Semiannual Groundwater Monitoring Report
First Quarter and Second Quarter 2009
Lockheed Martin Corporation, Beaumont Site 1
Beaumont, California

Prepared for:

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December 23, 2009

Mr. Daniel Zogaib
Southern California Cleanup Operations
Department of Toxic Substances Control
5796 Corporate Avenue
Cypress, CA 90630

Subject: Submittal of "Annual Groundwater Monitoring Report, Lockheed Martin Corporation, Beaumont Site 1, Beaumont, California"

Dear Mr. Zogaib:

Please find enclosed one (1) copy of the "Annual Groundwater Monitoring Report, Lockheed Martin Corporation, Beaumont Site 1, Beaumont, California" for the first and second quarters of 2009 for your approval or comments.

If you have any questions regarding this submittal or the status of site activities, please contact me at 408.756.9595 or denise.kato@lmco.com.

Sincerely,

Denise Kato

Denise Kato
Remediation Analyst Senior Staff

Enclosure

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Semiannual Groundwater Monitoring Report
First Quarter and Second Quarter 2009

Lockheed Martin Corporation, Beaumont Site 1
Beaumont, California

December 2009
TC #: 23521-0103

Prepared for
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1.0 INTRODUCTION

This Semiannual Groundwater Monitoring Report (Report) has been prepared by Tetra Tech, Inc. (Tetra Tech), on behalf of Lockheed Martin Corporation (LMC), and presents the results of the First Quarter 2009 and Second Quarter 2009 water quality monitoring activities of the Beaumont Site 1 (Site) Groundwater Monitoring Program (GMP). The Site is located south of the City of Beaumont, Riverside County, California (Figure 1-1). Currently, the Site is inactive with the exception of remedial activities performed under Consent Order 88/89 034 and Operation and Maintenance Agreement (O&M Agreement) 93/94 025 with the Department of Toxic Substances Control (DTSC). The State of California owns the 9,117 acre Site, and LMC maintains a conservation easement over 565 acres (Figure 1-2).

The GMP has a quarterly/semiannual/annual/biennial frequency. Both groundwater and surface water are collected and sampled as part of the GMP. The annual and biennial events are larger major monitoring events, and the quarterly and semiannual events are smaller minor events. All new wells are sampled quarterly for 1 year. The semiannual wells are sampled 2nd and 4th quarter of each year, annual wells are sampled the 2nd quarter of each year, and the biennial wells are sampled during the 2nd quarter of even numbered years.

The objectives of this Report are to:

- Briefly summarize the Site history;
- Document water quality monitoring procedures and results; and
- Analyze and evaluate the water quality monitoring data generated.

This Report is organized into the following sections: 1) Introduction, 2) Summary of Monitoring Activities, 3) Groundwater Monitoring Results, 4) Summary and Conclusions, 5) References, and 6) Acronyms. A brief description of the previous site environmental investigations and the current conceptual site model (CSM) can be found in Appendix A. The CSM has been updated to include the recently performed structural analysis of Potrero Valley (i.e., lineament study and geologic mapping) to better understand the possible influence of local faulting and fracturing on groundwater flow in the area.

1.1 SITE BACKGROUND

The Site is a 9,117 acre parcel located south of Beaumont, California. The Site was primarily used for ranching prior to 1960. From 1960 to 1974, the Site was used by Lockheed Propulsion Company (LPC) for solid rocket motor and ballistics testing (Tetra Tech, 2003a). Activities at the Site also included burning of process chemicals and waste rocket propellants in an area commonly referred to as the burn pit area (BPA).

Nine primary historical operational areas have been identified at the Site. A Site historical operational areas and features map is presented as Figure 1-2. Historical operational areas were used for various activities associated with rocket motor assembly, testing, and propellant incineration. A brief description of each historical operational area follows:

Historical Operational Area A – Eastern Aerojet Range

Between 1970 and 1972, Aerojet leased an area (referred to as the Eastern Aerojet Range) along the eastern portion of the Site. The Eastern Aerojet Range was used periodically for ballistics research and development experimentation on several types of 30-millimeter projectiles. Avanti, a highly classified project, utilized the land directly east of the Eastern Aerojet Range, including several U-shaped revetments for the storage of explosive materials and rocket motors. Due to its classified status, the purpose of the Avanti project and its operational procedures are unknown (Radian, 1986).

Historical Operational Area B – Rocket Motor Production Area

The Rocket Motor Production Area (RMPA), also known as the Propellant Mixing Area, was used for the processing and mixing of rocket motor solid propellants. The rocket motor production process consisted of: 1) a fuel slurry station, 2) a mixing station, and 3) a cast and curing station.

If a defect was found in the solid propellant mix, the rocket motor was scrapped. The solid propellant was removed from the casings by water jetting at the motor washout located south of the mixing station (Radian, 1986).

In 1973, an area east of the mixing station, known as the blue motor burn pit, was utilized for the destruction of 4 motors, which included a motor with “Maloy blue” solid propellant (Radian, 1986).

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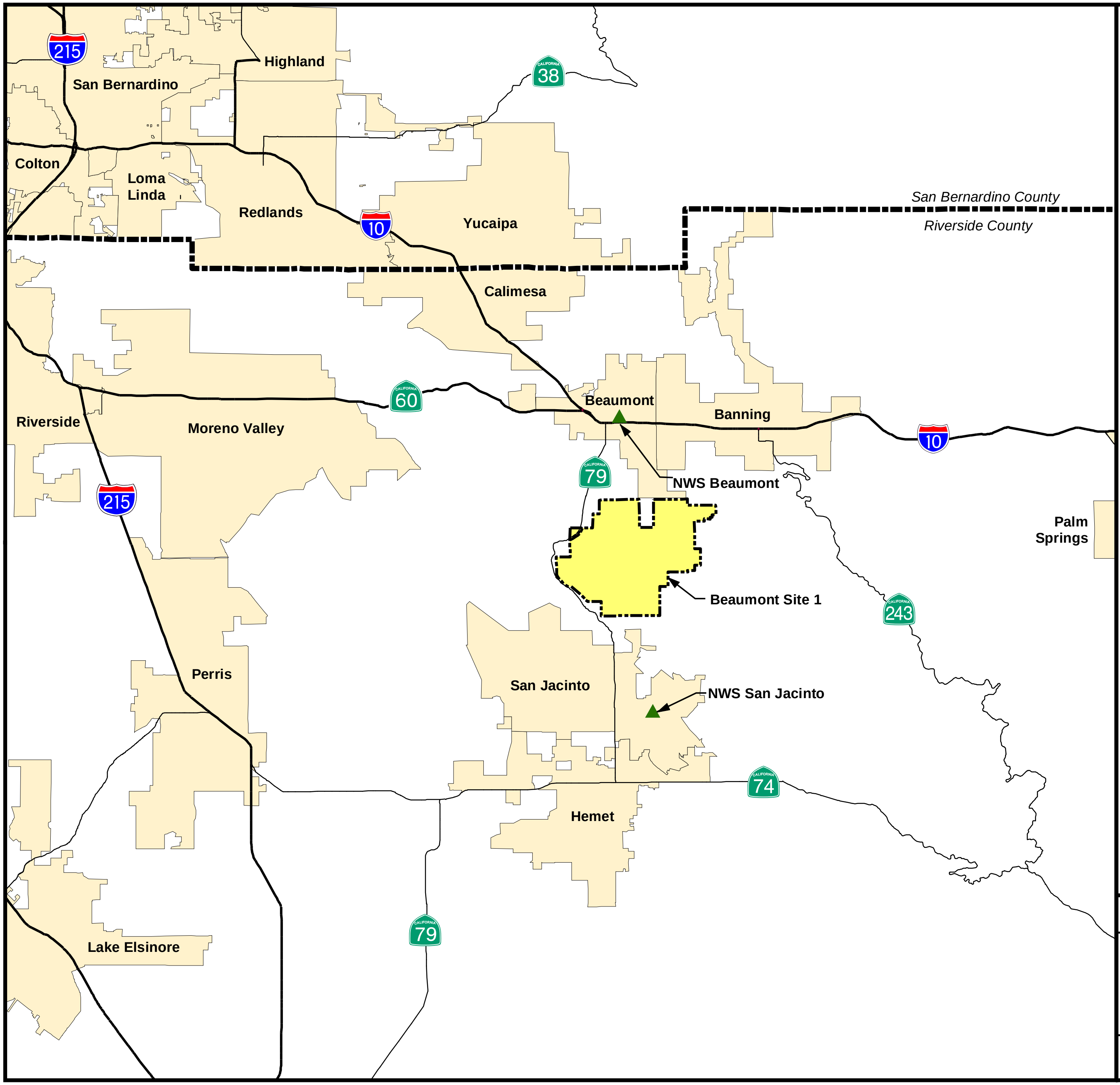

0 5 Miles

Adapted from:

U.S. Census Bureau TIGER line data, 2000.

LEGEND

▲	National Weather Service Station
—	Interstate/Freeway
—	State Highway
▬ ▪ ▬	County Boundary
▨	Beaumont Site 1 Property Boundary
▨	City/Municipality

Beaumont Site 1

Figure 1-1
Regional Location of Beaumont Site 1

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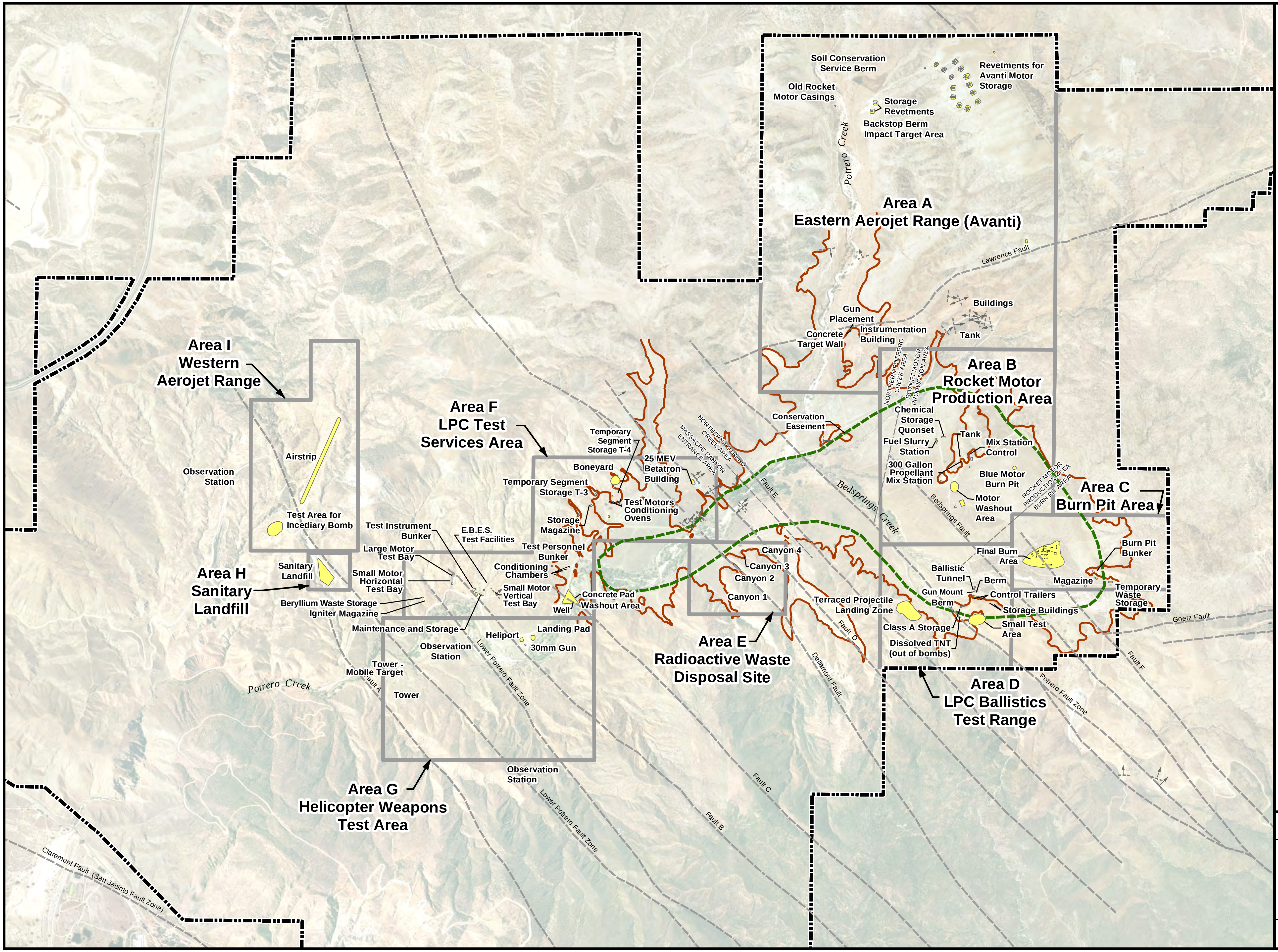

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0 1,000 2,000 Feet

Adapted from: March 2007 aerial photograph.

Faults from structural analysis of Potrero Valley, *Lineament and Geologic Mapping Study, Tetra Tech, 2009.*

LEGEND

Fault, Accurately Located Showing Dip

Fault, Approximately Located

Bedrock/Alluvium Surface Contact
Dashed where inferred

Historic Feature Location

Conservation Easement Boundary

Beaumont Site 1 Property Boundary

Historical Operational Area Boundary

Notes: Beaumont Site 1 property boundary is approximate.

Beaumont Site 1

Figure 1-2
Historical Operational Areas, Site Features, and Conservation Easement

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Historical Operational Area C – Burn Pit Area

The BPA consisted of 3 primary features: 1) the chemical storage area, 2) burn pits, and 3) the beryllium test stand. Hazardous waste materials generated at the Site were stored in 55-gallon drums on a concrete pad east of the burn pits at the chemical storage area until enough material was generated for a burning event. The hazardous materials burned in the pits included: ammonium perchlorate, wet propellant from motor washout, dry propellant, batches of out-of-specification propellant, various kinds of adhesives, resin curatives such as polybutadiene acrylonitrile/acrylic acid copolymer, burn rate modifiers such as ferrocene, pyrotechnic and ignition components, packaging materials (e.g., metal drums, plastic bags, and paper drums), and solvents (Radian, 1986).

On the south side of the spur, where the burn pit instrumentation bunker was located, there was a 1-time firing of small beryllium research motors (Radian, 1986).

Historical Operational Area D – LPC Ballistics Test Range

The LPC Ballistics Test Range facilities included gun mounts, a ballistic tunnel, and storage buildings and trailers. Guns were tested by firing through the tunnel toward a terraced hill. Live rounds were not used although projectiles were often specially shaped and weighted to simulate actual live rounds (Radian, 1986). Another major project conducted in this area was experimentation on a rocket-assisted projectile to test penetration capability. Additional experiments included impact testing of various motors and pieces of equipment (Radian, 1986).

Class A explosives were reportedly stored in 2 or 3 10-foot by 10-foot buildings located behind a berm. A small canyon behind the hill to the south of the former storage buildings was reportedly used as a small test area for incendiary bombs. An incendiary bomb was detonated in the center of drums containing various types of fuel (e.g., jet fuel, gasoline, and diesel) set in circles of different radii to observe shrapnel and penetration patterns. This test may have been conducted in Area I. At a small area near the bend in the road, acetone was used to dissolve 2,4,6-trinitrotoluene (TNT) out of projectiles before they were fired (Radian, 1986).

Historical Operational Area E – Radioactive Waste Disposal Site

During 1971, low-level radioactive waste was buried in 1 of 4 canyons southeast of the LPC test services area as reported by former Site employees. In 1990, the radioactive waste was located and removed. The analytical results indicated that detected radiation levels were within the range of naturally occurring levels (Radian, 1990). Maps from the removal action report suggest the waste was removed from Canyon 2.

Historical Operational Area F – LPC Test Services Area

The LPC Test Services Area included the following features: 1) 3 bays for structural load tests, 2) a 13-foot-diameter spherical pressure vessel, 3) 6 temperature conditioning chambers, 4) 4 environmental chambers, 5) a 25-million electron volt (MeV) Betatron for X-raying large structures, 6) personnel and instrumentation protection bunkers, and 7) supporting workshops and storage areas (Radian, 1986).

If defects were identified during the integrity and environmental testing activities, the rocket motors were taken to a secondary washout area located south of the conditioning chambers adjacent to Potrero Creek (Radian, 1986).

Rocket motor structural load testing under static and captive firing conditions occurred at the LPC test bays. During several of the initial tests conducted at Bay 309, the readied motor exploded instead of firing (Radian, 1986).

Historical Operational Area G – Helicopter Weapons Test Area

The helicopter weapons test area was used to develop equipment for handling helicopter weapons systems. The facilities within this area included a hanger (Building 302), helicopter landing pad, stationary ground mounted gun platforms, and a mobile target suspended between towers. The primary project at this test area was testing of both stationary guns and guns mounted on helicopters. Experimentation also was performed on the solid propellant portion of an armor-piercing round. The majority of rounds were fired into the side of the creek wash, about 100 yards to the south of the hanger. A longer impact area labeled with distance markers was located in the canyon to the south of the wash. Projectiles were steel only; warheads were not used during tests at this facility (Tetra Tech, 2003a).

Historical Operational Area H – Sanitary Landfill

A permitted sanitary landfill was located along the western side of the Site. The permit for the landfill authorized LPC to dispose of trash such as paper, scrap metal, concrete, and wood generated during routine daily operations. Lockheed policy strictly dictated that hazardous materials were not to be disposed of at this landfill. The trenches were later covered and leveled, with only an occasional tire, metal scrap, or piece of wood remaining on the surface (Tetra Tech, 2003a).

Historical Operational Area I – Western Aerojet Range

Between 1970 and 1972, Aerojet leased an area (referred to as the Western Aerojet Range) along the western portion of the Site. LPC conducted an incendiary test with a 500-pound bomb at the southwest end of the Western Aerojet Range. This test was reportedly similar to testing performed at the LPC Ballistics Test Area. According to a historical report prepared by Radian Corporation, Inc. in 1986, the Western Aerojet Range was originally leveled to be used as an airstrip (Radian, 1986). Based on employee interviews, the airstrip may have been used only on 1 occasion (Tetra Tech, 2003a). During Munitions and Explosives of Concern (MEC) investigations performed in 2006 it was discovered that inert 27.5 millimeter projectiles were tested in this area.

Post LPC and Aerojet Facility Usage

LMC leased portions of the Site to several outside parties for use in various activities (Radian, 1986; Tetra Tech, 2003a). The International Union of Operating Engineers (IUOE) utilized the Site from 1971 through 1991 for surveying and heavy equipment training. The main office of the IUOE was formerly located within Bunker 304 of Historical Operational Area F (LPC Test Services Area). The IUOE earth-moving activities involved maintaining roads and reshaping various parts of the Site, primarily within Historical Operational Areas F and G.

On several occasions, General Dynamics utilized Historical Operational Area B (RMPA) for testing activities (Radian, 1986). In 1983 and 1984, General Dynamics conducted weapons testing of a Viper Bazooka and Phalanx Gatling gun.

Structural Composites used the steep terrain of the Site for vehicle rollover tests on a number of occasions. Structural Composites also conducted heat and puncture tests on pressurized fiberglass and plastic reinforced cylinders. The tests involved shooting a single 30-caliber round at the cylinders and recording the results (Radian, 1986).

2.0 SUMMARY OF MONITORING ACTIVITIES

Section 2.0 summarizes the First Quarter 2009 and Second Quarter 2009 groundwater monitoring events conducted at the Site. The results from these monitoring events are discussed in Section 3.0.

2.1 GROUNDWATER LEVEL MEASUREMENTS

Between December 2008 (Fourth Quarter 2008) and March 2009 (First Quarter 2009), the Beaumont National Weather Service (NWS) station reported approximately 4.37 inches of precipitation. Between March 2009 (First Quarter 2009) and June 2009 (Fourth Quarter 2009), the Beaumont NWS reported approximately 0.34 inches of precipitation. The First Quarter 2009 groundwater level measurements were collected from 171 of the Site's wells between February 26 and March 3, 2009. The Second Quarter 2009 groundwater level measurements were collected from 171 of the Site's wells between May 7, and May 15, 2009. Water level measurements for 171 wells were proposed for the First Quarter 2009 and 171 wells were proposed for the Second Quarter 2009. Copies of field data sheets from the water quality monitoring events are presented in Appendix B. A summary of well construction details is presented in Appendix C.

2.2 SURFACE WATER FLOW

The areas within Potrero and Bedsprings Creek where surface water was present were mapped during the First Quarter 2009 and Second Quarter 2009 groundwater monitoring events. The 4 previously identified fixed locations were checked for flowing water and, if present, the flow rate and volume were determined through field observation and measurements.

2.3 GROUNDWATER AND SURFACE WATER SAMPLING

The frequency of groundwater monitoring is dependent on the monitoring well's intended purpose. Groundwater is sampled as frequently as quarterly and surface water samples are collected semiannually. The First Quarter 2009 monitoring event consisted of water level monitoring and natural attenuation sampling of the large rocket motor washout area (F-33) monitoring wells. The Second Quarter 2009 monitoring event consisted of water level monitoring, surface water sampling, the quarterly sampling of newly installed wells, the semiannual sampling of increasing contaminant trend wells and guard wells, and the annual sampling of plume monitoring and vertical distribution wells. Tables 2-1 and 2-2 lists the locations sampled during the First Quarter 2009 and Second Quarter 2009 monitoring events respectively. The tables summarize analytical methods, sampling dates, Quality Assurance/Quality Control (QA/QC) samples collected, and field notes. The surface water samples are collected from 18 fixed locations. One designated alternate location is sampled if flowing water is not encountered at the southern end of Massacre Canyon at Gilman Hot Springs Road (Figure 2-1).

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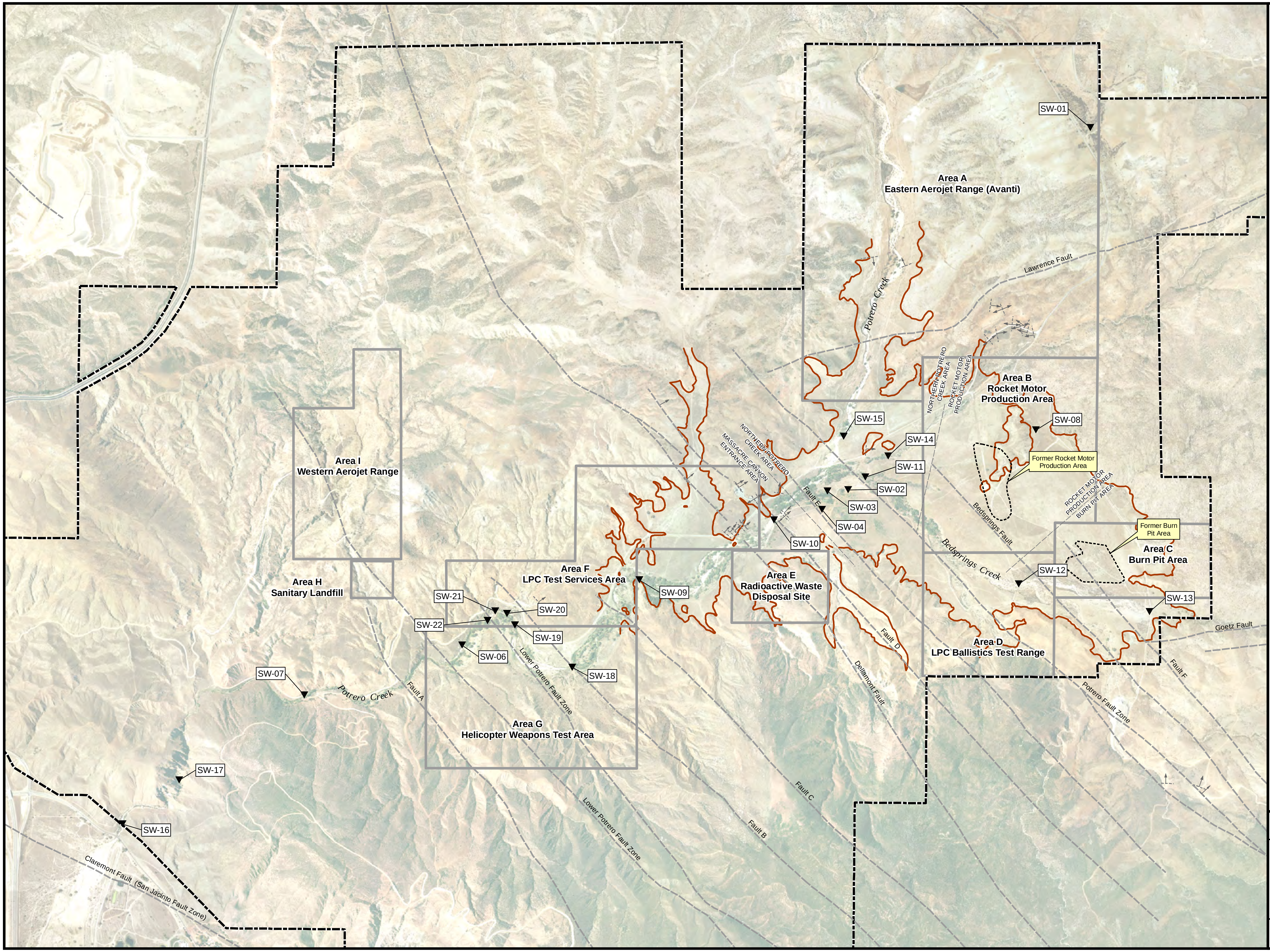

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Adapted from: March 2007 aerial photograph.

Faults from structural analysis of Potrero Valley, *Lineament and Geologic Mapping Study, Tetra Tech, 2009.*

LEGEND

▼ Surface Water Sample Location

Fault, Accurately Located Showing Dip

Fault, Approximately Located

Bedrock/Alluvium Surface Contact
Dashed where inferred

Burn Pit and Rocket
Motor Production Area

Historical Operational Area Boundary

Beaumont Site 1 Property Boundary

Notes:
Beaumont Site 1 property boundary is approximate.

Beaumont Site 1

Figure 2-1
Surface Water Sample Locations

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Because of the ephemeral nature of the streams on the Site, certain locations are generally sampled only during or shortly after periods of precipitation. Sampling, analytical, and QA/QC procedures for the monitoring events are described in the Revised Groundwater Sampling and Analysis Plan (Tetra Tech, 2003b).

2.3.1 Proposed and Actual Surface Water and Well Locations Sampled

For the First Quarter 2009 monitoring event, a total of 6 monitoring wells as shown in Figure 2-2, were proposed sampled for the First Quarter 2009 monitoring event.

For the Second Quarter 2009 monitoring event, a total of 113 sampling locations (17 surface water, 1 alternate surface water, and 95 monitoring wells) were proposed for water quality monitoring. Nine proposed surface water sample locations were not sampled because the locations were dry (SW-01, SW-08, SW-10, SW-11, SW-12, SW-13, SW-14, SW-15, and SW-16). SW-17, an alternate surface water location sampled when SW-16 is dry, was also dry and was not sampled. Therefore, water quality data was collected from 8 surface water and 95 monitoring wells locations. Figure 2-3 presents groundwater and surface water locations sampled for the Second Quarter 2009 monitoring event.

Table 2-1 Sampling Schedule and Analysis Method - First Quarter 2009

Monitoring Well Location	Sample Date	VOCs (1)	1,4-Dioxane (2)	Per chlorate (3)	Natural Attenuation Parameters (4)	Comments and QA / QC Samples
F33-TMP2	03/23/09	X	X	X	X	Sample with Peristaltic Pump, Duplicate F33-TW2-Dup
F33-TMP3	03/23/09	X	X	X	X	Sample with Peristaltic Pump
F33-TMP6	03/25/09	X	X	X	X	Sample with Peristaltic Pump
MW-70	03/24/09	X	X	X	X	Sample with Dedicated Pump
MW-82	03/25/09	X	X	X	X	Sample with Dedicated Pump
MW-83	03/24/09	X	X	X	X	Sample with Dedicated Pump
	Total Sample Locations:	6				
	Total Samples Collected:	6				

Notes:

(1) - Volatile organic compounds (VOCs) analyzed by United States Environmental Protection Agency (EPA) Method 8260 B.
(2) - 1,4 - Dioxane analyzed by EPA Method 8270 C(M) isotope dilution.
(3) - Perchlorate analyzed by EPA Method 314.0.
(4) - Natural attenuation parameters by various methods
MS / MSD - Matrix Spike / Matrix Spike Duplicate.
NA - Not available.

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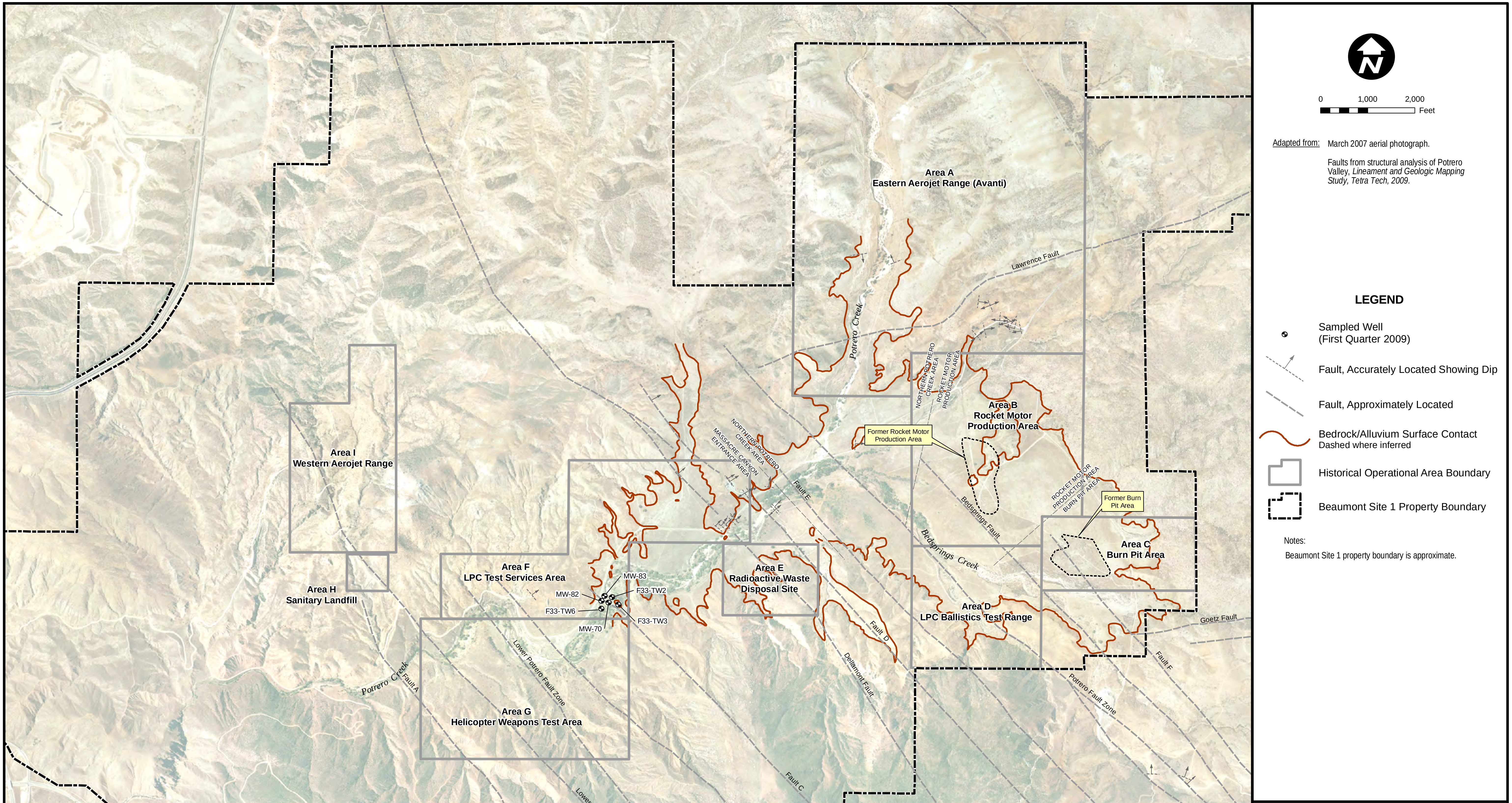

Beaumont Site 1

Figure 2-2

First Quarter (March) 2009 Sample Locations

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Table 2-2 Sampling Schedule – Second Quarter 2009

Monitoring Well or Surface Water Location	Sample Date	VOCs (1)	1,4-Dioxane (2)	Per chlorate (3)	Per chlorate (4)	Natural Attenuation Parameters (5)	Lead (6)	Comments and QA / QC Samples
SW-01	NA	-	-	-	-	-	-	Dry, no sample collected.
SW-02	06/04/09	X	X	-	X	-	-	Surface Water Sample, Duplicate SW-02-Dup
SW-03	06/04/09	X	X	-	X	-	-	Surface Water Sample
SW-04	06/04/09	X	X	-	X	-	-	Surface Water Sample
SW-06	06/09/09	X	X	-	X	-	-	Surface Water Sample
SW-07	06/04/09	X	X	-	X	-	-	Surface Water Sample, MS/MSD
SW-08	NA	-	-	-	-	-	-	Dry, no sample collected.
SW-09	06/04/09	X	X	-	X	-	-	Surface Water Sample
SW-10	NA	-	-	-	-	-	-	Dry, no sample collected.
SW-11	NA	-	-	-	-	-	-	Dry, no sample collected.
SW-12	NA	-	-	-	-	-	-	Dry, no sample collected.
SW-13	NA	-	-	-	-	-	-	Dry, no sample collected.
SW-14	NA	-	-	-	-	-	-	Dry, no sample collected.
SW-15	NA	-	-	-	-	-	-	Dry, no sample collected.
SW-16	NA	-	-	-	-	-	-	Dry, no sample collected.
SW-17	NA	-	-	-	-	-	-	Dry, no sample collected.
SW-18	06/04/09	X	X	-	X	-	-	Surface Water Sample
SW-19	06/04/09	X	X	-	X	-	-	Surface Water Sample
F33-TW2	06/12/09	X	X	-	X	X	-	Sample with Peristaltic Pump
F33-TW3	06/12/09	X	X	-	X	X	-	Sample with Peristaltic Pump
F33-TW6	06/19/09	X	X	X	-	X	-	Sample with Peristaltic Pump
F34-TW1	06/19/09	X	X	X	-	-	-	Sample with Peristaltic Pump
EW-13	06/09/09	X	X	-	X	-	-	Sample with Dedicated Pump
IW-04	06/09/09	X	X	-	X	-	-	Sample with Dedicated Pump
MW-02	06/18/09	X	X	X	-	-	-	Sample with Dedicated Pump, Duplicate MW-02-Dup
MW-05	06/18/09	X	X	X	-	-	-	Sample with Dedicated Pump
MW-07	06/22/09	X	X	X	-	-	-	Sample with Dedicated Pump
MW-09	06/19/09	X	X	X	-	-	-	Sample with Peristaltic Pump
MW-13	06/04/09	X	X	-	X	-	-	Sample with Dedicated Pump
MW-14	06/08/09	X	X	-	X	-	-	Sample with Dedicated Pump, MS/MSD
MW-15	06/08/09	X	X	X	-	-	-	Sample with Dedicated Pump
MW-17	06/18/09	X	X	X	-	-	-	Sample with Dedicated Pump
MW-18	06/10/09	X	X	X	-	X	-	Sample with Dedicated Pump
MW-19	06/18/09	X	X	X	-	-	-	Sample with Dedicated Pump
MW-22	06/17/09	X	X	X	-	-	-	Sample with Dedicated Pump
MW-26	06/17/09	X	X	X	-	-	-	Sample with Dedicated Pump
MW-27	06/15/09	X	X	-	X	-	-	Sample with Dedicated Pump
MW-28	06/17/09	X	X	X	-	-	-	Sample with Dedicated Pump
MW-31	06/15/09	X	X	-	X	-	-	Sample with Dedicated Pump
MW-34	06/10/09	X	X	-	X	-	-	Sample with Dedicated Pump, MS/MSD
MW-35	06/08/09	X	X	-	X	-	-	Sample with Dedicated Pump
MW-36	06/08/09	X	X	-	X	-	-	Sample with Dedicated Pump
MW-37	06/11/09	X	X	-	X	X	-	Sample with Dedicated Pump
MW-40	06/17/09	X	X	X	-	-	-	Sample with Dedicated Pump, Duplicate MW-40-Dup
MW-42	06/11/09	X	X	-	X	-	-	Sample with Dedicated Pump
MW-45	06/12/09	X	X	-	X	-	-	Sample with Dedicated Pump, MS/MSD, Duplicate MW-45-Dup
MW-46	06/11/09	X	X	-	X	-	-	Sample with Dedicated Pump
MW-47	06/19/09	X	X	X	-	-	-	Sample with Peristaltic Pump
MW-49	06/18/09	X	X	X	-	-	-	Sample with Dedicated Pump
MW-53	06/11/09	X	X	-	X	-	-	Sample with Dedicated Pump
MW-54	06/17/09	X	X	X	-	-	-	Sample with Dedicated Pump
MW-55	06/17/09	X	X	X	-	-	-	Sample with Dedicated Pump, MS/MSD
MW-56C	06/11/09	X	X	-	X	-	-	Sample with Dedicated Pump
MW-59B	06/09/09	X	X	-	X	-	-	Sample with Dedicated Pump
MW-59D	06/09/09	X	X	-	X	-	-	Sample with Dedicated Pump
MW-60A	06/09/09	X	X	-	X	-	X	Sample with Dedicated Pump, MS/MSD, Duplicate MW-60A-Dup
MW-60B	06/09/09	X	X	-	X	-	-	Sample with Dedicated Pump

Total Sample Locations:	113
Dry Sample Locations:	10
Total Samples Collected:	103

Notes:

▨	Well not sampled or surface water sample not collected.
(1) -	Volatile organic compounds (VOCs) analyzed by United States Environmental Protection Agency (EPA) Method 8260 B.
(2) -	1,4 - Dioxane analyzed by EPA Method 8270 C(M) isotope dilution.
(3) -	Perchlorate analyzed by EPA Method 331.0.
(4) -	Perchlorate analyzed by EPA Method 314.0.
(5) -	Natural attenuation parameters by various methods
(6) -	Lead analyzed by EPA Method 6010.
MS / MSD -	Matrix Spike / Matrix Spike Duplicate.
NA -	Not available.

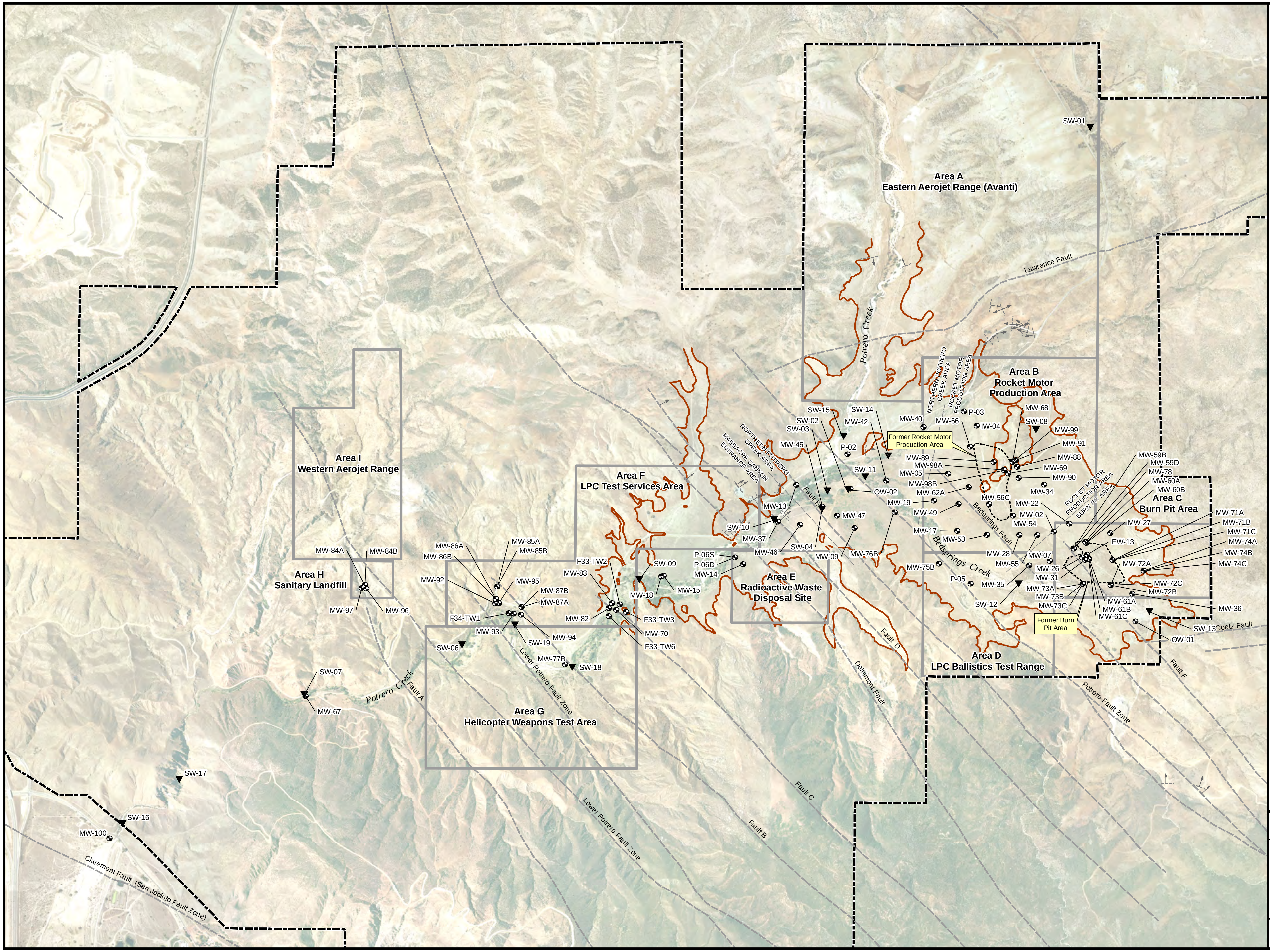
Table 2 2 Sampling Schedule – Second Quarter 2009 (continued)

Monitoring Well or Surface Water Location	Sample Date	VOCs (1)	1,4-Dioxane (2)	Per chlorate (3)	Per chlorate (4)	Natural Attenuation Parameters (5)	Lead (6)	Comments and QA / QC Samples
MW-61A	06/05/09	X	X	-	X	-	-	Sample with Dedicated Pump
MW-61B	06/05/09	X	X	-	X	-	-	Sample with Dedicated Pump, Duplicate MW-61B-Dup
MW-61C	06/05/09	X	X	-	X	-	-	Sample with Dedicated Pump
MW-62A	06/18/09	X	X	X	-	-	-	Sample with Dedicated Pump
MW-66	06/19/09	X	X	X	-	-	-	Sample with Dedicated Pump
MW-67	06/10/09	X	X	X	-	X	-	Sample with Dedicated Pump, MS/MSD
MW-68	06/22/09	X	X	X	-	-	-	Sample with Dedicated Pump
MW-69	06/09/09	X	X	-	X	-	-	Sample with Dedicated Pump, Duplicate MW-69-Dup
MW-70	06/10/09	X	X	-	X	X	-	Sample with Dedicated Pump
MW-71A	06/05/09	X	X	-	X	-	-	Sample with Dedicated Pump
MW-71B	06/05/09	X	X	-	X	-	-	Sample with Dedicated Pump
MW-71C	06/05/09	X	X	-	X	-	-	Sample with Dedicated Pump
MW-72A	06/04/09	X	X	-	X	-	-	Sample with Dedicated Pump
MW-72B	06/04/09	X	X	-	X	-	-	Sample with Dedicated Pump
MW-72C	06/11/09	X	X	-	X	-	-	Sample with Dedicated Pump
MW-73A	06/04/09	X	X	-	X	-	-	Sample with Dedicated Pump
MW-73B	06/04/09	X	X	-	X	-	-	Sample with Dedicated Pump
MW-73C	06/04/09	X	X	-	X	-	-	Sample with Dedicated Pump, Duplicate MW-73C-Dup
MW-74A	06/04/09	X	X	X	-	-	-	Sample with Dedicated Pump
MW-74B	06/04/09	X	X	X	-	-	-	Sample with Dedicated Pump
MW-74C	06/04/09	X	X	-	X	-	-	Sample with Dedicated Pump
MW-75B	06/12/09	X	X	-	X	-	-	Sample with Dedicated Pump
MW-76B	06/12/09	X	X	-	X	-	-	Sample with Dedicated Pump
MW-77B	06/12/09	X	X	-	X	-	-	Sample with Dedicated Pump
MW-78	06/10/09	X	X	-	X	-	-	Sample with Dedicated Pump
MW-82	06/11/09	X	X	-	X	X	-	Sample with Dedicated Pump, Duplicate MW-82-Dup
MW-83	06/10/09	X	X	-	X	X	-	Sample with Dedicated Pump
MW-84A	06/02/09	X	X	-	X	-	-	Sample with Dedicated Pump
MW-84B	06/02/09	X	X	-	X	-	-	Sample with Dedicated Pump
MW-85A	06/10/09	X	X	-	X	-	-	Sample with Dedicated Pump
MW-85B	06/10/09	X	X	-	X	-	-	Sample with Dedicated Pump
MW-86A	06/10/09	X	X	-	X	-	-	Sample with Dedicated Pump
MW-86B	06/10/09	X	X	-	X	-	-	Sample with Dedicated Pump
MW-87A	06/11/09	X	X	-	X	-	-	Sample with Dedicated Pump
MW-87B	06/11/09	X	X	-	X	-	-	Sample with Dedicated Pump, Duplicate MW-87B-Dup
MW-88	06/09/09	X	X	-	X	-	-	Sample with Dedicated Pump
MW-89	06/11/09	X	X	-	X	-	-	Sample with Dedicated Pump, Duplicate MW-89-Dup
MW-90	06/09/09	X	X	-	X	-	-	Sample with Dedicated Pump
MW-91	06/09/09	X	X	-	X	-	-	Sample with Dedicated Pump
MW-92	06/12/09	X	X	-	X	-	-	Sample with Dedicated Pump
MW-93	06/19/09	X	X	X	-	-	-	Sample with Dedicated Pump
MW-94	06/22/09	X	X	X	-	-	-	Sample with Dedicated Pump
MW-95	06/12/09	X	X	-	X	-	-	Sample with Dedicated Pump
MW-96	06/02/09	X	X	-	X	-	-	Sample with Dedicated Pump
MW-97	06/02/09	X	X	-	X	-	-	Sample with Dedicated Pump
MW-98A	06/03/09	X	X	-	X	-	-	Sample with Dedicated Pump
MW-98B	06/03/09	X	X	-	X	-	-	Sample with Dedicated Pump
MW-99	06/09/09	X	X	-	X	-	-	Sample with Dedicated Pump
MW-100	06/15/09	X	X	X	-	-	-	Sample with Dedicated Pump
OW-01	06/15/09	X	X	-	X	-	-	Sample with Dedicated Pump
OW-02	06/12/09	X	X	-	X	-	-	Sample with Peristaltic Pump
P-02	06/04/09	X	X	-	X	-	-	Sample with Dedicated Pump
P-03	06/08/09	X	X	-	X	-	-	Sample with Dedicated Pump
P-05	06/08/09	X	X	-	X	-	-	Sample with Dedicated Pump
P-06S	07/16/09	X	X	-	X	-	-	Sample with Portable Bladder Pump
P-06D	07/16/09	X	X	-	X	-	-	Sample with Portable Bladder Pump

Total Sample Locations: 113
Dry Sample Locations: 10
Total Samples Collected: 103

Notes:

▨ Well not sampled or surface water sample not collected.
(1) - Volatile organic compounds (VOCs) analyzed by United States Environmental Protection Agency (EPA) Method 8260 B.
(2) - 1,4 - Dioxane analyzed by EPA Method 8270 C(M) isotope dilution.
(3) - Perchlorate analyzed by EPA Method 331.0.
(4) - Perchlorate analyzed by EPA Method 314.0.
(5) - Natural attenuation parameters by various methods
(6) - Lead analyzed by EPA Method 6010.
MS / MSD - Matrix Spike / Matrix Spike Duplicate.
NA - Not available.



N

0 1,000 2,000
Feet

Adapted from: March 2007 aerial photograph.

Faults from structural analysis of Potrero Valley, *Lineament and Geologic Mapping Study, Tetra Tech, 2009.*

LEGEND

- ● Sampled Well (Second Quarter 2009)
- ▼ Surface Water Sample Location (Second Quarter 2009)
- Fault, Accurately Located Showing Dip
- Fault, Approximately Located
- Bedrock/Alluvium Surface Contact Dashed where inferred
- Burn Pit and Rocket Motor Production Area
- Historical Operational Area Boundary
- Beaumont Site 1 Property Boundary

Notes:

Beaumont Site 1 property boundary is approximate.

Beaumont Site 1

Figure 2-3
Second Quarter (June) 2009 Sample Locations

TETRA TECH

2.3.2 Field Sampling Procedures

The following water quality field parameters were measured and recorded on field data sheets (Appendix B) during well purging activities: water level, temperature, pH, electrical conductivity (EC), turbidity, oxidation reduction potential (ORP), and dissolved oxygen (DO). Groundwater samples were collected from monitoring wells by low-flow purging and sampling through dedicated double valve pumps, a portable bladder pump, or a peristaltic pump.

Collection of water quality parameters was initiated when at least 1 discharge hose / pump volume had been removed and purging was considered complete when the above parameters had stabilized, or the well was purged dry (evacuated). Stabilization of water quality parameters were used as an indication that representative formation water had entered the well and was being purged. The criteria for stabilization of these parameters are as follows: water level ± 0.1 foot, pH ± 0.1, EC ± 3%, turbidity < 10 nephelometric turbidity units (NTUs) (if > 10 NTUs ± 10%), DO ± 0.3 milligrams per liter (mg/L) and ORP ± 10 millivolts (mV). Sampling instruments and equipment were maintained, calibrated, and operated in accordance with the manufacturer’s specifications, guidelines, and recommendations. If a well was purged dry, the well was sampled with a disposable bailer after sufficient recharge had taken place to allow sample collection.

Groundwater samples were collected in order of decreasing volatilization potential and placed in appropriate containers. A sample identification label was affixed to each sample container and sample custody was maintained by chain-of-custody record. Groundwater samples collected were chilled and transported to a state accredited analytical laboratory, via courier, thus maintaining proper temperatures and sample integrity. Trip blanks (LTBs) were collected for the monitoring events to assess cross-contamination potential of water samples while in transit. Equipment blanks (LEBs) were collected when sampling with non-dedicated equipment to assess cross-contamination potential of water samples via sampling equipment.

Surface water sampling locations were previously located using a global positioning satellite (GPS) system and marked in the field. Surface water samples were collected at previously GPS mapped locations using either a disposable bailer and transferred to the laboratory supplied water sample containers or the water sample was collected directly in the laboratory supplied water sample containers. Temperature, pH, EC, turbidity, ORP, and DO were measured and recorded on field data sheets at surface water sampling locations.

2.4 ANALYTICAL DATA QA/QC

The samples were tested using approved United States Environmental Protection Agency (EPA) methods. Since the analytical data were obtained by following EPA approved method criteria, the data were evaluated by using the EPA approved validation methods described in the National Functional Guidelines (EPA, 1999 and 2004). The National Functional Guidelines contain instructions on method required quality control parameters and on how to interpret these parameters to confer validation to environmental data results.

Quality control parameters used in validating data results include: holding times, field blanks, laboratory control samples, method blanks, duplicate environmental samples, spiked samples, and surrogate and spike recovery data.

2.5 HABITAT CONSERVATION

All monitoring activities were performed in accordance with the U.S. Fish and Wildlife Service approved Habitat Conservation Plan (HCP) [USFWS, 2005] and subsequent clarifications (LMC, 2006a and 2006b) of the HCP. Groundwater sampling activities were conducted with light duty vehicles and, as specified in the Low Affect HCP, do not require biological monitoring.

3.0 GROUNDWATER MONITORING RESULTS

Section 3.0 presents the results and interpretations of the First Quarter 2009 and Second Quarter 2009 groundwater monitoring events. The following subsections include tabulated summaries of groundwater elevation and water quality data contour maps, and primary COPC analyte results. Plots of groundwater elevation versus time (hydrographs) and concentration versus time (time series graphs) for primary and secondary COPC analytes are presented in Appendices D and E, respectively.

3.1 GROUNDWATER ELEVATION

Groundwater elevations during the First Quarter 2009 and Second Quarter 2009 monitoring events ranged from approximately 2,150 feet mean sea level (msl) upgradient of the former BPA to approximately 1,795 feet msl in the Massacre Canyon Entrance Area (MCEA). A total of 171 monitoring wells were identified for groundwater level measurements for the First Quarter 2009 and Second Quarter 2009 monitoring events. For the First Quarter 2009 monitoring events, 3 wells (OW-05, OW-06, and OW-07) were dry, and measurements from 2 other wells could not be collected due to obstructions in their casings (EW-15 and MW-24). For the Second Quarter 2009 monitoring events, 3 wells were dry (OW-05, OW-06, and OW-07). Measurements from 2 wells (EW-15 and MW-24) could not be collected due to obstructions in their casings. Downhole camera surveys that were conducted on EW-15 and MW-24 to determine the nature of the obstructions were inconclusive and attempts to clear the obstructions have been unsuccessful. Both EW-15 and MW-24 are considered redundant with wells EW-13 and MW-26; if further attempts to clear the obstructions are unsuccessful, LMC proposes both wells be destroyed. Groundwater elevations for the First Quarter 2009 and Second Quarter 2009 monitoring events from wells screened in the alluvial and weathered Mount Eden formation are shown on Figures 3-1 and 3-2, respectively. A tabulated summary of groundwater elevations for all the wells measured during the First Quarter 2009 and Second Quarter 2009 monitoring events are presented in Table 3-1. Hydrographs for individual wells and well groups are presented in Appendix D.

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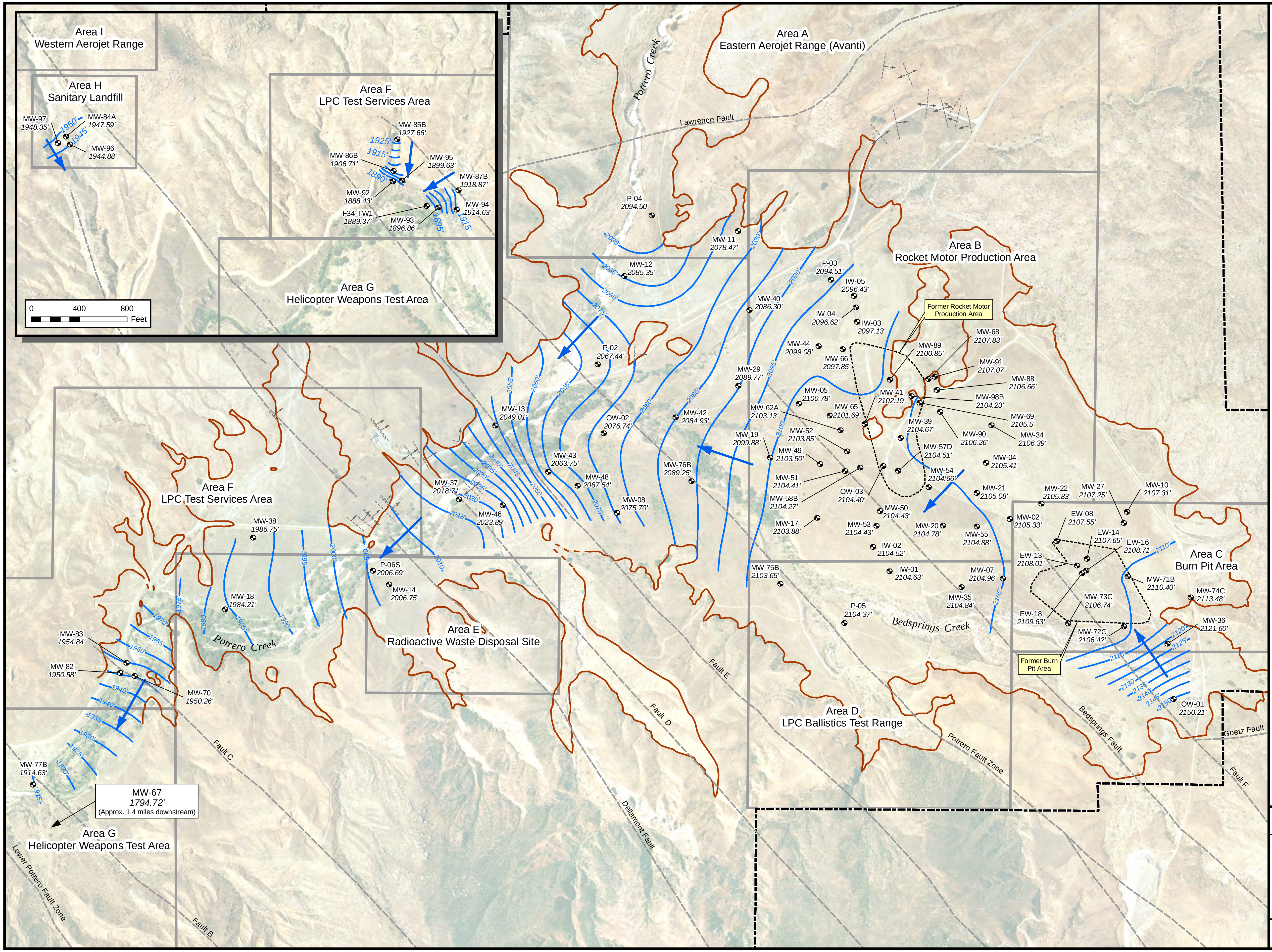


Adapted from: March 2007 aerial photograph.

Faults from structural analysis of Potrero Valley, *Lineament and Geologic Mapping Study, Tetra Tech, 2009.*

LEGEND

MW-10 2107.31' ●	Monitoring Well and Groundwater Elevation (February 2009)
∼	Bedrock/Alluvium Surface Contact Dashed where inferred
⤏	Fault, Accurately Located Showing Dip
╌	Fault, Approximately Located
∼	Groundwater Elevation Contour
←	Groundwater Flow Direction
⬚	Burn Pit and Rocket Motor Production Area
⬚	Beaumont Site 1 Property Boundary
☐	Historical Operational Area Boundary

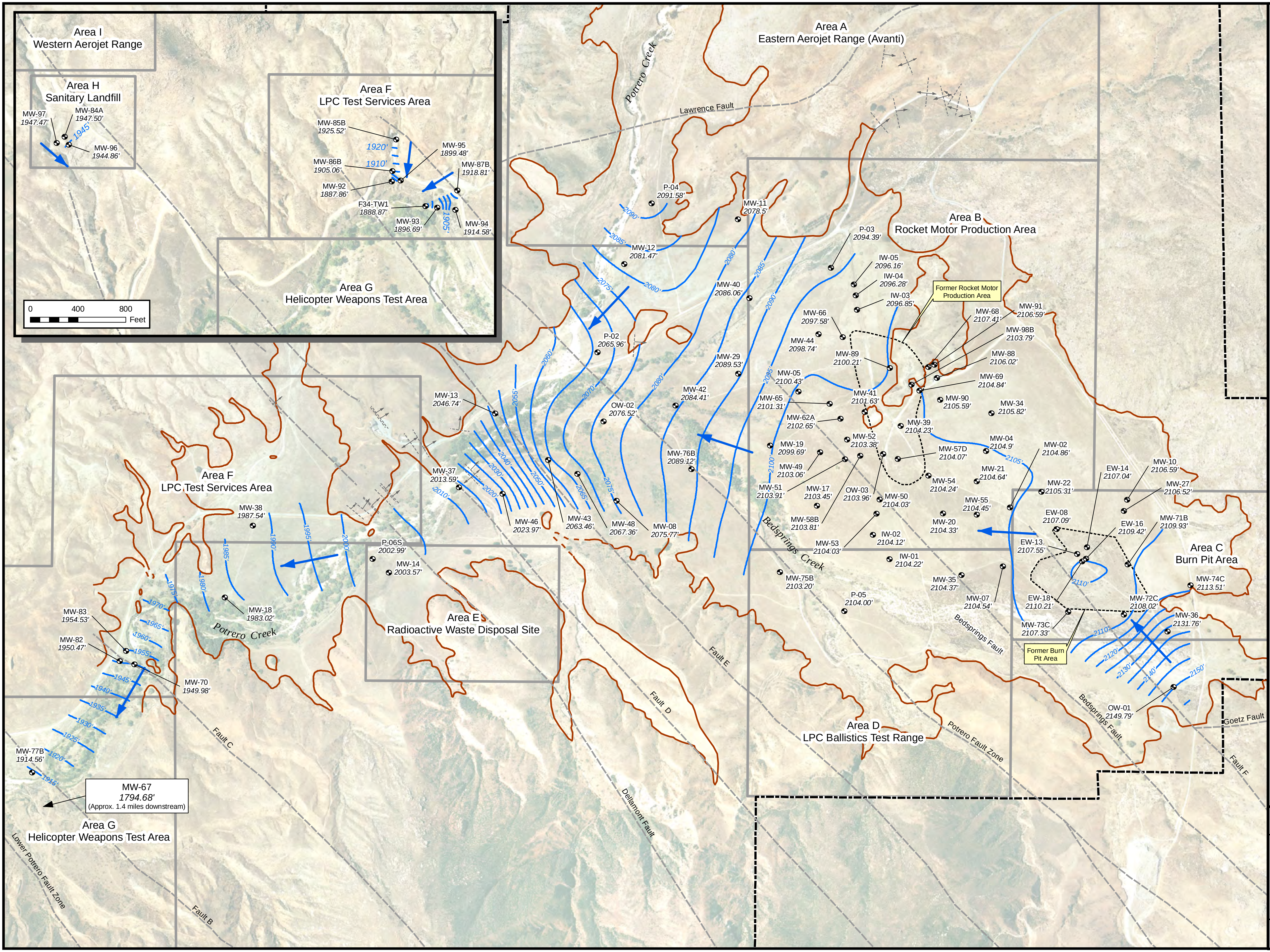
Notes: Beaumont Site 1 property boundary is approximate.

Beaumont Site 1

Figure 3-1
First Quarter (February) 2009 Groundwater Contours for Alluvium and Weathered Mount Eden Formation

TETRA TECH

X:\GIS\Lockheed S1 Q1\Q209\GW_Cont_Q209.mxd



N

0 500 1,000 Feet

Adapted from: March 2007 aerial photograph.

Faults from structural analysis of Potrero Valley, *Lineament and Geologic Mapping Study, Tetra Tech, 2009.*

LEGEND

MW-10 2106.59' ●	Monitoring Well and Groundwater Elevation (May 2009)
←	Groundwater Flow Direction
～	Groundwater Elevation Contour
～	Bedrock/Alluvium Surface Contact Dashed where inferred
⤢	Fault, Accurately Located Showing Dip
⟋	Fault, Approximately Located
⬚	Burn Pit and Rocket Motor Production Area
⬚	Beaumont Site 1 Property Boundary
▭	Historical Operational Area Boundary

Notes: Beaumont Site 1 property boundary is approximate.

Beaumont Site 1

Figure 3-2
Second Quarter (May) 2009 Groundwater Contours for Alluvium and Weathered Mount Eden Formation

TETRA TECH

Table 3-1 Groundwater Elevation - First Quarter and Second Quarter 2009

				February 2009 Groundwater Elevation Data				May 2009 Groundwater Elevation Data			
Well ID	**Site Area**	**Formation Screened**	**Measuring Point Elevation (feet msl)**	**Date Measured**	**Feb 2009 Depth to Water (feet BTOC)**	**Feb 2009 Groundwater Elevation (feet msl)**	**Groundwater Elevation Change from Fourth Quarter 2008**	**Date Measured**	**May 2009 Depth to Water (feet BTOC)**	**May 2009 Groundwater Elevation (feet msl)**	**Groundwater Elevation Change from First Quarter 2009**
EW-01	RMPA	QAL	2142.62	02/27/09	38.31	2104.31	-1.19	05/07/09	38.74	2103.88	-0.43
EW-02	RMPA	QAL	2126.15	02/26/09	24.24	2101.91	-0.79	05/15/09	24.75	2101.40	-0.51
EW-08	BPA	MEF	2178.40	02/27/09	70.85	2107.55	-0.04	05/08/09	71.31	2107.09	-0.46
EW-09	BPA	MEF	2179.67	02/27/09	72.42	2107.25	-1.11	05/07/09	72.95	2106.72	-0.53
EW-10	BPA	MEF	2180.19	02/27/09	72.63	2107.56	-1.05	05/08/09	73.14	2107.05	-0.51
EW-11	BPA	MEF	2182.09	02/27/09	72.74	2109.35	-0.34	05/08/09	72.68	2109.41	0.06
EW-12	BPA	MEF	2183.28	02/27/09	75.62	2107.66	-1.03	05/08/09	74.80	2108.48	0.82
EW-13	BPA	MEF	2185.57	02/27/09	77.56	2108.01	-1.24	05/08/09	78.02	2107.55	-0.46
EW-14	BPA	QAL/MEF	2184.59	02/27/09	76.94	2107.65	-1.10	05/08/09	77.55	2107.04	-0.61
EW-15	BPA	MEF	2183.55	02/27/09	NA	NA	NA	05/08/09	NA	NA	NA
EW-16	BPA	MEF	2185.52	02/27/09	76.81	2108.71	-1.05	05/08/09	76.10	2109.42	0.71
EW-17	BPA	MEF	2179.15	02/27/09	73.05	2106.10	-1.24	05/08/09	73.31	2105.84	-0.26
EW-18	BPA	MEF	2184.98	02/27/09	75.35	2109.63	-1.01	05/08/09	74.77	2110.21	0.58
EW-19	MCEA	QAL	2033.89	02/27/09	28.51	2005.38	NA	05/12/09	31.81	2002.08	-3.30
F33-TW1	NPCA	QAL	1962.32	02/26/09	NA	NA	NA	05/11/09	NA	NA	NA
F33-TW2	NPCA	QAL	1959.75	02/26/09	3.34	1956.41	2.76	05/11/09	4.93	1954.82	-1.59
F33-TW3	NPCA	QAL	1955.79	02/26/09	3.40	1952.39	0.88	05/11/09	4.13	1951.66	-0.73
F33-TW4	NPCA	QAL	1951.32	02/26/09	NA	NA	NA	05/11/09	NA	NA	NA
F33-TW5	NPCA	QAL	1949.55	02/26/09	NA	NA	NA	05/11/09	NA	NA	NA
F33-TW6	NPCA	QAL	1950.62	02/26/09	4.30	1946.32	1.61	05/15/09	4.61	1946.01	-0.31
F34-TW1	MCEA	QAL	1894.08	02/27/09	4.71	1889.37	NA	05/12/09	5.21	1888.87	-0.50
IW-01	RMPA	QAL	2160.73	02/27/09	56.10	2104.63	-1.12	05/07/09	56.51	2104.22	-0.41
IW-02	RMPA	QAL	2155.01	02/27/09	50.49	2104.52	-1.17	05/07/09	50.89	2104.12	-0.40
IW-03	NPCA	QAL	2132.86	02/26/09	35.73	2097.13	-0.53	05/07/09	36.01	2096.85	-0.28
IW-04	NPCA	QAL	2135.09	02/26/09	38.47	2096.62	-0.47	05/07/09	38.81	2096.28	-0.34
IW-05	NPCA	QAL	2136.94	02/26/09	40.51	2096.43	-0.50	05/07/09	40.78	2096.16	-0.27
MW-01	RMPA	MEF	2176.98	02/27/09	72.14	2104.84	-1.16	05/08/09	72.57	2104.41	-0.43
MW-02	RMPA	MEF	2170.10	02/27/09	64.77	2105.33	-1.25	05/07/09	65.24	2104.86	-0.47
MW-03	RMPA	MEF	2169.36	02/27/09	125.22	2044.14	-0.72	05/07/09	126.40	2042.96	-1.18
MW-04	RMPA	QAL	2160.02	02/27/09	54.61	2105.41	-1.21	05/08/09	55.12	2104.90	-0.51
MW-05	RMPA	QAL	2121.40	02/26/09	20.62	2100.78	-0.64	05/07/09	20.97	2100.43	-0.35
MW-06	RMPA	QAL	2121.76	02/26/09	23.52	2098.24	-0.73	05/07/09	23.90	2097.86	-0.38
MW-07	BPA	QAL	2176.52	02/27/09	71.56	2104.96	-1.16	05/08/09	71.98	2104.54	-0.42
MW-08	NPCA	QAL	2090.53	02/27/09	14.83	2075.70	0.50	05/12/09	14.76	2075.77	0.07
MW-09	NPCA	QAL	2089.16	02/27/09	Artesian (0.2 PSI)	2089.62	-1.04	05/12/09	Artesian (0.25 PSI)	2089.74	0.12
MW-10	RMPA	QAL	2179.40	02/27/09	72.09	2107.31	-1.14	05/11/09	72.81	2106.59	-0.72
MW-11	NPCA	QAL	2122.61	02/26/09	44.14	2078.47	-0.09	05/11/09	44.11	2078.50	0.03
MW-12	NPCA	QAL	2098.49	02/26/09	13.14	2085.35	6.26	05/11/09	17.02	2081.47	-3.88
MW-13	NPCA	QAL	2057.89	02/26/09	8.88	2049.01	5.96	05/11/09	11.15	2046.74	-2.27
MW-14	MCEA	QAL	2029.67	02/27/09	22.92	2006.75	8.94	05/12/09	26.10	2003.57	-3.18
MW-15	MCEA	QAL	2009.76	02/26/09	24.50	1985.26	3.02	05/11/09	25.72	1984.04	-1.22
MW-17	RMPA	QAL	2140.40	02/27/09	36.52	2103.88	-1.06	05/07/09	36.95	2103.45	-0.43
MW-18	MCEA	QAL	2008.69	02/26/09	24.48	1984.21	2.72	05/11/09	25.67	1983.02	-1.19
MW-19	NPCA	QAL	2118.49	02/26/09	18.61	2099.88	-0.39	05/07/09	18.80	2099.69	-0.19
MW-20	RMPA	QAL	2162.03	02/27/09	57.25	2104.78	-1.20	05/08/09	57.70	2104.33	-0.45
MW-21	RMPA	QAL	2160.73	02/27/09	55.65	2105.08	-1.25	05/08/09	56.09	2104.64	-0.44
MW-22	RMPA	QAL	2173.48	02/27/09	67.65	2105.83	-1.25	05/08/09	68.17	2105.31	-0.52
MW-23	RMPA	QAL	2165.02	02/27/09	60.00	2105.02	-1.23	05/08/09	60.50	2104.52	-0.50
MW-24	BPA	MEF	2182.89	02/27/09	NA	NA	NA	05/08/09	NA	NA	NA
MW-26	BPA	MEF	2183.81	02/27/09	76.49	2107.32	-1.29	05/08/09	76.72	2107.09	-0.23
MW-27	BPA	QAL	2182.73	02/27/09	75.48	2107.25	-1.15	05/11/09	76.21	2106.52	-0.73
MW-28	RMPA	QAL	2160.84	02/27/09	56.15	2104.69	-1.15	05/08/09	56.70	2104.14	-0.55
MW-29	NPCA	MEF	2115.09	02/26/09	25.32	2089.77	0.07	05/07/09	25.56	2089.53	-0.24
MW-30	RMPA	QAL	2165.01	02/27/09	59.20	2105.81	-1.15	05/08/09	59.72	2105.29	-0.52
MW-31	BPA	Granite	2186.52	02/27/09	92.02	2094.50	-1.21	05/08/09	92.41	2094.11	-0.39
MW-32	RMPA	Granite	2176.61	02/27/09	85.43	2091.18	-1.13	05/08/09	85.70	2090.91	-0.27
MW-34	RMPA	QAL	2153.80	02/27/09	47.41	2106.39	-1.04	05/08/09	47.98	2105.82	-0.57
MW-35	RMPA	QAL	2170.98	02/27/09	66.14	2104.84	-1.10	05/08/09	66.61	2104.37	-0.47
MW-36	UG	QAL	2205.18	02/27/09	83.58	2121.60	-2.94	05/08/09	73.42	2131.76	10.16
MW-37	MCEA	QAL	2040.97	02/27/09	22.26	2018.71	12.71	05/11/09	27.38	2013.59	-5.12
MW-38	MCEA	MEF	2030.29	02/26/09	43.54	1986.75	1.21	05/11/09	42.75	1987.54	0.79
MW-39	RMPA	QAL	2144.18	02/27/09	39.51	2104.67	-1.13	05/07/09	39.95	2104.23	-0.44
MW-40	NPCA	MEF	2126.39	02/26/09	40.09	2086.30	0.06	05/11/09	40.33	2086.06	-0.24
MW-41	RMPA	MEF	2133.95	02/26/09	31.76	2102.19	-0.80	05/07/09	32.32	2101.63	-0.56
MW-42	NPCA	QAL	2092.55	02/26/09	7.62	2084.93	0.99	05/07/09	8.14	2084.41	-0.52
MW-43	NPCA	QAL	2068.58	02/27/09	4.83	2063.75	0.59	05/12/09	5.12	2063.46	-0.29
MW-44	NPCA	QAL	2128.69	02/26/09	29.61	2099.08	-0.59	05/07/09	29.95	2098.74	-0.34
MW-45	MCEA	QAL	2068.18	02/27/09	Artesian (4.2 PSI)	2077.88	0.92	05/12/09	Artesian (4.2 PSI)	2077.88	0.00
MW-46	MCEA	QAL	2072.17	02/27/09	48.28	2023.89	3.00	05/12/09	48.20	2023.97	0.08
MW-47	NPCA	QAL	2076.67	02/27/09	Artesian (3.3 PSI)	2084.29	0.46	05/12/09	Artesian (3.3 PSI)	2083.83	-0.46
MW-48	NPCA	QAL	2076.44	02/27/09	8.90	2067.54	1.52	05/12/09	9.08	2067.36	-0.18
MW-49	RMPA	QAL	2130.92	02/26/09	27.42	2103.50	-1.03	05/07/09	27.86	2103.06	-0.44
MW-50	RMPA	QAL	2151.43	02/27/09	47.00	2104.43	-1.18	05/07/09	47.40	2104.03	-0.40
MW-51	RMPA	QAL	2138.36	02/26/09	33.95	2104.41	-1.05	05/07/09	34.45	2103.91	-0.50
MW-52	RMPA	QAL	2136.18	02/26/09	32.33	2103.85	-1.04	05/07/09	32.80	2103.38	-0.47
MW-53	RMPA	QAL	2153.29	02/27/09	48.86	2104.43	-1.18	05/07/09	49.26	2104.03	-0.40
MW-54	RMPA	QAL	2153.44	02/27/09	48.78	2104.66	-1.22	05/07/09	49.20	2104.24	-0.42
MW-55	RMPA	QAL	2166.66	02/27/09	61.78	2104.88	-1.20	05/08/09	62.21	2104.45	-0.43
MW-56A	RMPA	MEF	2143.09	02/27/09	50.72	2092.37	-1.00	05/07/09	51.15	2091.94	-0.43
MW-56B	RMPA	QAL	2142.58	02/27/09	38.16	2104.42	-1.14	05/07/09	38.63	2103.95	-0.47
MW-56C	RMPA	QAL	2142.77	02/27/09	38.51	2104.26	-1.15	05/07/09	38.95	2103.82	-0.44
MW-56D	RMPA	QAL	2142.48	02/27/09	38.06	2104.42	-1.19	05/07/09	38.44	2104.04	-0.38
MW-57A	RMPA	QAL	2145.98	02/27/09	41.38	2104.60	-1.12	05/07/09	41.85	2104.13	-0.47
MW-57B	RMPA	QAL	2146.19	02/27/09	41.61	2104.58	-1.15	05/07/09	42.04	2104.15	-0.43
MW-57C	RMPA	QAL	2146.02	02/27/09	41.41	2104.61	-1.14	05/07/09	41.83	2104.19	-0.42
MW-57D	RMPA	QAL	2146.10	02/27/09	41.59	2104.51	-1.19	05/07/09	42.03	2104.07	-0.44
MW-58A	RMPA	QAL	2140.73	02/26/09	36.62	2104.11	-1.09	05/07/09	37.10	2103.63	-0.48

Notes:

BPA - Burn Pit Area.
MCEA - Massacre Canyon Entrance Area.
NPCA - Northern Protero Creek Area.
RMPA - Rocket Motor Production Area.
UG - Upgradient
DG - Downgradient
BTOC - Below top of casing.
msl - Mean sea level.
NA - Not available.
PSI - pounds per square inch
"-" Formation screened not defined.
QAL - Quaternary alluvium.
QAL/MEF - Quaternary alluvium / Mt Eden.
MEF - Mount Eden formation.

Table 3-1 Groundwater Elevation – First Quarter and Second Quarter 2009 (continued)

				February 2009 Groundwater Elevation Data				**May 2009 Groundwater Elevation Data**			
Well ID	**Site Area**	**Formation Screened**	**Measuring Point Elevation (feet msl)**	**Date Measured**	**Feb 2009 Depth to Water (feet BTOC)**	**Feb 2009 Groundwater Elevation (feet msl)**	**Groundwater Elevation Change from Fourth Quarter 2008**	**Date Measured**	**May 2009 Depth to Water (feet BTOC)**	**May 2009 Groundwater Elevation (feet msl)**	**Groundwater Elevation Change from First Quarter 2009**
MW-58B	RMPA	QAL	2140.78	02/26/09	36.51	2104.27	-1.17	05/07/09	36.97	2103.81	-0.46
MW-58C	RMPA	QAL	2141.02	02/26/09	36.85	2104.17	-1.08	05/07/09	37.34	2103.68	-0.49
MW-58D	RMPA	QAL	2140.94	02/26/09	36.85	2104.09	-1.13	05/07/09	37.31	2103.63	-0.46
MW-59A	BPA	MEF	2180.14	02/27/09	77.96	2102.18	-1.18	05/07/09	78.49	2101.65	-0.53
MW-59B	BPA	MEF	2180.39	02/27/09	73.56	2106.83	-1.15	05/07/09	74.05	2106.34	-0.49
MW-59C	BPA	MEF	2179.93	02/27/09	75.17	2104.76	-1.22	05/07/09	75.68	2104.25	-0.51
MW-59D	BPA	MEF	2180.53	02/27/09	75.06	2105.47	-1.21	05/07/09	75.54	2104.99	-0.48
MW-60A	BPA	MEF	2182.59	02/27/09	77.61	2104.98	-1.10	05/08/09	78.15	2104.44	-0.54
MW-60B	BPA	MEF	2182.77	02/27/09	76.08	2106.69	-1.16	05/08/09	76.65	2106.12	-0.57
MW-61A	BPA	MEF	2186.95	02/27/09	85.26	2101.69	-1.11	05/08/09	85.71	2101.24	-0.45
MW-61B	BPA	MEF	2186.77	02/27/09	77.64	2109.13	-0.99	05/08/09	78.09	2108.68	-0.45
MW-61C	BPA	MEF	2186.84	02/27/09	83.35	2103.49	-1.20	05/08/09	83.74	2103.10	-0.39
MW-61D	BPA	MEF	2186.83	02/27/09	80.80	2106.03	-1.19	05/08/09	81.15	2105.68	-0.35
MW-62A	RMPA	QAL	2131.32	02/26/09	28.19	2103.13	-0.99	05/07/09	28.67	2102.65	-0.48
MW-62B	RMPA	QAL	2131.49	02/26/09	28.35	2103.14	-1.00	05/07/09	28.81	2102.68	-0.46
MW-63	RMPA	QAL	2156.20	02/27/09	51.45	2104.75	-1.23	05/08/09	51.91	2104.29	-0.46
MW-64	RMPA	QAL	2128.41	02/26/09	26.52	2101.89	-0.80	05/07/09	26.94	2101.47	-0.42
MW-65	RMPA	QAL	2128.92	02/26/09	27.23	2101.69	-0.81	05/07/09	27.61	2101.31	-0.38
MW-66	RMPA	QAL	2130.43	02/26/09	32.58	2097.85	-0.62	05/07/09	32.85	2097.58	-0.27
MW-67	MCEA	QAL	1799.54	02/26/09	4.82	1794.72	0.34	05/11/09	4.86	1794.68	-0.04
MW-68	RMPA	QAL	2144.69	02/26/09	36.86	2107.83	-0.22	05/11/09	37.28	2107.41	-0.42
MW-69	RMPA	QAL	2143.26	02/26/09	37.76	2105.50	-0.81	05/11/09	38.42	2104.84	-0.66
MW-70	NPCA	QAL	1976.15	02/26/09	25.89	1950.26	2.23	05/11/09	26.17	1949.98	-0.28
MW-71A	BPA	Granite	2193.77	02/27/09	158.71	2035.06	-0.41	05/08/09	158.85	2034.92	-0.14
MW-71B	BPA	QAL/MEF	2194.01	02/27/09	83.61	2110.40	1.24	05/08/09	84.08	2109.93	-0.47
MW-71C	BPA	MEF	2193.87	02/27/09	86.06	2107.81	-1.01	05/08/09	86.52	2107.35	-0.46
MW-72A	BPA	Granite	2199.06	02/27/09	98.81	2100.25	-2.36	05/08/09	96.43	2102.63	2.38
MW-72B	BPA	MEF	2199.22	02/27/09	92.81	2106.41	-2.06	05/08/09	91.21	2108.01	1.60
MW-72C	BPA	QAL	2199.35	02/27/09	92.93	2106.42	-2.05	05/08/09	91.33	2108.02	1.60
MW-73A	BPA	MEF	2189.39	02/27/09	111.22	2078.17	-0.82	05/08/09	111.04	2078.35	0.18
MW-73B	BPA	MEF	2189.48	02/27/09	95.11	2094.37	-0.42	05/08/09	94.91	2094.57	0.20
MW-73C	BPA	QAL	2189.65	02/27/09	82.91	2106.74	-0.53	05/08/09	82.32	2107.33	0.59
MW-74A	UG	Granite	2199.66	02/27/09	159.32	2040.34	-0.34	05/08/09	159.10	2040.56	0.22
MW-74B	UG	Granite	2199.81	02/27/09	118.50	2081.31	1.72	05/08/09	117.94	2081.87	0.56
MW-74C	UG	MEF	2199.96	02/27/09	86.48	2113.48	-0.61	05/08/09	86.45	2113.51	0.03
MW-75A	RMPA	MEF	2149.44	02/27/09	54.90	2094.54	-0.92	05/12/09	55.29	2094.15	-0.39
MW-75B	RMPA	QAL	2149.51	02/27/09	45.86	2103.65	-1.04	05/12/09	46.31	2103.20	-0.45
MW-75C	RMPA	QAL	2150.02	02/27/09	46.57	2103.45	-1.08	05/12/09	46.99	2103.03	-0.42
MW-76A	NPCA	MEF	2105.91	02/27/09	22.41	2083.50	-0.44	05/12/09	22.84	2083.07	-0.43
MW-76B	NPCA	QAL	2105.40	02/27/09	16.15	2089.25	0.73	05/12/09	16.28	2089.12	-0.13
MW-76C	NPCA	QAL	2106.29	02/27/09	8.37	2097.92	-0.69	05/12/09	8.87	2097.42	-0.50
MW-77A	MCEA	MEF	1930.62	02/27/09	11.74	1918.88	2.71	05/11/09	11.79	1918.83	-0.05
MW-77B	MCEA	MEF	1930.88	02/27/09	16.25	1914.63	1.36	05/11/09	16.32	1914.56	-0.07
MW-78	BPA	MEF	2182.63	02/27/09	87.74	2094.89	-1.19	05/08/09	88.32	2094.31	-0.58
MW-79A	RMPA	MEF	2142.00	02/27/09	41.72	2100.28	-1.03	05/07/09	42.12	2099.88	-0.40
MW-79C	RMPA	QAL	2142.07	02/27/09	38.62	2103.45	-1.02	05/07/09	39.07	2103.00	-0.45
MW-80	NPCA	MEF	2070.47	02/27/09	Artesian (1.05 PSI)	2072.90	1.39	05/12/09	Artesian (1.05 PSI)	2072.90	0.00
MW-81	MCEA	MEF	2010.72	02/26/09	25.98	1984.74	2.84	05/11/09	27.10	1983.62	-1.12
MW-82	NPCA	QAL	1974.17	02/26/09	23.59	1950.58	2.28	05/11/09	23.70	1950.47	-0.11
MW-83	NPCA	QAL	1976.93	02/26/09	22.09	1954.84	3.18	05/11/09	22.40	1954.53	-0.31
MW-84A	MCEA	MEF	2,010.02	02/26/09	62.43	1947.59	NA	05/11/09	62.52	1947.50	-0.09
MW-84B	MCEA	MEF	2,011.19	02/26/09	65.02	1946.17	NA	05/11/09	65.05	1946.14	-0.03
MW-85A	MCEA	MEF	1,929.31	02/26/09	5.55	1923.76	NA	05/11/09	6.20	1923.11	-0.65
MW-85B	MCEA	MEF	1,928.74	02/26/09	1.08	1927.66	NA	05/11/09	3.22	1925.52	-2.14
MW-86A	MCEA	MEF	1,923.21	02/26/09	14.9	1908.31	NA	05/11/09	15.43	1907.78	-0.53
MW-86B	MCEA	QAL/MEF	1,923.21	02/26/09	16.5	1906.71	NA	05/11/09	18.15	1905.06	-1.65
MW-87A	MCEA	MEF	1,938.92	02/26/09	21.1	1917.82	NA	05/11/09	21.26	1917.66	-0.16
MW-87B	MCEA	MEF	1,938.82	02/26/09	19.95	1918.87	NA	05/11/09	20.01	1918.81	-0.06
MW-88	RMPA	QAL	2,141.97	02/26/09	35.31	2106.66	NA	05/11/09	35.95	2106.02	-0.64
MW-89	RMPA	QAL	2,130.82	02/26/09	29.97	2100.85	NA	05/11/09	30.61	2100.21	-0.64
MW-90	RMPA	QAL	2,147.71	02/26/09	41.45	2106.26	NA	05/11/09	42.12	2105.59	-0.67
MW-91	RMPA	MEF	2,144.85	02/26/09	37.78	2107.07	NA	05/11/09	38.26	2106.59	-0.48
MW-92	MCEA	MEF	1,919.83	02/26/09	31.4	1888.43	NA	05/11/09	31.97	1887.86	-0.57
MW-93	MCEA	MEF	1,931.47	02/26/09	34.61	1896.86	NA	05/11/09	34.78	1896.69	-0.17
MW-94	MCEA	MEF	1,936.55	02/26/09	21.92	1914.63	NA	05/11/09	21.97	1914.58	-0.05
MW-95	MCEA	MEF	1,920.80	02/26/09	21.17	1899.63	NA	05/11/09	21.32	1899.48	-0.15
MW-96	MCEA	MEF	1998.63	02/26/09	53.75	1944.88	NA	05/11/09	53.77	1944.86	-0.02
MW-97	MCEA	MEF	1996.47	02/26/09	48.12	1948.35	NA	05/11/09	49.00	1947.47	-0.88
MW-98A	RMPA	MEF	2141.68	02/26/09	45.37	2096.31	NA	05/11/09	45.54	2096.14	-0.17
MW-98B	RMPA	MEF	2141.73	02/26/09	37.5	2104.23	NA	05/11/09	37.94	2103.79	-0.44
MW-99	RMPA	MEF	2144.63	02/26/09	55.52	2089.11	NA	05/11/09	55.77	2088.86	-0.25
MW-100	DG	Granite	1525.79	03/02/09	108.97	1416.82	NA	05/13/09	108.57	1417.22	0.40
OW-01	BPA	QAL	2204.62	02/27/09	54.41	2150.21	-0.72	05/12/09	54.83	2149.79	-0.42
OW-02	NPCA	QAL	2078.97	02/27/09	2.23	2076.74	0.29	05/12/09	2.45	2076.52	-0.22
OW-03	RMPA	QAL	2143.65	02/27/09	39.25	2104.40	-1.15	05/07/09	39.69	2103.96	-0.44
OW-05	NPCA	QAL	2160.85	02/26/09	Dry	Dry Well	NA	05/11/09	Dry	Dry Well	NA
OW-06	MCEA	QAL	2084.67	02/26/09	Dry	Dry Well	NA	05/15/09	Dry	Dry Well	NA
OW-07	MCEA	QAL	2108.06	02/26/09	Dry	Dry Well	NA	05/15/09	Dry	Dry Well	NA
OW-08	MCEA	QAL	2036.33	02/26/09	47.36	1988.97	2.06	05/11/09	47.94	1988.39	-0.58
P-02	NPCA	QAL	2081.15	02/26/09	13.71	2067.44	4.22	05/11/09	15.19	2065.96	-1.48
P-03	NPCA	QAL	2140.25	02/26/09	45.74	2094.51	-0.43	05/07/09	45.86	2094.39	-0.12
P-04	NPCA	QAL	2112.63	02/26/09	18.13	2094.50	6.17	05/11/09	21.05	2091.58	-2.92
P-05	RMPA	QAL	2162.20	02/27/09	57.83	2104.37	-1.13	05/12/09	58.20	2104.00	-0.37
P-06S	MCEA	QAL	2034.44	02/27/09	27.75	2006.69	NA	05/12/09	31.45	2002.99	-3.70
P-06D	MCEA	QAL	2034.41	02/27/09	28.95	2005.46	NA	05/12/09	32.20	2002.21	-3.25
P-07	MCEA	QAL	2034.60	02/27/09	29.40	2005.20	NA	05/12/09	32.66	2001.94	-3.26
P-08	MCEA	QAL	2030.87	02/27/09	25.15	2005.72	NA	05/12/09	28.43	2002.44	-3.28

Notes:						
	BPA -	Burn Pit Area.	DG -	Downgradient	"-"	Formation screened not defined.
	MCEA -	Massacre Canyon Entrance Area.	BTOC -	Below top of casing.	QAL -	Quaternary alluvium.
	NPCA -	Northern Protero Creek Area.	msl -	Mean sea level.	QAL/MEF -	Quaternary alluvium / Mt Eden formation.
	RMPA -	Rocket Motor Production Area.	NA -	Not available.	MEF -	Mount Eden formation.
	UG -	Upgradient	PSI -	pounds per square inch		

Between December 2008 (Fourth Quarter 2008) and March 2009 (First Quarter 2009), the Beaumont NWS reported approximately 4.37 inches of precipitation, and the average site-wide groundwater elevation decreased approximately 0.14 feet. Between March 2009 (First Quarter 2009) and June 2009 (Second Quarter 2008), the Beaumont NWS reported approximately 0.34 inches of precipitation and the average site-wide groundwater elevation decreased approximately 0.46 feet. Table 3-2 presents the range and average change in groundwater elevation by area. Figures 3-3 and 3-4 present elevation differences between the Fourth Quarter 2008 and First Quarter 2009 and First Quarter 2009 and Second Quarter 2009 groundwater monitoring events.

Table 3-2 Groundwater Elevation Change – First Quarter 2009 and Second Quarter 2009

Site Area	Range of Groundwater Elevation Change - First Quarter 2009		Average Change By Area	Range of Groundwater Elevation Change - Second Quarter 2009		Average Change By Area
BPA	-2.36	1.24	-1.02	-0.73	2.38	-0.08
MCEA	0.34	12.71	3.49	-5.12	0.79	-1.13
NPCA	-1.04	6.26	1.23	-3.88	0.12	-0.61
RMPA	-1.25	-0.22	-1.05	-1.18	-0.17	-0.46

Notes
BPA - Burn Pit Area
MCEA - Massacre Canyon Entrance Area
NPCA - Northern Protero Creek Area.

Groundwater elevations and seasonal responses to changes in recharge for select shallow and deeper wells are shown on Figures 3-5 through 3-7. The selected wells represent a groundwater flow path from upgradient of the former BPA, through the former BPA, through the former RMPA and southwestward (downgradient) through the Northern Potrero Creek Area (NPCA) and MCEA.

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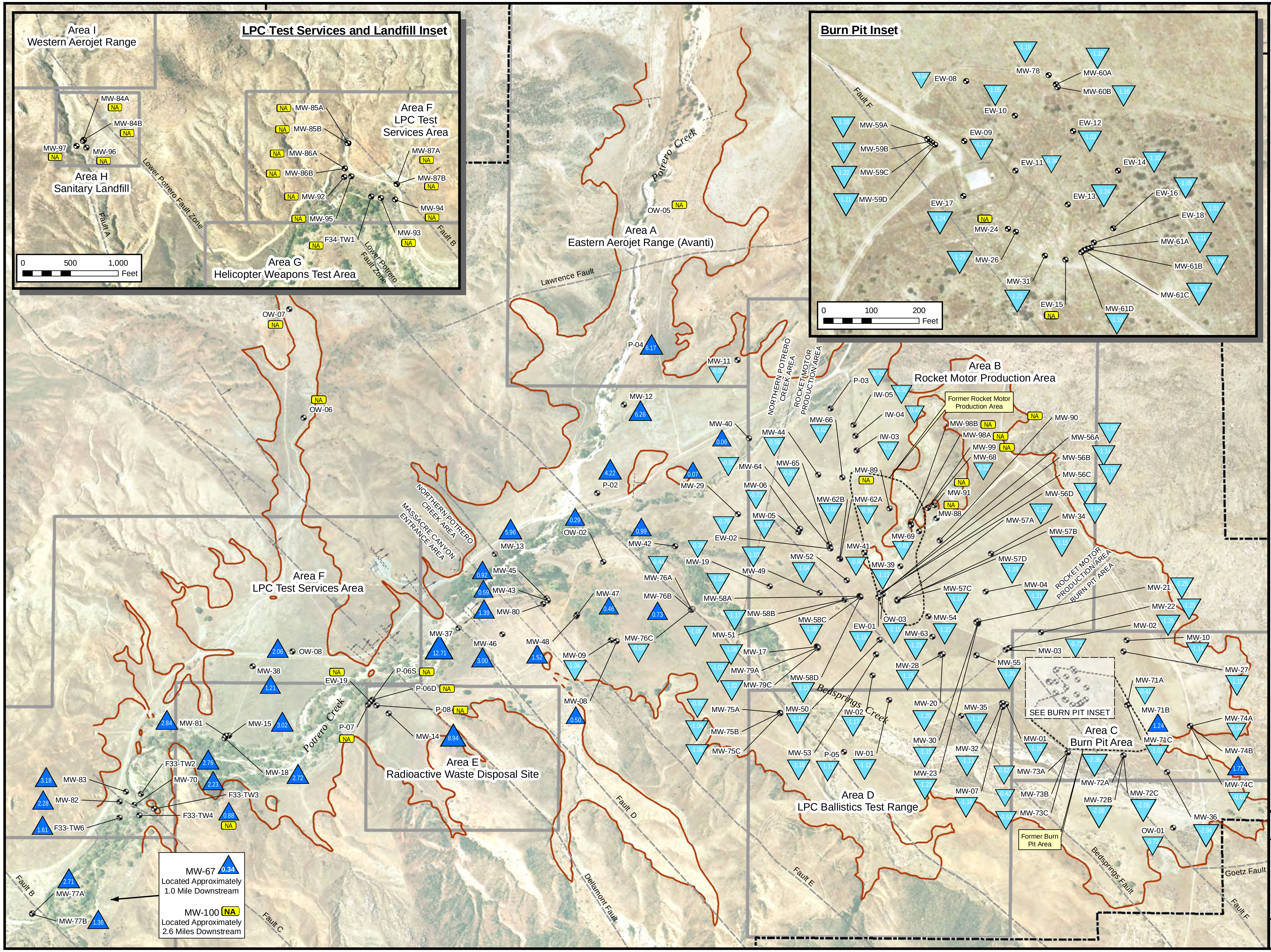

0 500 1,000 Feet

Adapted from: March 2007 aerial photograph.

Faults from structural analysis of Potrero Valley, *Lineament and Geologic Mapping Study, Tetra Tech, 2009.*

LEGEND

●	Well Location
▲ 1.50	Groundwater Elevation Increase (feet) *
▼ 2.33	Groundwater Elevation Decrease (feet) * * Compared to previous quarter groundwater elevations
NA	Groundwater Elevation Change Not Available
〰	Bedrock/Alluvium Surface Contact Dashed where inferred
⇢	Fault, Accurately Located Showing Dip
⇢	Fault, Approximately Located
▭	Historical Operational Area Boundary
⬚	Beaumont Site 1 Property Boundary

Notes: Beaumont Site 1 property boundary is approximate.

Beaumont Site 1

Figure 3-3

First Quarter (March) 2009 Groundwater Elevation Change

TETRA TECH

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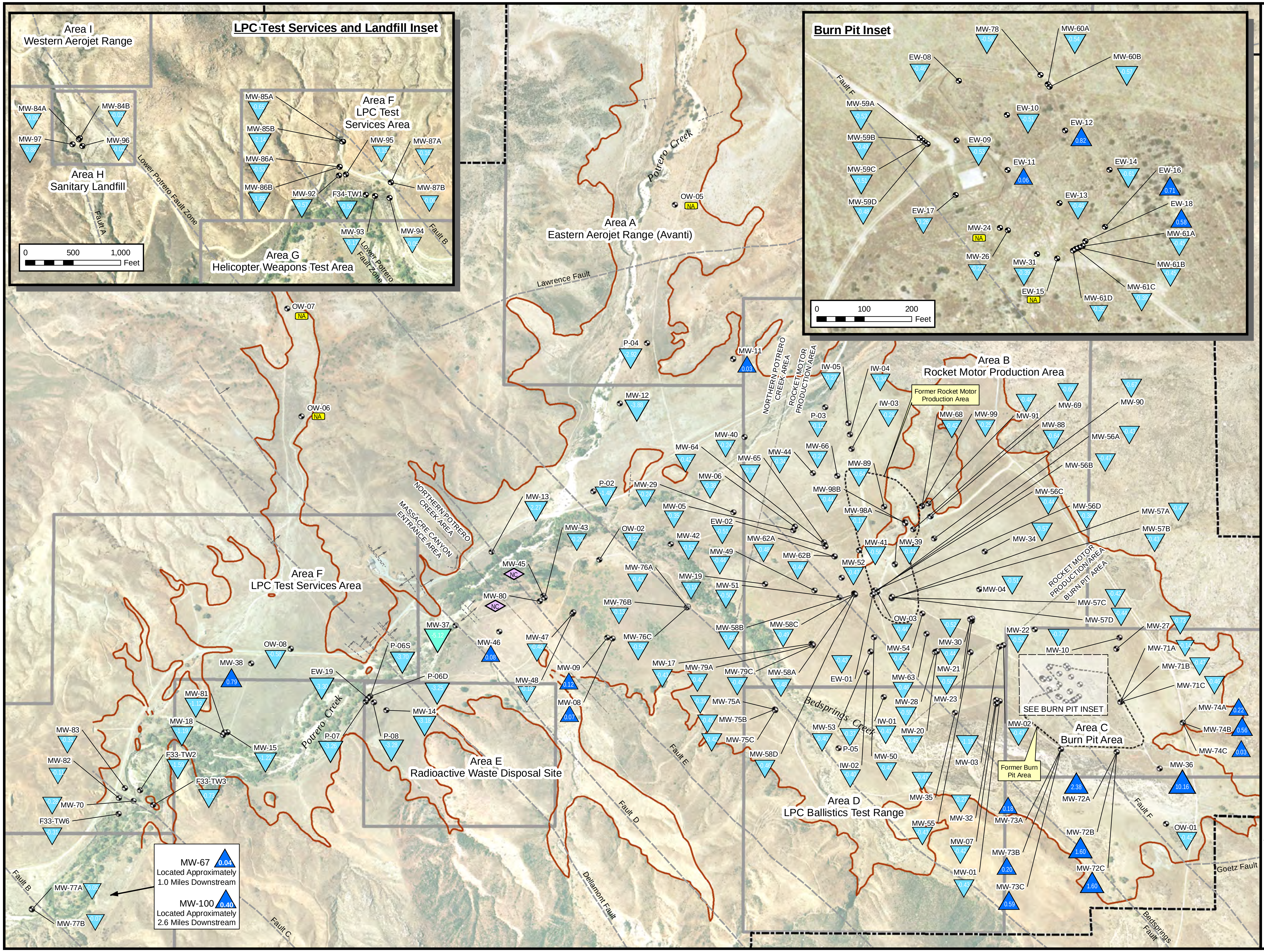


0 500 1,000 Feet

Adapted from: March 2007 aerial photograph.

Faults from structural analysis of Potrero Valley, *Lineament and Geologic Mapping Study, Tetra Tech, 2009.*

LEGEND

- ● Well Location
- ▲ 1.50 Groundwater Elevation Increase (feet) *
- ▼ 2.30 Groundwater Elevation Decrease (feet) *
- ◆ NC No Change in Groundwater Elevation
  * Compared to previous quarter groundwater elevations
- NA Groundwater Elevation Change Not Available
- Bedrock/Alluvium Surface Contact
  Dashed where inferred
- Fault, Accurately Located Showing Dip
- Fault, Approximately Located
- Historical Operational Area Boundary
- Beaumont Site 1 Property Boundary

Notes: Beaumont Site 1 property boundary is approximate.

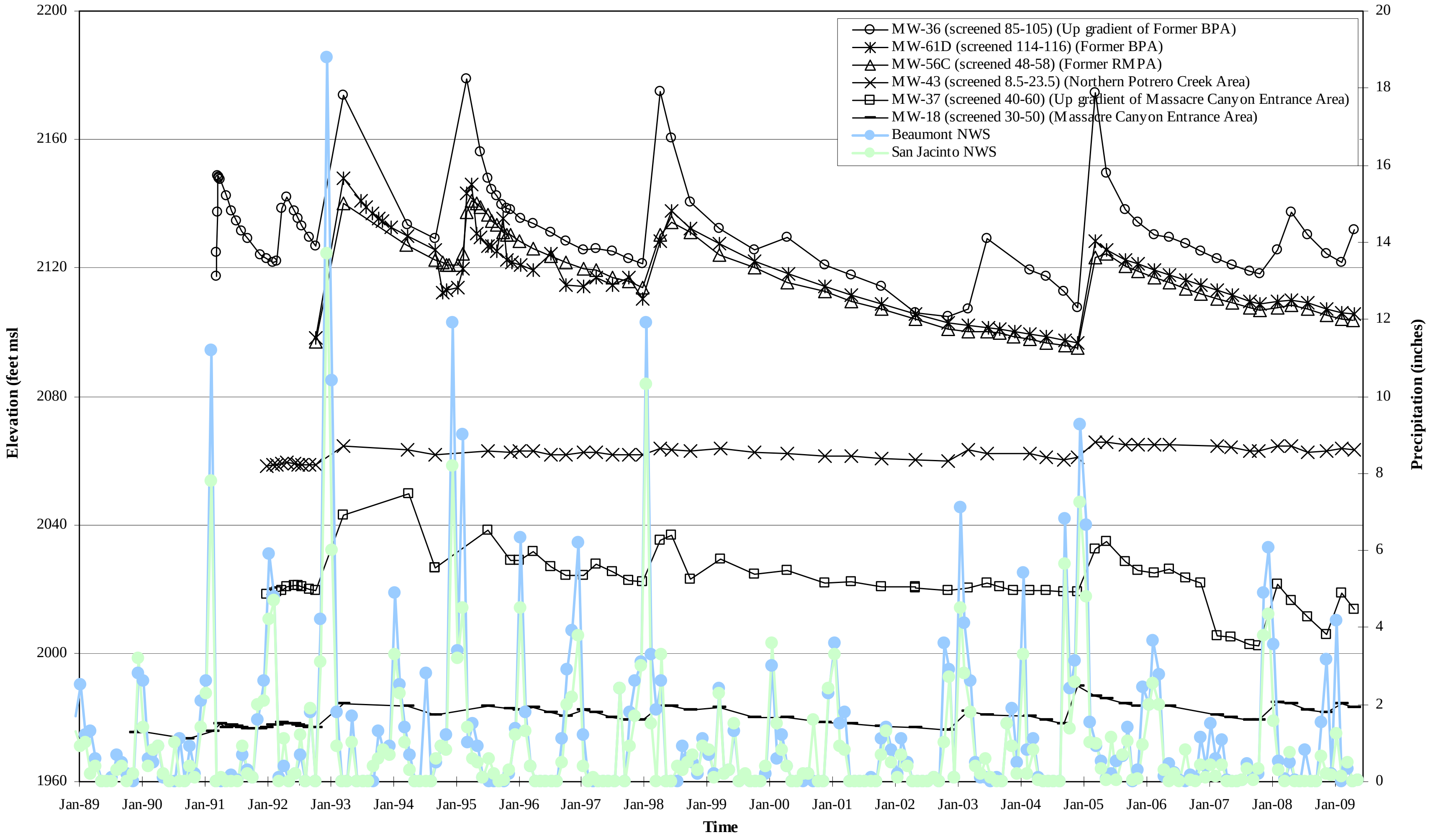
Beaumont Site 1

Figure 3-4

Second Quarter (June) 2009 Groundwater Elevation Change

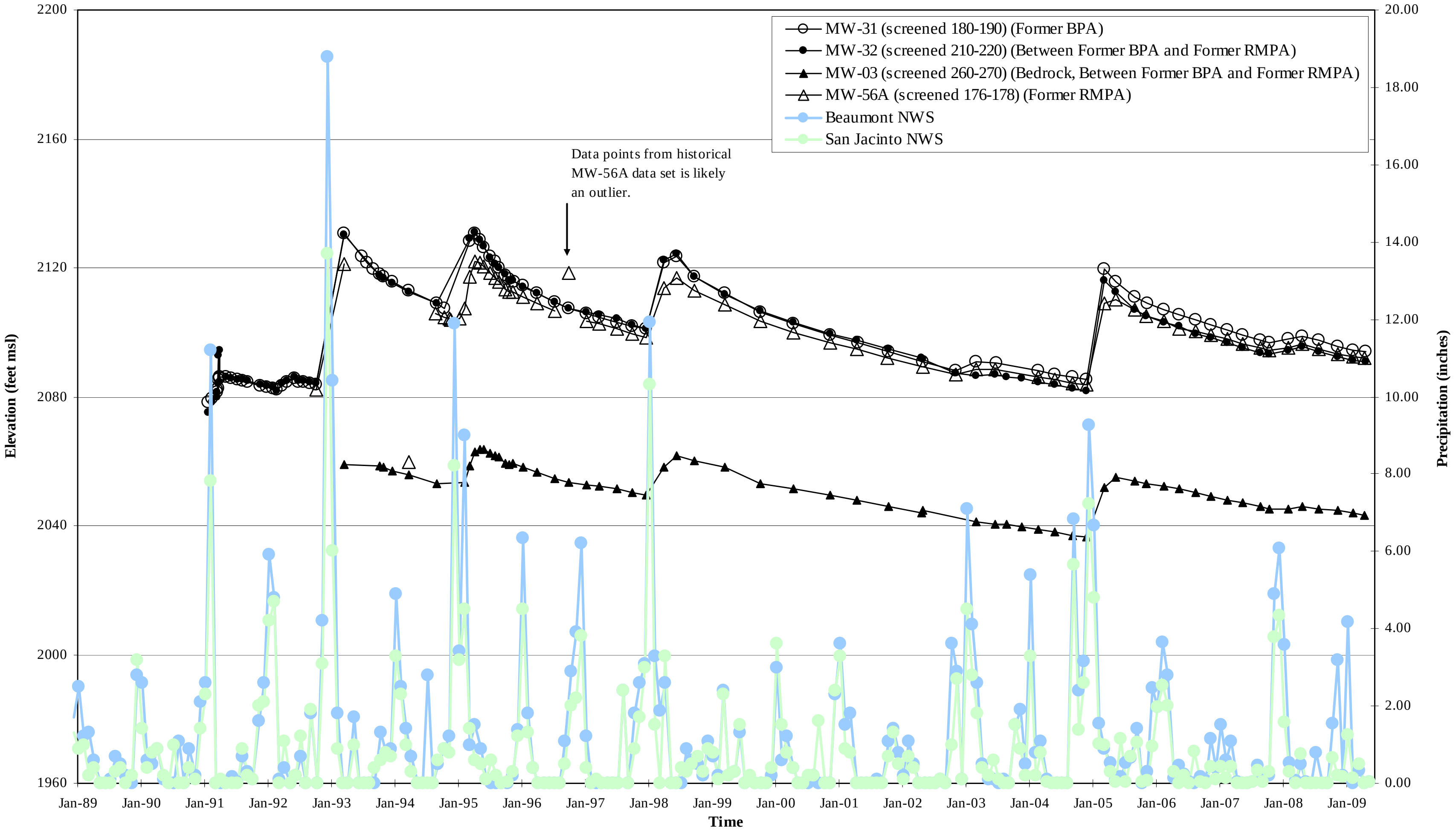
TETRA TECH

Figure 3-5 Groundwater Elevations vs. Time - Selected Alluvial and Shallow Mount Eden formation Wells



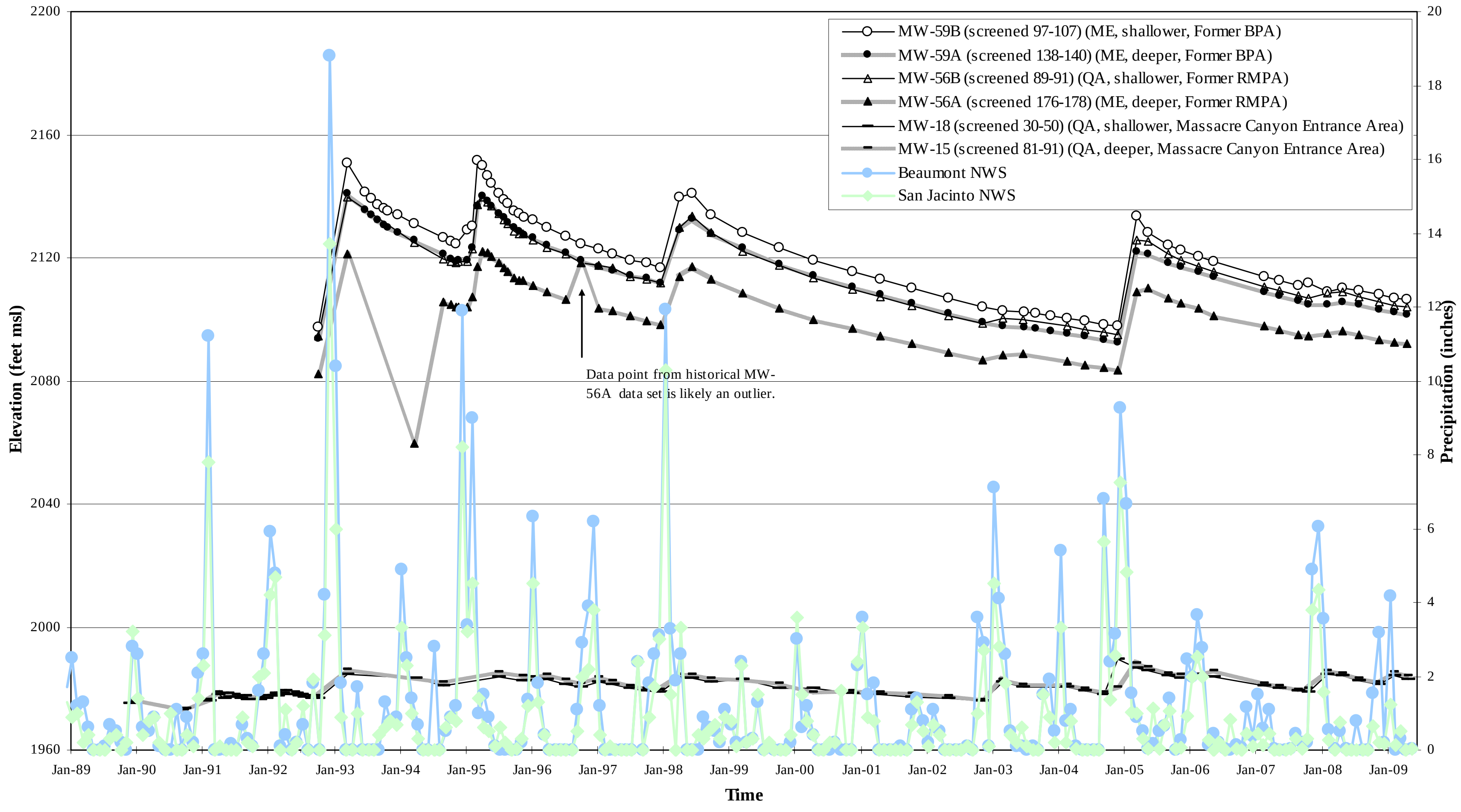
NWS - National Weather Service

Figure 3-6 Groundwater Elevations vs. Time - Deeper Mount Eden formation and Bedrock Wells



NWS - National Weather Service

Figure 3-7 Groundwater Elevations Comparison - Selected Shallower and Deeper Screened Wells in the Alluvial and Shallow Mount Eden formation



NWS - National Weather Service

3.2 SURFACE WATER FLOW

During First Quarter 2009 and Second Quarter 2009, the Potrero and Bedsprings creek riparian corridors were walked to determine the presence, nature, and quantity of surface water within the creek beds. The locations where surface water was encountered were plotted and a determination was made whether the water was flowing or stagnant. Where flowing water was encountered, the flow rate was determined using a modified version of the EPA Volunteer Stream Monitoring: Methods Manual (USEPA 1997).

Four fixed stream locations, SF-1 through SF-4, were previously chosen for stream flow measurements. SF-1 is located near Gilman Hot Springs at the southeast border of the Site, SF-2 is located in the vicinity of MW-67, SF-3 is located in the vicinity of MW-15 and 18, and SF-4 is located near MW-42.

At each location a section of stream that is relatively straight for at least 20 feet was chosen for measurement. This 20 foot section was marked and width measurements were taken at various points to determine the average width. Depth measurements were collected at 5 points along the width of the stream to determine the average depth of the stream. The average width and depth measurements were multiplied together to obtain an average cross sectional area. Velocity was measured by releasing a float upgradient and recording the time it took to float through the 20 foot marked section.

Three velocity measurements were taken and averaged. The length of the measured section was divided by the average velocity and the answer was multiplied by a correction factor of 0.9 to correct for friction between the water and stream bed. The average cross sectional area was then multiplied by the corrected average surface velocity to obtain the average cubic feet of water per second (cfs) flowing through that section of the stream.

A summary of the surface water flow rates is presented in Table 3-3, and the measurement locations and the locations where surface water was encountered are shown on Figures 3-8 and 3-9.

Table 3-3 Surface Water flow Rates

Location ID	Description of Location	Date Measured	Length of Measured Section (ft)	Width of Measured Section (ft)	Depth of Measured Section (ft)	Float Travel Time (seconds)	Cross Sectional Area (ft2)	Surface Velocity (ft /sec)	Stream Flow Rate (cfs)	Site Stream Flow Rate (cfs)
First Quarter (February) 2009										
SF-1	Near Gilman Hot Springs Road	02/27/09	20	5.17	0.07	10.76	0.36	1.67	0.60	1.07
SF-2	Near MW-67	02/27/09	20	4.83	0.10	10.18	0.48	1.77	0.85	
SF-3	Near MW-15 and 18	02/27/09	20	14.00	0.08	11.94	1.17	1.51	1.76	
SF-4	Near MW-42	02/27/09	Dry	Dry	Dry	Dry	Dry	Dry	Dry	
Second Quarter (May) 2009										
SF-1	Near Gilman Hot Springs Road	05/28/09	Dry	Dry	Dry	Dry	Dry	Dry	Dry	0.28
SF-2	Near MW-67	05/28/09	20	1.70	0.07	19.08	0.12	0.94	0.11	
SF-3	Near MW-15 and 18	05/28/09	20	8.67	0.05	16.09	0.39	1.12	0.44	
SF-4	Near MW-42	05/28/09	Dry	Dry	Dry	Dry	Dry	Dry	Dry	
Notes:	Measurements are averaged. cfs - cubic feet per second									

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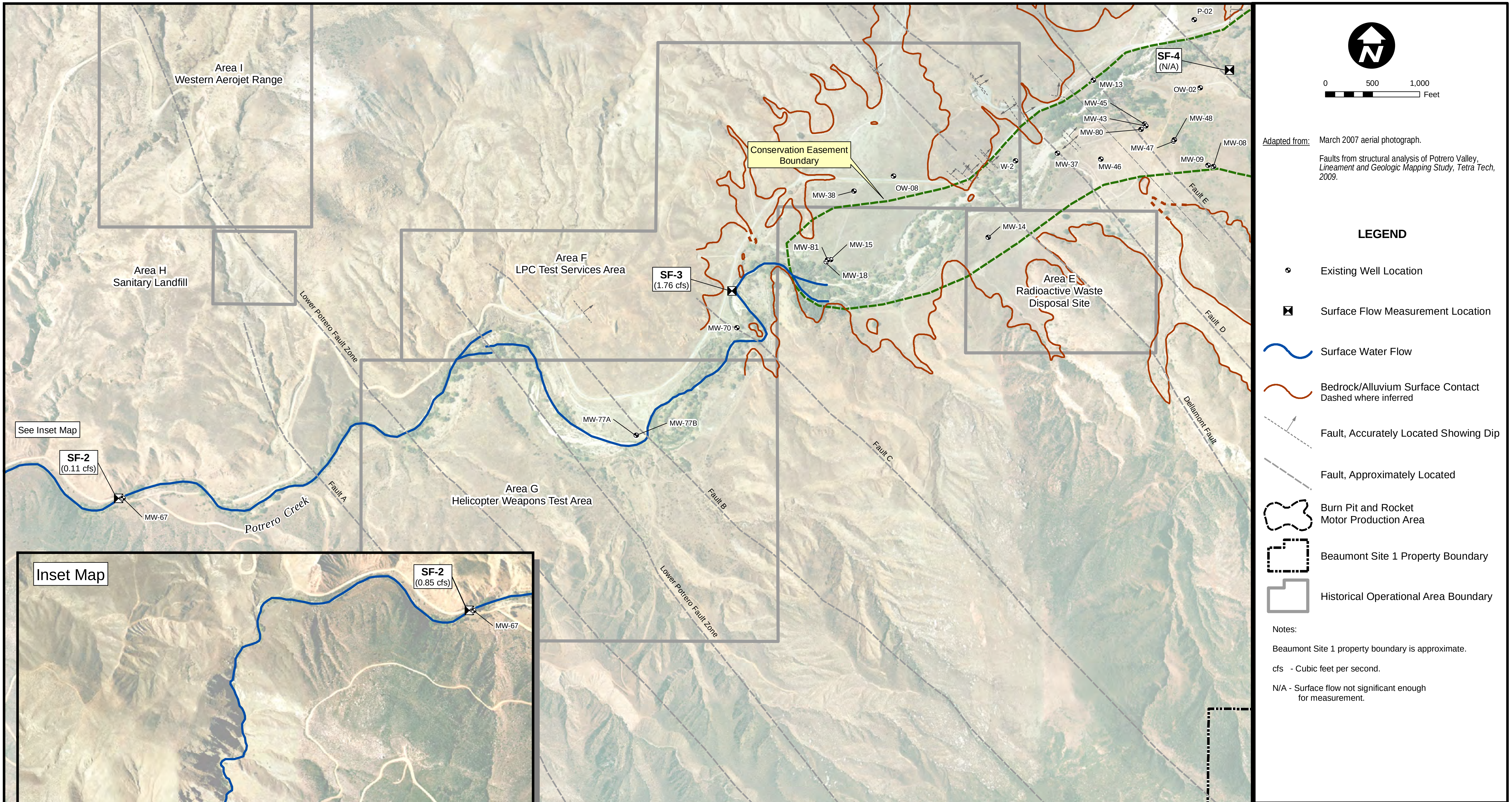


Adapted from: March 2007 aerial photograph.

Faults from structural analysis of Potrero Valley, *Lineament and Geologic Mapping Study, Tetra Tech, 2009.*

Notes:

Beaumont Site 1 property boundary is approximate.

cfs - Cubic feet per second.

N/A - Surface flow not significant enough for measurement.

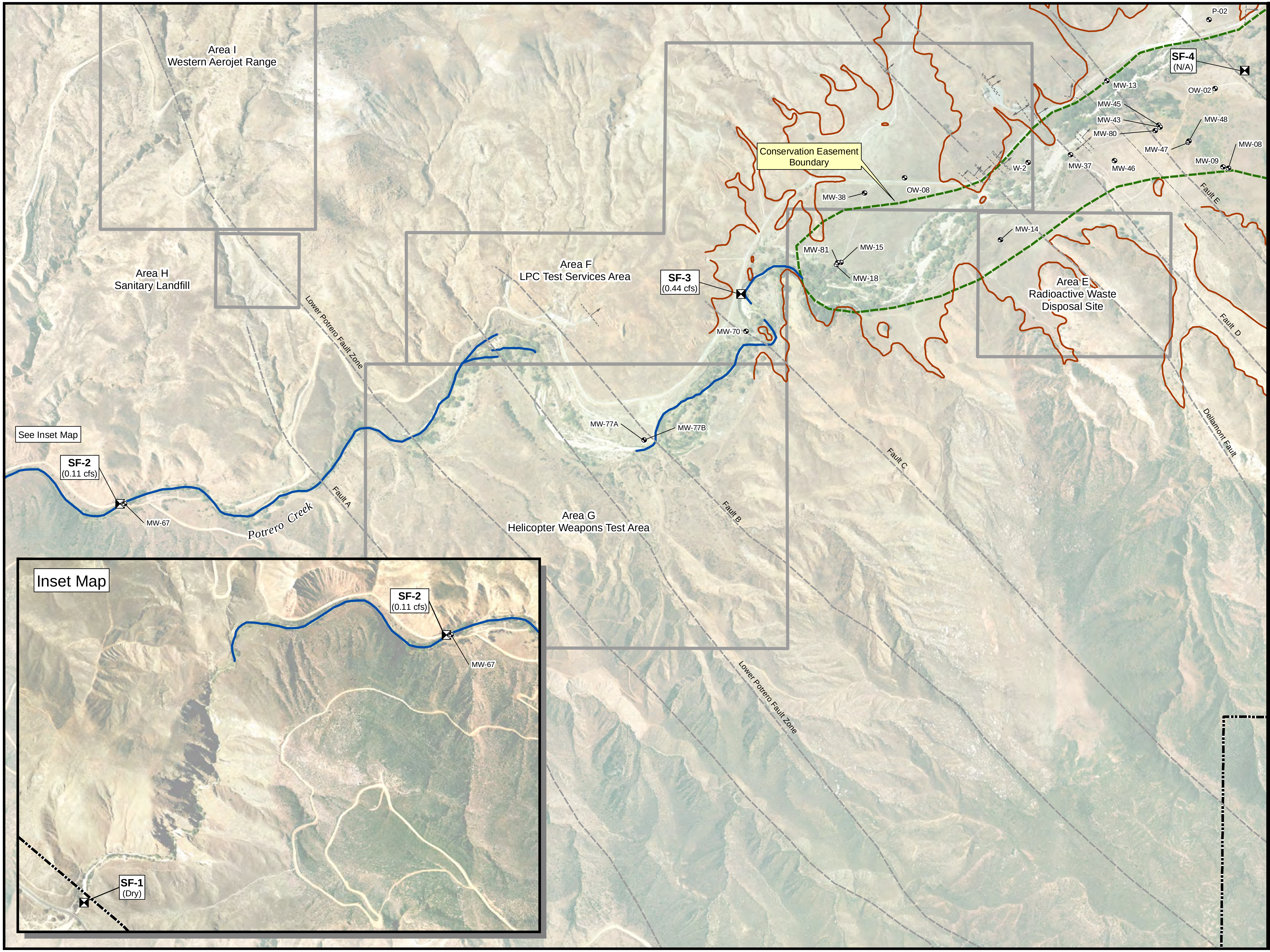
Beaumont Site 1

Figure 3-8

First Quarter (February) 2009 Surface Water Flow Locations

TETRA TECH

X:\GIS\Lockheed S1 Q1Q2009SurfWater_Q2-2009.mxd



0 500 1,000 Feet

Adapted from: March 2007 aerial photograph.

Faults from structural analysis of Potrero Valley, *Lineament and Geologic Mapping Study, Tetra Tech, 2009.*

LEGEND

- Existing Well Location
- Surface Flow Measurement Location
- Surface Water Flow
- Bedrock/Alluvium Surface Contact
  Dashed where inferred
- Fault, Accurately Located Showing Dip
- Fault, Approximately Located
- Burn Pit and Rocket
  Motor Production Area
- Beaumont Site 1 Property Boundary
- Historical Operational Area Boundary

Notes:

Beaumont Site 1 property boundary is approximate.

cfs - Cubic feet per second.

N/A - Surface flow not significant enough
for measurement.

Beaumont Site 1

Figure 3-9
Second Quarter (May) 2009
Surface Water Flow Locations

TETRA TECH

3.3 EVAPOTRANSPIRATION MONITORING

In areas where plant growth is pulling water from the shallow water table, daily fluctuations of groundwater levels have been shown to correlate with the rate of evapotranspiration (White, 1932, and Lewis et al., 2002). Since the Site 1 conceptual model includes evapotranspiration from the riparian zone where very shallow groundwater is observed, a survey was undertaken to record daily groundwater level variations in several wells in these riparian areas in order to help quantify the evapotranspiration mechanism and rate. Six temporary piezometers installed with pressure transducers were placed in the streambed to monitor the fluctuation of water level within the streambed during storm events and evapotranspiration during the dry season (Figure 3-10). These water level transducers were used to continuously record depth to groundwater from First Quarter 2008 through Second Quarter 2009, as shown in the monitoring and temporary well transducer charts in Appendix F. These charts also show daily measurements of precipitation from the nearby Beaumont and San Jacinto NWS stations, and daily measurements of evapotranspiration from the nearby University of California, Riverside (UCR) monitoring station maintained by the California Irrigation Management Information System (CIMIS) (CIMIS, 2009).

The water level variations seen in the Appendix F transducer charts correlate well with the precipitation and evapotranspiration measurements, with rising water levels found during and following precipitation events, and falling water levels that correlate with the time variation of evapotranspiration rates. For example:

- Water levels rise several feet following large storms events recorded during November 27-28, 2008; December 16-18, 2008; and February 8-10, 2009; and
- The rate of water table decline as measured in water levels (for example for MW-70 as given in Figure 3-11) is greater during extended periods with high evapotranspiration rates and lower during extended periods with low evapotranspiration rates. The exception is when there is interference from precipitation events.

In addition, as shown in Figure 3-12, the daily fluctuations in water levels show a daily trend, with decreasing water levels during the day when evapotranspiration is greatest and recovering water levels during the night.

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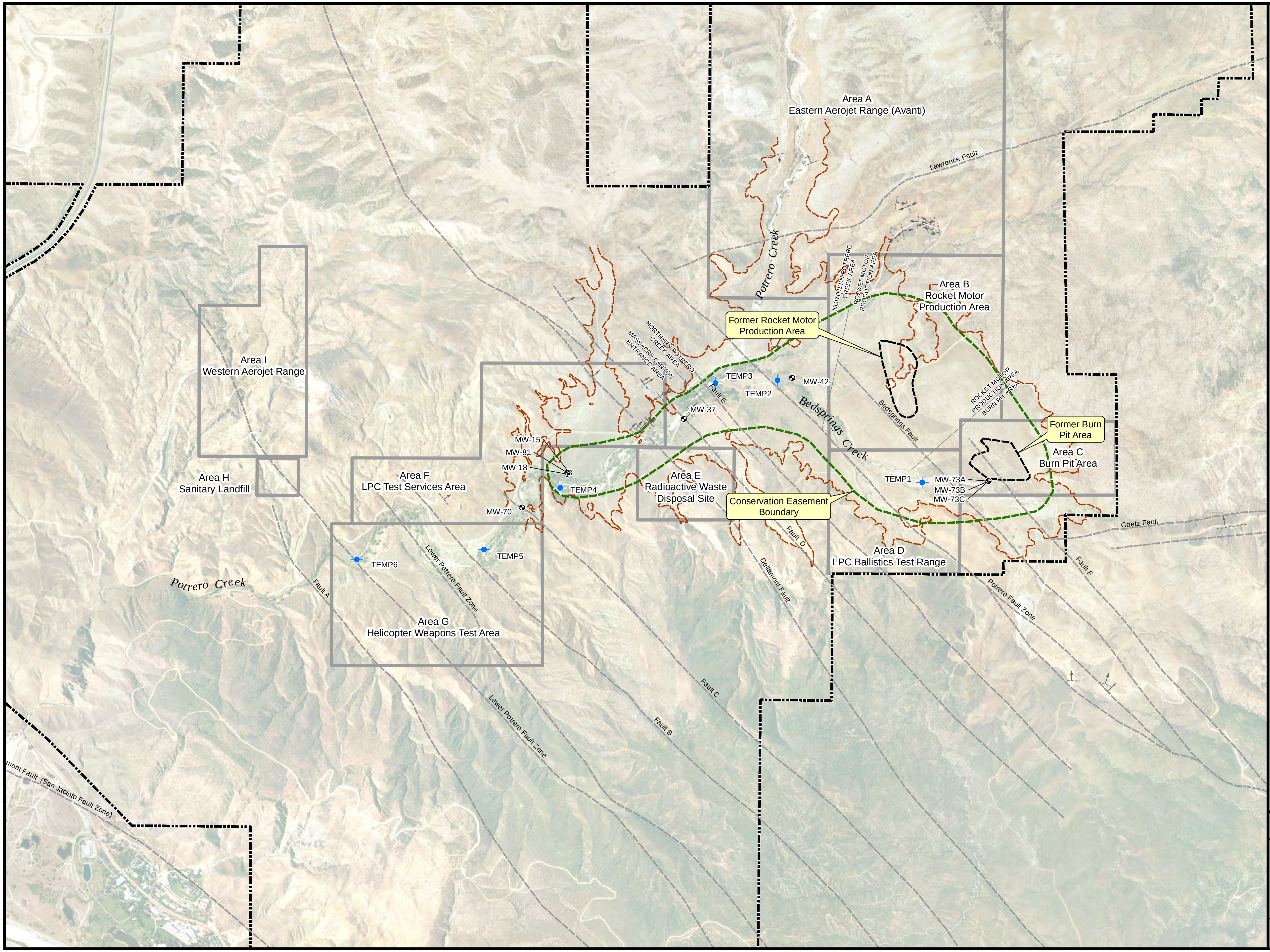


N

0 1,000 2,000
Feet

Adapted from: March 2007 aerial photograph.

Faults from structural analysis of Potrero Valley, *Lineament and Geologic Mapping Study, Tetra Tech, 2009.*

LEGEND

⊗	Monitoring Well Locations
✦	Temporary Well Locations
⤢	Fault, Accurately Located Showing Dip
╲	Fault, Approximately Located
〰	Bedrock/Alluvium Surface Contact (Dshed where inferred)
◌	Conservation Easement Boundary
⌐	Beaumont Site 1 Property Boundary
▢	Historical Operational Area Boundary

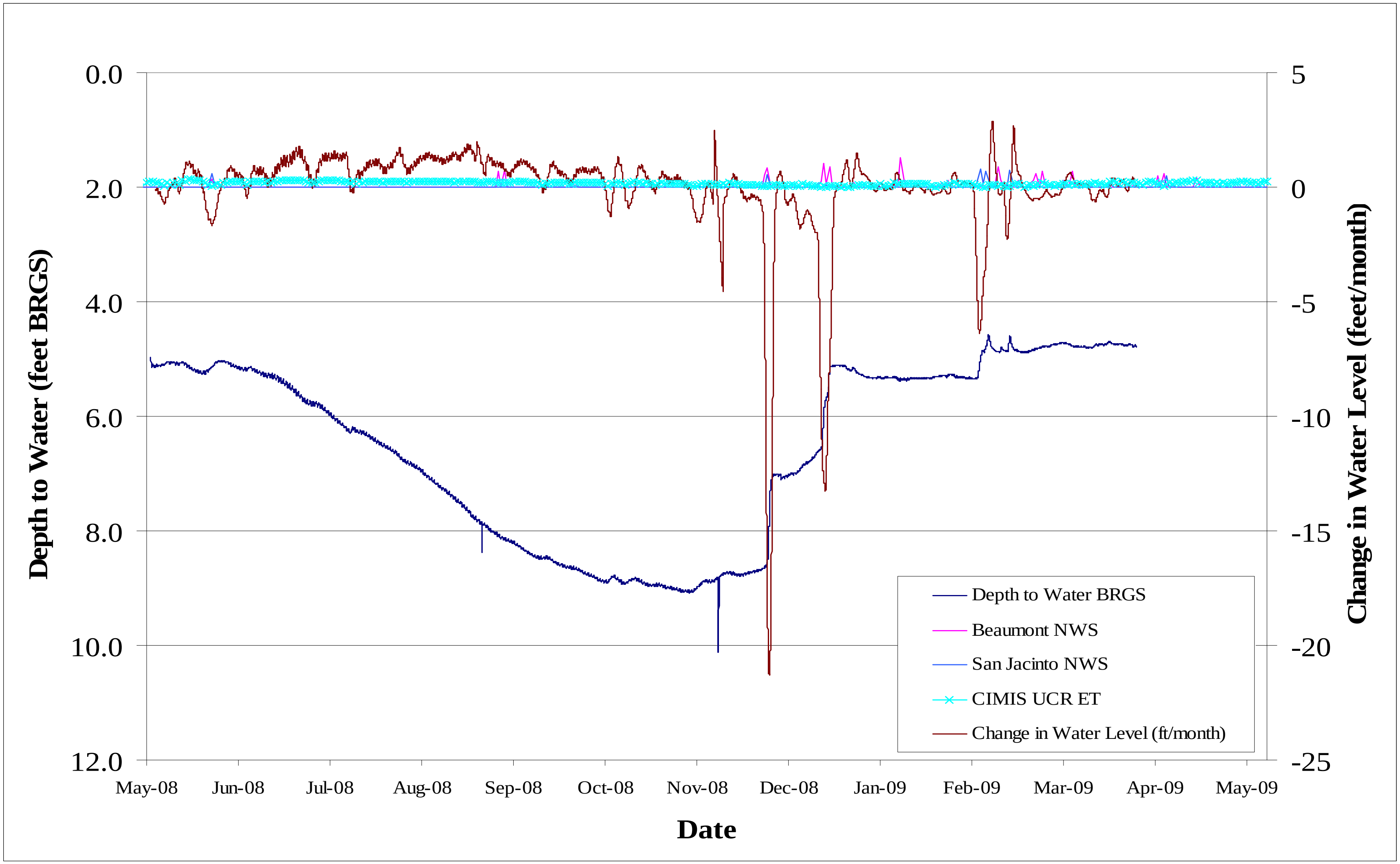
Beaumont Site 1

Figure 3-10

Water Level Transducer Locations

TETRA TECH

Figure 3-11 Long Term Trends In MW-70

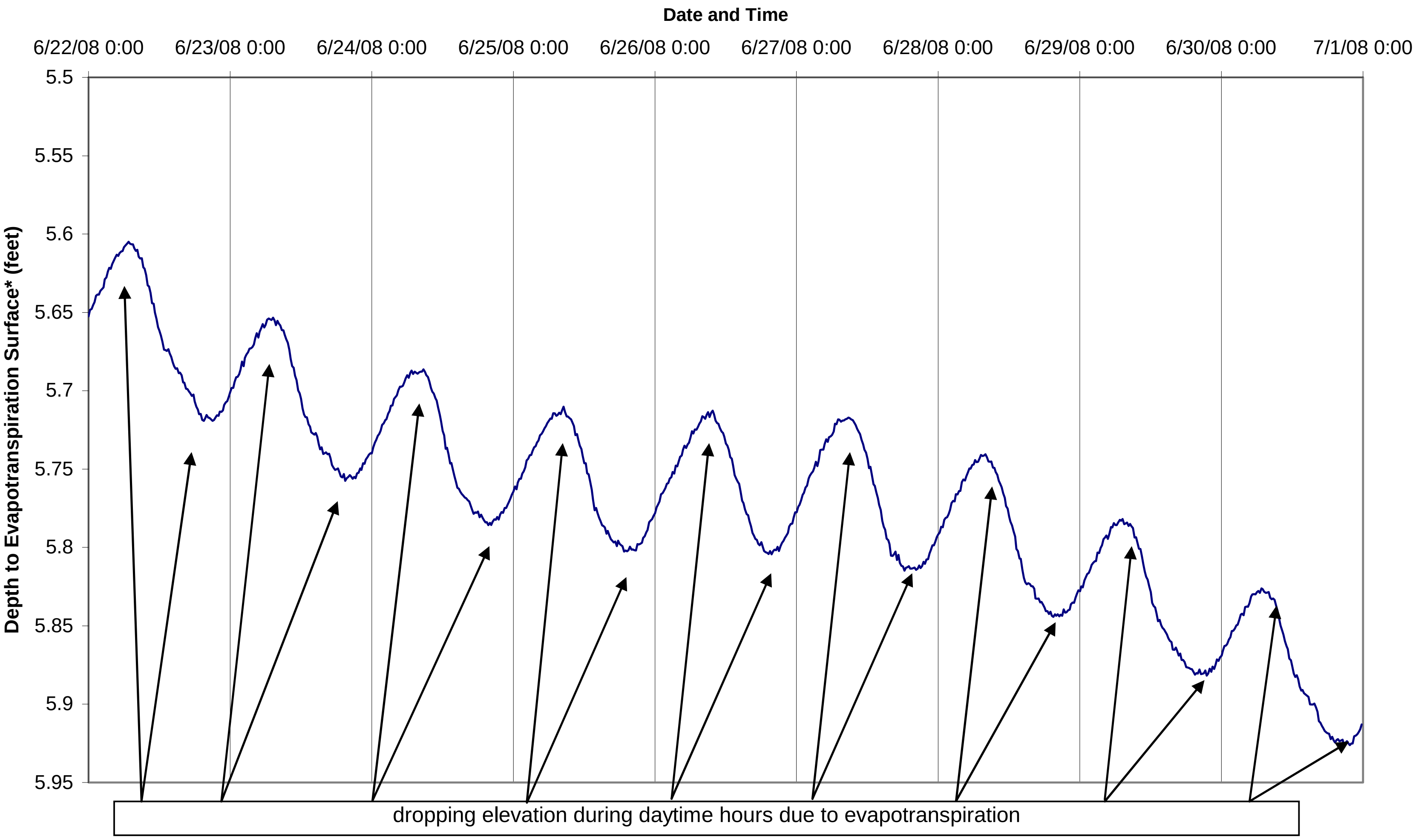


BRGS – Below riparian ground surface.

NWS – National Weather Service

CIMIS - California Irrigation Management Information System

Figure 3-12 Daily Water Level Trends In MW-70



* evapotranspiration surface = Depth below TOC - Elevation difference between TOC and riparian ground surface

The daily fluctuations found in these site water levels are similar to those observed in other studies of evapotranspiration (White, 1932, and Lewis et al., 2002). These studies in areas overlain by vegetation and underlain by shallow water tables have found that the rate of evapotranspiration from the water table can be estimated from daily variations in monitoring well water levels using the following equation:

$QET = Sy\ (24\ r + s)$ Equation ET-1 (from White, 1932) where:

QET = evapotranspiration rate, inches/day

Sy = specific yield

r = hourly rate of water table rise between midnight and 4 AM, inch/hour

s = net rise or fall of the water table per day, inch/day

Except during periods of precipitation when the effects of evapotranspiration on water levels are masked by the influence of precipitation and intermittent streamflow, the values for the hourly rate of water table rise between midnight and 4 AM (r) and the net rise or fall of the water table per day (s) can be directly estimated from the water level variations given in the Appendix F transducer charts and in Figures 3-11, and 3-12. The specific yield value (Sy) in Equation ET-1 has not been directly measured in each of the survey wells; however, specific yield has been estimated to be 5 to 15 percent in site pumping tests, the site conceptual model, and the site water balance. In addition, the evapotranspiration rate measured from nearby CIMIS monitoring station can also be used to indirectly calculate specific yield as follows (Lewis et al., 2002):

$Sy = QET\ /\ (24\ r + s)$ Equation ET-2 (from Lewis et al., 2002)

Thus, the data given in the Appendix F transducer charts and in Figures 3-11, and 3-12 were used along with Equations ET-1 and ET-2 to estimate the evapotranspiration rate at the these well locations during the precipitation free periods from May 2008 through May 2009 (Figures 3-13 and 3-14). Evapotranspiration rates were not calculated for periods of measurable precipitation as reported by the nearby Beaumont and San Jacinto NWS stations. In Figures 3-13 and 3-14, the trends and magnitude of the evapotranspiration rates derived from groundwater fluctuations generally matches the CIMIS evapotranspiration rate measurements from UCR. The specific yield values vary between 7 and 15 percent (Figures 3-13 and 3-14) which is in fairly good agreement with the site conceptual model. Admittedly, there is more variation in evapotranspiration rate measurements from site groundwater levels than those measured using ET methods at the UCR site; however, this is similar to observations at other locations (Lewis et al., 2002).

The correlation between climatic time series data sets can be estimated by the cross-correlation function or coefficient (van Storch and Zwiers, 1999). The cross-correlation coefficient has a value near positive one for perfect correlation, near minus one for perfect inverse correlation, and near zero for no correlation. Table 3-4 shows values of the cross-correlation coefficient between the evapotranspiration measurements in the Site 1 monitoring wells and the CIMIS UCR site. Four of the Site 1 locations (Temp-4, Temp-5, Temp-6, and MW-70) show fairly high cross-correlation coefficients of 0.6 to 0.7, while 3-locations (Temp-2, Temp-3, and MW-42) showed rather low cross-correlation coefficients of 0.1 to 0.2. One location (Temp-2) also showed a flat trend during July through October 2008 that does not correlate with the CIMIS UCR measurements during that period. The cause for the poorer agreement with the UCR data at the Temp-2, Temp-3, and MW-42 well locations is not known. It is assumed that a factor other than evapotranspiration is also influencing water levels at the Temp-2, Temp-3, and MW-42 well locations. Other evapotranspiration studies (Lewis et al., 2002) have noted that well locations closest to the riparian vegetation have the highest correlation between water level fluctuations and evapotranspiration measurements, while well locations closer to surface water features have lower correlations between water level fluctuations and evapotranspiration measurements. Thus, it may be that the Temp-2, Temp-3, and MW-42 locations are all influenced by features such as the ponds or the artesian zone, since these sites are all located in the artesian area near the ponds.

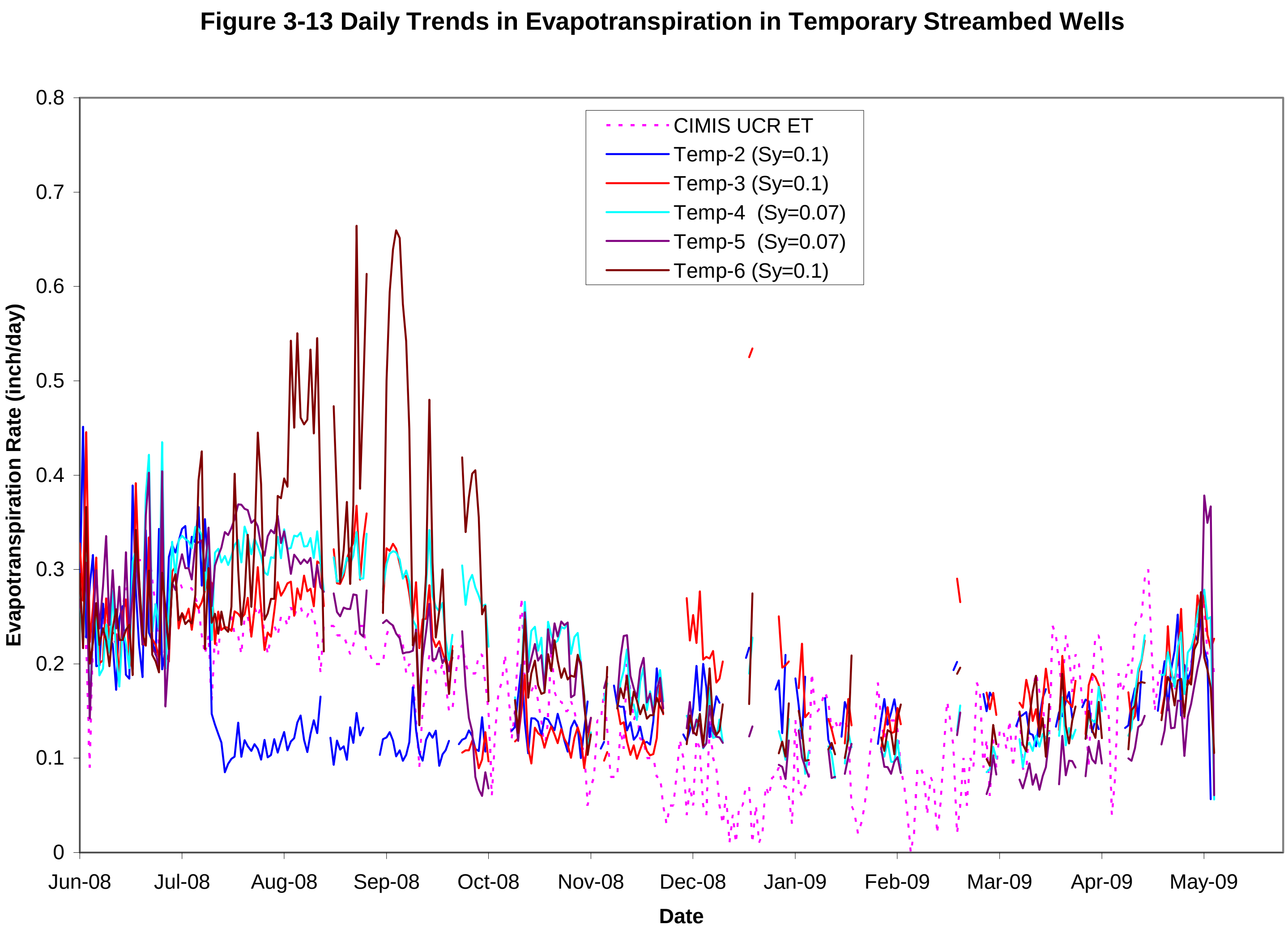
The mean evapotranspiration rate for the monitoring period is 0.17 inch per day, or roughly 5 inches per month. Values were as high as 7.5 inches per month in June and July 2008, and as low as 1.9 inches per month during December 2008. By comparison, the long-term monthly average evapotranspiration rate at the CIMIS UCR Station is 4.7 inches. Thus, the values for the May 2008 to May 2009 period were slightly above average.

Long-term annual average evapotranspiration rates for Beaumont Site 1 are likely to be similar to the 56.37 inches per year long-term annual average rate for the CIMIS UCR station. Total evapotranspiration from the riparian areas, however, will also depend upon depth to groundwater, with effective evapotranspiration rates of 56.37 inches per year in areas such as Temp-2 through Temp-6, MW-42, and MW-70 where groundwater is within a few feet of the surface, but diminishing to near zero in the riparian areas where groundwater is greater than the extinction depth of 15 to 25 feet. Using this site evapotranspiration rate of 56.37 inches per year and the depth to groundwater in the riparian areas, total annual evapotranspiration has been estimated in the site groundwater model as 139 acre-feet per year during the 1992-2008 period (Tetra Tech, Inc., 2009).

Table 3-4 Cross correlation between Evapotranspiration Measurements in Site 1 Monitoring Wells and CIMIS UCR Evapotranspiration Measurements

Well Location	Cross-Correlation Coefficient
Temp-2	0.06
Temp-3	0.08
Temp-4	0.74
Temp-5	0.62
Temp-6	0.57
MW-42	0.22
MW-70	0.59
Notes	CIMIS - California Irrigation Management Information System
	UCR – University of California, Riverside

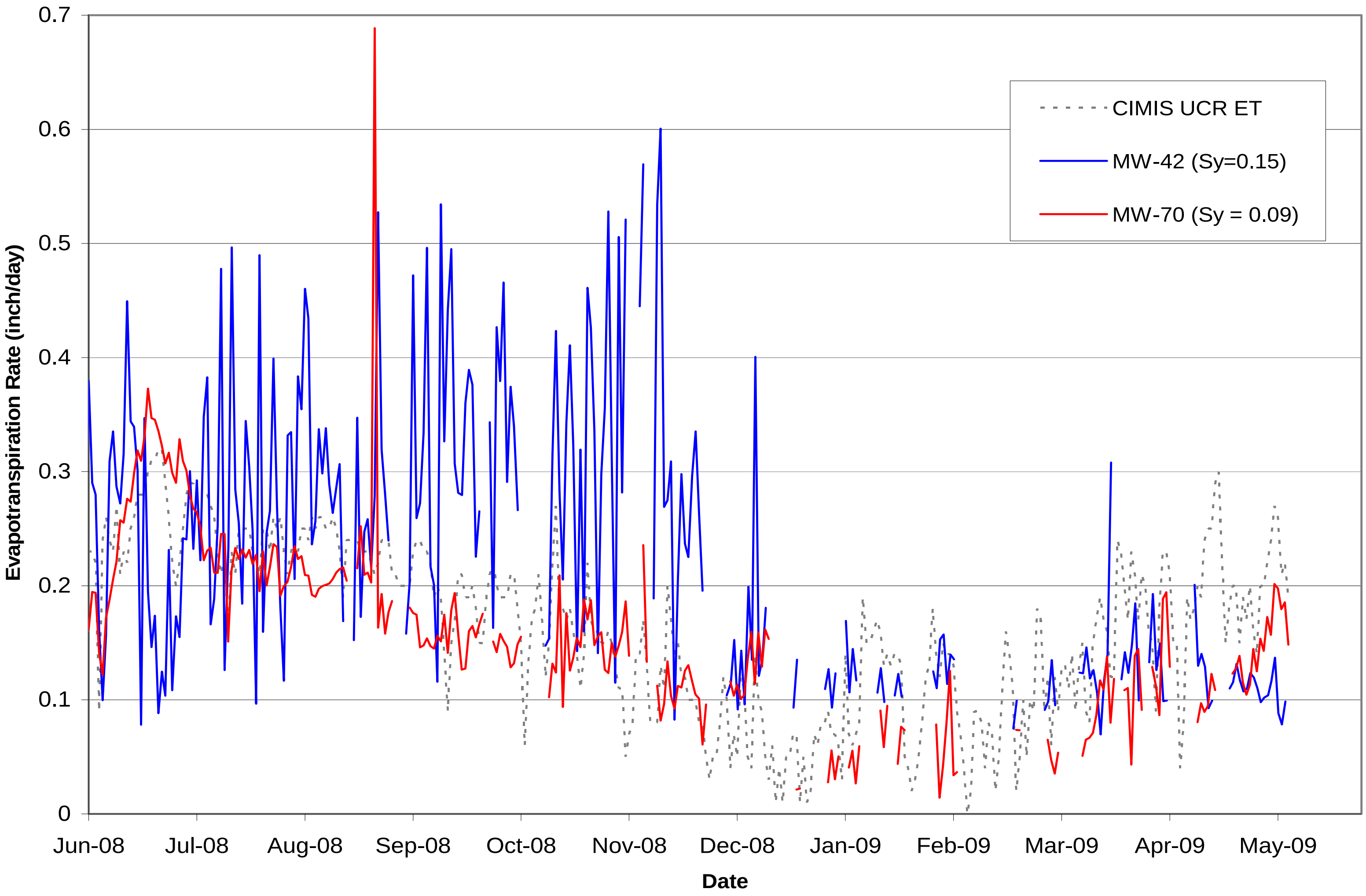
Figure 3-13 Daily Trends in Evapotranspiration in Temporary Streambed Wells



CIMIS UCR ET - California Irrigation Management Information System, University of California, Riverside evapotranspiration

SY - Specific yield value

Figure 3-14 Daily Trends in Evapotranspiration in Monitoring Wells



CIMIS UCR ET - California Irrigation Management Information System, University of California, Riverside evapotranspiration

SY - Specific yield value

3.3.1 Stream Recharge

Previous groundwater monitoring at the site has demonstrated large rises in groundwater levels in wells located near Potrero Creek and Bedsprings Creek very shortly after large precipitation events. Thus, water level transducers were placed in the following monitoring wells located near these streams: the shallow, intermediate, and deep nested monitoring wells MW-18, MW-15, and MW-81 in lower Potrero Creek; the shallow monitoring well MW-37 in middle Potrero Creek; and the shallow, intermediate, and deep nested monitoring wells MW-73C, MW-73B, and MW-73A adjacent to Bedsprings Creek. Water levels were continuously recorded in these wells from July 2008 through May 2009 covering the majority of the 2009 wet season, and water levels along with daily measurements of precipitation from the nearby Beaumont and San Jacinto NWS stations are given in the Appendix F transducer charts. These figures show increases in water levels of up to 10 to 15 feet from the large storms recorded during December 16 - 19, 2008 and February 8 through 18, 2009. The highest values of water level rise are recorded in Well MW-37. Values of water level rise after the storms are generally the same for both shallower and deeper wells (for example MW-81 and MW-18). Rainfall occurring during the summer and early fall had less of an impact on water levels, and presumably much of the precipitation during these hotter months is consumed by either evapotranspiration or soil moisture retention. Water table rises also seem to correlate better with precipitation recorded at the San Jacinto weather station than the Beaumont weather station. For example, large precipitation events were recorded at the Beaumont station in March and April 2009 while there was little precipation at the San Jacinto weather station, and almost no rise was observed in the water table during this period.

3.4 GROUNDWATER FLOW

Groundwater flow directions from First Quarter 2009 and Second Quarter 2009 (Figures 3-1 and 3-2 respectively) were similar to previously observed patterns for a dry period (Appendix A, Figure 2-14). Generally, groundwater flowed northwest from the southeastern limits of the valley (near the former BPA) beneath the former RMPA, towards Potrero Creek where groundwater flow then changes direction and begins heading southwest, parallel to the flow of Potrero Creek, into Massacre Canyon.

3.4.1 Horizontal and Vertical Groundwater Gradients

The overall horizontal groundwater gradient (approximating a flowline from MW-36, upgradient of the BPA, through the RMPA and NPCA to MW-18, in the MCEA) increased to 0.013 ft/ft between First Quarter 2009 and Second Quarter 2009.

Vertical groundwater gradients are calculated from individual clusters of wells. Well clusters are used to measure the difference in static water level at different depths within the aquifer. The vertical gradient is a comparison of static water level between wells at different depths within the aquifer and is an indication of the vertical flow (downward – negative gradient; upward – positive gradient), of groundwater. The vertical groundwater gradients at the site are generally negative in the BPA, negative in the RMPA, negative in the NPCA, and positive in the MCEA.

A summary of horizontal and vertical groundwater gradients is presented in Table 3-5. A complete listing of historical horizontal and vertical groundwater gradients and associated calculations is presented in Appendix G.

Table 3-5 Summary of Horizontal and Vertical Groundwater Gradient

Horizontal Groundwater Gradients (feet / foot), approximating a flowline from MW-36 to MW-18 and subsections

Location:	**Overall**	**BPA**	**RMPA**	**NPCA**	**MCEA**
Date	**MW-36 to MW-18**	**MW-36 to MW-2**	**MW-2 to MW-5**	**MW-5 to MW-46**	**MW-46 to MW-18**
Second Quarter (May) 2009	0.013	0.011	0.002	0.021	0.013
First Quarter (February) 2009	0.012	0.008	0.002	0.021	0.013
Previous - Fourth Quarter (Dec) 2008	0.013	0.009	0.002	0.022	0.013

Vertical Groundwater Gradients (feet / foot)

Location:	**BPA**	**RMPA**	**NPCA**	**MCEA**	**MCEA**
shallow screen	**MW-59B** (MEF)	**MW-56B** (QAL	**MW-75B** (QAL)	**MW-18** (QAL)	**MW-77B** (MEF)
Date deep screen	**MW-59A** (MEF)	**MW-56A** (MEF)	**MW-75A** (MEF)	**MW-15** (QAL)	**MW-77A** (MEF)
Second Quarter (May) 2009	-0.13	-0.14	-0.07	0.02	0.05
First Quarter (February) 2009	-0.12	-0.14	-0.07	0.02	0.05
Previous - Fourth Quarter (Dec) 2008	-0.12	-0.14	-0.08	0.02	0.03

Notes:

BPA - Burn Pit Area.
RMPA - Roket Motor Production Area
NPCA - Northern Potrero Creek Area.
MCEA - Massacre Canyon Entarnce Area.

QAL - Quaternary alluvium.
MEF - Mount Eden formation.

3.5 ANALYTICAL DATA SUMMARY

Summaries of validated laboratory analytical results for organic (VOCs, 1,4-dioxane) and inorganic (perchlorate, natural attenuation parameters) analytes detected above their respective method detection limits (MDLs) from the First Quarter 2009 water quality monitoring event are presented in Table 3-6 and from the Second Quarter 2009 water quality monitoring event in Table 3-7. A complete list of analytes tested, along with validated sample results by analytical method are provided in Appendix H.

Sample results detected above the published maximum contaminant level (MCL), federal or state, whichever is lower, or the California Department of Health Services state drinking water notification level (DWNL) are bolded in Tables 3-6 and 3-7. Laboratory analytical data packages, which include environmental, field QC, and laboratory QC results are provided in Appendix I and consolidated analytical data summary tables are presented in Appendix J. Tables 3-8 and 3-9 present basic statistical analysis of the organic and inorganic analytes detected during the First Quarter 2009 and Second Quarter 2009 monitoring events respectively.

Table 3-6 Summary of Validated Detected Organic and Inorganic Analytes - First Quarter 2009

Sample Location	Sample Date	Perchlorate	1,4-Dioxane	1,1-Dichloro ethene	c-1,2-Dichloro ethene	Trichloro ethene
All results reported in µg/L unless otherwise stated						
F33-TW2	03/23/09	<0.5	1.9	<0.2	<0.2	<0.2
F33-TW3	03/23/09	<0.5	2.3	0.8 Jq	0.24 Jq	0.27 Jq
F33-TW6	03/25/09	<0.5	1.2	<0.2	<0.2	<0.2
MW-70	03/24/09	**13.8**	1.3	<0.2	<0.2	<0.2
MW-82	03/25/09	<0.5	2.2	<0.2	<0.2	<0.2
MW-83	03/24/09	<0.5	1.6	<0.2	<0.2	<0.2
Reporting Limit (µg/L)		2	1.0	1.0	1.0	1.0
Method Detection Limit (µg/L)		0.50	0.40	0.20	0.20	0.20
MCL/DWNL (µg/L)		6	3 (1)	6	6	5

Notes:
Only analytes positively detected are presented in this table.
For a complete list, refer to the laboratory data package.
µg/L - micrograms pre liter.
MCL - California Department of Public Health maximum contaminant level.
DWNL - California Department of Public Health drinking water notification level.
(1) DWNL
Bold - MCL or DWNL exceeded.
<# - Analyte not detected, method detection limit concentration is shown.
J - The analyte was positively identified, but the analyte concentration is an estimated value.
q - The analyte detection was below the Practical Quantitation Limit (PQL).

Table 3-7 Summary of Validated Detected Organic and Inorganic Analytes - Second Quarter 2009

Sample Location	Sample Date	Per chlorate	Lead (mg/L)	1,4-Dioxane	Acetone	2-Butanone	Benzene	Carbon disulfide	Chloro methane	Carbon Tetra chloride	Chloro form	1,1-Dichloro ethane	1,2-Dichloro ethane	1,1-Dichloro ethene	cis-1,2-Dichloro ethene	trans-1,2-Dichloro ethene	Ethyl benzene	Methyl tert-butyl ether (MTBE)	Toluene	1,1,1-Trichloro ethane	1,1,2-Trichloro ethane	Trichloro ethene	1,2,4-Trimethyl benzene	Tetrachloro ethene	Vinyl Chloride	m,p-Xylenes	o-Xylene
All results reported in µg/L unless otherwise stated																											
SW-02	6/4/09	**40**	NA	**13**	<9.1	<6.9	<0.28	<1.9	<0.49	<0.43	<0.33	<0.37	<0.31	1.1	<0.49	<0.40	<0.22	<0.30	<0.33	<0.45	<0.54	0.96 Jq	<0.24	<0.51	<0.33	<0.45	<0.24
SW-03	6/4/09	<0.36	NA	**13**	<9.1	<6.9	<0.28	<1.9	<0.49	<0.43	<0.33	<0.37	<0.31	<0.40	<0.49	<0.40	<0.22	<0.30	6.5	<0.45	<0.54	<0.30	<0.24	<0.51	<0.33	<0.45	<0.24
SW-04	6/4/09	<0.36	NA	**6.8**	21 Jq	7.1 Jq	<0.28	<1.9	<0.49	<0.43	<0.33	<0.37	<0.31	1.2	<0.49	<0.40	0.74 Jq	<0.30	42	<0.45	<0.54	<0.30	<0.24	<0.51	<0.33	<0.45	<0.24
SW-06	6/9/09	<0.36	NA	2.4	<9.1	<6.9	<0.28	<1.9	<0.49	<0.43	<0.33	<0.37	<0.31	<0.40	<0.49	<0.40	<0.22	<0.30	<0.33	<0.45	<0.54	<0.30	<0.24	<0.51	<0.33	<0.45	<0.24
SW-07	6/4/09	<0.36	NA	<0.40	<9.1	<6.9	<0.28	<1.9	<0.49	<0.43	<0.33	<0.37	<0.31	<0.40	<0.49	<0.40	<0.22	<0.30	<0.33	<0.45	<0.54	<0.30	<0.24	<0.51	<0.33	<0.45	<0.24
SW-09	6/4/09	<0.36	NA	<0.40	<9.1	<6.9	<0.28	<1.9	<0.49	<0.43	<0.33	<0.37	<0.31	<0.40	<0.49	<0.40	<0.22	<0.30	<0.33	<0.45	<0.54	<0.30	<0.24	<0.51	<0.33	<0.45	<0.24
SW-18	6/4/09	<0.36	NA	**4**	<9.1	<6.9	<0.28	<1.9	<0.49	<0.43	<0.33	<0.37	<0.31	<0.40	<0.49	<0.40	<0.22	<0.30	<0.33	<0.45	<0.54	<0.30	<0.24	<0.51	<0.33	<0.45	<0.24
SW-19	6/4/09	<0.36	NA	**3.6**	<9.1	<6.9	<0.28	<1.9	<0.49	<0.43	<0.33	<0.37	<0.31	<0.40	<0.49	<0.40	<0.22	<0.30	<0.33	<0.45	<0.54	<0.30	<0.24	<0.51	<0.33	<0.45	<0.24
EW-13	6/9/09	3.3	NA	**1,600**	17 Jq	<6.9	**1.4**	<1.9	<0.49	<0.43	1.9	**48**	**130**	**2,900**	**280**	1.1	<0.22	<0.30	<0.33	<0.45	**16**	**460**	<0.24	1.5	**8**	<0.45	<0.24
F33-TW2	6/12/09	<0.36	NA	**4.2**	<9.1	<6.9	<0.28	<1.9	<0.49	<0.43	<0.33	<0.37	<0.31	<0.40	<0.49	<0.40	<0.22	<0.30	<0.33	<0.45	<0.54	<0.30	<0.24	<0.51	<0.33	<0.45	<0.24
F33-TW3	6/12/09	<0.36	NA	**5.1**	<9.1	<6.9	<0.28	<1.9	<0.49	<0.43	<0.33	<0.37	<0.31	<0.40	<0.49	<0.40	<0.22	<0.30	<0.33	<0.45	<0.54	<0.30	<0.24	<0.51	<0.33	<0.45	<0.24
F33-TW6	6/19/09	<0.071	NA	**3.1**	<5.0	<1.2	<0.14	<0.36	<0.36	<0.15	<0.17	<0.098	<0.21	<0.12	<0.18	<0.10	<0.26	<0.29	<0.22	<0.12	<0.31	<0.17	NA	<0.17	<0.13	<0.36	<0.41
F34-TW1	6/19/09	<0.071	NA	2.8	<5.0	<1.2	<0.14	<0.36	<0.36	<0.15	<0.17	<0.098	<0.21	<0.12	<0.18	<0.10	<0.26	<0.29	<0.22	<0.12	<0.31	0.34 Jq	NA	<0.17	<0.13	<0.36	<0.41
IW-04	6/9/09	<0.36	NA	**23**	17 Jq	<6.9	<0.28	<1.9	<0.49	<0.43	<0.33	0.68 Jq	<0.31	**19**	0.87 Jq	<0.40	<0.22	<0.30	<0.33	<0.45	<0.54	**15**	<0.24	<0.51	**0.62**	<0.45	<0.24
MW-02	6/18/09	**2,500**	NA	**160**	<5.0	<1.2	0.17 Jq	<0.36	<0.36	0.20 Jq	1.5	4.8	3.1	**250**	1.5	<0.10	<0.26	<0.29	<0.22	1.2	1.8	**170**	NA	0.49 Jq	<0.13	<0.36	<0.41
MW-05	6/18/09	**2,300**	NA	**43**	<5.0	<1.2	<0.14	<0.36	<0.36	<0.15	4.2	4.1	0.64	**150**	0.52	<0.10	<0.26	<0.29	<0.22	0.78	0.33 Jq	**130**	NA	<0.17	<0.13	<0.36	<0.41
MW-07	6/22/09	**220**	NA	0.69	<5.0	<1.2	<0.14	<0.36	<0.36	<0.15	<0.17	0.68	0.78	**21**	<0.18	<0.10	<0.26	<0.29	<0.22	0.26 Jq	<0.31	**51**	NA	0.18 Jq	<0.13	<0.36	<0.41
MW-09	6/19/09	<0.071	NA	**7**	<5.0	<1.2	<0.14	<0.36	<0.36	<0.15	<0.17	<0.098	<0.21	<0.12	<0.18	<0.10	<0.26	<0.29	<0.22	<0.12	<0.31	<0.17	NA	<0.17	<0.13	<0.36	<0.41
MW-13	6/4/09	<0.36	NA	<0.40	<9.1	<6.9	<0.28	<1.9	<0.49	<0.43	<0.33	<0.37	<0.31	<0.40	<0.49	<0.40	<0.22	<0.30	<0.33	<0.45	<0.54	<0.30	<0.24	<0.51	<0.33	<0.45	<0.24
MW-14	6/8/09	1.4 Jq	NA	1.5 Jq	<9.1	<6.9	<0.28	<1.9	<0.49	<0.43	<0.33	<0.37	<0.31	<0.40	<0.49	<0.40	<0.22	<0.30	<0.33	<0.45	<0.54	<0.30	<0.24	<0.51	<0.33	<0.45	<0.24
MW-15	6/8/09	<0.071	NA	**6.4**	<9.1	<6.9	<0.28	<1.9	<0.49	<0.43	<0.33	0.47 Jq	<0.31	2.6	<0.49	<0.40	<0.22	<0.30	<0.33	<0.45	<0.54	1.3	<0.24	<0.51	<0.33	<0.45	<0.24
MW-17	6/18/09	**420**	NA	**10**	<5.0	<1.2	<0.14	<0.36	<0.36	<0.15	<0.17	<0.098	<0.21	0.42 Jq	<0.18	<0.10	<0.26	<0.29	<0.22	0.19 Jq	<0.31	1.1	NA	<0.17	<0.13	<0.36	<0.41
MW-18	6/10/09	2.1	NA	**6.5**	<9.1	<6.9	<0.28	<1.9	<0.49	<0.43	<0.33	<0.37	<0.31	1.5 Jd	<0.49	<0.40	<0.22	<0.30	<0.33	<0.45	<0.54	1.2	<0.24	<0.51	<0.33	<0.45	<0.24
MW-19	6/18/09	**120**	NA	**69**	<5.0	<1.2	<0.14	0.40 Jq	<0.36	<0.15	<0.17	2.6	<0.21	**29**	0.44 Jq	<0.10	<0.26	<0.29	<0.22	0.28 Jq	<0.31	**14**	NA	<0.17	**0.72**	<0.36	<0.41
MW-22	6/17/09	**340**	NA	**16**	<5.0	<1.2	<0.14	<0.36	<0.36	<0.15	<0.17	0.25 Jq	<0.21	**25**	<0.18	<0.10	<0.26	<0.29	<0.22	<0.12	<0.31	**25**	NA	<0.17	<0.13	<0.36	<0.41
MW-26	6/17/09	**6,400**	NA	**550**	<5.0	<1.2	**1.8**	0.58	<0.36	**3.9**	14	**86**	**100**	**3,900**	**44**	2.2	<0.26	1.4 Jq	<0.22	5.4	**23**	**2,700**	NA	**7.7**	<0.13	<0.36	<0.41
MW-27	6/15/09	0.61 Jq	NA	<0.40	<9.1	<6.9	<0.28	<1.9	<0.49	<0.43	<0.33	<0.37	<0.31	<0.40	<0.49	<0.40	<0.22	<0.30	<0.33	<0.45	<0.54	<0.30	<0.24	<0.51	<0.33	<0.45	<0.24
MW-28	6/17/09	**210**	NA	**6.4**	<5.0	<1.2	<0.14	<0.36	<0.36	<0.15	<0.17	0.88	0.82	**26**	0.19 Jq	<0.10	<0.26	<0.29	<0.22	0.48 Jq	<0.31	**33**	NA	<0.17	<0.13	<0.36	<0.41
MW-31	6/15/09	2.5	NA	<0.40	<9.1	<6.9	<0.28	<1.9	<0.49	<0.43	<0.33	<0.37	<0.31	<0.40	<0.49	<0.40	<0.22	<0.30	<0.33	<0.45	<0.54	<0.30	<0.24	<0.51	<0.33	<0.45	<0.24
MW-34	6/10/09	**78**	NA	<0.40	<9.1	<6.9	<0.28	<1.9	<0.49	<0.43	<0.33	<0.37	<0.31	1.1	<0.49	<0.40	<0.22	<0.30	<0.33	<0.45	<0.54	**2**	<0.24	<0.51	<0.33	<0.45	<0.24
MW-35	6/8/09	<0.36	NA	<0.40	<9.1	<6.9	<0.28	<1.9	<0.49	<0.43	<0.33	<0.37	<0.31	<0.40	<0.49	<0.40	<0.22	<0.30	<0.33	<0.45	<0.54	<0.30	<0.24	<0.51	<0.33	<0.45	<0.24
MW-36	6/8/09	<0.36	NA	<0.40	<9.1	<6.9	<0.28	<1.9	<0.49	<0.43	<0.33	<0.37	<0.31	<0.40	<0.49	<0.40	<0.22	<0.30	<0.33	<0.45	<0.54	<0.30	<0.24	<0.51	<0.33	<0.45	<0.24
MW-37	6/11/09	<0.36	NA	**7.2**	<9.1	<6.9	<0.28	<1.9	<0.49	<0.43	<0.33	0.45 Jq	<0.31	2.5	<0.49	<0.40	<0.22	<0.30	<0.33	<0.45	<0.54	1.4	<0.24	<0.51	<0.33	<0.45	<0.24
MW-40	6/17/09	**840**	NA	**20**	<5.0	<1.2	<0.14	<0.36	<0.36	<0.15	0.85	1.2	<0.21	**24**	0.94	<0.10	<0.26	<0.29	<0.22	<0.12	<0.31	**43**	NA	<0.17	<0.13	<0.36	<0.41
MW-42	6/11/09	<0.36	NA	**32**	<9.1	<6.9	<0.28	<1.9	<0.49	<0.43	<0.33	**5.2**	0.57	**90**	2.7	<0.40	<0.22	<0.30	<0.33	<0.45	<0.54	**84**	<0.24	<0.51	**2.1**	<0.45	<0.24
Reporting Limit (µg/L)		2.0	0.01	2.0	50	10	0.5	10	10	0.5	1.0	1.0	0.5	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	0.5	1.0	1.0
MCL/DWNL (µg/L)		6	0.015	3 (1)	-	-	1	160 (1)	-	0.5	-	5	5	6	6	10	300	13	150	200	5	5	330 (1)	5	0.5	1750	1750

Notes: Only analytes positively detected are presented in this table. For a complete list, refer to the laboratory data package.
µg/L - micrograms pre liter.
mg/L - milligrams per liter
DWNL - California Department of Public Health drinking water notification level.
MCL - California Department of Public Health maximum contaminant level.
(1) DWNL
"-" - MCL or DWNL not available.
Bold - MCL or DWNL exceeded.
<# - Analyte not detected, method detection limit concentration is shown.

NA - not analyzed.
J - The analyte was positively identified, but the analyte concentration is an estimated value.
R - The sample result is rejected and not usable for any purpose. The presence or absence of the analyte cannot be verified.
c - The Matrix Spike (MS) and/or Matrix Spike Duplicate (MSD) recoveries were outside control limits.
d - The Laboratory Control Sample (LCS) recovery was outside control limits.
f - The duplicate Relative Percent Differnce was outside the control limit.
q - The analyte detection was below the Practical Quantitation Limit (PQL).

Table 3 7 Summary of Validated Detected Organic and Inorganic Analytes - Second Quarter 2009 (continued)

Sample Location	Sample Date	Per chlorate	Lead (mg/L)	1,4-Dioxane	Acetone	2-Butanone	Benzene	Carbon disulfide	Chloro methane	Carbon Tetra chloride	Chloro form	1,1-Dichloro ethane	1,2-Dichloro ethane	1,1-Dichloro ethene	cis-1,2-Dichloro ethene	trans-1,2-Dichloro ethene	Ethyl benzene	Methyl tert-butyl ether (MTBE)	Toluene	1,1,1-Trichloro ethane	1,1,2-Trichloro ethane	Trichloro ethene	1,2,4-Trimethyl benzene	Tetrachloro ethene	Vinyl Chloride	m,p-Xylenes	o-Xylene
All results reported in µg/L unless otherwise stated																											
MW-45	6/12/09	**150**	NA	**12 Jc**	<9.1	<6.9	<0.28	<1.9	<0.49	<0.43	<0.33	0.42 Jq	<0.31	**8**	<0.49	<0.40	<0.22	<0.30	<0.33	<0.45	<0.54	**8.3**	<0.24	<0.51	<0.33	<0.45	<0.24
MW-46	6/11/09	<0.36	NA	**12**	<9.1	<6.9	<0.28	<1.9	<0.49	<0.43	<0.33	0.51 Jq	<0.31	2.8	1.1	<0.40	<0.22	<0.30	<0.33	<0.45	<0.54	1.9	<0.24	<0.51	0.44 Jq	<0.45	<0.24
MW-47	6/19/09	5	NA	<0.043	<5.0	<1.2	<0.14	<0.36	<0.36	<0.15	<0.17	<0.098	<0.21	<0.12	<0.18	<0.10	<0.26	<0.29	<0.22	<0.12	<0.31	<0.17	NA	<0.17	<0.13	<0.36	<0.41
MW-49	6/18/09	**630**	NA	**24**	<5.0	<1.2	<0.14	0.88	<0.36	<0.15	0.71	0.39 Jq	<0.21	**15**	<0.18	<0.10	<0.26	<0.29	<0.22	0.87	<0.31	**25**	NA	<0.17	<0.13	<0.36	<0.41
MW-53	6/11/09	**98**	NA	**3.6**	<9.1	<6.9	<0.28	<1.9	<0.49	<0.43	<0.33	<0.37	<0.31	1.6	<0.49	<0.40	<0.22	<0.30	<0.33	<0.45	<0.54	2.1	<0.24	<0.51	<0.33	<0.45	<0.24
MW-54	6/17/09	**830**	NA	**22**	<5.0	<1.2	<0.14	<0.36	<0.36	<0.15	0.47 Jq	0.93	0.54	**57**	0.27 Jq	<0.10	<0.26	<0.29	<0.22	0.38 Jq	0.32 Jq	**56**	NA	<0.17	<0.13	<0.36	<0.41
MW-55	6/17/09	**1,600**	NA	**80**	<5.0	<1.2	0.15 Jq	<0.36	<0.36	<0.15	1.2	3.7	2.7	**210**	1.3	<0.10	<0.26	<0.29	<0.22	1	1.3	**170**	NA	0.37 Jq	<0.13	<0.36	<0.41
MW-56C	6/11/09	**880**	NA	**29**	<9.1	<6.9	<0.28	<1.9	<0.49	<0.43	0.61 Jq	1.1	0.54	**56**	<0.49	<0.40	<0.22	<0.30	<0.33	<0.45	<0.54	**49**	<0.24	<0.51	<0.33	<0.45	<0.24
MW-59B	6/9/09	**4,000**	NA	**48**	<9.1	<6.9	<0.28	<1.9	<0.49	<0.43	2.1	**9.1**	**14**	**170**	1.3	<0.40	<0.22	0.53 Jq	<0.33	<0.45	1.3	**110**	<0.24	<0.51	<0.33	<0.45	<0.24
MW-59D	6/9/09	**6,100**	NA	**52**	<9.1	<6.9	0.40 Jq	<1.9	<0.49	**0.92**	3.7	**18**	**25**	**500**	2.7	<0.40	<0.22	<0.30	<0.33	0.71 Jq	2	**300**	<0.24	<0.51	<0.33	<0.45	<0.24
MW-60A	6/9/09	**5,300**	**0.0657**	**140**	<9.1	<6.9	<0.28	<1.9	<0.49	**0.47 Jq**	2.9	**5.8**	**8.2**	**570**	2.5	<0.40	<0.22	<0.30	<0.33	0.73 Jq	1.7	**310**	<0.24	<0.51	<0.33	<0.45	<0.24
MW-60B	6/9/09	**1,200**	NA	**6.6**	<9.1	<6.9	<0.28	<1.9	<0.49	<0.43	0.53 Jq	0.56 Jq	0.47 Jq	**46**	<0.49	<0.40	<0.22	<0.30	<0.33	<0.45	<0.54	**10**	<0.24	<0.51	<0.33	<0.45	<0.24
MW-61A	6/5/09	**10,000**	NA	**25**	14 Jq	<6.9	<0.28	<1.9	<0.49	<0.43	<0.33	3.6	3.6	**87**	0.77 Jq	<0.40	<0.22	<0.30	0.83 Jq	<0.45	<0.54	**14**	<0.24	<0.51	<0.33	<0.45	<0.24
MW-61B	6/5/09	**74000**	NA	**560**	<1800	<1400	<57	<380	<97	<85	<66	**110 Jq**	<63	**5,900**	<97	<81	<44	<61	<65	<90	<110	**1,100**	<49	<100	<65	<91	<47
MW-61C	6/5/09	**1,300**	NA	**6.5**	<9.1	<6.9	<0.28	<1.9	<0.49	<0.43	0.72 Jq	2.8	2.5	**110**	0.49 Jq	<0.40	<0.22	<0.30	<0.33	<0.45	<0.54	**18**	<0.24	<0.51	<0.33	<0.45	<0.24
MW-62A	6/18/09	**1,400**	NA	**37**	<5.0	<1.2	<0.14	<0.36	<0.36	<0.15	1.4	1.2	<0.21	**52**	0.19 Jq	<0.10	<0.26	<0.29	<0.22	0.51	0.32 Jq	**76**	NA	0.19 Jq	<0.13	<0.36	<0.41
MW-66	6/19/09	**1,200**	NA	**28**	<5.0	<1.2	<0.14	<0.36	<0.36	<0.15	2.7	3.4	0.79	**110**	0.49 Jq	<0.10	<0.26	<0.29	<0.22	0.32 Jq	<0.31	**130**	NA	0.27 Jq	<0.13	<0.36	<0.41
MW-67	6/10/09	<0.071	NA	1.2 Jcq	<9.1	<6.9	<0.28	<1.9	<0.49	<0.43	<0.33	<0.37	<0.31	<0.40	<0.49	<0.40	<0.22	<0.30	<0.33	<0.45	<0.54	<0.30	<0.24	<0.51	<0.33	<0.45	<0.24
MW-68	6/22/09	**3,600**	NA	**9.8**	<5.0	<1.2	<0.14	<0.36	<0.36	<0.15	<0.17	<0.098	<0.21	3.3	<0.18	<0.10	<0.26	<0.29	<0.22	<0.12	<0.31	<0.17	NA	<0.17	<0.13	<0.36	<0.41
MW-69	6/9/09	**1,300**	NA	**7**	<9.1	<6.9	<0.28	<1.9	<0.49	<0.43	0.87 Jq	<0.37	<0.31	2.7	<0.49	<0.40	<0.22	<0.30	<0.33	<0.45	<0.54	**9.9**	<0.24	<0.51	<0.33	<0.45	<0.24
MW-70	6/10/09	<0.36	NA	**3.8**	<9.1	<6.9	<0.28	<1.9	<0.49	<0.43	<0.33	<0.37	<0.31	<0.40	<0.49	<0.40	<0.22	<0.30	<0.33	<0.45	<0.54	<0.30	<0.24	<0.51	<0.33	<0.45	<0.24
MW-71A	6/5/09	<0.36	NA	<0.40	<9.1	<6.9	<0.28	<1.9	<0.49	<0.43	<0.33	<0.37	<0.31	<0.40	<0.49	<0.40	<0.22	<0.30	<0.33	<0.45	<0.54	<0.30	<0.24	<0.51	<0.33	<0.45	<0.24
MW-71B	6/5/09	**400**	NA	<0.40	<9.1	<6.9	<0.28	<1.9	<0.49	<0.43	<0.33	<0.37	<0.31	<0.40	<0.49	<0.40	<0.22	<0.30	<0.33	<0.45	<0.54	<0.30	<0.24	<0.51	<0.33	<0.45	<0.24
MW-71C	6/5/09	2.7	NA	<0.40	<9.1	<6.9	<0.28	<1.9	<0.49	<0.43	<0.33	<0.37	<0.31	<0.40	<0.49	<0.40	<0.22	<0.30	<0.33	<0.45	<0.54	<0.30	<0.24	<0.51	<0.33	<0.45	<0.24
MW-72A	6/4/09	<0.36	NA	<0.40	<9.1	<6.9	<0.28	<1.9	<0.49	<0.43	<0.33	<0.37	<0.31	<0.40	<0.49	<0.40	<0.22	<0.30	<0.33	<0.45	<0.54	<0.30	<0.24	<0.51	<0.33	<0.45	<0.24
MW-72B	6/4/09	<0.36	NA	<0.40	<9.1	<6.9	<0.28	<1.9	<0.49	<0.43	<0.33	<0.37	<0.31	<0.40	<0.49	<0.40	<0.22	<0.30	<0.33	<0.45	<0.54	<0.30	<0.24	<0.51	<0.33	<0.45	<0.24
MW-72C	6/11/09	<0.36	NA	<0.40	<9.1	<6.9	<0.28	<1.9	<0.49	<0.43	<0.33	<0.37	<0.31	<0.40	<0.49	<0.40	<0.22	<0.30	<0.33	<0.45	<0.54	<0.30	<0.24	<0.51	<0.33	<0.45	<0.24
MW-73A	6/4/09	2.2	NA	<0.40	<9.1	<6.9	<0.28	<1.9	<0.49	<0.43	<0.33	<0.37	<0.31	<0.40	<0.49	<0.40	<0.22	<0.30	<0.33	<0.45	<0.54	<0.30	<0.24	<0.51	<0.33	<0.45	<0.24
MW-73B	6/4/09	<0.36	NA	<0.40	<9.1	<6.9	<0.28	<1.9	<0.49	<0.43	<0.33	<0.37	<0.31	<0.40	<0.49	<0.40	<0.22	<0.30	<0.33	<0.45	<0.54	<0.30	<0.24	<0.51	<0.33	<0.45	<0.24
MW-73C	6/4/09	<0.36	NA	<0.40	<9.1	<6.9	<0.28	<1.9	<0.49	<0.43	<0.33	<0.37	<0.31	<0.40	<0.49	<0.40	<0.22	<0.30	<0.33	<0.45	<0.54	<0.30	<0.24	<0.51	<0.33	<0.45	<0.24
MW-74A	6/4/09	<0.071	NA	<0.40	<9.1	<6.9	<0.28	<1.9	<0.49	<0.43	<0.33	<0.37	<0.31	<0.40	<0.49	<0.40	<0.22	<0.30	<0.33	<0.45	<0.54	<0.30	<0.24	<0.51	<0.33	<0.45	<0.24
MW-74B	6/4/09	**15**	NA	<0.40	<9.1	<6.9	<0.28	<1.9	<0.49	<0.43	<0.33	<0.37	<0.31	<0.40	<0.49	<0.40	<0.22	<0.30	<0.33	<0.45	<0.54	<0.30	<0.24	<0.51	<0.33	<0.45	<0.24
MW-74C	6/4/09	**13**	NA	<0.40	<9.1	<6.9	<0.28	<1.9	<0.49	<0.43	<0.33	<0.37	<0.31	<0.40	<0.49	<0.40	<0.22	<0.30	<0.33	<0.45	<0.54	<0.30	<0.24	<0.51	<0.33	<0.45	<0.24
MW-75B	6/12/09	0.92 Jq	NA	<0.40	<9.1	<6.9	<0.28	<1.9	<0.49	<0.43	<0.33	<0.37	<0.31	<0.40	<0.49	<0.40	<0.22	<0.30	<0.33	<0.45	<0.54	<0.30	<0.24	<0.51	<0.33	<0.45	<0.24
MW-76B	6/12/09	<0.36	NA	<0.40	<9.1	<6.9	<0.28	<1.9	<0.49	<0.43	<0.33	<0.37	<0.31	<0.40	<0.49	<0.40	<0.22	<0.30	<0.33	<0.45	<0.54	<0.30	<0.24	<0.51	<0.33	<0.45	<0.24
Reporting Limit (µg/L)		2.0	0.01	2.0	50	10	0.5	10	10	0.5	1.0	1.0	0.5	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	0.5	1.0	1.0
MCL/DWNL (µg/L)		6	0.015	3 (1)	-	-	1	160 (1)	-	0.5	-	5	5	6	6	10	300	13	150	200	5	5	330 (1)	5	0.5	1750	1750

Notes: Only analytes positively detected are presented in this table. For a complete list, refer to the laboratory data package.

µg/L - micrograms pre liter.
mg/L - milligrams per liter
DWNL - California Department of Public Health drinking water notification level.
MCL - California Department of Public Health maximum contaminant level.
(1) DWNL
"-" - MCL or DWNL not available.
Bold - MCL or DWNL exceeded.
<# - Analyte not detected, method detection limit concentration is shown.

NA - not analyzed.
J - The analyte was positively identified, but the analyte concentration is an estimated value.
R - The sample result is rejected and not usable for any purpose. The presence or absence of the analyte cannot be verified.
c - The Matrix Spike (MS) and/or Matrix Spike Duplicate (MSD) recoveries were outside control limits.
d - The Laboratory Control Sample (LCS) recovery was outside control limits.
f - The duplicate Relative Percent Differnce was outside the control limit.
q - The analyte detection was below the Practical Quantitation Limit (PQL).

Table 3 7 Summary of Validated Detected Organic and Inorganic Analytes - Second Quarter 2009 (continued)

Sample Location	Sample Date	Per chlorate	Lead (mg/L)	1,4-Dioxane	Acetone	2-Butanone	Benzene	Carbon disulfide	Chloro methane	Carbon Tetra chloride	Chloro form	1,1-Dichloro ethane	1,2-Dichloro ethane	1,1-Dichloro ethene	cis-1,2-Dichloro ethene	trans-1,2-Dichloro ethene	Ethyl benzene	Methyl tert-butyl ether (MTBE)	Toluene	1,1,1-Trichloro ethane	1,1,2-Trichloro ethane	Trichloro ethene	1,2,4-Trimethyl benzene	Tetrachloro ethene	Vinyl Chloride	m,p-Xylenes	o-Xylene
All results reported in µg/L unless otherwise stated																											
MW-77B	6/12/09	<0.36	NA	<0.40	<9.1	<6.9	<0.28	<1.9	<0.49	<0.43	<0.33	<0.37	<0.31	<0.40	<0.49	<0.40	<0.22	<0.30	<0.33	<0.45	<0.54	<0.30	<0.24	<0.51	<0.33	<0.45	<0.24
MW-78	6/10/09	**9.9**	NA	2.5	<9.1	<6.9	<0.28	3.9 Jq	1.1 Jq	<0.43	<0.33	<0.37	<0.31	4.9	<0.49	<0.40	<0.22	<0.30	<0.33	<0.45	<0.54	1.5	<0.24	<0.51	<0.33	<0.45	<0.24
MW-82	6/11/09	<0.36	NA	**3.6**	<9.1	<6.9	<0.28	<1.9	<0.49	<0.43	<0.33	<0.37	<0.31	<0.40	<0.49	<0.40	<0.22	<0.30	<0.33	<0.45	<0.54	<0.30	<0.24	<0.51	<0.33	<0.45	<0.24
MW-83	6/10/09	<0.36	NA	**3.8**	<9.1	<6.9	<0.28	<1.9	<0.49	<0.43	<0.33	<0.37	<0.31	<0.40	<0.49	<0.40	<0.22	<0.30	<0.33	<0.45	<0.54	<0.30	<0.24	<0.51	<0.33	<0.45	<0.24
MW-84A	6/2/09	0.68 Jq	NA	<0.40	<9.1	<6.9	<0.28	3.2 Jq	<0.49	<0.43	<0.33	<0.37	<0.31	<0.40	<0.49	<0.40	<0.22	<0.30	<0.33	<0.45	<0.54	<0.30	<0.24	<0.51	<0.33	<0.45	<0.24
MW-84B	6/2/09	<0.36	NA	<0.40	<9.1	<6.9	<0.28	<1.9	<0.49	<0.43	<0.33	<0.37	<0.31	<0.40	<0.49	<0.40	<0.22	<0.30	<0.33	<0.45	<0.54	<0.30	<0.24	<0.51	<0.33	<0.45	<0.24
MW-85A	6/10/09	<0.36	NA	<0.40	<9.1	<6.9	<0.28	4.0 Jq	<0.49	<0.43	<0.33	<0.37	<0.31	<0.40	<0.49	<0.40	<0.22	<0.30	<0.33	<0.45	<0.54	<0.30	<0.24	<0.51	<0.33	<0.45	<0.24
MW-85B	6/10/09	<0.36	NA	<0.40	<9.1	<6.9	<0.28	<1.9	<0.49	<0.43	<0.33	<0.37	<0.31	<0.40	<0.49	<0.40	<0.22	<0.30	<0.33	<0.45	<0.54	**21**	<0.24	<0.51	<0.33	<0.45	<0.24
MW-86A	6/10/09	<0.36	NA	<0.40	<9.1	<6.9	<0.28	<1.9	<0.49	<0.43	<0.33	<0.37	<0.31	<0.40	<0.49	<0.40	<0.22	<0.30	<0.33	<0.45	<0.54	<0.30	<0.24	<0.51	<0.33	<0.45	<0.24
MW-86B	6/10/09	<0.36	NA	<0.40	<9.1	<6.9	<0.28	2.7 Jq	<0.49	<0.43	<0.33	<0.37	<0.31	<0.40	1.8	<0.40	<0.22	<0.30	<0.33	<0.45	<0.54	**73**	<0.24	<0.51	<0.33	<0.45	<0.24
MW-87A	6/11/09	<0.36	NA	**6.7**	<9.1	<6.9	<0.28	<1.9	<0.49	<0.43	<0.33	<0.37	<0.31	<0.40	<0.49	<0.40	<0.22	<0.30	<0.33	<0.45	<0.54	0.44 Jq	<0.24	<0.51	<0.33	<0.45	<0.24
MW-87B	6/11/09	**20**	NA	**58**	<9.1	<6.9	<0.28	<1.9	<0.49	<0.43	<0.33	<0.37	<0.31	**6.3**	<0.49	<0.40	<0.22	<0.30	<0.33	<0.45	<0.54	**26**	<0.24	<0.51	<0.33	<0.45	<0.24
MW-88	6/9/09	**360**	NA	<0.40	<9.1	<6.9	<0.28	<1.9	<0.49	<0.43	<0.33	<0.37	<0.31	<0.40	<0.49	<0.40	<0.22	<0.30	<0.33	<0.45	<0.54	<0.30	<0.24	<0.51	<0.33	<0.45	<0.24
MW-89	6/11/09	**2,100**	NA	**7.9**	<9.1	<6.9	<0.28	<1.9	<0.49	<0.43	0.56 Jq	<0.37	<0.31	3.4	<0.49	<0.40	<0.22	<0.30	<0.33	<0.45	<0.54	4.1 Jf	<0.24	<0.51	<0.33	<0.45	<0.24
MW-90	6/9/09	**190**	NA	<0.40	<9.1	<6.9	<0.28	<1.9	<0.49	<0.43	<0.33	<0.37	<0.31	2.2	<0.49	<0.40	<0.22	<0.30	<0.33	<0.45	<0.54	2.2	<0.24	<0.51	<0.33	<0.45	<0.24
MW-91	6/9/09	**1,700**	NA	1.5 Jq	<9.1	<6.9	<0.28	<1.9	<0.49	<0.43	<0.33	<0.37	<0.31	<0.40	<0.49	<0.40	<0.22	<0.30	<0.33	<0.45	<0.54	<0.30	<0.24	<0.51	<0.33	<0.45	<0.24
MW-92	6/12/09	**25**	NA	<0.40	<9.1	<6.9	<0.28	<1.9	<0.49	<0.43	<0.33	<0.37	<0.31	<0.40	<0.49	<0.40	<0.22	<0.30	<0.33	<0.45	<0.54	**16**	<0.24	<0.51	<0.33	<0.45	<0.24
MW-93	6/19/09	<0.71	NA	**17**	<5.0	<1.2	<0.14	0.49 Jq	<0.36	<0.15	<0.17	<0.098	<0.21	0.67	<0.18	<0.10	<0.26	<0.29	<0.22	<0.12	<0.31	2	NA	<0.17	<0.13	<0.36	<0.41
MW-94	6/22/09	<0.071	NA	**8.8**	<5.0	<1.2	<0.14	2.5	<0.36	<0.15	<0.17	0.37 Jq	<0.21	0.54	<0.18	<0.10	<0.26	<0.29	<0.22	<0.12	<0.31	1.9	NA	<0.17	<0.13	<0.36	<0.41
MW-95	6/12/09	<0.36	NA	<0.40	<9.1	<6.9	<0.28	<1.9	<0.49	<0.43	<0.33	<0.37	<0.31	<0.40	<0.49	<0.40	<0.22	<0.30	<0.33	<0.45	<0.54	**12**	<0.24	<0.51	<0.33	<0.45	<0.24
MW-96	6/2/09	<0.36	NA	<0.40	<9.1	<6.9	<0.28	<1.9	<0.49	<0.43	<0.33	<0.37	<0.31	<0.40	<0.49	<0.40	<0.22	<0.30	<0.33	<0.45	<0.54	<0.30	<0.24	<0.51	<0.33	<0.45	<0.24
MW-97	6/2/09	<0.36	NA	<0.40	<9.1	<6.9	<0.28	<1.9	<0.49	<0.43	<0.33	<0.37	<0.31	<0.40	<0.49	<0.40	<0.22	<0.30	<0.33	<0.45	<0.54	<0.30	<0.24	<0.51	<0.33	<0.45	<0.24
MW-98A	6/3/09	<0.36	NA	<0.40	<9.1	<6.9	<0.28	<1.9	<0.49	<0.43	<0.33	<0.37	<0.31	<0.40	<0.49	<0.40	<0.22	<0.30	<0.33	<0.45	<0.54	<0.30	<0.24	<0.51	<0.33	<0.45	<0.24
MW-98B	6/3/09	**1,500**	NA	**12**	<9.1	<6.9	<0.28	<1.9	<0.49	<0.43	1.3	<0.37	<0.31	**8.3**	<0.49	<0.40	<0.22	<0.30	<0.33	<0.45	<0.54	**18**	<0.24	<0.51	<0.33	<0.45	<0.24
MW-99	6/9/09	**960**	NA	2.4	31 Jq	<6.9	<0.28	<1.9	<0.49	<0.43	<0.33	<0.37	<0.31	3.9	<0.49	<0.40	0.36 Jq	<0.30	3.5	<0.45	<0.54	1.8	0.25 Jq	<0.51	<0.33	1.3	0.91 Jq
MW-100	6/15/09	<0.071	NA	<0.40	<9.1	<6.9	<0.28	5.5 Jq	<0.49	<0.43	<0.33	<0.37	<0.31	<0.40	<0.49	<0.40	<0.22	<0.30	<0.33	<0.45	<0.54	<0.30	<0.24	<0.51	<0.33	<0.45	<0.24
OW-01	6/15/09	<0.36	NA	<0.40	<9.1	<6.9	<0.28	2.2 Jq	<0.49	<0.43	<0.33	<0.37	<0.31	<0.40	<0.49	<0.40	<0.22	<0.30	<0.33	<0.45	<0.54	<0.30	<0.24	<0.51	<0.33	<0.45	<0.24
OW-02	6/12/09	**340**	NA	**16**	<9.1	<6.9	<0.28	<1.9	<0.49	<0.43	<0.33	0.52 Jq	<0.31	**16**	<0.49	<0.40	<0.22	<0.30	<0.33	<0.45	<0.54	**15**	<0.24	<0.51	<0.33	<0.45	<0.24
P-02	6/4/09	<0.36	NA	<0.40	<9.1	<6.9	<0.28	<1.9	<0.49	<0.43	<0.33	<0.37	<0.31	<0.40	<0.49	<0.40	<0.22	<0.30	<0.33	<0.45	<0.54	<0.30	<0.24	<0.51	<0.33	<0.45	<0.24
P-03	6/8/09	<0.36	NA	<0.40	<9.1	<6.9	<0.28	<1.9	<0.49	<0.43	<0.33	<0.37	<0.31	<0.40	<0.49	<0.40	<0.22	<0.30	<0.33	<0.45	<0.54	<0.30	<0.24	<0.51	<0.33	<0.45	<0.24
P-05	6/8/09	5	NA	<0.40	<9.1	<6.9	<0.28	<1.9	<0.49	<0.43	<0.33	<0.37	<0.31	<0.40	<0.49	<0.40	<0.22	<0.30	<0.33	<0.45	<0.54	<0.30	<0.24	<0.51	<0.33	<0.45	<0.24
P-06S	7/16/09	1.3	NA	1.1	<5.0	<1.2	<0.14	<0.36	<0.36	<0.15	<0.17	<0.098	<0.21	<0.12	<0.18	<0.10	<0.26	<0.29	<0.22	<0.12	<0.31	<0.17	NA	<0.17	<0.13	<0.36	<0.41
P-06D	7/16/09	<0.071	NA	**7.5**	<5.0	<1.2	<0.14	<0.36	<0.36	<0.15	0.69	0.48 Jq	<0.21	3.2	0.49 Jq	<0.10	<0.26	<0.29	<0.22	<0.12	<0.31	2.2	NA	<0.17	<0.13	<0.36	<0.41
Reporting Limit (µg/L)		2.0	0.01	2.0	50	10	0.5	10	10	0.5	1.0	1.0	0.5	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	0.5	1.0	1.0
MCL/DWNL (µg/L)		6	0.015	3 (1)	-	-	1	160 (1)	-	0.5	-	5	5	6	6	10	300	13	150	200	5	5	330 (1)	5	0.5	1750	1750

Notes: Only analytes positively detected are presented in this table. For a complete list, refer to the laboratory data package.

µg/L - micrograms pre liter.
mg/L - milligrams per liter
DWNL - California Department of Public Health drinking water notification level.
MCL - California Department of Public Health maximum contaminant level.
(1) DWNL
"-" - MCL or DWNL not available.
Bold - MCL or DWNL exceeded.
<# - Analyte not detected, method detection limit concentration is shown.

NA - not analyzed
J - The analyte was positively identified, but the analyte concentration is an estimated value.
R - The sample result is rejected and not usable for any purpose. The presence or absence of the analyte cannot be verified.
c - The Matrix Spike (MS) and/or Matrix Spike Duplicate (MSD) recoveries were outside control limits.
d - The Laboratory Control Sample (LCS) recovery was outside control limits.
f - The duplicate Relative Percent Differnce was outside the control limit.
q - The analyte detection was below the Practical Quantitation Limit (PQL).

Table 3-8 Summary Statistics of Validated First Quarter 2009 Organic and Inorganic Analytes Detected in Groundwater

Organic Analytes Detected	Total Number of Samples Analyzed	Total Number of Detections (1)	Number of Detections Exceeding MCL or DWNL (1)	Corresponding MCL / DWNL		Minimum Concentration Detected		Maximum Concentration Detected	
1,4-Dioxane	6	6	0	3 (2)	µg/L	1.2	µg/L	2.3	µg/L
1,1-Dichloroethene	6	1	0	6	µg/L	0.8	µg/L	0.8	µg/L
cis-1,2-Dichloroethene	6	1	0	6	µg/L	0.24	µg/L	0.24	µg/L
Trichloroethene	6	1	0	5	µg/L	0.27	µg/L	0.27	µg/L
Inorganic Analytes Detected	**Total Number of Samples Analyzed**	**Total Number of Detections (1)**	**Number of Detections Exceeding MCL or DWNL (1)**	**Corresponding MCL / DWNL**		**Minimum Concentration Detected**		**Maximum Concentration Detected**	
Perchlorate -ug/L	6	1	1	6	µg/L	13.8	µg/L	13.8	µg/L

Notes: " - " - MCL or California Department of Health Services state drinking water notification level not established.
(1) - Number of detections exclude sample duplicates, trip blanks and equipment blanks.
(2) - DWNL.
DWNL - California Department of Health Services state drinking water notification level.
MCL - Maximum Contaminant Level.
mg/L - Milligrams per liter.
µg/L - Micrograms per liter.

Table 3-9 Summary Statistics of Validated Second Quarter 2009 Organic and Inorganic Analytes Detected in Groundwater

Organic Analytes Detected	Total Number of Samples Analyzed	Total Number of Detections (1)	Number of Detections Exceeding MCL or DWNL (1)	Corresponding MCL / DWNL		Minimum Concentration Detected		Maximum Concentration Detected	
1,4-Dioxane	103	61	53	3 (2)	µg/L	0.69	µg/L	1,600	µg/L
Acetone	103	5	0	-	µg/L	17	µg/L	31	µg/L
Benzene	103	5	2	1	µg/L	0.15	µg/L	1.8	µg/L
2-Butanone	103	1	0	-	µg/L	7.1	µg/L	7.1	µg/L
Carbon disulfide	103	11	0	160 (2)	µg/L	0.40	µg/L	5.5	µg/L
Carbon tetrachloride	103	4	2	0.5	µg/L	0.20	µg/L	3.9	µg/L
Chloromethane	103	1	0	-	µg/L	1.1	µg/L	1.1	µg/L
Chloroform	103	19	0	-	µg/L	0.47	µg/L	4.2	µg/L
1,1-Dichloroethane	103	31	7	5	µg/L	0.25	µg/L	110	µg/L
1,2-Dichloroethane	103	17	5	5	µg/L	0.47	µg/L	130	µg/L
1,1-Dichloroethene	103	45	27	6	µg/L	0.42	µg/L	5,900	µg/L
cis-1,2-Dichloroethene	103	21	2	6	µg/L	0.19	µg/L	280	µg/L
trans-1,2-Dichloroethene	103	2	0	10	µg/L	1.1	µg/L	2.2	µg/L
Ethylbenzene	103	2	0	300	µg/L	0.36	µg/L	0.74	µg/L
Methyl tert-butyl ether	103	2	0	13	µg/L	0.53	µg/L	1.4	µg/L
Toluene	103	4	0	150	µg/L	0.83	µg/L	42	µg/L
1,1,1-Trichloroethane	103	14	0	200	µg/L	0.19	µg/L	5.4	µg/L
1,1,2-Trichloroethane	103	10	2	5	µg/L	0.32	µg/L	23	µg/L
1,2,4-Trimethylbenzene	80	1	0	330 (2)	µg/L	0.25	µg/L	0.25	µg/L
Trichloroethene	103	50	34	5	µg/L	0.34	µg/L	2,700	µg/L
Tetrachloroethene	103	7	1	5	µg/L	0.18	µg/L	7.7	µg/L
Vinyl chloride	103	5	4	0.5	µg/L	0.44	µg/L	8	µg/L
m, p-Xylene	103	1	0	1750	µg/L	1.3	µg/L	1.3	µg/L
o-Xylene	103	1	0	1750	µg/L	0.91	µg/L	0.91	µg/L
Inorganic Analytes Detected	**Total Number of Samples Analyzed**	**Total Number of Detections (1)**	**Number of Detections Exceeding MCL or DWNL (1)**	**Corresponding MCL / DWNL**		**Minimum Concentration Detected**		**Maximum Concentration Detected**	
Perchlorate	103	53	41	6	µg/L	0.61	µg/L	74,000	µg/L
Lead	1	1	1	0.015	mg/L	0.0657	mg/L	0.0657	mg/L

Notes:

" - " -	MCL or California Department of Health Services state drinking water notification level not established.
(1) -	Number of detections exclude sample duplicates, trip blanks and equipment blanks.
(2) -	DWNL.
DWNL -	California Department of Health Services state drinking water notification level.
MCL -	Maximum Contaminant Level.
mg/L -	Milligrams per liter.
µg/L -	Micrograms per liter.

3.5.1 Data Quality Review

The quality control samples were reviewed as described in the Revised Groundwater Sampling and Analysis Plan (Tetra Tech, 2003b). The data for the groundwater sampling activities were contained in analytical data packages generated by EMAX Laboratories Inc, Calscience Environmental Laboratories Inc, and Microseeps Laboratories Inc. These data packages were reviewed using the latest versions of the National Functional Guidelines for Organic and Inorganic Data Review documents from the EPA (EPA, 2003 and 2005).

Holding times, field blanks, laboratory control samples, method blanks, duplicate environmental samples, spiked samples, and surrogate and spike recovery data were reviewed. Within each environmental sample the sample specific quality control spike recoveries were examined. These data examinations include comparing statistically calculated control limits to percent recoveries of all spiked analytes and duplicate spiked analytes. Relative Percent Difference (RPD) control limits are compared to actual spiked (MS/MSD) RPD results. Surrogate recoveries were examined for all organic compound analyses and compared to their control limits.

Environmental samples were analyzed by the following methods: Method A3500D for Ferrous Iron, Method AM23G for Metabolic Acids, Method AM20GAX for Hydrogen, Method E300.0 for Nitrate, Sulfate, and Chloride, Method E310.1 for Alkalinity, Methods E314.0 and E332.0 for Perchlorate, Method E376.2 for Sulfide, Method A5310 for Total and Dissolved Organic Carbon, Method RSK-175 for Methane, Ethane, Ethene, Methods SW8270C and E1625C for 1,4-Dioxane, Methods SW6010B and SW6020 for Metals, and Method SW8260B for VOCs. Unless discussed below, all data results met required criteria, are of known precision and accuracy, did not require any qualification, and may be used as reported.

Method SW8270C and E1625C had matrix spike recovery and surrogate errors that qualified as estimated six percent of the total SW8270C M and E1625C data. Method SW8260B had field duplicate RPD, LCS recovery, and matrix spike recovery errors that qualified 0.07 percent of the total SW8260B data. All data qualified as estimated are usable for the intended purpose.

Method SW8260B had low LCS recovery that qualified as rejected in 0.1 percent of the total SW8260B data. All data qualified as rejected are not usable for any purpose. These rejected data were not compounds of concern for the site. The Data Quality Objectives (DQOs) were met for the project.

3.6 CHEMICALS OF POTENTIAL CONCERN

The identification of COPCs is an ongoing process that takes place as part of the annual sampling event conducted during the second quarter of each year. The purpose of identifying COPCs is to establish a list of analytes that best represents the extent and magnitude of affected groundwater and to focus more detailed analysis on those analytes. The analytes were organized and evaluated in 2 groups, organic and inorganic analytes, and divided into primary and secondary COPCs. Data B qualified because of its association with either laboratory blank or field cross contamination and R qualified data are not included in the COPC evaluation.

The COPC process does not eliminate analytes from testing but reduces the number of analytes that are evaluated and discussed during reporting. The standard list of analytes for each method will continue to be tested for and screened annually to insure that the appropriate COPCs are being identified and evaluated as specified in the Revised Groundwater Sampling and Analysis Plan (Tetra Tech, 2003b).

3.6.1 Identification of Chemicals of Potential Concern

COPCs have been selected to include compounds that consistently have been detected in groundwater samples collected from the Site at concentrations above regulatory limits and that can be used to assess the extent of affected groundwater. Primary COPCs are parent products such as TCE and 1,1,1-TCA and are always present with a secondary COPC. Secondary COPCs are breakdown products such as 1,1-DCA and 1,1-DCE and are detected at lower concentrations then their parent products. At this site 1,1-DCE, a breakdown product of 1,1,1-TCA, is detected at higher concentrations then 1,1,1-TCA so it is considered the Primary COPC, and 1,1,1-TCA is considered a secondary COPC.

As discussed above, the COPC analysis is intended to streamline and focus the evaluation of the contaminant data collected during monitoring events. It is not intended to trivialize or dismiss the analytes screened out as part of the process. Therefore, to ensure that all analytes detected receive the proper attention this analysis is performed annually.

Laboratory analytical results from the First Quarter 2009 and Second Quarter 2009 monitoring events were reviewed to develop a consolidated list of analytes detected. The results were then screened against the MCLs and DWNLs (if an MCL has not been established). The analytes were organized and evaluated in 2 groups, organic and inorganic analytes, and divided into primary and secondary COPCs.

3.6.2 Organic Analytes

Twenty four organic analytes were detected in the groundwater and/or surface water samples. Eleven organic analytes were detected at concentrations above their respective MCLs/DWNLs: benzene, carbon tetrachloride, 1,1-dichloroethane (1,1-DCA), 1,2-dichloroethane (1,2-DCA), 1,1-DCE, cis-1,2-dichloroethene (cis 1,2-DCE), 1,4-dioxane, TCE, PCE, 1,1,2-trichloroethane (1,1,2-TCA) and vinyl chloride.

TCE was disposed of at the Site and has been routinely detected in groundwater samples collected from the Site. Observed concentrations of TCE breakdown products have been generally lower than TCE concentrations observed, therefore TCE is classified as a primary COPC. While 1,1,1-TCA was reportedly disposed of at the Site, it has not been detected at elevated concentrations in recent groundwater samples collected. However, in general, 1,1,1-TCA is not stable in the subsurface (Bielefeldt et al., 1995; Vogel et al, 1987); therefore it is assumed that concentrations of 1,1-DCE detected in groundwater samples collected from the Site resulted from the breakdown of 1,1,1-TCA. Since observed concentrations of 1,1-DCE are higher than the parent product, 1,1-DCE is classified as a primary COPC. Similarly, because detected concentrations of 1,1,1-TCA are relatively low and the distribution of 1,1,1-TCA is within the 1,1-DCE plume, 1,1,1-TCA is regarded as a secondary COPC.

It is assumed that 1,4-dioxane was introduced into the subsurface along with the solvent 1,1,1-TCA, since it is commonly used as a stabilizer in 1,1,1-TCA (Archer, 1996; Mohr, 2001). Because of the concentration and distribution of 1,4-dioxane and because its behavior in the environment are different than the other organic COPCs identified, 1,4-dioxane is also classified as a primary COPC.

The compounds 1,1-DCA, 1,2-DCA, 1,1-DCE, and cis-1,2-DCE could have been introduced into the environment as a primary product (solvent) but they are more commonly introduced as an impurity in a more common solvent such as TCE or 1,1,1-TCA, or as a breakdown product of TCE or 1,1,1-TCA. In groundwater samples collected, concentrations of 1,1-DCA, 1,2-DCA, and cis-1,2-DCE are detected at 1 to 2 orders of magnitude less than concentrations of TCE and 1,1-DCE. Until 1,1-DCA, 1,2-DCA or cis-1,2-DCE are detected in groundwater samples where a primary chlorinated COPC is absent or the concentration of 1,1-DCA, 1,2-DCA or cis-1,2-DCE is higher than the primary COPC, these analytes will continue to be classified as secondary COPCs.

Vinyl chloride, which likely was introduced into the environment as a breakdown product of TCE or 1,1,1-TCA, was reported in 5 groundwater samples collected, 4 of which exceeded the MCL of 0.5 µg/L. The distribution of vinyl chloride is limited and, except for the samples from EW-13 and MW-42, reported concentrations are relatively close to the MCL. The compound is always found with 1 or more of the primary and secondary COPCs and generally detected at 1 to 2 orders of magnitude less than concentrations of TCE and 1,1-DCE. Therefore, vinyl chloride is not considered a primary or secondary COPC at the Site.

1,1,2-TCA, which likely was introduced into the environment as an isomeric impurity of 1,1,1-TCA, was reported in 10 groundwater samples collected, of which 2 exceeded the MCL of 5 µg/L. The distribution of 1,1,2-TCA is limited. The compound is always found with 1 of the primary COPC. Therefore, 1,1,2-TCA is not proposed as a secondary COPC.

The other 15 organic analytes detected in the groundwater samples collected include: acetone, benzene, 2-butanone (MEK), carbon disulfide, carbon tetrachloride, chloromethane, chloroform, trans 1,2-DCE, ethylbenzene, methyl tert-butyl ether (MTBE), toluene, tetrachloroethene (PCE), 1,2,4-trimethyl benzene, and m, p, and o-xylenes. Twelve of the 15 organic analytes were not detected at concentrations above their respective MCL/DWNL. Three analytes (benzene, carbon tetrachloride, and PCE) were detected at concentrations which exceed their respective MCLs, however they were infrequently detected, the concentrations were relatively low, and they were always detected with a primary COPC. Some of these compounds appear to be anthropogenic and some are not but none of them will be further addressed in this report.

3.6.3 Inorganic Analytes

Based on the number of detections, the concentrations, and the distribution of perchlorate reported in groundwater samples collected from the Site, perchlorate has been identified as a primary COPC. Perchlorate is the only inorganic analyte identified as a COPC at the Site.

Previously groundwater samples collected from well MW-60A showed lead concentrations exceeding the MCL of 0.015 mg/L. As proposed in the Semiannual Groundwater Monitoring Report First Quarter 2008 and Second Quarter 2008 (Tetra Tech, 2009a) a groundwater sample was collected from MW-60A for total lead analysis during Second Quarter 2009. Lead was detected at a concentration of 0.0657 mg/L exceeding the MCL of 0.015 mg/L. In general, the reported concentration of lead is limited in distribution and relatively close to its MCL. Lead, therefore is not considered a primary or secondary COPC at the Site.

3.6.4 Chemicals of Potential Concern Conclusions

Table 3-10 presents those groundwater analytes that have been identified as COPCs. Time-series graphs of primary and secondary COPCs are provided in Appendix E. These results are consistent with the last analysis (Tetra Tech, 2009a).

Table 3-10 Groundwater Chemicals of Potential Concern

Analyte	Classification	Comments
Perchlorate	Primary	Parent product (propellant), widely detected at Site.
1,1-Dichloroethene	Primary	Breakdown product of 1,1,1-TCA, detected at higher concentrations than 1,1,1-TCA at Site.
Trichloroethene	Primary	Parent product (solvent), widely detected at Site.
1,4-Dioxane	Primary	Stabilizer in 1,1,1-TCA, widely detected at Site.
1,1-Dichloroethane	Secondary	Breakdown product of 1,1,1-TCA.
1,2-Dichloroethane	Secondary	Breakdown product of 1,1,1-TCA.
1,1,1-Trichloroethane	Secondary	Parent product (solvent), detected at lower concentrations than breakdown product (1,1-DCE) at Site.
cis-1,2-Dichloroethene	Secondary	Breakdown product of TCE.

3.7 DISTRIBUTION OF THE PRIMARY CHEMICALS OF POTENTIAL CONCERN

The distribution of the COPC in the alluvium and shallow Mount Eden formation groundwater zones are described in the following subsections and illustrated in Figures 3-15 through 3-18. The figures were generated from the Second Quarter 2009 groundwater monitoring analytical results and the latest analytical results for the other wells.

3.7.1 Perchlorate

Concentrations of perchlorate reported in groundwater samples collected from the Second Quarter 2009 event ranged from not detected above the MDL to 74,000 µg/L (MW-61B). The MCL for perchlorate is 6 µg/L. Concentrations of perchlorate above the MDL were reported in 52 of the 95 groundwater samples collected, of which 40 groundwater samples exceeded the perchlorate MCL.

Based on the data collected during this reporting period, the highest concentrations of perchlorate have been reported in groundwater samples collected from monitoring wells screened in the alluvium and shallow Mount Eden formation located in the former BPA. Groundwater concentrations decrease by several orders of magnitude outside, and downgradient of the footprint of the former BPA. Downgradient of the former BPA, perchlorate concentrations decrease to below 1,000 µg/L. Further downgradient in the RMPA the concentrations of perchlorate increase. Groundwater samples collected in the former RMPA exceed 3,000 µg/L. Downgradient of the RMPA the concentrations decrease to below 1,000 µg/L again. The plume continues its migration downgradient of the RMPA toward Massacre Canyon. The primary source area appears to be the former BPA, but based on plume morphology secondary sources are present in the former RMPA.

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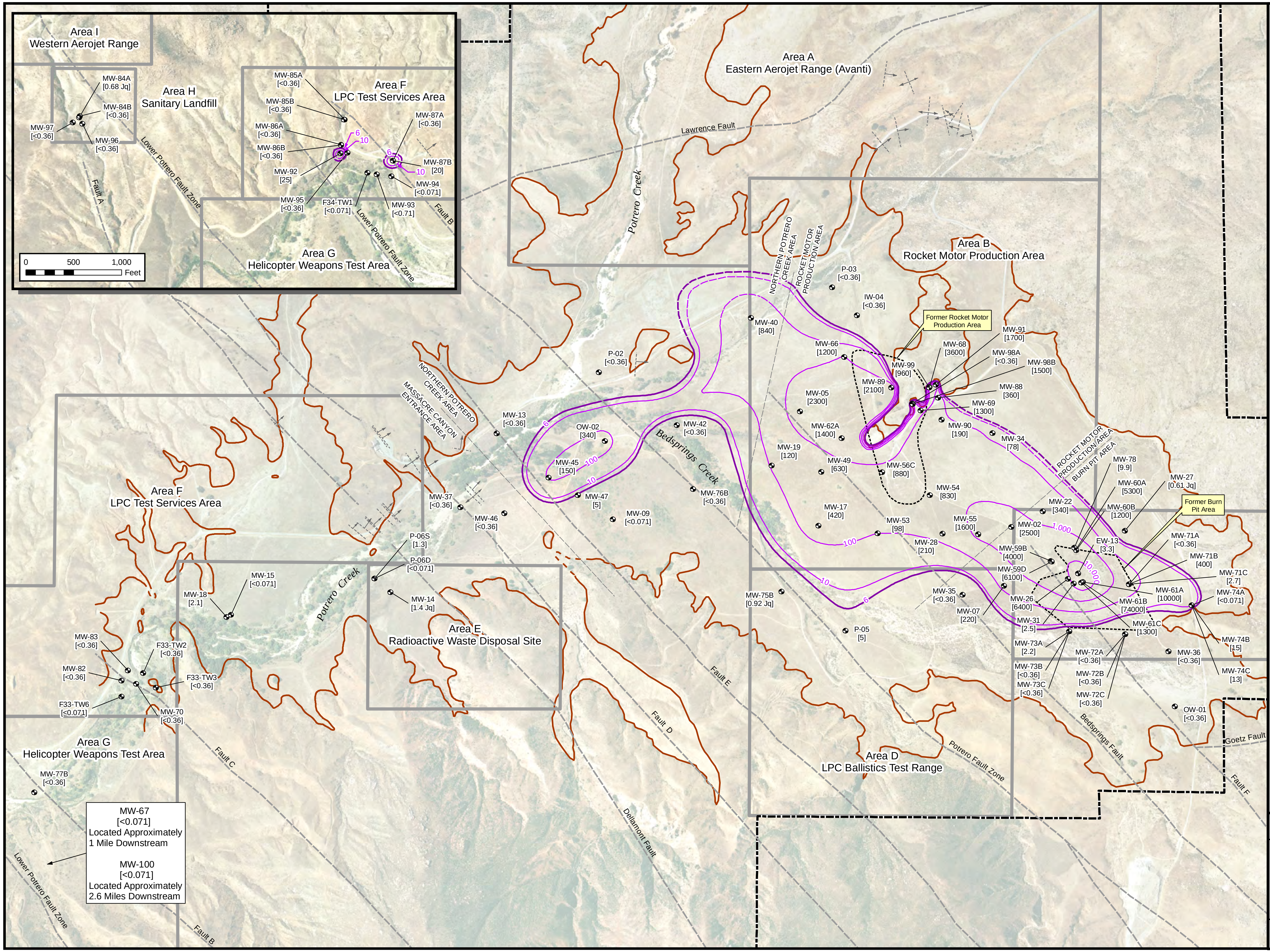

0 500 1,000 Feet

Adapted from: March 2007 aerial photograph.

Faults from structural analysis of Potrero Valley, *Lineament and Geologic Mapping Study, Tetra Tech, 2009.*

LEGEND

MW-22 [340] ●	Well ID Perchlorate Concentration
〰	Perchlorate Concentration Contour (µg/L) - Dashed where inferred
〰	MCL Contour (6.0 µg/L) - Dashed where inferred
〰	Bedrock/Alluvium Surface Contact Dashed where inferred
⇢	Fault, Accurately Located Showing Dip
⇢	Fault, Approximately Located
▭	Historical Operational Area Boundary
⬚	Beaumont Site 1 Property Boundary

Notes:

MCL - Maximum Contaminant Level.
Concentrations shown are in microgram per liter (µg/L)

Highest concentration shown is contoured for clustered or nested well locations.

Beaumont Site 1 property boundary is approximate.

Beaumont Site 1

Figure 3-15
Perchlorate Isoconcentration Map (µg/L) for Alluvium and Shallow Mount Eden Formation

TETRA TECH

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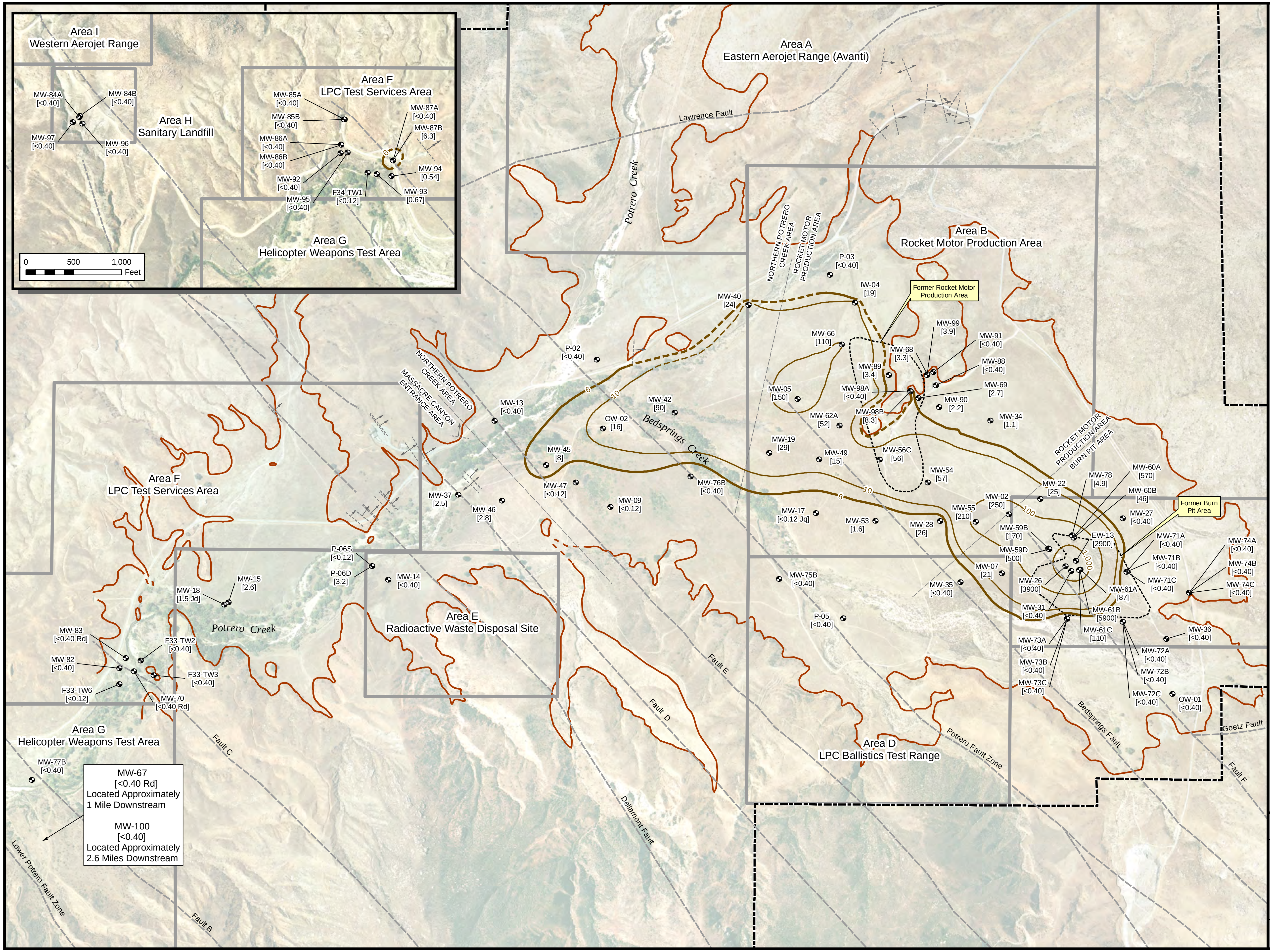

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0 500 1,000 Feet

Adapted from: March 2007 aerial photograph.

Faults from structural analysis of Potrero Valley, *Lineament and Geologic Mapping Study, Tetra Tech, 2009.*

LEGEND

MW-22 [25] ●	Well ID 1,1-DCE Concentration
∼	1,1-DCE Concentration Contour (µg/L) - Dashed where inferred
∼	MCL Contour (6.0 µg/L) - Dashed where inferred
∼	Bedrock/Alluvium Surface Contact Dashed where inferred
⇢	Fault, Accurately Located Showing Dip
– –	Fault, Approximately Located
▢	Historical Operational Area Boundary
⬚	Beaumont Site 1 Property Boundary

Notes:

MCL - Maximum contaminant level.

1,1-DCE - 1,1-Dichloroethene.

Concentrations shown are in micrograms per liter (µg/L).

Highest concentration shown is contoured for clustered or nested well locations.

Beaumont Site 1 property boundary is approximate.

Beaumont Site 1

Figure 3-16

1,1-DCE Isoconcentration Map (µg/L) for Alluvium and Shallow Mount Eden Formation

TETRA TECH

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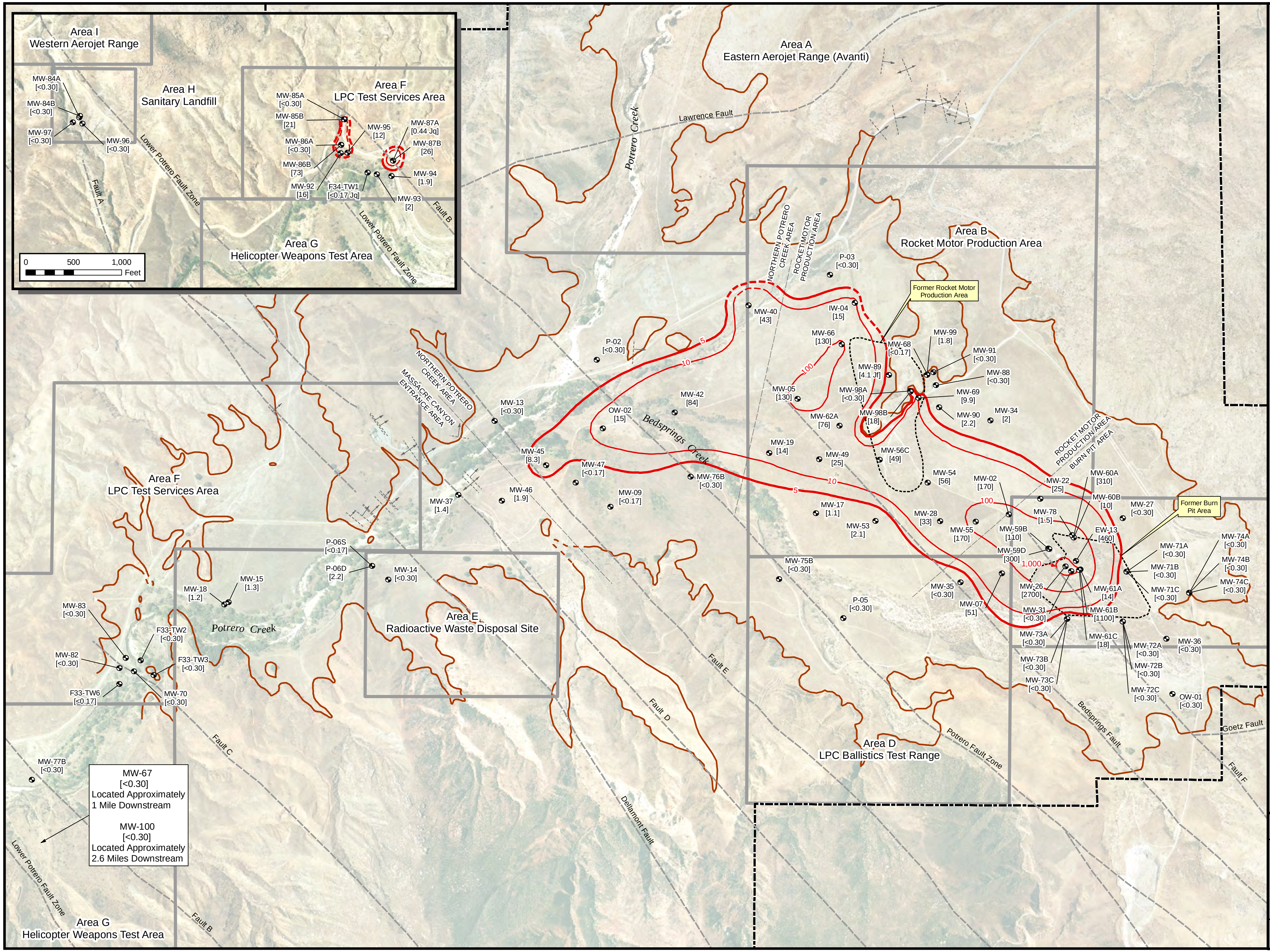

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0 500 1,000 Feet

Adapted from: March 2007 aerial photograph.

Faults from structural analysis of Potrero Valley, *Lineament and Geologic Mapping Study, Tetra Tech, 2009.*

LEGEND

MW-22 [25] ●	Well ID TCE Concentration
〰	TCE Concentration Contour (µg/L) - Dashed where inferred
〰	MCL Contour (5.0 µg/L) - Dashed where inferred
〰	Bedrock/Alluvium Surface Contact Dashed where inferred
⇢	Fault, Accurately Located Showing Dip
╲	Fault, Approximately Located
▭	Historical Operational Area Boundary
⬚	Beaumont Site 1 Property Boundary

Notes:

MCL - Maximum contaminant level.

TCE - Trichloroethene.

Concentrations shown are in micrograms per liter (µg/L).

Highest concentration shown is contoured for clustered or nested well locations.

Beaumont Site 1 property boundary is approximate.

Beaumont Site 1

Figure 3-17

TCE Isoconcentration Map (µg/L) for Alluvium and Shallow Mount Eden Formation

TETRA TECH

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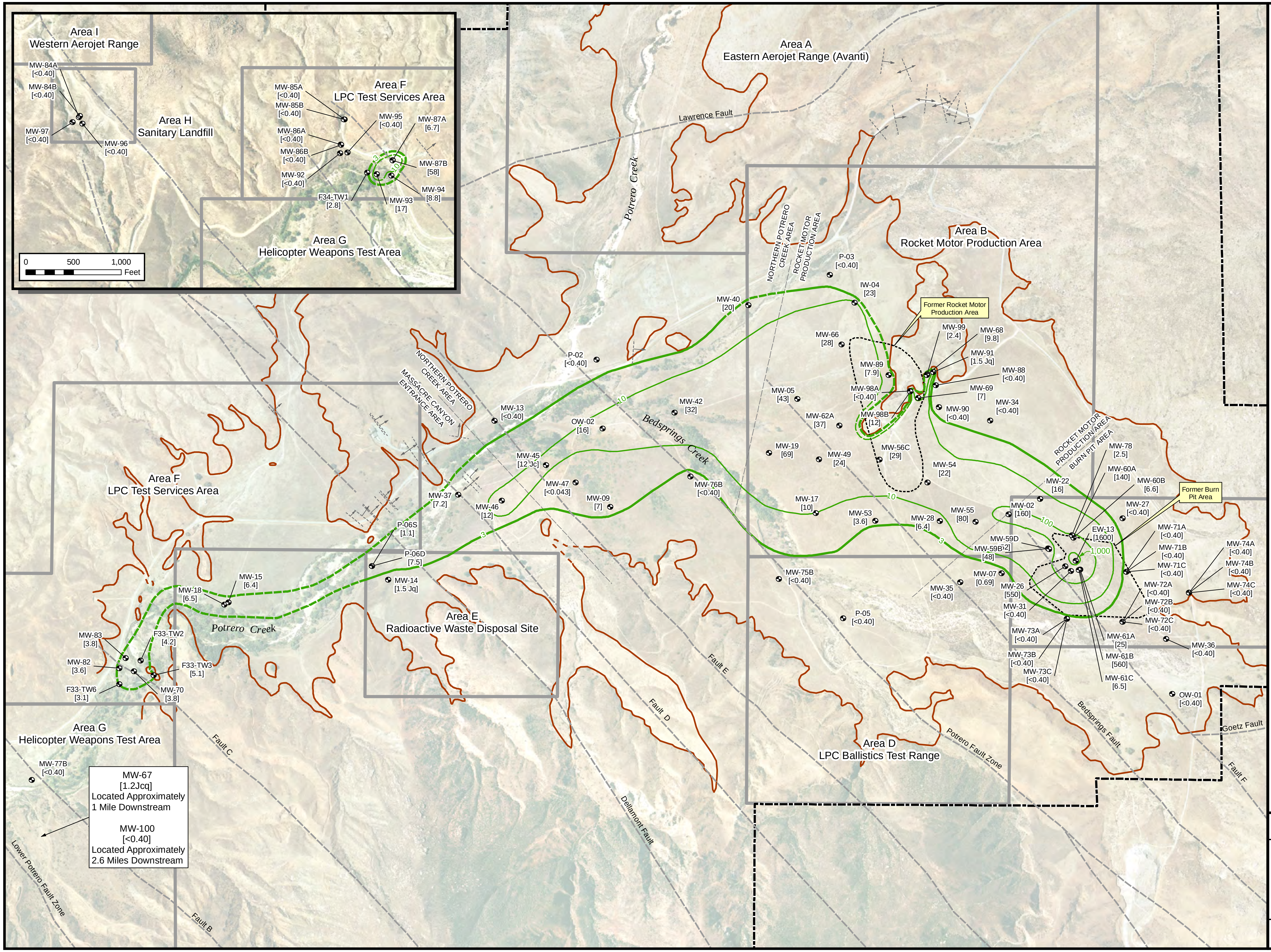


N

0 500 1,000 Feet

Adapted from: March 2007 aerial photograph.

Faults from structural analysis of Potrero Valley, *Lineament and Geologic Mapping Study, Tetra Tech, 2009.*

LEGEND

MW-22 [16] Well ID
1,4-Dioxane Concentration

1,4-Dioxane Concentration Contour (µg/L) - Dashed where inferred

DWNL Contour (3.0 µg/L) - Dashed where inferred

Fault, Accurately Located Showing Dip

Fault, Approximately Located

Bedrock/Alluvium Surface Contact
Dashed where inferred

Historical Operational Area Boundary

Beaumont Site 1 Property Boundary

Notes:

DWNL - Drinking Water Notification Level.

Concentrations shown are in micrograms per liter (µg/L).

Highest concentration shown is contoured for clustered or nested well locations.

Beaumont Site 1 property boundary is approximate.

Beaumont Site 1

Figure 3-18

1,4-Dioxane Isoconcentration Map (µg/L) for Alluvium and Shallow Mount Eden Formation

TETRA TECH

Concentrations of perchlorate were not detected above the MDL in groundwater samples collected from alluvial/shallow Mount Eden formation guard wells MW-15 and MW-67. The perchlorate concentration reported in the groundwater sample collected from alluvial/shallow Mount Eden formation guard well MW-18 decreased slightly in the Second Quarter 2009 to 2.1 µg/L.

In Area F, concentrations of perchlorate in monitoring well MW-70 located at F-33 decreased from a concentration of 13.8 µg/L to below the MDL between First and Second Quarter 2009. Concentrations of perchlorate in new monitoring well MW-87B located in the Test Instrument Bunker area (F-34) decreased from a concentration of 35.2 µg/L to 20 µg/L between its initial sampling and Second Quarter 2009 and in new monitoring well MW-92 located in the Large Motor Test Bay area (F-39) concentrations of perchlorate increased slightly from a concentration of 24.5 µg/L to 25 µg/L between its initial sampling and Second Quarter 2009. Figure 3-15 presents the lateral distribution of perchlorate based on recent groundwater sampling results collected from alluvium and shallow Mount Eden formation screened wells.

3.7.2 1,1-Dichloroethene

Concentrations of 1,1-DCE reported in groundwater samples collected from the Second Quarter 2009 monitoring event ranged from not detected above the MDL to 5,900 µg/L (MW-61B). The MCL for 1,1-DCE is 6 µg/L. Concentrations of 1,1-DCE above the MDL were reported in 43 of the 95 groundwater samples collected from wells, of which 28 groundwater samples exceeded the 1,1-DCE MCL.

Based on the data collected during this reporting period, the highest concentrations of 1,1-DCE have been reported in groundwater samples collected from monitoring wells screened in the alluvium and shallow Mount Eden formation located in the former BPA. The distribution of 1,1-DCE has the highest VOC concentration detected at the Site. Approximately 3,000 feet downgradient of the former RMPA, groundwater concentrations have generally decreased to around 10 µg/L. The primary source area appears to be the former BPA.

The concentration of 1,1-DCE was not detected above the MDL in the groundwater sample collected from alluvial/shallow Mount Eden formation guard well MW-67. The 1,1-DCE concentration reported in the groundwater samples collected from alluvial/shallow Mount Eden formation guard wells increased slighty in MW-15 to 2.6 µg/L and decreased slightly in MW-18 to 1.5 µg/L in the Second Quarter 2009. Figure 3-16 presents the lateral distribution of 1,1-DCE based on recent groundwater sampling results collected from alluvium and shallow Mount Eden formation screened wells.

In Area F concentrations of 1,1-DCE in new monitoring well MW-87B located in the F-34 area decreased from a concentration of 10.2 µg/L to 6.3 µg/L between its initial sampling and Second Quarter 2009 and increased slightly from 0.130 µg/L to 0.67 µg/L and from 0.140 µg/L to 0.54 µg/L in new monitoring wells MW-93 an MW-94 respectively.

3.7.3 Trichloroethene

Concentrations of TCE reported in groundwater samples collected from the Second Quarter 2009 monitoring event ranged from not detected above the MDL to 2,700 µg/L (MW-26). The MCL of TCE is 5 µg/L. Concentrations of TCE above the MDL were reported in 48 of the 95 groundwater samples collected from wells, of which 34 groundwater samples exceeded the TCE MCL.

Based on the data collected during this reporting period, the highest concentrations of TCE have been reported in groundwater samples collected from monitoring wells screened in the alluvial/shallow Mount Eden formation HSU located in the former BPA. Groundwater concentrations of TCE generally decrease to around 100 µg/L approximately 2,000 feet down-gradient of the former BPA. Approximately 3,000 feet down-gradient of the former RMPA, TCE concentrations decrease to near 10 µg/L. The primary source area appears to be the former BPA.

The concentration of TCE was not detected above the MDL in the groundwater sample collected from alluvial/shallow Mount Eden formation guard well MW-67. The TCE concentration reported in the groundwater samples collected from alluvial/shallow Mount Eden formation guard wells increased slightly in MW-15 to 1.3 µg/L and decreased slightly in MW-18 to 1.2 µg/L in the Second Quarter 2009.

In Area F, concentrations of TCE in new monitoring wells MW-87A and MW-87B located in the F-34 area decreased from a concentration of 0.57 µg/L to 0.44 µg/L and 60 µg/L to 26 µg/L respectively and increased slightly from a concentration of 1.67 µg/L to 2.0 µg/L and 1.74 µg/L to 1.9 µg/L in new monitoring wells MW-93 and MW-94 respectively between their initial sampling and Second Quarter 2009. Concentrations of TCE in new monitoring wells located in the F-39 area ranged from not detected above the MDL to 73 µg/L (MW-86B). The concentration of TCE in all wells located in the F-39 area decreased between their initial sampling and Second Quarter 2009. Figure 3-17 presents the lateral distribution of TCE based on recent groundwater sampling results collected from alluvium and shallow Mount Eden formation screened wells.

3.7.4 1,4-Dioxane

Concentrations of 1,4-dioxane reported in groundwater samples collected from the Second Quarter 2009 monitoring event ranged from not detected above the MDL to 1,600 µg/L (EW-13). The DWNL of 1,4-dioxane is 3 µg/L. Concentrations of 1,4-dioxane above the MDL were reported in 55 of the 95 groundwater samples collected from wells, of which 47 groundwater samples exceeded the 1,4-dioxane DWNL.

Based on the data collected during this reporting period, the highest concentrations of 1,4 dioxane have been reported in groundwater samples collected from monitoring wells screened in the alluvial/shallow Mount Eden formation HSU located in the former BPA. Groundwater concentrations generally decreased to less than 50 µg/L approximately 1,500 feet down-gradient of the former BPA. The primary source area appears to be the former BPA.

The 1,4-dioxane concentration reported in the groundwater samples collected from alluvial/shallow Mount Eden formation guard wells increased slightly in MW-15 to 6.5 µg/L and decreased slightly in MW-18 to 6.5 µg/L in the Second Quarter 2009. The 1,4-dioxane concentration reported in the groundwater sample collected from alluvial/shallow Mount Eden formation guard well MW-67 increased during the Second Quarter 2009 to 1.2 µg/L.

In Area F, concentrations of 1,4-dioxane in monitoring wells MW-70, MW-82, and MW-83 located at F-33 increased slightly between First and Second Quarter 2009 with concentrations ranging from 3.6 µg/L to 3.8 µg/L. Concentrations of 1,4-dioxane in new monitoring wells MW-87A, MW-93, and MW-94 located in the F-34 area increased slightly and in MW-87B, decreased slightly between their initial sampling and Second Quarter 2009. Concentrations ranged from 6.7 µg/L (MW-87A) to 58 µg/L (MW-87B). Figure 3-18 presents the lateral distribution of 1,4 dioxane based on recent groundwater sampling results collected from alluvium and shallow Mount Eden formation screened wells.

3.7.5 Surface Water

Surface water samples were collected in Second Quarter 2009 during the routine groundwater sampling event. Table 3-12 present concentrations of COPCs reported in surface water samples collected from the Second Quarter 2009 sampling event.

During Second Quarter 2009 surface water samples were collected from 8 locations (SW-02, SW-03, SW-04, SW-06, SW-07, SW-09, SW-18, and SW-19) along the Potrero and Bedsprings Creek drainages. The remaining 10 locations and the 1 alternate location were dry at the time of sampling. The 4 primary COPCs, 1,4-dioxane, 1,1-DCE, TCE, and perchlorate, were detected in surface water samples collected from locations SW-02, SW-03, and SW-04; these samples were collected from springs and or spring fed ponds located outside of the stream beds but near the intersection of Bedsprings and Potrero Creeks.

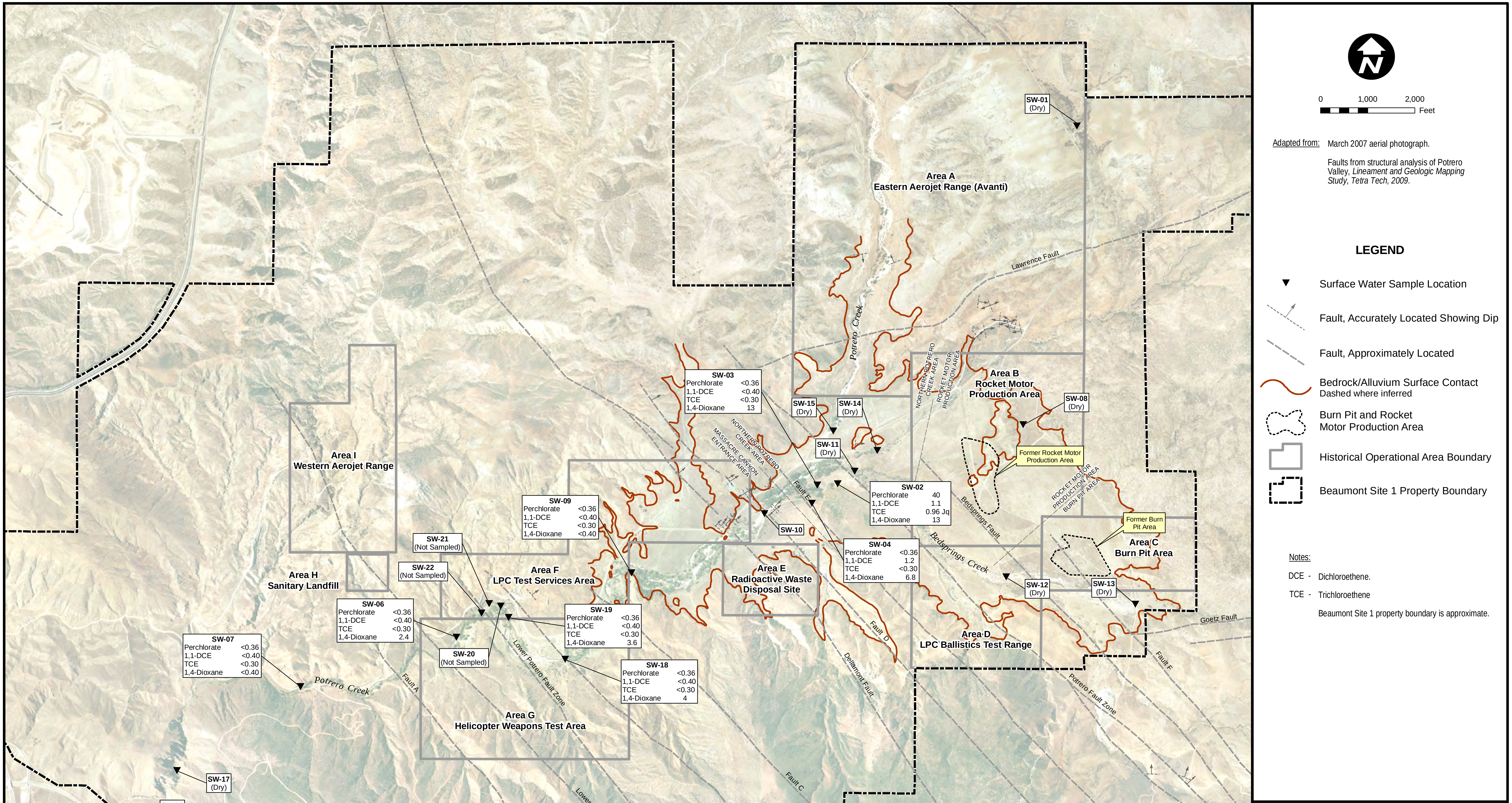
One of the primary COPCs, 1,4-dioxane, and no secondary COPCs were detected in the surface water samples collected from locations SW-06, SW-07, SW-09, SW-18, and SW-19. These samples were collected from water flowing in Potrero Creek and are located topographically downgradient of the springs discussed in the previous paragraph. Figure 3-19 present concentrations of COPCs reported in surface water samples collected from the Second Quarter 2009 monitoring event.

Table 3-11 Summary of Detected COPCs in Surface Water

Sample Location	Sample Date	1,4-Dioxane	1,1-Dichloroethene	Trichloroethene	Perchlorate
All results reported in µg/L unless otherwise stated					
SW-02	6/4/2009	**13**	1.1	0.96 Jq	**40**
SW-03	6/4/2009	**13**	<0.40	<0.30	<0.36
SW-04	6/4/2009	**6.8**	1.2	<0.30	<0.36
SW-06	6/9/2009	2.4	<0.40	<0.30	<0.36
SW-07	6/4/2009	<0.40	<0.40	<0.30	<0.36
SW-09	6/4/2009	<0.40	<0.40	<0.30	<0.36
SW-18	6/4/2009	**4**	<0.40	<0.30	<0.36
SW-19	6/4/2009	**3.6**	<0.40	<0.30	<0.36
Reporting Limit (µg/L)		1.0	1.0	1.0	2.0
Method Detection Limit (µg/L)		0.40	0.40	0.30	0.36
MCL/DWNL (µg/L)		3 (1)	6	5	6

Notes: Only analytes positively detected are presented in this table.
For a complete list, refer to the laboratory data package.
µg/L - micrograms pre liter.
MCL - California Department of Public Health maximum contaminant level.
DWNL - California Department of Public Health drinking water notification level.
(1) DWNL
Bold - MCL or DWNL exceeded.
<# - Analyte not detected, method detection limit concentration is shown.
J - The analyte was positively identified, but the analyte concentration is an estimated value.
q - The analyte detection was below the Practical Quantitation Limit (PQL).

X:\GIS\Lockheed S1 Q1Q209SurfWater_Q2 COPC.mxd



Adapted from: March 2007 aerial photograph.

Faults from structural analysis of Potrero Valley, *Lineament and Geologic Mapping Study, Tetra Tech, 2009.*

LEGEND

- ▼ Surface Water Sample Location
- Fault, Accurately Located Showing Dip
- Fault, Approximately Located
- Bedrock/Alluvium Surface Contact
  Dashed where inferred
- Burn Pit and Rocket
  Motor Production Area
- Historical Operational Area Boundary
- Beaumont Site 1 Property Boundary

Notes:

DCE - Dichloroethene.
TCE - Trichloroethene

Beaumont Site 1 property boundary is approximate.

Beaumont Site 1

Figure 3-19
Second Quarter (June) 2009 Surface Water Primary COPC Sampling Results (μg/L)

TETRA TECH

3.8 F-33 MONITORED NATURAL ATTENUATION SAMPLING

Six monitoring wells (F33-TW2, F33-TW3, F33-TW6, MW-70, MW-82, and MW-83) located in the F-33 area were sampled for monitored natural attenuation parameters (MNA) during the First Quarter 2009 and Second Quarter 2009 monitoring event. Additionally monitoring wells MW-18, MW-37, and MW-67 were sampled for MNA during the Second Quarter 2009 monitoring event. Samples for laboratory analysis were collected for total organic carbon (TOC), dissolved organic carbon (DOC), total iron, ferrous iron, sulfide, sulfate, methane, hydrogen, and volatile fatty acids (VFAs). Ferrous iron and sulfide were analyzed using a field instrument during Second Quarter 2009. Additionally, DO and ORP were monitored with field instruments during purging and sampling. Figure 3-20 presents monitoring well locations sampled for MNA during the First Quarter 2009 and Second Quarter 2009 monitoring event. Table 3-13 presents a summary of detected analytes and field measurements.

Perchlorate

Perchlorate concentrations have been below detection limits in all monitoring wells within the F-33 area except for MW-70 where concentrations appear to increase seasonally with increased rainfall and higher groundwater levels (Figure 3-21). During First Quarter 2009 and Second Quarter 2009 perchlorate concentrations were 13.8 µg/L and below the MDL respectively. Perchlorate concentrations have ranged from below the MDL to 48.5 µg/L (First Quarter 2008). Based on the high concentrations of perchlorate in the Feature F-33 vadose zone soil and the fact that perchlorate was below the detection limit in all other area wells supports that geochemical conditions in groundwater are generally conducive to natural biodegradation.

The concentration of perchlorate in soil samples collected in the vicinity of the surrounding and downgradient wells is much lower than the perchlorate concentrations in soil samples collected adjacent to MW-70. Therefore, even though geochemical conditions appear to support natural attenuation in the entire vicinity, seasonal increases in surface water infiltration and groundwater elevation result in an increase in perchlorate concentrations in groundwater in the vicinity of MW-70. Perchlorate movement from soil into groundwater appears to be limited or stopped completely by biodegradation as perchlorate is not observed in the surrounding and downgradient wells.

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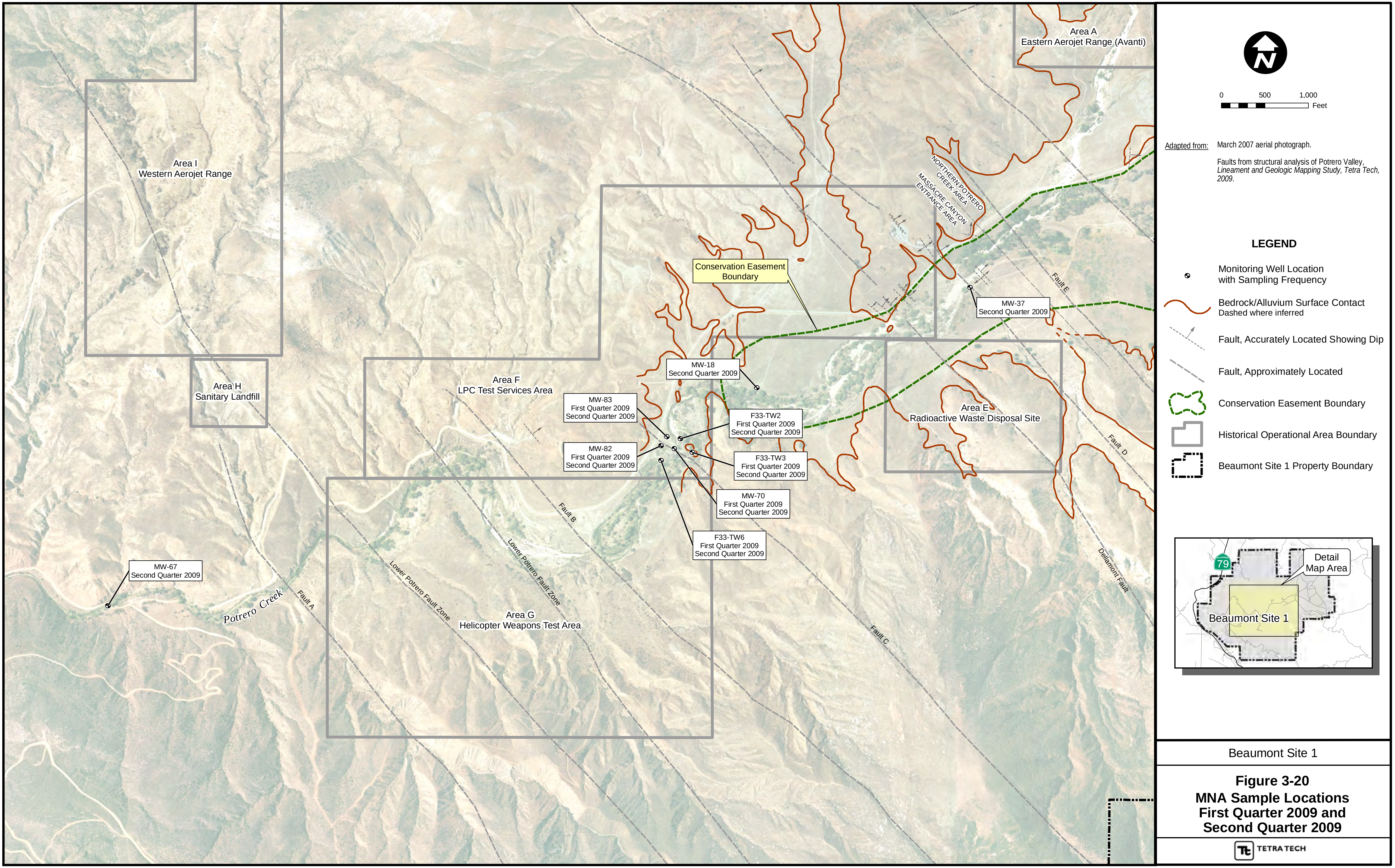


Adapted from: March 2007 aerial photograph.

Faults from structural analysis of Potrero Valley, *Lineament and Geologic Mapping Study, Tetra Tech, 2009.*

LEGEND

- Monitoring Well Location with Sampling Frequency
- Bedrock/Alluvium Surface Contact
  Dashed where inferred
- Fault, Accurately Located Showing Dip
- Fault, Approximately Located
- Conservation Easement Boundary
- Historical Operational Area Boundary
- Beaumont Site 1 Property Boundary

Beaumont Site 1

Figure 3-20
MNA Sample Locations First Quarter 2009 and Second Quarter 2009

TETRA TECH

Table 3-12 Summary of Validated Detected Natural Attenuation Analytes and Field Measurements – First Quarter 2009 and Second Quarter 2009

		Field Parameters		**Analytes**															
Sample Location	**Sample Date**	**DO - mg/L**	**ORP - mVs**	**Per chlorate -ug/L**	**Acetic Acid - mg/L**	**Butyric Acid - mg/L**	**Hexanoic Acid - mg/L**	**Lactic Acid and HIBA - mg/L**	**i-Pentanoic Acid -mg/L**	**Pentanoic Acid - mg/L**	**Dissolved Organic Carbon - mg/L**	**Total Organic Carbon - mg/L**	**Hydrogen -nM**	**Methane -ug/L**	**Sulfide -mg/L (1)**	**Nitrate (as N) - mg/L**	**Sulfate -mg/L**	**Ferrous Iron - mg/L (1)**	**Iron - mg/L**
F33-TW2	3/23/09	0.68	-56.4	<0.5	0.10	<0.060	0.090 Jq	0.24	<0.070	<0.070	3.73	3.94	1.5	37	<0.4	<0.05	61.7	<2.5	**1.28**
F33-TW2	6/12/09	0.19	-95.8	<0.36	0.082	<0.006	<0.007	0.13	<0.032	<0.016	3.6	3.5	1.2	49.7	0.00	<0.017	61	**0.99**	**1.05**
F33-TW3	3/23/09	0.85	-48.0	<0.5	0.19	<0.060	0.090 Jq	0.27	<0.070	<0.070	2.76	2.76	2.1	75	<0.4	<0.05	68.2	<2.5	**0.546**
F33-TW3	6/12/09	0.36	-85.2	<0.36	0.068 Jq	<0.006	<0.007	0.090 Jq	<0.032	<0.016	3.7	3.2	1.1	213	0.01	<0.017	44	**0.72**	**0.848**
F33-TW6	3/25/09	1.16	33.2	<0.5	0.060 Jq	<0.060	<0.080	0.16	<0.070	<0.070	2.92	3.3	2.6	1.4 Jq	<0.4	0.0575 Jq	89.9	<2.5	**0.406**
F33-TW6	6/19/09	0.22	-41.3	<0.071	0.10	<0.006	<0.007	0.14	<0.032	<0.016	2.5	2.3	1.3	<0.001	0.00	<0.11	72	0.27	0.250
MW-18	6/10/09	0.37	-9.5	2.1	0.092	0.048 Jq	<0.007	0.086 Jq	0.18	<0.016	2.5	1.9	0.61	0.550 Jq	0.00	0.42	59	0.03	0.0136 Jq
MW-37	6/11/09	0.54	-52.1	<0.36	0.084	<0.006	<0.007	0.099 Jq	<0.032	<0.016	1.8	0.98	0.87	0.720 Jq	0.00	0.019 Jq	84	0.06	0.0385 Jq
MW-67	6/10/09	0.14	-31.7	<0.071	0.14	<0.006	<0.007	0.16	<0.032	0.039 Jq	7.2	7.0	0.65	30.4	0.01	<0.017	96	0.05	0.0977
MW-70	3/24/09	1.83	59.4	**13.8**	0.060 Jq	<0.060	<0.080	0.16	<0.070	<0.070	3.81	3.35	1.4	<0.6	<0.4	0.0932 Jq	68.5	<2.5	<0.04
MW-70	6/10/09	0.38	3.9	<0.36	0.12	<0.006	<0.007	0.074 Jq	<0.032	<0.016	4.2	3.9	2.0	10.7	0.01	<0.017	51	0.06	0.0180 Jq
MW-82	3/25/09	0.57	28.4	<0.5	0.70	<0.060	<0.080	0.13	<0.070	<0.070	2.93	2.88	1.7	3.7	<0.4	<0.05	94.6	<2.5	0.241
MW-82	6/11/09	0.19	45.2	<0.36	0.10	<0.006	<0.007	0.096 Jq	<0.032	0.10	3.3	3.2	0.73	0.450 Jq	0.10	<0.017	78	0.15	**2.02**
MW-83	3/24/09	2.21	44.8	<0.5	0.070	<0.060	<0.080	0.14	<0.070	<0.070	3.03	2.87	1.6	<0.6	0.8 Jq	0.111	69.5	<2.5	<0.04
MW-83	6/10/09	1.06	-25.0	<0.36	<0.015	<0.006	<0.007	<0.042	<0.032	<0.016	3.5	3.2	1.9	0.420 Jq	0.00	<0.017	52	0.06	0.0354 Jq
Reporting Limit (µg/L)		-	-	2	-	-	-	-	-	-	1	1	-	2	0.5	0.1	2.5	5	0.2
Method Detection Limit		-	-	0.5	0.07	0.07	0.10	0.10	0.07	0.07	0.5	0.5	0.6	0.6	0.1	0.05	1.25	2.5	0.04
MCL/DWNL (µg/L)		-	-	6	-	-	-	-	-	-	-	-	-	-	-	10	250	0.3	0.3

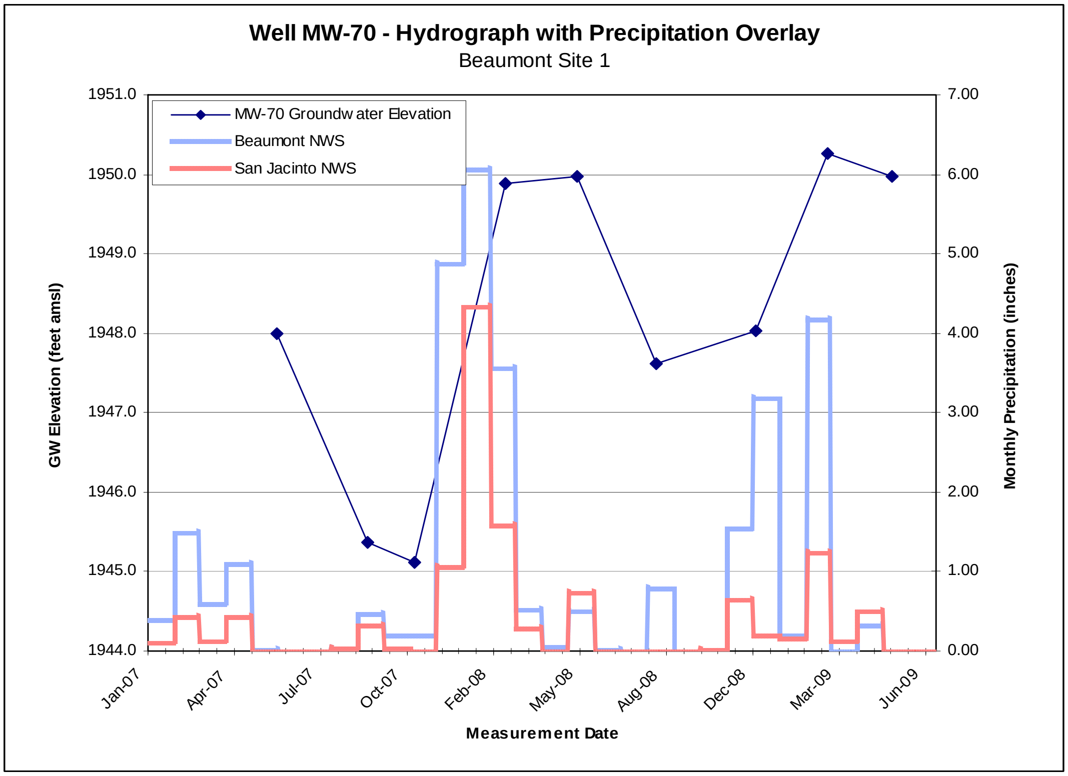
Notes: Only analytes positively detected are presented in this table. For a complete list, refer to the laboratory data package.

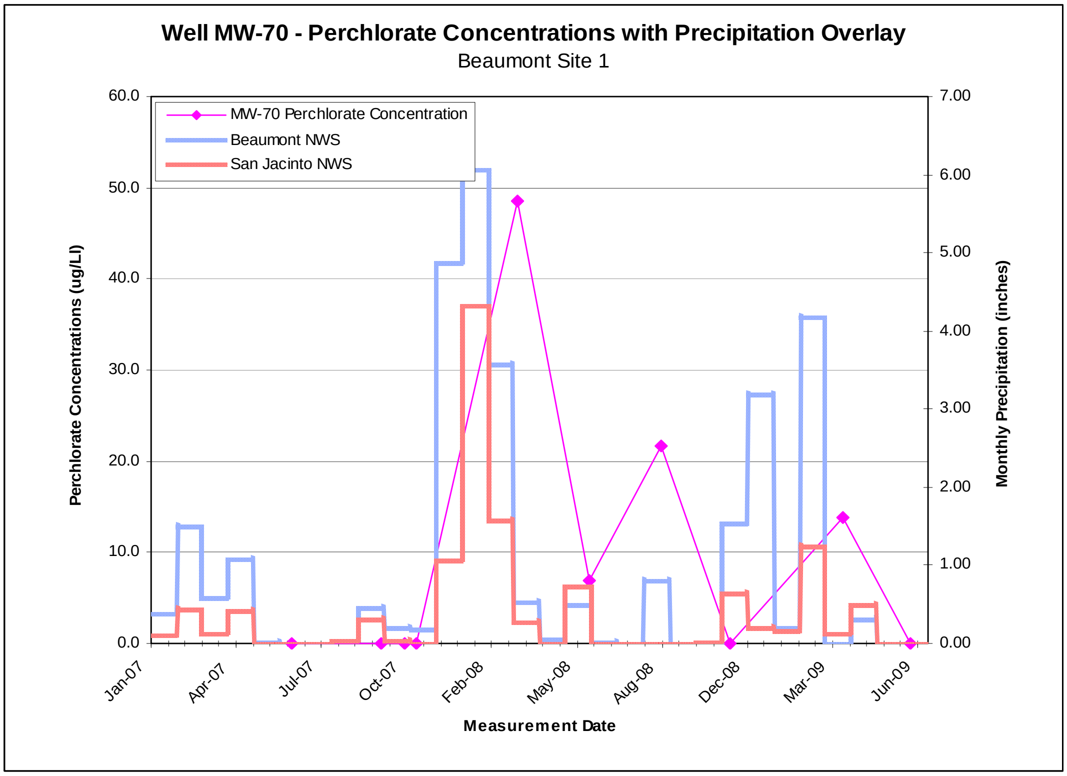
(1) - Sulfide and ferrous iron sample analysis during June 2009 (Second Quarter) was performed in the field using a Hach DR 850 colorimeter.

mg/L - milligrams per liter
µg/L - micrograms per liter.
nM – nanomoles
MCL - California Department of Public Health maximum contaminant level.
DWNL - California Department of Public Health drinking water notification level.

Bold - MCL or DWNL exceeded.
"-" - Not available.
<# - Analyte not detected, method detection limit concentration is shown.
J - The analyte was positively identified, but the analyte concentration is an estimated value.
q - The analyte detection was below the Practical Quantitation Limit (PQL).

Figure 3-21 Water Level Elevation and Perchlorate Concentrations with Precipitation Overlay





NWS – National Weather Service

Nitrate

Nitrate was either absent or detected at very low concentrations. Nitrate is often considered the most critical electron acceptor competitor to perchlorate. Its absence in the aquifer permits native groundwater microorganisms to utilize perchlorate as an electron acceptor in the respiratory process. The absence of nitrate is also significant because it means that natural organic carbon that exists in the aquifer does not get consumed for denitrification.

DO and ORP

DO measurements are used to assess whether the aquifer is aerobic or anaerobic. In F-33 monitoring wells the DO concentrations have generally been less than 1.0 mg/L, which is considered to be anaerobic and provides an environment that could sustain natural perchlorate biodegradation. However, following periods of heavy precipitation, MW-70 has shown DO levels greater than 1.0 mg/L. This increase in DO measurements corresponds with elevated perchlorate detections.

With the exception of the First Quarter 2009 results for MW-70, ORP values in the F33 monitoring wells were all measured below 50 mV; several were substantially less than 0 mV. These results are indicative of anaerobic conditions. Therefore, the DO and the ORP values are in tandem, suggesting a redox environment that encourages natural perchlorate biodegradation. ORP values in MW-70 during First Quarter 2009 is greater than 50 mVs, which correlates with the higher DO concentrations in this well as well as the higher perchlorate detections.

Total Iron and Ferrous Iron

Both forms of iron were measured and were either not detected or detected at very low levels in the groundwater. Therefore, it appears that there is almost no oxidized or reduced iron in the aquifer. Oxidized iron could have consumed natural organic carbon in the process of biological iron reduction. In the vicinity of F-33 this does not appear to be the case, leaving the available organic carbon for direct consumption by native perchlorate reducing microorganisms.

Sulfate and Sulfide

During First Quarter 2009 and Second Quarter 2009 sulfate was detected at concentrations up to 96 mg/L in F-33 monitoring wells, and sulfide was generally absent or detected at very low concentrations. Very little biological sulfate reduction appears to be occurring in the vicinity of F-33, primarily because redox conditions do not strongly support such an occurrence. In general, sulfate is not a major competitor for perchlorate as an electron acceptor, in comparison with nitrate. However, it is important to note that sulfate does exist at high enough concentrations where it could consume natural organic carbon that would otherwise be used for biodegradation.

Methane

Methane concentrations ranged from below the MDL to a high of 213 µg/L (F33-TW3). Methanogenesis generally occurs when the aquifer becomes strongly anaerobic and, as a result, methane is found in the 1,000 ppb range. Under moderately anaerobic conditions, methane may generally be greater than 500 ppb; and under mildly methanogenic conditions, methane is generally measured at concentrations greater than 100 ppb. These results indicate that conditions are mildly anaerobic and sufficiently reducing to support perchlorate biodegradation.

Hydrogen

Hydrogen concentrations were greater than 1.0 nanoMoles (nM) in all monitoring wells where it was analyzed during First Quarter 2009. Hydrogen concentrations were greater than 1.0 nanoMoles (nM) in 5 of the 9 locations where it was analyzed during Second Quarter 2009. Hydrogen above 1.0 nM is indicative of anaerobic conditions with the likelihood of the onset of mildly sulfate-reducing conditions. This level of hydrogen is supportive of natural perchlorate biodegradation. Hydrogen is considered a more reliable indicator of redox conditions than ORP because it is easier to measure to a high degree of accuracy and ORP measurements using field instruments can be impacted by the various redox pairs in the groundwater. In this area, redox measurements from ORP field instruments and hydrogen concentrations match fairly closely, making deductions about the geochemical environment in the aquifer more accurate. In general, hydrogen measurements in the F-33 monitoring wells point to anaerobic conditions that are reducing enough to support perchlorate biodegradation.

TOC and DOC

TOC and DOC in the F-33 monitoring wells were both generally measured at concentrations ranging from 2.3 mg/L to 4.2 mg/L. Although these levels are not suggestive of an aquifer rich in natural organic carbon, they are likely to be sufficient to sustain natural biodegradation of low levels of perchlorate. However, as seen in MW-70, perchlorate concentrations tend to increase in groundwater following periods of heavy precipitation as perchlorate from the vadose zone migrates into the aquifer. Increasing perchlorate concentrations in the groundwater do not appear to coincide with higher amounts of organic carbon, which would be required to keep perchlorate concentrations below detectable levels. Hence, we see perchlorate in MW-70 where the natural processes are not able to degrade the increased perchlorate with fluctuating groundwater levels; and a continuing absence in surrounding and downgradient wells where perchlorate degradation can still be sustained.

Therefore, the current natural biodegradation potential may not be sufficient to sustain perchlorate degradation in the immediate vicinity of MW-70 during periods of heavy precipitation or elevated groundwater levels but it is attenuated before it can migrate to other F-33 monitoring wells. This may be the case even though other electron acceptors such as iron and nitrate do not appear to be competing for organic carbon in the aquifer.

VFAs:

VFAs are a more direct indication of the carbon substrate form which is immediately available to native microorganisms involved in biodegradation. Perhaps the most important of the VFAs is acetic acid, which plays a key and direct role in metabolism and energy generation. Acetic acid, when present even in small amounts, indicates that there is an excess that is available for consumption by perchlorate reducing microorganisms. In the Feature F-33 vicinity, acetic acid concentrations generally range up to 0.70 mg/L. These concentrations appear to be sufficient to sustain natural biodegradation of perchlorate except during periods of heavy precipitation.

3.9 GROUNDWATER QUALITY STATISTICAL TEMPORAL TREND ANALYSIS

Groundwater sampling results from the 95 wells and 8 fixed surface water locations sampled for COPCs during the Second Quarter 2009 monitoring event as well as 12 new monitoring wells sampled during Fourth Quarter 2008 were included in a temporal trend analysis of perchlorate, 1,1-DCE, TCE, and 1,4 dioxane (the primary COPCs).

The temporal trends were analyzed using Mann-Kendall and linear regression methods. Brief descriptions of the methods follow:

- Mann Kendall Analysis – This statistical procedure was used to evaluate the data for trends. It is a non parametric statistical procedure that is well suited for analyzing trends in data over time that does not require assumptions as to the statistical distribution of the data and can be used with irregular sampling intervals and missing data. The Mann-Kendall test for trend is suitable for analyzing data that follows a normal or non-normal distribution pattern. The Mann-Kendall test has no distributional assumptions and allows for irregularly spaced measurement periods. The advantage with this approach involves the cases where outliers in the data would produce biased estimates of the least squares estimated slope.

- Linear Regression Analysis – This statistical procedure was used to calculate the magnitude of the trends. A parametric statistical procedure is typically used for analyzing trends in data over time and requires a normal statistical distribution of the data.

There are 6 statistical concentration trend types derived from Mann-Kendall analysis: 1) decreasing, 2) increasing 3) no trend [displaying 2 sets of conditions], 4) probably decreasing, 5) probably increasing, and 6) stable. These statistical concentration trend types are determined by the following conditions summarized in Table 3-14 (AFCEE, 2004).

Table 3-13 Mann-Kendall Concentration Trend Matrix

Mann-Kendall Statistic (S)	Confidence in Trend	Concentration Trend
S > 0	> 95%	Increasing
S > 0	90 - 95%	Probably Increasing
S > 0	< 90%	No Trend
S ≤ 0	< 90% and COV ≥ 1	No Trend
S ≤ 0	< 90% and COV < 1	Stable
S < 0	90 - 95%	Probably Decreasing
S < 0	> 95%	Decreasing

Notes:

> -	Greater than.
≥ -	Greater than or equal to.
< -	Less than.
≤ -	Less than or equal to.
COV -	Coefficient of Variation.

The Mann-Kendall statistic (S) measures the trend in the data. Positive values indicate an increase in constituent concentrations over time, whereas negative values indicate a decrease in constituent concentrations over time. The strength of the trend is proportional to the magnitude of the Mann-Kendall Statistic (i.e., large magnitudes indicate a strong trend).

The Coefficient of Variation (COV) is a statistical measure of how the individual data points vary about the mean value. Values less than or near 1.00 indicate that the data form a relatively close group about the mean value. Values larger than 1.00 indicate that the data show a greater degree of scatter about the mean.

The "Confidence in Trend" is the statistical confidence that the constituent concentration is increasing (S>0) or decreasing (S<0).

If there is insufficient data, less than 4 sampling events, then not applicable (NA) would be applied to the results. Of the 160 locations evaluated, between 55 and 62 of the locations did not contain enough data to perform Mann-Kendall analysis, this includes 46 wells classified as redundant and not presently being sampled.

The temporal trend analyses were performed using data from Second Quarter 2002 to Second Quarter 2009. The start of this period spans the shut down of the groundwater extraction system located in the RMPA. The system was shut down in late 2002. While including data from Second Quarter (May) 2002 represents a time of active remediation, it was near the end of the active phase and should represent initial concentrations at the termination of active remediation.

The 4 primary COPCs were analyzed for temporal trends at up to 160 locations. In other words, 624 trends were evaluated. Any 1 well location may have a different trend for each of the 4 analytes evaluated. Of the 624 trends that were evaluated: 232 data sets had insufficient data to evaluate trends, 161 had no trend, 51 had a decreasing or probably decreasing trend, 165 had a stable trend, and 15 had an increasing or probably increasing trend. The 12 wells displaying an increasing or probably increasing trend are IW-04: 1,1-DCE at 1.9 µg/L/yr, MW-28: perchlorate at 9.1 µg/L/yr and 1,1-DCE at 2.0 µg/L/yr, MW-31: perchlorate at 0.1 µg/L/yr, MW-46: 1,1-DCE at 0.2 µg/L/yr, MW-55: perchlorate at 87.4 µg/L/yr, MW-59D: perchlorate at 125 µg/L/yr, MW-60A: 1,4-dioxane at 5.9 µg/L/yr and perchlorate at 1480 µg/L/yr, MW-60B: 1,4-dioxane at 0.3 µg/L/yr, MW-61C: 1,1-DCE at 5.4 µg/L/yr, MW-68: 1,4-dioxane at 1.0 µg/L/yr and perchlorate at 179 µg/L/yr, MW-71B: perchlorate at 34.6 µg/L/yr, and MW-80: TCE at 0.4 µg/L/yr. Wells MW-28, MW-31, MW-60A, MW-60B, MW-61C, and MW-71B are located in the BPA, well MW-59D is located just downgradient of the BPA, wells IW-04, MW-55, and MW-68 are located in the RMPA, and wells MW-46 and MW-80 are located in the NPCA. None of the 12 wells displaying increasing trends are guard wells. The farthest downgradient well displaying an increasing or probably increasing trend was MW-46 and the magnitude of the trend was 0.2 µg/L/yr. In general, the majority of the wells display stable or decreasing trends. Guard wells MW-15, MW-18 and MW-67 primarily displayed stable or decreasing COPC trends, with the exception of MW-15, in which a TCE trend could not be discerned. Surface water locations SW-01, SW-02, SW-03, SW-04 SW-06, SW-07, and SW-09 displayed stable or decreasing COPC trends. The remaining surface water locations had insufficient data for Mann-Kendall trend analysis. A summary of the Mann-Kendall trend analysis is presented in Table 3-15 and the magnitude of the trends determined by linear regression analyses are presented in Table 3-16. Figures 3-22 through 3-25 present a spatial representation of the results of the trend analysis. Appendix K presents a summary of the results of the Mann-Kendall and linear regression analyses.

Table 3-14 Summary of Mann-Kendall Trend Analysis of COPC for Second Quarter 2009 Sampled Wells

Analyte	Wells Tested	Insufficient Data	No Trend	Decreasing Trend	Probably Decreasing Trend	Stable Trend	Probably Increasing Trend	Increasing Trend
Perchlorate	160	60	25	16	6	46	1	6
1,1-Dichloroethene	152	55	47	4	4	38	2	2
Trichloroethene	152	55	56	6	1	33	1	0
1,4-Dioxane	160	62	33	9	5	48	1	2
Total Analysis	624	232	161	35	16	165	5	10

Notes:

COPC - Chemicals of Potential Concern.

Table 3-15 Magnitude of Trends Detected for COPC Second Quarter 2009 Sampled Wells

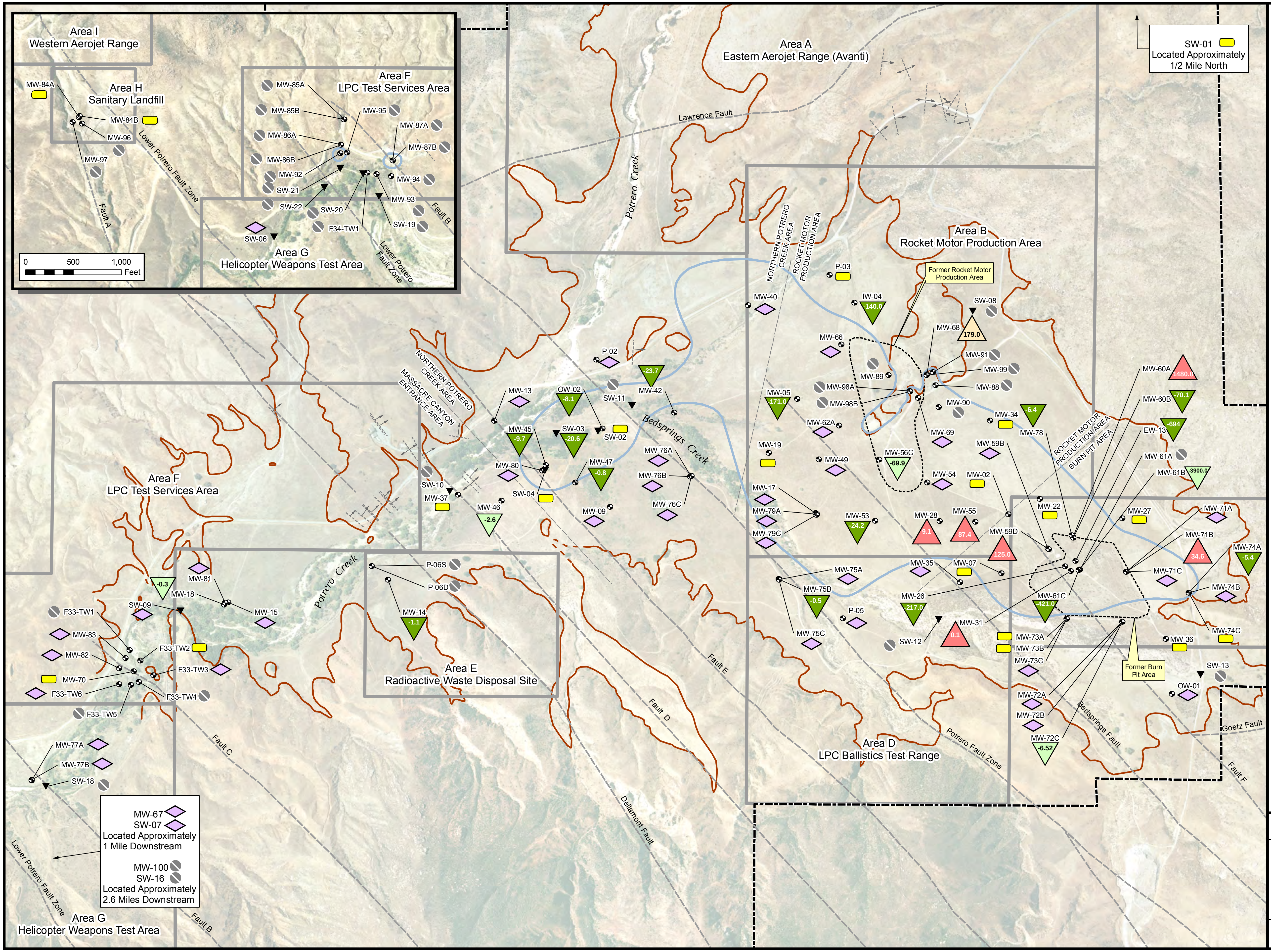
Analyte	Decreasing Trend		Probably Decreasing Trend		Probably Increasing Trend		Increasing Trend	
	Number	Magnitude (ug/L/yr)	Number	Magnitude (ug/L/yr)	Number	Magnitude (ug/L/yr)	Number	Magnitude (and well) (ug/L/yr)
Perchlorate	16	0.5 to 694	6	0.3 to 3900	1	179	6	9.1 (MW-28) 0.1 (MW-31) 87.4 (MW-55) 125 (MW-59D) 1480 (MW-60A) 34.6 (MW-71B)
1,1-Dichloroethene	4	0.5 to 8.2	4	0.1 to 1.4	2	0.2 to 2.0	2	1.9 (IW-04) 5.4 (MW-61C)
Trichloroethene	6	0.1 to 11.8	1	3.6	1	0.4	0	NA
1,4-Dioxane	9	0.3 to 3.41	5	0.1 to 1.1	1	0.3	2	5.9 (MW-60A) 1 (MW-68)

Notes:

ug/L/yr - Micrograms per liter per year.

NA - Not applicable.

COPC - Chemicals of Potential Concern.



0 500 1,000 Feet

Adapted from: March 2007 aerial photograph.

Faults from structural analysis of Potrero Valley, *Lineament and Geologic Mapping Study, Tetra Tech, 2009.*

LEGEND

- ● Well Location
- ▼ Surface Water Sample Location
- MCL Contour (6.0 µg/L) - Dashed where inferred
- Bedrock/Alluvium Surface Contact Dashed where inferred
- Fault, Accurately Located Showing Dip
- Fault, Approximately Located
- Beaumont Site 1 Property Boundary
- Historical Operational Area Boundary

Analyte Trend Results

- ▲ 2.00 Increasing: Confidence in trend >95% (change shown in micrograms per liter per year (µg/L/yr)
- ▲ 2.00 Probably Increasing: Confidence between 90 and 95% (change shown in µg/L/yr)
- ▼ -2.00 Probably Decreasing: Confidence betwee 90 and 95% (change shown in µg/L/yr)
- ▼ -2.00 Decreasing: Confidence in trend >95% (change shown in µg/L/yr)
- ◆ Stable: Confidence in trend <90, coefficient of variation <1 and Mann-Kendall statistic ≤0
- ▬ No Trend: Confidence in trend >90% and Mann-Kendall statistic >0 or confidence in trend <90%, coefficient of variation ≥1 and Mann-Kendall statistic ≤0
- ⊘ Insufficient Data for Statistical Analysis

Notes:

MCL - Maximum Contaminant Level.

Beaumont Site 1 property boundary is approximate.

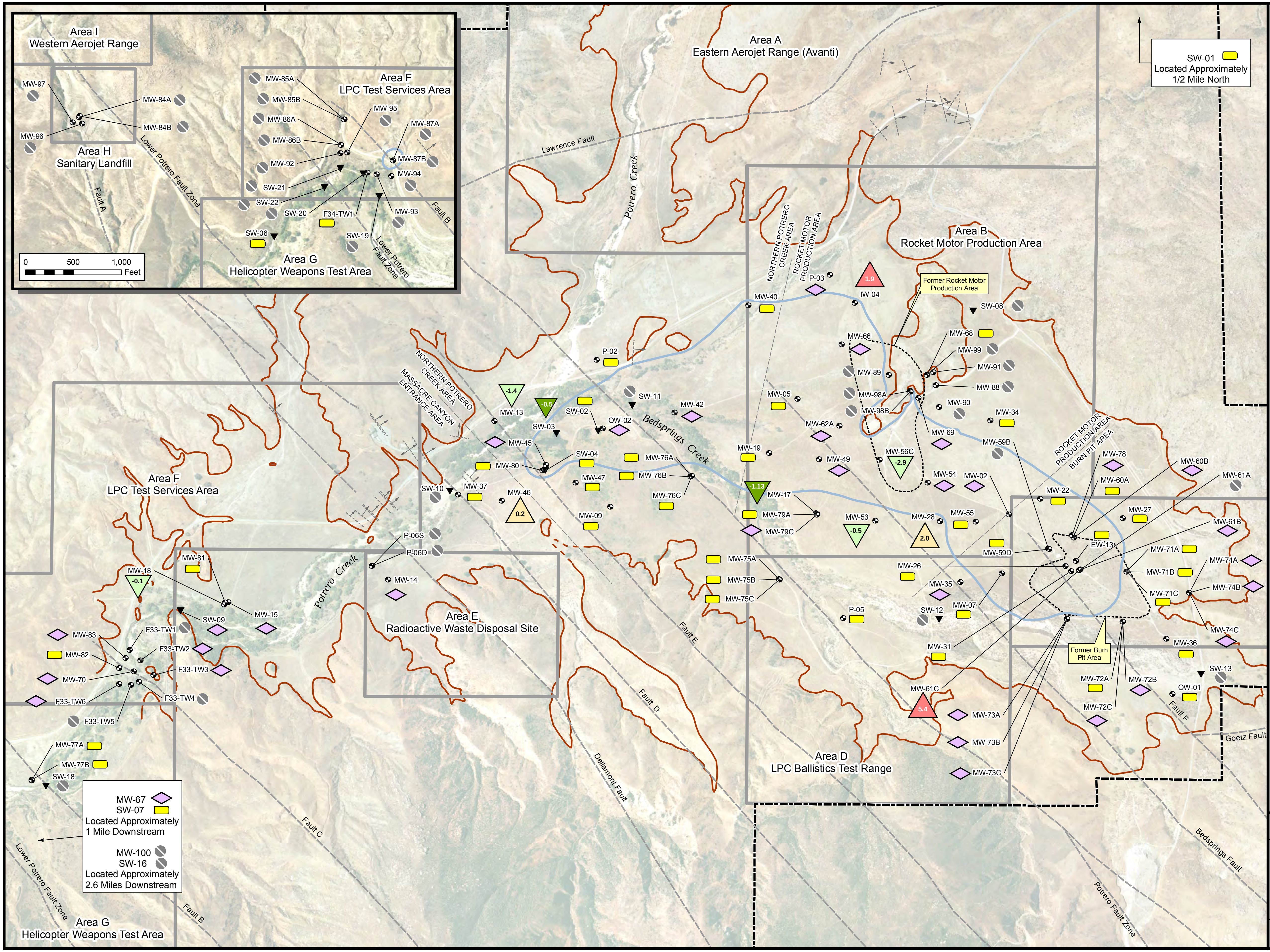
Beaumont Site 1

Figure 3-22

Perchlorate Statistical Summary Analysis Results with Overlay Extent for Alluvium and Shallow Mount Eden Formation

TETRA TECH

X:\GIS\Lockheed S1 Q1Q2009\Trend DCE.mxd



0 500 1,000 Feet

Adapted from: March 2007 aerial photograph.

Faults from structural analysis of Potrero Valley, *Lineament and Geologic Mapping Study, Tetra Tech, 2009.*

LEGEND

●	Well Location
▼	Surface Water Sample Location
～	MCL Contour (6.0 µg/L) - Dashed where inferred
～	Bedrock/Alluvium Surface Contact Dashed where inferred
╲	Fault, Accurately Located Showing Dip
╲	Fault, Approximately Located
▭	Historical Operational Area Boundary
⬚	Beaumont Site 1 Property Boundary

Analyte Trend Results

▲ 2.00	Increasing Confidence in trend >95% (change shown in micrograms per liter per year (µg/L/yr)
▲ 2.00	Probably Increasing Confidence between 90 and 95% (change shown in µg/L/yr)
▼ -2.00	Probably Decreasing Confidence betwee 90 and 95% (change shown in µg/L/yr)
▼ -2.00	Decreasing Confidence in trend >95% (change shown in µg/L/yr)
◆	Stable Confidence in trend <90, coefficient of variation <1 and Mann-Kendall statistic ≤0
▬	No Trend Confidence in trend >90% and Mann-Kendall statistic >0 or confidence in trend <90%, coefficient of variation ≥1 and Mann-Kendall statistic ≤0
●	Insufficient Data for Statistical Analysis

Notes:

MCL - Maximum Contaminant level.

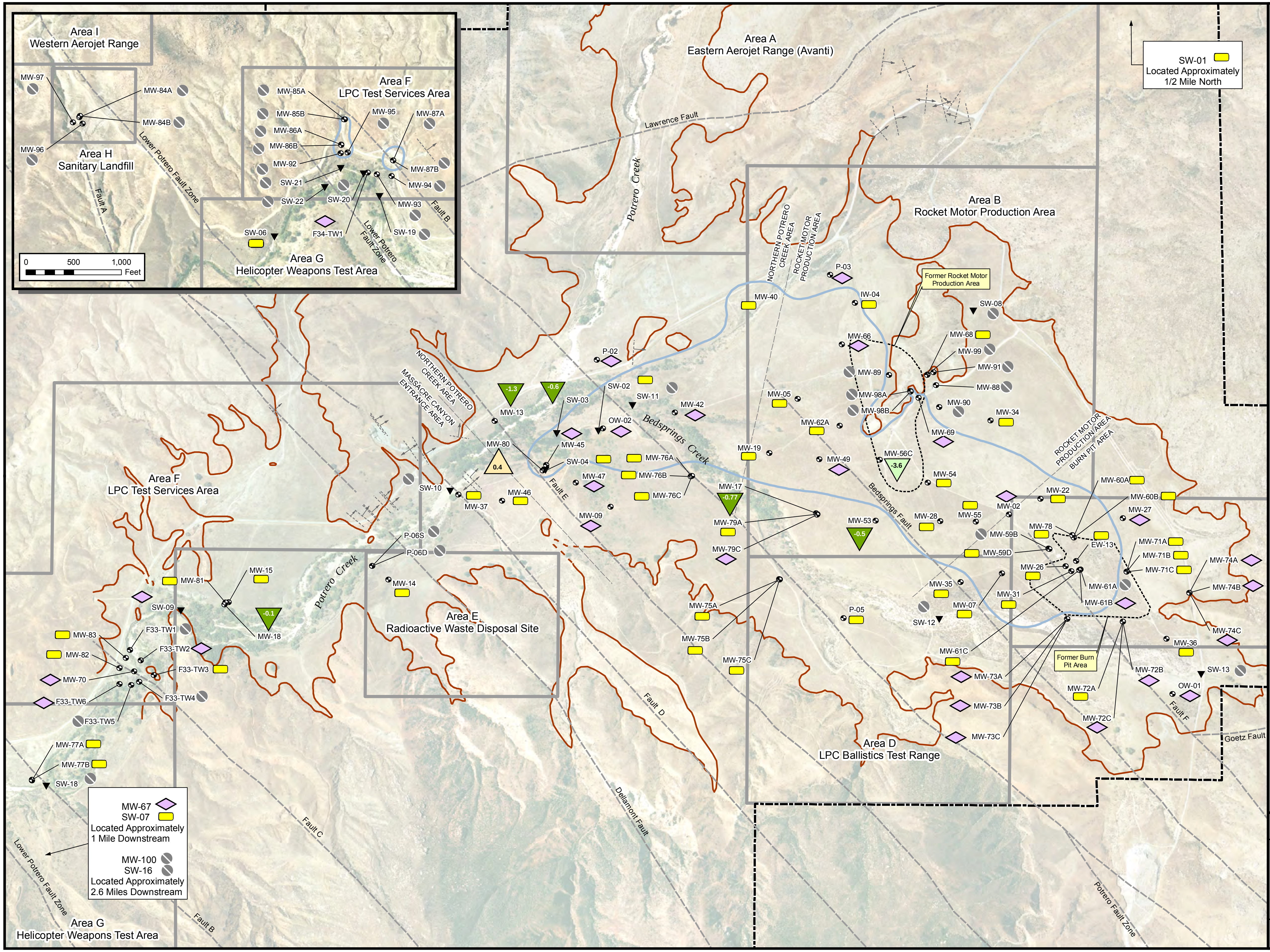
1,1-DCE - 1,1-Dichloroethene.

Beaumont Site 1 property boundary is approximate.

Beaumont Site 1

Figure 3-23
1,1-DCE Statistical Summary Analysis Results with Overlay Extent for Alluvium and Shallow Mount Eden Formation

TETRA TECH



0 500 1,000 Feet

Adapted from: March 2007 aerial photograph.

Faults from structural analysis of Potrero Valley, *Lineament and Geologic Mapping Study, Tetra Tech, 2009.*

LEGEND

- ● Well Location
- ▼ Surface Water Sample Location
- MCL Contour (5.0 µg/L) - Dashed where inferred
- Bedrock/Alluvium Surface Contact Dashed where inferred
- Fault, Accurately Located Showing Dip
- Fault, Approximately Located
- Historical Operational Area Boundary
- Beaumont Site 1 Property Boundary

Analyte Trend Results

- △ 2.00 Probably Increasing Confidence between 90 and 95% (change shown in µg/L/yr)
- ▽ -2.00 Probably Decreasing Confidence betwee 90 and 95% (change shown in µg/L/yr)
- ▼ -2.00 Decreasing Confidence in trend >95% (change shown in µg/L/yr)
- ◆ Stable Confidence in trend <90, coefficient of variation <1 and Mann-Kendall statistic ≤0
- ▬ No Trend Confidence in trend >90% and Mann-Kendall statistic >0 or confidence in trend <90%, coefficient of variation ≥1 and Mann-Kendall statistic ≤0
- ● Insufficient Data for Statistical Analysis

Notes:

MCL - Maximum Contaminant level.

TCE - Trichloroethene.

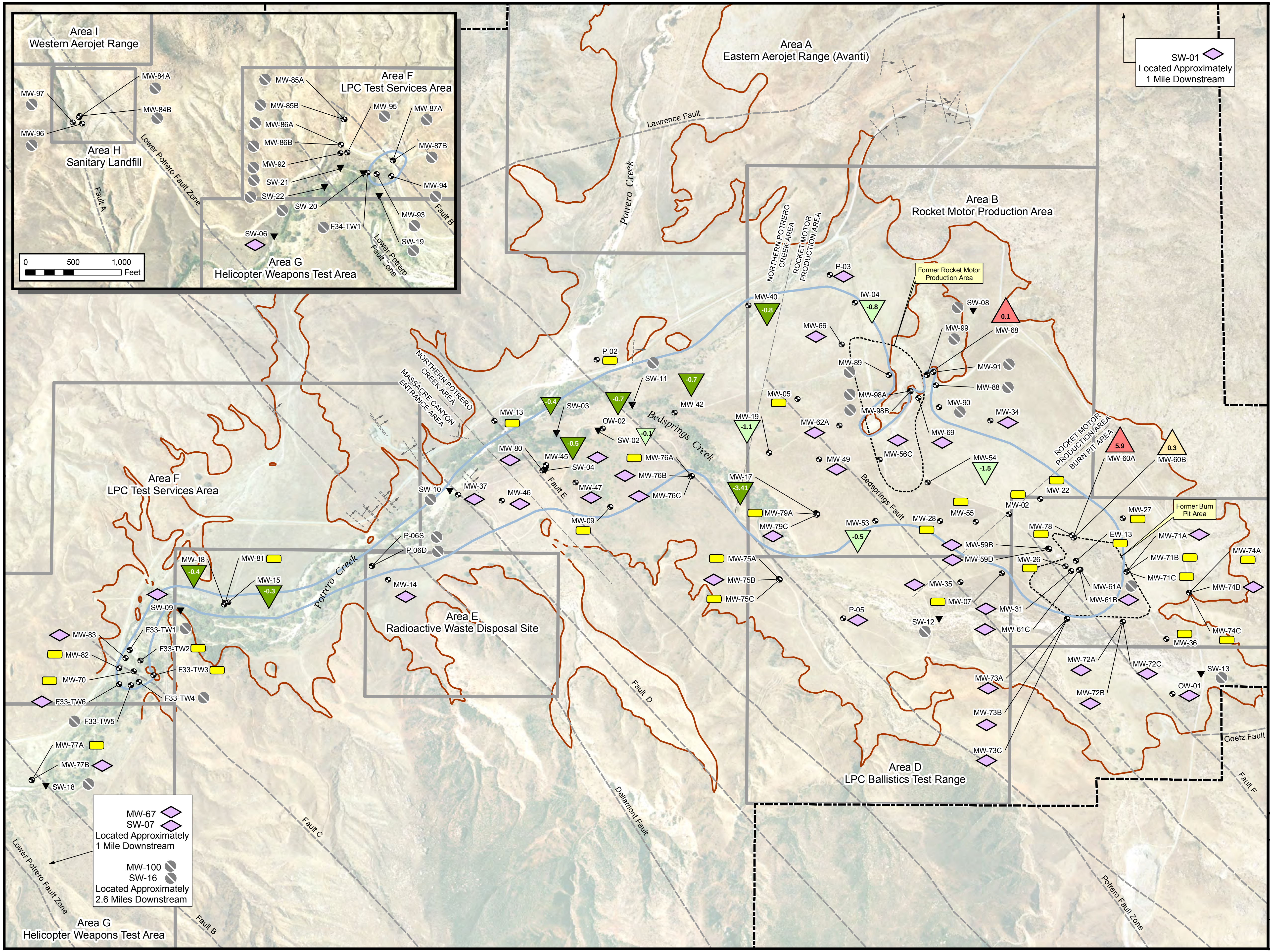
Beaumont Site 1 property boundary is approximate.

Beaumont Site 1

Figure 3-24
TCE Statistical Summary Analysis Results with Overlay Extent for Alluvium and Shallow Mount Eden Formation

TETRA TECH

X:\GIS\Lockheed S1 Q1Q209\Trend DIOX.mxd



N

0 500 1,000
Feet

Adapted from: March 2007 aerial photograph.

Faults from structural analysis of Potrero Valley, *Lineament and Geologic Mapping Study, Tetra Tech, 2009.*

LEGEND

●	Well Location
▼	Surface Water Sample Location
∿	DWNL Contour (3.0 µg/L) - Dashed where inferred
∿	Bedrock/Alluvium Surface Contact Dashed where inferred
╌	Fault, Accurately Located Showing Dip
╌	Fault, Approximately Located
▭	Historical Operational Area Boundary
▭	Beaumont Site 1 Property Boundary

Analyte Trend Results

▲ 2.00	Increasing Confidence in trend >95% (change shown in micrograms per liter per year (µg/L/yr)
▲ 2.00	Probably Increasing Confidence between 90 and 95% (change shown in µg/L/yr)
▼ -2.00	Probably Decreasing Confidence betwee 90 and 95% (change shown in µg/L/yr)
▼ -2.00	Decreasing Confidence in trend >95% (change shown in µg/L/yr)
◆	Stable Confidence in trend <90, coefficient of variation <1 and Mann-Kendall statistic ≤0
▬	No Trend Confidence in trend >90% and Mann-Kendall statistic >0 or confidence in trend <90%, coefficient of variation ≥1 and Mann-Kendall statistic ≤0
⊘	Insufficient Data for Statistical Analysis

Notes:

DWNL - Drinking Water Notification Level.

Beaumont Site 1 property boundary is approximate.

Beaumont Site 1

Figure 3-25

1,4-Dioxane Statistical Summary Analysis Results with Overlay Extent for Alluvium and Shallow Mount Eden Formation

TETRA TECH

3.10 HABITAT CONSERVATION

Consistent with the U.S. Fish and Wildlife Service approved HCP (USFWS, 2005) and subsequent clarifications (LMC, 2006a, 2006b and 2006c) of the HCP describing activities for environmental remediation at the Site, all field activities were performed under the supervision of a Section 10A permitted or sub-permitted biologist who monitored each work location. As a result, no impact to SKR occurred during the performance of the field activities related to the First Quarter 2009 and Second Quarter 2009 monitoring events.

4.0 SUMMARY AND CONCLUSIONS

Groundwater level measurements were collected for the First Quarter 2009 and Second Quarter 2009 water quality monitoring events. A total of 171 groundwater level measurements were collected for the First Quarter 2009 monitoring event and a total 171 groundwater level measurements were collected during the Second Quarter 2009 monitoring event. For the First Quarter 2009 monitoring event, 3 wells were observed to be dry and measurements from 2 other wells could not be collected due to obstructions in their casings. For the Second Quarter 2009 monitoring event, 3 wells were observed to be dry and measurements from 2 other wells could not be collected due to obstructions in their casings.

For the First Quarter 2009 monitoring event, a total of 6 sampling locations (6 well locations) were proposed and sampled for water quality monitoring.

For the Second Quarter 2009 monitoring event, a total of 114 sampling locations (17 surface water, 1 alternate surface water, and 95 monitoring wells) were proposed for water quality monitoring. Nine proposed surface water sample locations were not sampled because the locations were dry (SW-01, SW-08, SW-10, SW-11, SW-12, SW-13, SW-14, SW-15, and SW-16). SW-17, the alternate surface water location, was also dry and was not sampled. Therefore, water quality data was collected from 8 surface water and 95 monitoring wells locations.

4.1 GROUNDWATER ELEVATIONS

The Beaumont National Weather Station (NWS) reported approximately 4.3 inches of rain between December 2008 (Fourth Quarter 2008) and March 2009 (First Quarter 2009) and approximately 0.34 inches of precipitation between March 2009 (First Quarter 2009) and June 2009 (Second Quarter 2008). During this time period groundwater elevations generally decreased across the site. Groundwater elevation decreases were seen in wells located in the BPA and RMPA during First Quarter 2009 and Second Quarter 2009. Groundwater elevation increases were seen in wells located along Potrero Creek in the NPCA and the MCEA during the First Quarter 2009 followed by decreases during the Second Quarter 2009.

Groundwater elevations during the First Quarter 2009 monitoring event ranged from approximately 2,150 feet mean sea level (msl) upgradient of the former BPA to approximately 1,795 feet msl in the MCEA. Groundwater elevations during the Second Quarter 2009 monitoring event ranged from approximately 2,150 feet msl upgradient of the former BPA to approximately 1,795 feet msl in the MCEA.

Groundwater elevation differences in all wells from quarter to quarter appear to depend on the short- and long-term weather patterns. In general, the greatest differences in quarterly groundwater elevations occur during periods of seasonal precipitation. Wells located within the NPCA and the MCEA appear to respond the quickest to precipitation compared to the former BPA and RMPA, which generally respond 1 quarter later to seasonal precipitation. The response also diminishes within each area with depth and distance from the Potrero and Bedsprings Creeks. The site has experienced overall groundwater level declines since 2005; this decline in water levels coincides with a slight elongation in the plume geometry and increase in concentrations at the Site.

4.2 SURFACE WATER FLOW

During the First Quarter 2009 and Second Quarter 2009, the Potrero and Bedsprings creek riparian corridors were walked to determine the presence, nature, and quantity of surface water within the creek beds. The locations where surface water was encountered were plotted and a determination was made whether the water was flowing or stagnant. At specific locations where flowing water was encountered the flow rate was determined using a modified version of the EPA Volunteer Stream Monitoring: Methods Manual (USEPA 1997).

Four fixed stream locations, SF-1 through SF-4, were chosen for stream flow measurements, SF-1, located near Gilman Hot Springs at the southeast border of the Site, SF-2, located in the vicinity of MW-67, SF-3, located in the vicinity of MW-15 and 18, and SF-4, located near MW-42.

During First Quarter 2008 SF-1 had an average flow rate of 0.60 cubic feet per second (cfs), SF-2 had an average flow rate of 0.85 cfs, SF-3 had an average flow rate of 1.76 cfs, and SF-4 had insufficient flow for measurement. The average site flow rate for First Quarter 2009 is 1.07 cfs.

During Second Quarter 2008 SF-1 had insufficient flow for measurement, SF-2 had an average flow rate of 0.11 cfs, SF-3 had an average flow rate of 0.44 cfs, and SF-4 had insufficient flow for measurement. The average site flow rate for Second Quarter 2009 is 0.28 cfs.

4.3 EVAPOTRANSPIRATION MONITORING

The water level variations seen correlate well with the precipitation and evapotranspiration measurements, with rising water levels found during and following precipitation events and falling water levels that correlate with the time variation of evapotranspiration rates. In addition, the daily fluctuations in water levels show a daily trend, with decreasing water levels during the day when evapotranspiration is greatest and recovering water levels during the night. The trends and magnitude of the evapotranspiration rates derived from groundwater fluctuations generally matches the CIMIS evapotranspiration rate measurements from UCR.

Continuously recorded groundwater level data in the riparian area have confirmed that plants in the riparian area are pulling groundwater from the water table via evapotranspiration, and provided an estimate of the rate of groundwater withdrawal due to evapotranspiration. The long-term average evapotranspiration rate was found to be roughly 56.37 inches per year in areas where the water table is very close to the ground surface. This information was used in the site conceptual model and numerical flow model to estimate that the annual evapotranspiration from the site during the 1992-2008 period was an average of 139 acre-feet per year (Tetra Tech, Inc., 2009).

4.4 GROUNDWATER FLOW AND GRADIENTS

Groundwater flow directions from First Quarter 2009 and Second Quarter 2009 were similar to previously observed patterns for a dry period. Generally, groundwater flowed northwest from the southeastern limits of the valley (near the former BPA) beneath the former RMPA, towards Potrero Creek where groundwater flow then changes direction and begins heading southwest, parallel to the flow of Potrero Creek, into Massacre Canyon.

Between December 2008 (Fourth Quarter 2008) and March 2009 (First Quarter 2009), the overall groundwater gradient (approximating a flowline from MW-36, upgradient of the BPA, through the RMPA and NPCA to MW-18, in the MCEA) decreased to 0.012 ft/ft. Between March 2009 (First Quarter 2009) and June 2009 (Second Quarter 2008) the overall groundwater gradient through the same flow path increased to 0.013 ft/ft. In general the horizontal gradient is lowest between the BPA and the RMPA with a greatly increased flow through the NPCA and the MCEA. The flattening of the gradient in the BPA and RMPA appears to be attributed to the aquifer transmissivity and thickness in these areas.

Vertical groundwater gradients between shallow and deeper monitoring well pairs are generally negative in the BPA, RMPA, and the NPCA, and positive in the MCEA. The response to seasonal changes in groundwater recharge, although dampened by depth, are consistent within the different vertical well pairs installed at the Site. This suggests that there is vertical hydraulic communication within the aquifer.

4.5 WATER QUALITY

The GMP has a quarterly/semiannual/annual/biennial frequency. Both groundwater and surface water are collected and sampled as part of the GMP. The annual and biennial events are larger major monitoring events and the quarterly and semiannual events are smaller minor events. All new wells are sampled quarterly for 1 year. The semiannual wells are sampled 2nd and 4th quarter of each year, annual wells are sampled 2nd quarter of each year and the biennial wells are sampled 2nd quarter of even numbered years. The primary COPCs identified for the Site during the Second Quarter 2009 monitoring events were: perchlorate, 1,1-DCE, TCE and 1,4-dioxane. The secondary COPCs identified for the Site during the

Second Quarter 2009 monitoring event were: 1,1-DCA, 1,2-DCA, cis-1,2-DCE, and 1,1,1-TCA. These are consistent with the COPCs identified during the Second Quarter 2008 event. The results of surface and groundwater samples collected and tested during this quarterly and annual event are discussed below.

4.5.1 Surface Water

Surface water samples were collected in Second Quarter 2009 during the routine groundwater sampling event from 8 locations. The remaining 9 locations and the 1 alternate location were dry at the time of sampling. The 4 primary and none of the secondary COPCs were detected in surface water samples collected.

4.5.2 Groundwater

During the annual groundwater monitoring event (Tetra Tech, 2003b) plume wells, increasing contaminant trend wells, new wells, other select wells, and guard wells are sampled.

Plume Wells

The primary COPCs (perchlorate, 1,1-DCE, TCE and 1,4-dioxane) were reported in groundwater samples collected from the 50 wells designated as plume monitoring wells during the Second Quarter 2009 monitoring event. Perchlorate was detected in 33 of 50 groundwater samples collected at concentrations ranging from 0.61 µg/L to 74,000 µg/L in MW-61B located in the BPA. The perchlorate MCL of 6 µg/L was exceeded in 26 of the groundwater samples collected. 1,1-DCE was detected in 26 of 50 groundwater samples collected at concentrations ranging from 1.1 to 5,900 µg/L in MW-61B located in the BPA. The 1,1-DCE MCL of 6 µg/L was exceeded in 21 of the groundwater samples collected. TCE was detected in 26 of 50 groundwater samples collected at concentrations ranging from 1.9 to 2,700 µg/L in MW-26 located in the BPA. The TCE MCL of 5 µg/L was exceeded in 23 of the groundwater samples collected. 1,4-dioxane was detected in 29 of 50 groundwater samples collected at concentrations ranging from 0.69 to 1,600 µg/L in EW-13 located in the BPA. The 1,4-dioxane DWNL of 3 µg/L was exceeded in 27 of the groundwater samples collected.

In general, plume morphology does not appear to have changed significantly from Second Quarter 2008 The primary contaminant source area for perchlorate, 1,1-DCE, TCE and 1,4-dioxane appears to be the former BPA, but based on plume morphology secondary sources are present in the former RMPA and areas F-33, F-34, and F-39.

Increasing Trend Monitoring Wells

During Second Quarter 2008, (Tetra Tech, 2009a), 6 monitoring wells were designated as increasing or probably increasing trend monitoring wells: EW-13 (TCE), IW-04 (1,1-DCE), MW-31 (perchlorate), MW-55 (perchlorate), MW-59D (perchlorate), and MW-60A (perchlorate).

The concentration of TCE in groundwater samples collected from EW-13 was 2,100 µg/L in 2005 and 1,600 µg/L in 2006. The concentration of TCE peaked during Second Quarter 2007 at 3,200 µg/L. In Second Quarter 2008, EW-13 had a TCE concentration of 1.900 µg/L. The current concentration is 460 µg/L, which is down 2,740 µg/L from the Second Quarter 2007 concentration. Based on the Second Quarter 2009 trend analysis EW-13 is no longer considered an increasing trend well. EW-13 is located within the BPA which is a known source area.

The concentration of 1,1-DCE in groundwater samples collected from IW-04 was 8.7 µg/L in 2007 and 15 µg/L in 2008. The current concentration is 19 µg/L. IW-04 is located within the RMPA which is a known source area.

The concentration of perchlorate in groundwater samples collected from MW-31 was 2.4 µg/L in 2006 and peaked during Second Quarter 2008 at 4.33 µg/L. The current concentration is 2.5 µg/L. MW-31 is located in the BPA, which is a known source area.

The concentration of perchlorate in groundwater samples collected from MW-55 was 1,000 µg/L in 2006, 1,370 µg/L in 2007, and peaked during Second Quarter 2008 at 1,750 µg/L. The current concentration is 1,600 µg/L. MW-55 is located just downgradient of the BPA, which is a known source area.

The concentration of perchlorate in groundwater samples collected from MW-59D was 7,080 µg/L in 2006 and 6,940 µg/L in 2007, and 7,040 µg/L in 2008. The current concentration is 6,100 µg/L. MW-59D is located just downgradient of the BPA, which is a known source area.

The concentration of perchlorate in groundwater samples collected from MW-60A were 4,700 µg/L in 2005, 5,910 µg/L in 2006, and 5,740 µg/L 2008. The current concentration of perchlorate is 5,300 µg/L. MW-60A is located just downgradient of the BPA, which is a known source area.

Guard Wells

Three monitoring wells are designated as guard wells: MW-15, MW-18, and MW-67. Wells MW-15 and MW-18 are a clustered well pair. Well MW-18 is completed near the top of the alluvial aquifer and MW-15 is completed near the bottom of the alluvial aquifer. Well MW-67 is the furthest downgradient well and located approximately 0.9 miles upgradient of the southern Site boundary. The 3 wells are located along Potrero Creek, downgradient of the BPA and RMPA source areas.

In well MW-15 perchlorate was not detected above the MDL in groundwater samples collected. 1,1-DCE (2.6 µg/L), TCE (1.3 µg/L), and 1,4-dioxane (6.4 µg/L) were detected in groundwater samples collected from well MW-15. Previously (Fourth Quarter 2008), perchlorate was not detected above the MDL and concentrations of 1,1-DCE (2.4 µg/L), TCE (1.3 µg/L) and 1,4-dioxane (4.6 µg/L) were detected in groundwater samples collected from well MW-15 (Tetra Tech, 2009a). The MCLs for 1,1-DCE, TCE, and perchlorate are 6 µg/L, 5 µg/L, and 6 µg/L respectively. The DWNL for 1,4-dioxane is 3 µg/L. 1,4-dioxane is the only COPC to be detected above the MCL or DWNL.

In well MW-18 perchlorate (2.1 µg/L), 1,1-DCE (1.5 µg/L), TCE (1.2 µg/L), and 1,4-dioxane (6.5 µg/L) were detected in groundwater samples. Previously (Fourth Quarter 2008), perchlorate (3.07 µg/L), 1,1-DCE (1.8 µg/L), TCE (1.5 µg/L), and 1,4-dioxane(3.2 µg/L) were detected in groundwater samples collected from well MW-18 (Tetra Tech, 2009a). Only 1,4-dioxane and perchlorate have been detected above there respective MCL or DWNL.

In well MW-67 perchlorate, 1,1-DCE, and TCE were not detected above their respective MDLs. 1,4-dioxane was detected at 1.2 µg/L in groundwater samples collected. Previously (Fourth Quarter 2008), perchlorate, 1,1-DCE, TCE, and 1,4-dioxane were not detected above their respective MDLs in groundwater samples collected from well MW-67 (Tetra Tech, 2009a). 1,4-dioxane is the only COPC to be detected in this well.

4.6 MONITORED NATURAL ATTENUATION SAMPLING

The objective of the MNA sampling and analyses effort is to understand the geochemical characteristics that appear to be contributing to the natural attenuation of the low level perchlorate in groundwater in 2 areas: the Potrero Creek area that has migrated into the area from the BPA and the RMPA, and the area around the Large Motor Washout Area (F-33). In the F-33 area elevated perchlorate concentrations (up to 302 ppm at 16 feet below ground surface in F33- DP20, July 2008) have been detected in soil samples, while groundwater concentrations have fluctuated from below detection limits up to 48.5 µg/L.

The MNA sampling results confirm that the various geochemical parameters (redox conditions, the absence of electron acceptor competition, and the availability of low levels of useable organic carbon), as well as the environmental conditions in the aquifer, are within the required range to promote biodegradation of perchlorate in groundwater in the area. It appears this riparian area and its organic rich lithologic layers observed in the area are contributing to the TOC, which is in turn creating the small amounts of volatile fatty acids that provide the carbon substrate for perchlorate-reducing microorganisms. Seasonal detections of perchlorate in MW-70 may indicate that during periods of heavy rainfall, perchlorate contamination from the overlying soil is being flushed into the aquifer. However, the organic carbon in the aquifer does not appear to be sufficient to completely degrade the increased amount of perchlorate migrating from the vadose zone during periods of heavy rainfall, which results in temporary increases in perchlorate concentrations at MW-70. The concentrations of perchlorate in soil samples collected in the vicinity of the surrounding wells is much lower than in soil samples collected in the vicinity of MW-70. Therefore, even though the surrounding areas may also receive increased amounts of perchlorate migrating from the vadose zone during periods of heavy rainfall, the geochemical conditions still appear to be conducive to natural biodegradation.

It is likely that seasonal and long term changes in precipitation have an influence on the geochemical conditions observed, impacting the perchlorate reducing conditions. This is likely the reason for the fluctuation in perchlorate concentrations at MW-70. Monitoring should be continued to gain a better understanding of the geochemistry and its seasonal variations and to evaluate the long-term implications of these processes at F-33.

4.7 TEMPORAL TRENDS ANALYSIS

Groundwater sampling results from the 95 wells and 8 surface water locations sampled for COPCs during the Second Quarter 2009 were included in a temporal trend analysis of perchlorate, 1,1-DCE, TCE, and 1,4 dioxane (the primary COPCs). The temporal trend analyses were performed using data from Second Quarter 2002 to Second Quarter 2009. This period was chosen because operation of the RMPA PAT was discontinued in 2002. This temporal trend analysis updates the analysis performed following completion of the Second Quarter 2008 monitoring event (Tetra Tech, 2009a). The temporal trends were analyzed using Mann-Kendall and linear regression methods.

Twelve wells were found to display an increasing or probably increasing trend; IW-04: 1,1-DCE at 1.9 µg/L/yr, MW-28: perchlorate at 9.1 µg/L/yr and 1,1-DCE at 2.0 µg/L/yr, MW-31: perchlorate at 0.1 µg/L/yr, MW-46: 1,1-DCE at 0.2 µg/L/yr, MW-55: perchlorate at 87.4 µg/L/yr, MW-59D: perchlorate at 125 µg/L/yr, MW-60A: 1,4-dioxane at 5.9 µg/L/yr and perchlorate at 1,480 µg/L/yr, MW-60B: 1,4-dioxane at 0.3 µg/L/yr, MW-61C: 1,1-DCE at 5.4 µg/L/yr, MW-68: 1,4-dioxane at 1.0 µg/L/yr and perchlorate at 179 µg/L/yr, MW-71B: perchlorate at 34.6 µg/L/yr, and MW-80: TCE at 0.4 µg/L/yr. A summary of the trend analysis results for the 12 increasing or probably increasing trend wells is presented in Table 4-1. Wells MW-28, MW-31, MW-60A, MW-60B, MW-61C, and MW-71B are located in the BPA, well MW-59D is located just downgradient of the BPA, wells IW-04, MW-55, and MW-68 are located in the RMPA, and wells MW-46 and MW-80 are located in the NPCA. None of the 12 wells displaying increasing trends are guard wells. The farthest downgradient well displaying an increasing or probably increasing trend was MW-46, and the magnitude of the trend was 0.2 µg/L/yr for 1,1-DCE.

The number of increasing trend wells has increased from 6 wells in 2008 to 12 wells in the 2009 temporal trend analyses. Additionally in 2008 the farthest downgradient well was IW-04 located in the RMPA. In 2009 MW-46, located approximately 4250 feet downgradient of IW-04, was the farthest downgradient well. One possible reason for these changes is the increase in the sample size. As the sample size for the individual locations increase, the trends become more noticeable due to the ability to better define outliers. In general, the overall picture has not changed with the majority of the wells and the surface water locations displaying a stable trend or no trend. The guard wells MW-15, MW-18 and MW-67 primarily displayed stable or decreasing COPC trends, with the exception of MW-15, in which a TCE trend could not be discerned.

Table 4-1 Summary of Increasing COPC Trends – Second Quarter 2009

Analyte:	**Perchlorate Trend and Magnitude (ug/L/yr)**	**1,1-Dichloroethene Trend and Magnitude (ug/L/yr)**	**Trichloroethene Trend and Magnitude (ug/L/yr)**	**1,4-Dioxane Trend and Magnitude (ug/L/yr)**
Well Location				
IW-04	Decreasing (140)	**Increasing** (1.9)	No Trend	Probably Decreasing (0.8)
MW-28	**Increasing** (9.1)	**Probably Increasing** (2.0)	No Trend	No Trend
MW-31	**Increasing** (0.1)	No Trend	No Trend	Stable
MW-46	Probably Decreasing (2.6)	**Probably Increasing** (0.2)	No Trend	Stable
MW-55	**Increasing** (87.4)	No Trend	No Trend	No Trend
MW-59D	**Increasing** (125)	No Trend	No Trend	Stable
MW-60A	**Increasing** (1,480)	No Trend	No Trend	**Increasing** (5.9)
MW-60B	Decreasing (70.1)	Stable	No Trend	**Probably Increasing** (0.3)
MW-61C	Decreasing (421)	**Increasing** (5.4)	No Trend	Stable
MW-68	**Probably Increasing** (179)	No Trend	No Trend	**Increasing** (1)
MW-71B	**Increasing** (34.6)	No Trend	No Trend	No Trend
MW-80	Stable	No Trend	**Probably Increasing** (0.4)	Stable
Notes:	µg/L/yr - microgram per liter per year			

4.8 PROPOSED CHANGES TO THE GROUNDWATER MONITORING PROGRAM

The 23 monitoring wells recently installed during the DSI will continue to be sampled quarterly until they have been sampled for 4 quarters. After 4 quarters of sampling they will be evaluated for reclassification as specified in the Revised Groundwater Sampling and Analysis Plan (Tetra Tech, 2003b).

It is proposed to continue sampling monitoring wells F33-TW2, F33-TW3, F33-TW6, MW-82, and MW-83, located in the F-33 area, quarterly for perchlorate, VOCs, 1,4-dioxane, and natural attenuation parameters. Additionally it is proposed to change the sampling frequency of monitoring well MW-70 from annual to quarterly and sample for perchlorate, VOCs, 1,4-dioxane, and natural attenuation parameters. These changes will help in the evaluation of what effects seasonal changes have on the natural attenuation of perchlorate in the area.

Based on the results of the temporal trend analysis it is proposed that the frequency of sampling for increasing concentration trend wells MW-28, MW-46, MW-60B, MW-61C, MW-68, MW-71B, and MW-80 be increased from annual or biannual to semiannual. Continued semi-annual sampling for increasing trend wells IW-04, MW-31, MW-55, MW-59D, and MW-60A is proposed. EW-13 is no longer identified as an increasing trend well, and it is proposed to change its sampling frequency from semi-annual to annual. Additionally it is proposed to reclassify MW-29 as a plume monitoring well and to change the sampling frequency from suspended to annual to better define the perchlorate plume in the RMPA. No other changes to the number of wells being sampled or their frequency are proposed. A general summary of the current and proposed GMP is presented in Table 4-2.

Table 4-2 Summary of 2009 and Proposed 2010 Monitoring Program Well Sampling Status

Program Year	Semiannual Surface Water Samples	Quarterly Groundwater Samples	Semiannual Groundwater Samples	Annual Groundwater Samples	Biennial Groundwater Samples
2009	16	0	9	56	30
2010	18	7	15	51	22

No changes to the analytical program are proposed. All wells and surface water locations will continue to be tested for perchlorate, 1,4-dioxane, and VOCs. Well MW-60A, the 1 well that had concentrations of lead above the MCL in July 2004, continues to have lead concentrations above the MCL and will continue to be tested for lead annually. A detailed summary of the monitoring program proposed for 2010 is presented in Table 4-3. Surface water sampling will continue to be performed semiannually in the summer and fall. In addition, surface water samples will be collected during or soon after a storm event. Figure 4-1 presents the sampling locations and the frequency of the 2010 proposed GMP.

Table 4-3 Groundwater Quality Monitoring Frequency Recommendations

Well	Formation Screened	Well Classification	Monitoring Frequency		Comments
			2009	2010	
EW-13	MEF	Plume Monitoring	Semi-annual	Annual	TCE concentrations are stable, decrease to annual
MW-02	MEF	Plume Monitoring	Annual	Annual	
MW-05	QAL	Plume Monitoring	Annual	Annual	
MW-07	QAL	Plume Monitoring	Annual	Annual	
MW-09	QAL	Plume Monitoring	Annual	Annual	
MW-13	QAL	Plume Monitoring	Annual	Annual	
MW-14	QAL	Plume Monitoring	Annual	Annual	
MW-17	QAL	Plume Monitoring	Annual	Annual	
MW-19	QAL	Plume Monitoring	Annual	Annual	
MW-22	QAL	Plume Monitoring	Annual	Annual	
MW-26	MEF	Plume Monitoring	Annual	Annual	
MW-27	QAL	Plume Monitoring	Annual	Annual	
MW-29	MEF	Plume Monitoring	Suspend	Annual	
MW-34	QAL	Plume Monitoring	Annual	Annual	
MW-35	QAL	Plume Monitoring	Annual	Annual	
MW-36	QAL	Plume Monitoring	Annual	Annual	
MW-37	QAL	Plume Monitoring	Annual	Annual	
MW-40	MEF	Plume Monitoring	Annual	Annual	
MW-42	QAL	Plume Monitoring	Annual	Annual	
MW-45	QAL	Plume Monitoring	Annual	Annual	
MW-47	QAL	Plume Monitoring	Annual	Annual	
MW-49	QAL	Plume Monitoring	Annual	Annual	
MW-53	QAL	Plume Monitoring	Annual	Annual	
MW-54	QAL	Plume Monitoring	Annual	Annual	
MW-56C	QAL	Plume Monitoring	Annual	Annual	
MW-59B	MEF	Plume Monitoring	Annual	Annual	
MW-61A	MEF	Vertical Distribution	Annual	Annual	Fracture study well
MW-61B	MEF	Plume Monitoring	Annual	Annual	
MW-62A	QAL	Plume Monitoring	Annual	Annual	
MW-66	QAL	Plume Monitoring	Annual	Annual	
MW-69	QAL	Plume Monitoring	Annual	Annual	
MW-71A	Granite	Vertical Distribution	Annual	Annual	Fracture study well
MW-71C	MEF	Plume Monitoring	Annual	Annual	
MW-72A	Granite	Vertical Distribution	Annual	Annual	Fracture study well
MW-72B	MEF	Plume Monitoring	Annual	Annual	
MW-72C	QAL	Plume Monitoring	Annual	Annual	
MW-73A	MEF	Vertical Distribution	Annual	Annual	Fracture study well
MW-73B	MEF	Plume Monitoring	Annual	Annual	
MW-73C	QAL	Plume Monitoring	Annual	Annual	
MW-74A	Granite	Vertical Distribution	Annual	Annual	Fracture study well
MW-74B	Granite	Plume Monitoring	Annual	Annual	
MW-74C	MEF	Plume Monitoring	Annual	Annual	
MW-75B	QAL	Plume Monitoring	Annual	Annual	
MW-76B	QAL	Plume Monitoring	Annual	Annual	
MW-77B	MEF	Plume Monitoring	Annual	Annual	
MW-78	MEF	Vertical Distribution	Annual	Annual	Fracture study well
OW-01	QAL	Plume Monitoring	Annual	Annual	
OW-02	QAL	Plume Monitoring	Annual	Annual	
P-02	QAL	Plume Monitoring	Annual	Annual	
P-03	QAL	Plume Monitoring	Annual	Annual	
P-05	QAL	Plume Monitoring	Annual	Annual	
MW-01	MEF	Vertical Distribution	Biennial	Biennial	
MW-03	MEF	Vertical Distribution	Biennial	Biennial	
MW-06	QAL	Vertical Distribution	Biennial	Biennial	

Notes:

QAL - Quaternary alluvium.
QAL/MEF - Quaternary alluvium / Mt Eden.
MEF - Mount Eden Formation.
NA - Not available

Table 4 3 Groundwater Quality Monitoring Frequency Recommendations (continued)

Well	Formation Screened	Well Classification	Monitoring Frequency 2009	2010	Comments
MW-08	QAL	Vertical Distribution	Biennial	Biennial	
MW-11	QAL	Plume Monitoring	Biennial	Biennial	Site Boundary Well
MW-12	QAL	Plume Monitoring	Biennial	Biennial	Site Boundary Well
MW-23	QAL	Vertical Distribution	Biennial	Biennial	
MW-32	Granite	Vertical Distribution	Biennial	Biennial	
MW-43	QAL	Vertical Distribution	Biennial	Biennial	
MW-48	QAL	Vertical Distribution	Biennial	Biennial	
MW-56A	MEF	Vertical Distribution	Biennial	Biennial	
MW-56B	QAL	Vertical Distribution	Biennial	Biennial	
MW-59A	MEF	Vertical Distribution	Biennial	Biennial	
MW-75A	MEF	Vertical Distribution	Biennial	Biennial	
MW-75C	QAL	Vertical Distribution	Biennial	Biennial	
MW-76A	MEF	Vertical Distribution	Biennial	Biennial	
MW-76C	QAL	Vertical Distribution	Biennial	Biennial	
MW-77A	MEF	Vertical Distribution	Biennial	Biennial	
MW-79A	MEF	Vertical Distribution	Biennial	Biennial	
MW-79C	QAL	Vertical Distribution	Biennial	Biennial	
MW-81	MEF	Vertical Distribution	Biennial	Biennial	
OW-08	QAL	Plume Monitoring	Biennial	Biennial	Site boundary well
F33-TW2	QAL	MNA Monitoring	NA	Quarterly	F-33 - Large rocket motor washout area
F33-TW3	QAL	MNA Monitoring	NA	Quarterly	F-33 - Large rocket motor washout area
F33-TW6	QAL	MNA Monitoring	NA	Quarterly	F-33 - Large rocket motor washout area
F33-TW7	QAL	MNA Monitoring	NA	Quarterly	F-33 - Large rocket motor washout area
MW-70	QAL	MNA Monitoring	Annual	Quarterly	F-33 - Large rocket motor washout area
MW-82	QAL	MNA Monitoring	NA	Quarterly	F-33 - Large rocket motor washout area
MW-83	QAL	MNA Monitoring	NA	Quarterly	F-33 - Large rocket motor washout area
MW-84A	MEF	New Well	NA	Quarterly	New well - sample four quarters and evaluate
MW-84B	MEF	New Well	NA	Quarterly	New well - sample four quarters and evaluate
MW-85A	MEF	New Well	NA	Quarterly	New well - sample four quarters and evaluate
MW-85B	MEF	New Well	NA	Quarterly	New well - sample four quarters and evaluate
MW-86A	MEF	New Well	NA	Quarterly	New well - sample four quarters and evaluate
MW-86B	QAL/MEF	New Well	NA	Quarterly	New well - sample four quarters and evaluate
MW-87A	MEF	New Well	NA	Quarterly	New well - sample four quarters and evaluate
MW-87B	MEF	New Well	NA	Quarterly	New well - sample four quarters and evaluate
MW-88	QAL	New Well	NA	Quarterly	New well - sample four quarters and evaluate
MW-89	QAL	New Well	NA	Quarterly	New well - sample four quarters and evaluate
MW-90	QAL	New Well	NA	Quarterly	New well - sample four quarters and evaluate
MW-91	MEF	New Well	NA	Quarterly	New well - sample four quarters and evaluate
MW-92	MEF	New Well	NA	Quarterly	New well - sample four quarters and evaluate
MW-93	MEF	New Well	NA	Quarterly	New well - sample four quarters and evaluate
MW-94	MEF	New Well	NA	Quarterly	New well - sample four quarters and evaluate
MW-95	MEF	New Well	NA	Quarterly	New well - sample four quarters and evaluate
MW-96	MEF	New Well	NA	Quarterly	New well - sample four quarters and evaluate
MW-97	MEF	New Well	NA	Quarterly	New well - sample four quarters and evaluate
MW-98A	MEF	New Well	NA	Quarterly	New well - sample four quarters and evaluate
MW-98B	MEF	New Well	NA	Quarterly	New well - sample four quarters and evaluate
MW-99	MEF	New Well	NA	Quarterly	New well - sample four quarters and evaluate
MW-100	Granite	New Well	NA	Quarterly	New well - sample four quarters and evaluate
IW-04	QAL	Remedial Well	Semi-annual	Semi-annual	Increasing trend (1,1-DCE)
MW-15	QAL	Guard Well	Semi-annual	Semi-annual	
MW-18	QAL	Guard Well	Semi-annual	Semi-annual	
MW-28	QAL	Plume Monitoring	Annual	Semi-annual	Increasing trend (perchlorate, 1,1-DCE)
MW-31	Granite	Vertical Distribution	Semi-annual	Semi-annual	Increasing trend (perchlorate)
MW-46	QAL	Plume Monitoring	Annual	Semi-annual	Increasing trend (1,1-DCE)

Notes:

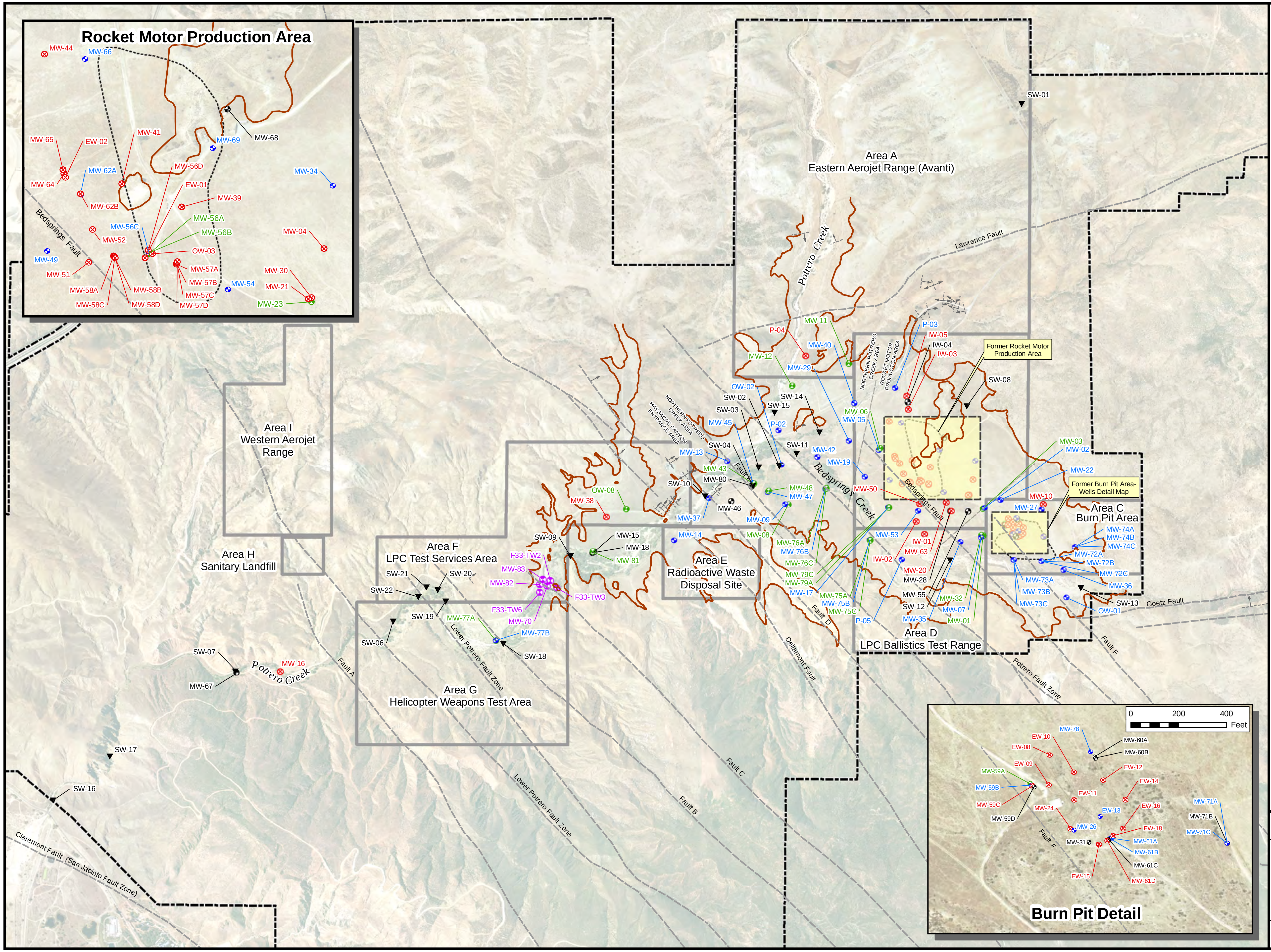
QAL - Quaternary alluvium.
QAL/MEF - Quaternary alluvium / Mt Eden.
MEF - Mount Eden Formation.
NA - Not available

Table 4 3 Groundwater Quality Monitoring Frequency Recommendations (continued)

Well	Formation Screened	Well Classification	Monitoring Frequency		Comments
			2009	2010	
MW-55	QAL	Vertical Distribution	Semi-annual	Semi-annual	Increasing trend (perchlorate)
MW-59D	MEF	Vertical Distribution	Semi-annual	Semi-annual	Increasing trend (perchlorate)
MW-60A	MEF	Vertical Distribution	Semi-annual	Semi-annual	Increasing trend (perchlorate, 1,4-dioxane) and continue to be sampled for lead annually
MW-60B	MEF	Plume Monitoring	Annual	Semi-annual	Increasing trend (1,4-dioxane)
MW-61C	MEF	Vertical Distribution	Annual	Semi-annual	Increasing trend (1,1-DCE), Fracture study well
MW-67	QAL	Guard Well	Semi-annual	Semi-annual	Installed in 2003 to replace MW-16
MW-68	QAL	Plume Monitoring	Annual	Semi-annual	Increasing trend (perchlorate, 1,4-dioxane)
MW-71B	QAL/MEF	Plume Monitoring	Annual	Semi-annual	Increasing trend (perchlorate)
MW-80	MEF	Vertical Distribution	Biennial	Semi-annual	Increasing trend (TCE)
EW-01	QAL	Remedial Well	Suspend	Suspend	Redundant, suspend pending GW remedial action
EW-02	QAL	Remedial Well	Suspend	Suspend	Redundant, suspend pending GW remedial action
EW-08	MEF	Redundant	Suspend	Suspend	Redundant with EW-13, MW-24, MW-61B
EW-09	MEF	Redundant	Suspend	Suspend	Redundant with EW-13, MW-24, MW-61B
EW-10	MEF	Redundant	Suspend	Suspend	Redundant with EW-13, MW-24, MW-61B
EW-11	MEF	Redundant	Suspend	Suspend	Redundant with EW-13, MW-24, MW-61B
EW-12	MEF	Redundant	Suspend	Suspend	Redundant with EW-13, MW-24, MW-61B
EW-14	QAL/MEF	Redundant	Suspend	Suspend	Redundant with EW-13, MW-24, MW-61B
EW-15	MEF	Redundant	Suspend	Suspend	Redundant with EW-13, MW-24, MW-61B
EW-16	MEF	Redundant	Suspend	Suspend	Redundant with EW-13, MW-24, MW-61B
EW-18	MEF	Redundant	Suspend	Suspend	Redundant with EW-13, MW-24, MW-61B
IW-01	QAL	Remedial Well	Suspend	Suspend	Redundant, suspend pending GW remedial action
IW-02	QAL	Remedial Well	Suspend	Suspend	Redundant, suspend pending GW remedial action
IW-03	QAL	Remedial Well	Suspend	Suspend	Redundant, suspend pending GW remedial action
IW-05	QAL	Remedial Well	Suspend	Suspend	Redundant, suspend pending GW remedial action
MW-04	QAL	Redundant	Suspend	Suspend	Redundant with MW-34
MW-10	QAL	Redundant	Suspend	Suspend	Redundant with MW-27
MW-20	QAL	Redundant	Suspend	Suspend	Poor construction and redundant with location MW-28
MW-21	QAL	Redundant	Suspend	Suspend	Poor construction, casing obstructed, replaced with MW-23
MW-24	MEF	Redundant	Suspend	Suspend	Casing obstructed, replaced with MW-26
MW-30	QAL	Redundant	Suspend	Suspend	Redundant with MW-23
MW-38	MEF	Redundant	Suspend	Suspend	Redundant with OW-08, outside Plume Monitoring Area
MW-39	QAL	Redundant	Suspend	Suspend	Redundant with MW-56C
MW-41	MEF	Redundant	Suspend	Suspend	Redundant with MW-62A
MW-44	QAL	Redundant	Suspend	Suspend	Redundant with MW-66
MW-50	QAL	Redundant	Suspend	Suspend	Redundant with MW-53
MW-51	QAL	Redundant	Suspend	Suspend	Redundant with MW-58D
MW-52	QAL	Redundant	Suspend	Suspend	Redundant with MW-49
MW-56D	QAL	Redundant	Suspend	Suspend	Redundant with MW-56B and MW-56C
MW-57A	QAL	Redundant	Suspend	Suspend	Redundant with MW-56C
MW-57B	QAL	Redundant	Suspend	Suspend	Redundant with MW-56B
MW-57C	QAL	Redundant	Suspend	Suspend	Redundant with MW-56B
MW-57D	QAL	Redundant	Suspend	Suspend	Redundant with MW-56C
MW-58A	QAL	Redundant	Suspend	Suspend	Redundant with MW-56B and MW-56D
MW-58B	QAL	Redundant	Suspend	Suspend	Redundant with MW-56C
MW-58C	QAL	Redundant	Suspend	Suspend	Redundant with MW-56C
MW-58D	QAL	Redundant	Suspend	Suspend	Redundant with MW-56D
MW-59C	MEF	Redundant	Suspend	Suspend	Redundant with MW-59A
MW-61D	MEF	Redundant	Suspend	Suspend	Obstruction in well, redundant with MW-61C
MW-62B	QAL	Redundant	Suspend	Suspend	Redundant with MW-62A
MW-63	QAL	Redundant	Suspend	Suspend	Redundant with MW-28
MW-64	QAL	Remedial Monitoring	Suspend	Suspend	Redundant, suspend pending GW remedial action
MW-65	QAL	Remedial Monitoring	Suspend	Suspend	Redundant, suspend pending GW remedial action
OW-03	QAL	Redundant	Suspend	Suspend	Redundant with MW-56A
P-04	QAL	Redundant	Suspend	Suspend	Redundant with MW-12

Notes:

QAL - Quaternary alluvium.
QAL/MEF - Quaternary alluvium / Mt Eden.
MEF - Mount Eden Formation.
NA - Not available



N

0 1,000 2,000 Feet

Adapted from: March 2007 aerial photograph.

Faults from structural analysis of Potrero Valley, *Lineament and Geologic Mapping Study, Tetra Tech, 2009.*

LEGEND

▼ Surface Water Sample Location
(sampled at a minimum semiannually)

WELL SAMPLING FREQUENCY

- ● Semi-annual
- ● Annual
- ● Biennial
- ● Quarterly
- ⊗ Redundant or Replaced (Not Sampled)
- Bedrock/Alluvium Surface Contact Dashed where inferred
- Fault, Accurately Located Showing Dip
- Fault, Approximately Located
- Historical Operational Area Boundary
- Beaumont Site 1 Property Boundary

Notes: Beaumont Site 1 property boundary is approximate.

Beaumont Site 1

Figure 4-1

Proposed 2010 Water Quality Monitoring Locations and Sampling Frequency

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6.0 ACRONYMS AND ABBREVIATIONS

B	The result is < 5 times the blank contamination. Cross contamination is suspected.
B	The surrogate spike recovery was outside control limits.
bgs	below ground surface
BPA	burn pit area
COPC	chemical of potential concern
COV	coefficient of variation
CSM	conceptual site model
1,1 DCA	1,1 dichloroethane
1,2 DCA	1,2 dichloroethane
1,1 DCE	1,1 dichloroethene
cis 1,2-DCE	cis 1,2-dichloroethene
DO	dissolved oxygen
DWNL	California drinking water notification level
DTSC	Department of Toxic Substances Control
e	A holding time violation occurred.
EC	electrical conductivity
EPA	United States Environmental Protection Agency
f	The duplicate relative percent difference was outside the control limit.
ft/day	feet per day
GMP	Groundwater Monitoring Program
GPS	global positioning system
GR	weathered granite / boulder
HCP	Habitat Conservation Plan
HSU	hydrostratigraphic unit
IUOE	International Union of Operating Engineers
J	The analyte was positively identified, but the analyte concentration is an estimated value.
K	hydraulic conductivity
k	The analyte was found in the field blank.

LEB	equipment blank
LMC	Lockheed Martin Corporation
LPC	Lockheed Propulsion Company
LTB	trip blank
MCL	Maximum Contaminant Level
MCEA	Massacre Canyon Entrance Area
MDLs	method detection limits
MEF	Mount Eden formation
MeV	Million electronic volts
mg/L	milligrams per liter
µg/L	microgram per liter
µg/L/yr	microgram per liter per year
MS/MSD	matrix spike/matrix spike duplicate
msl	mean sea level
MTBE	methyl-tert butyl ether
NA	not analyzed / applicable
NPCA	Northern Potrero Creek Area
NTUs	nephelometric turbidity units
NWS	National Weather Service
ORP	oxidation-reduction potential
PQL	practical quantitation limit
q	The analyte detection was below the practical quantitation limit.
QAL	Quaternary alluvium
QA/QC	quality assurance/quality control
Radian	Radian Corporation, Inc.
Report	Supplemental Site Investigation Report
RMPA	Rocket Motor Production Area
S	Mann-Kendall statistic
SKR	Stephens' Kangaroo Rat
Tetra Tech	Tetra Tech, Inc.

TOC	top of casing
TCE	trichloroethene
TNT	2,4,6-trinitrotoluene
1,1,1 TCA	1,1,1 trichloroethane
1,1,2 – TCA	1,1,2 trichloroethane
U	The analyte was not detected above the method detection limit.
UG	upgradient
USFWS	United States Fish and Wildlife Service
VOCs	volatile organic compounds