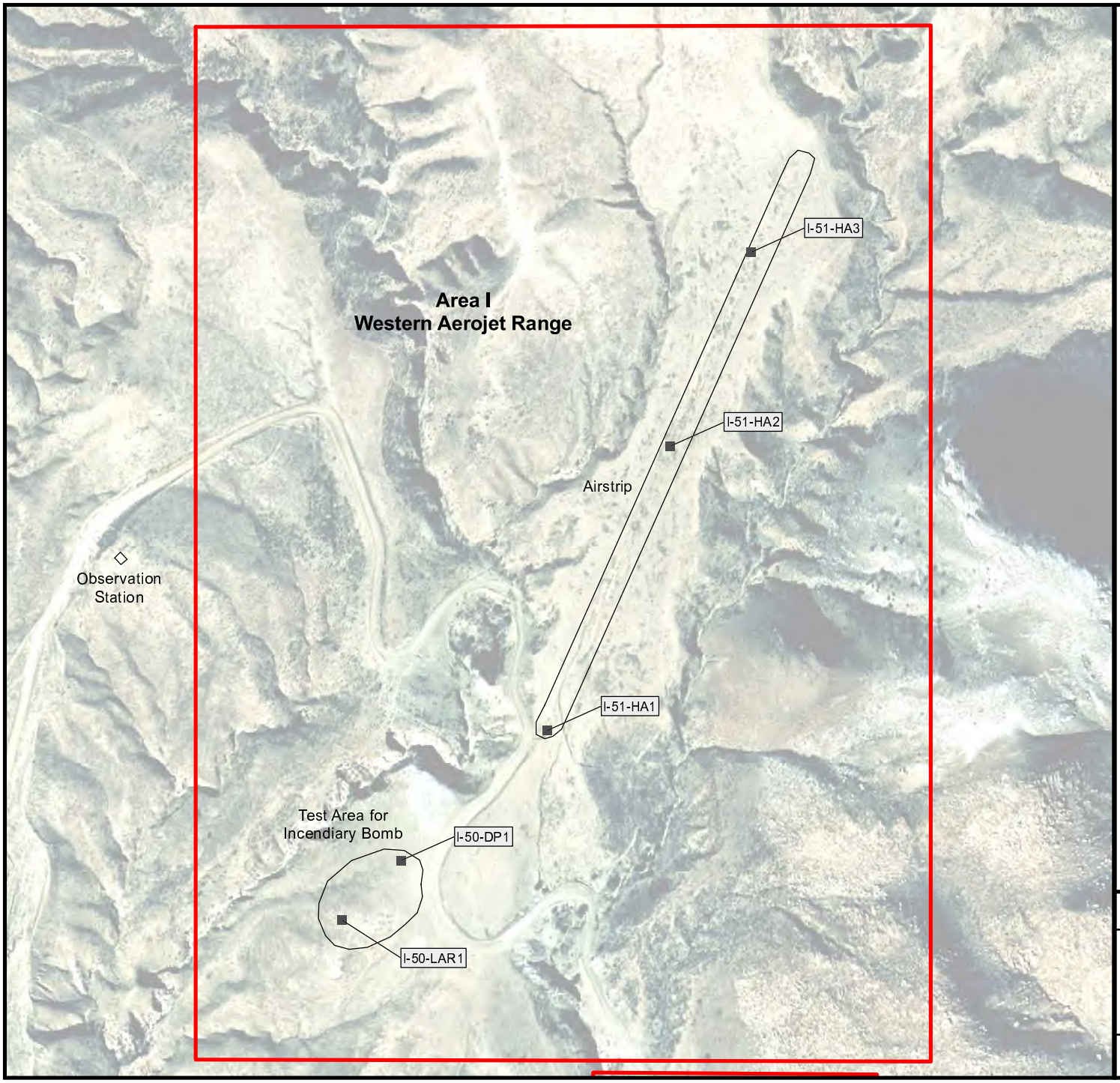


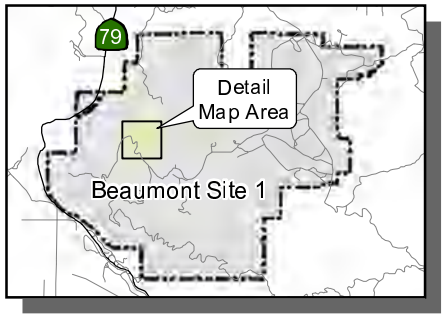
0 200 400 600 Feet

Adapted from:

2003 aerial photograph.

LEGEND

- Monitoring Well Location
- A-6-HAS1 — Proposed Soil Boring Location
- A-3-DP5 — Previous Soil Boring and Soil Gas Sample Location
- Beaumont Site 1 Property Boundary
- Historical Operational Area Boundary



Beaumont Site 1

Figure A-16
Historical Operational Area I
Western Aerojet Range
Previous and Planned Soil Borings, and Existing Monitoring Wells

Tetra Tech, Inc. December 2006

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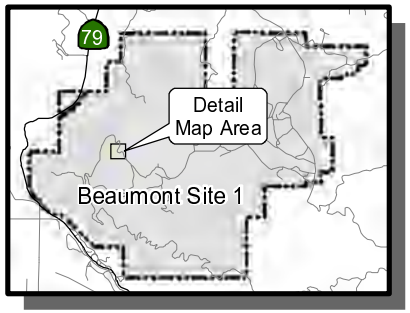
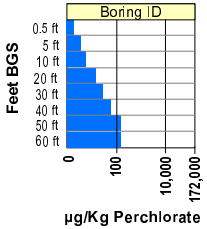
N

0 100 200 Feet



LEGEND



Soil Boring Location

Historical Operational Unit Boundary

Note: Beaumont Site 2 property boundary from Hillwig-Goodrow survey, May 2004.

Adapted from: February 2002 aerial photograph.

Beaumont Site 1

Figure A-17
Historical Operational Area I
Western Aerojet Range
Previous Soil Boring
Perchlorate Results

Tetra Tech, Inc. December 2006