Semiannual Groundwater Monitoring Report
Second Quarter 2010 and Third Quarter 2010
Lockheed Martin Corporation, Beaumont Site 2
Beaumont, California

Prepared for:

LOCKHEED MARTIN

Prepared by:

TETRA TECH
301 E. Vanderbilt, Suite 450
San Bernardino, California 92408
TC# 25241-02.0302 / December 2010

Semiannual Groundwater Monitoring Report Second Quarter 2010 and Third Quarter 2010 Beaumont Site 2, Beaumont, California

Prepared for:

Lockheed Martin Corporation

Prepared by:

Tetra Tech, Inc.

December 2010

Christopher Patrick
Environmental Scientist

Mark Feldman, CHG CEG
Project Manager

TABLE OF CONTENTS

Section **Page**

LIST OF FIGURES

Page

LIST OF TABLES

Page

APPENDICES

Acronyms

AFCEE	Air Force Center for Environmental Excellence
ARCH	air rotary casing hammer
B	The result is < 5 times the blank contamination. Cross-contamination is suspected.
bgs	below ground surface
btoc	below top of casing
BOS	bottom of screen
CAM	California Assessment Manual
CDHS	California Department of Health Services
COPCs	chemical(s) of potential concern
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
DTSC	Department of Toxic Substances Control
DWNL	drinking water notification level
EC	electrical conductivity
EPA	United States Environmental Protection Agency
ft/ft	feet per foot
ft/day	feet per day
GCR	Grand Central Rocket Company

GMP	Groundwater Monitoring Program
HCP	Habitat Conservation Plan
HSA	hollow stem auger
HSUs	hydrostratigraphic units
K	hydraulic conductivity
LAC	Lockheed Aircraft Corporation
LEB	Lockheed equipment blank
LMC	Lockheed Martin Corporation
LPC	Lockheed Propulsion Company
LR	Linear Regression
LTB	Lockheed trip blank
MAROS	Monitoring and Remediation Optimization System
MW	monitoring well
MCLs	maximum contaminant levels
MDLs	method detection limits
mg/L	milligrams per liter
MS	matrix spike
MSD	matrix spike duplicate
msl	mean sea level
µg/L	micrograms/liter
NA	not applicable
NDMA	N-nitrosodimethylamine
ng/L	nanograms per liter
NWS	National Weather Service
PCE	Tetrachloroethene
PW	production well

PVC	polyvinyl chloride
PZ	piezometer
QAL	Quaternary alluvium
QA/QC	quality assurance/quality control
RDX	Hexahydro-1,3,5-trinitro-1,3,5-triazine
SAP	sampling and analysis plan
SKR	Stephens' Kangaroo rat
SS	stainless steel
STF	San Timoteo formation
SVOCs	semi-volatile organic compounds
TCE	trichloroethene
1,2,3-TCP	1,2,3-trichloropropane
TOC	top of casing
TOS	top of screen
1,1,1-TCA	1,1,1-trichloroethane
1,1,2-TCA	1,1,2-trichloroethane
Unk.	unknown
u-DMH	unsymmetrical dimethyl hydrazine
U.S.	United States
USFWS	United States Fish and Wildlife Service
VFA	volatile fatty acids
VOCs	volatile organic compounds
WCA	West Coast Analytical Services, Inc.
wSTF	weathered San Timoteo formation

Section 1 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 Second Quarter 2010 and Third Quarter 2010 groundwater quality monitoring activities for the Beaumont Site 2 (Site) Groundwater Monitoring Program (GMP). The Site is located southwest of the City of Beaumont, Riverside County, California (Figure 1-1). Currently, the Site is inactive with the exception of ongoing investigative activities performed under Consent Order (HSA 88/89-034, amended January 1, 1991) with the Department of Toxic Substances Control (DTSC).

The objectives of this Report are to:

- Briefly summarize the Site history;
- Document the water quality monitoring procedures and results;
- 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, and 4) Summary and Conclusions. A brief description of the previous site environmental investigations and the current conceptual site model (CSM) can be found in Appendix A.

1.1 Site Background

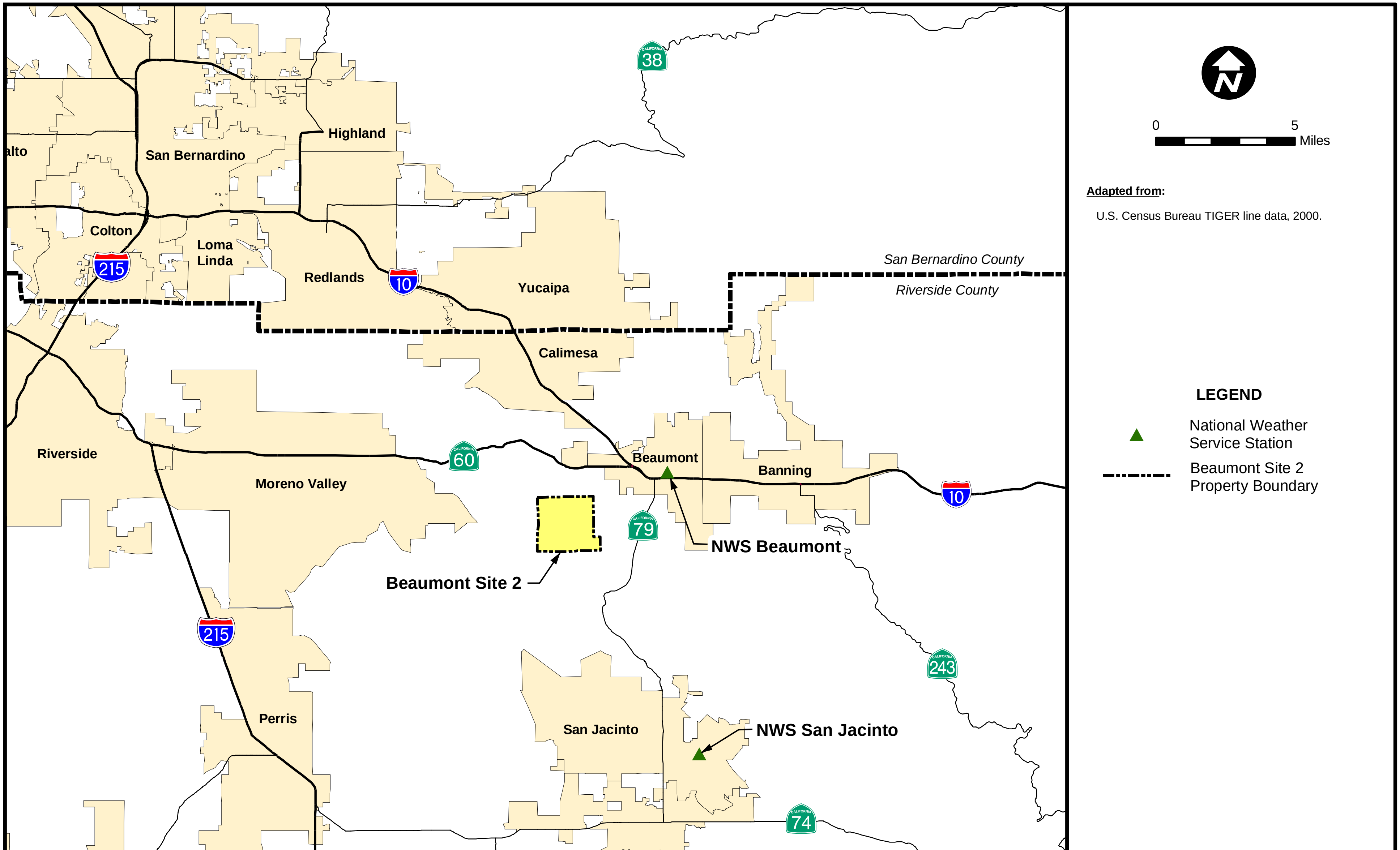
The Site is a 2,668 acre parcel located southwest of Beaumont, California. The parcels that comprise the Site were owned by individuals and the United States (U.S.) government prior to 1958. Between 1958 and 1960, portions of the Site were purchased by the Grand Central Rocket Company (GCR) and utilized as a remote test facility for early space and defense program efforts. In 1960, Lockheed Aircraft Corporation (LAC) purchased one-half interest in GCR. GCR became a wholly-owned subsidiary of LAC in 1961. The remaining parcels of land that comprise the Site were purchased from the U.S. government between 1961 and 1964. In 1963, Lockheed Propulsion Company (LPC) became an operating division of LAC and was responsible for the operation of the Site until its closure in 1974. The Site was utilized by GCR and LPC from 1958 to 1974 for small rocket motor assembly, testing operations, propellant incineration, and minor disposal activities. Ogden Labs is known to have leased portions of the Site in the 1970s (Radian, 1986a).

In 1989, the DTSC issued a Consent Order requiring LMC to clean up contamination at the Site related to past testing activities (CDHS, 1989). Based on investigative and cleanup activities performed at the Site, the DTSC issued a no further remedial action letter to LMC in 1993.

Based on regulatory interest in perchlorate and 1,4-dioxane, a groundwater sample was collected from an inactive groundwater production well (identified as W2-3) at the Site in January 2003. The sample was analyzed for volatile organic compounds (VOCs), perchlorate, and 1,4-dioxane to determine the potential presence and concentration of those chemicals in groundwater. The analytical results indicated that VOCs and 1,4-dioxane were not present at or above their respective method detection limits (MDLs). However, perchlorate was reported at a concentration of 4,080 micrograms per liter (µg/L), which exceeded the California Department of Public Health drinking water notification level (DWNL) which existed at that time of 6 µg/L. In October 2007 the DWNL was replaced by the California Department of Public Health Maximum Contaminant Level (MCL). Based on the detection of perchlorate in the groundwater sample collected, the DTSC reopened the Site for further assessment.

Four primary historical operational areas have been identified at the Site (Figure 1-2). Each operational area was responsible for various activities associated with rocket motor assembly, testing, and propellant incineration. A brief description of each operational area follows.

X:\GIS\Lockheed S2 Q2Q310\Region.mxd

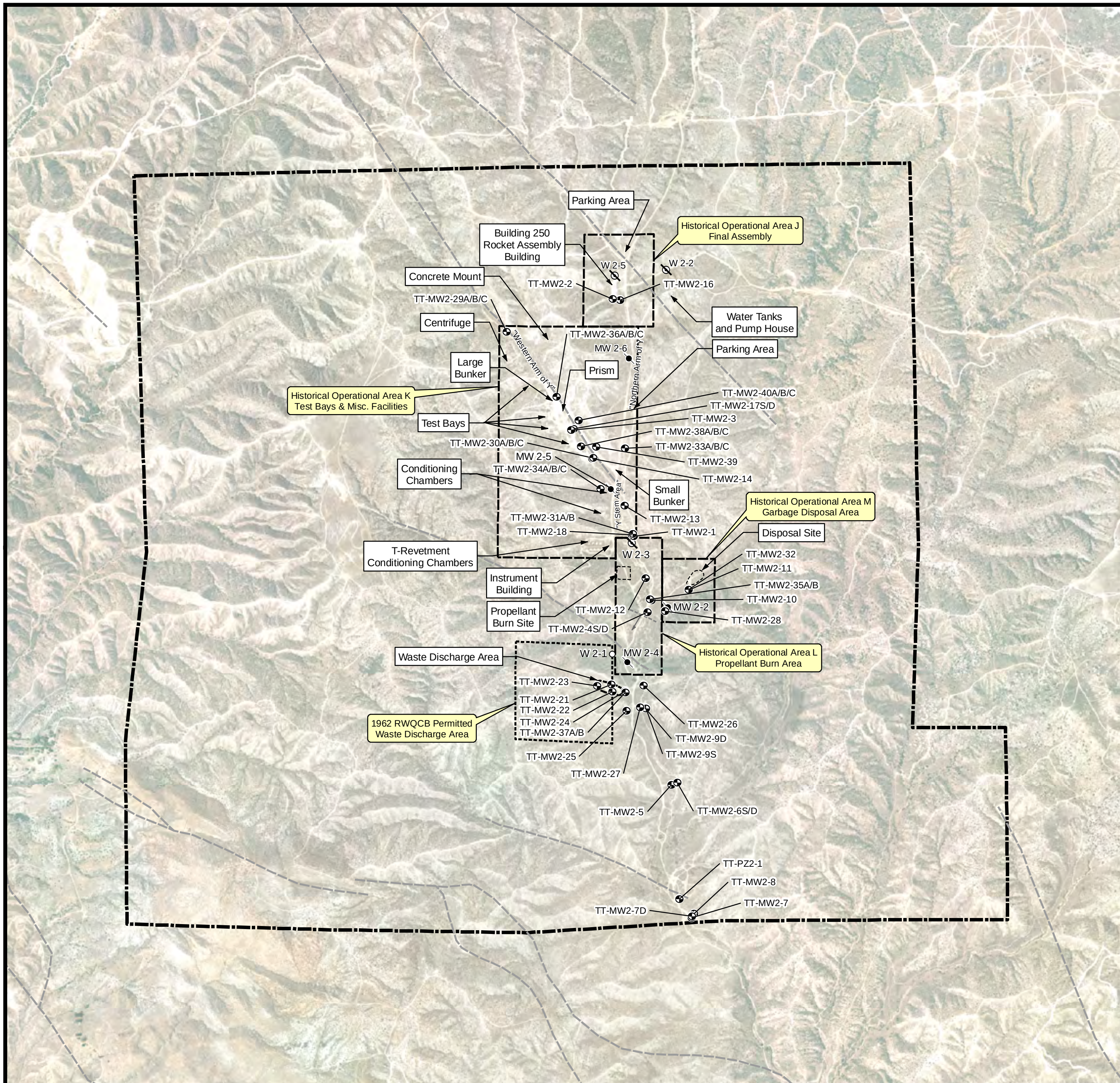


Beaumont Site 2

Figure 1-1
Regional Location of Beaumont Site 2

TETRA TECH

X:\GIS\Lockheed S2 Q2Q310Op_Areas.mxd



Adapted from:

March 2007 aerial photograph.

Faults from the, *Site 2 Lineament Study, Tetra Tech, 2009.*

LEGEND

- Groundwater Monitoring Well Location
- Destroyed Production Well Location
- Destroyed Monitoring Well Location
- Reported Production Well Location
- Fault, Accurately Located Showing Dip
- Fault, Approximately Located
- Waste Discharge Area
- RWQCB Permitted Waste Discharge Area
- Historical Operational Area Boundary
- Beaumont Site 2 Property Boundary

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

Disposal and Propellent Burn Site perimeters are estimated (Radian, 1986a).

Beaumont Site 2

Figure 1-2
Historical Operational Areas and Site Features

TETRA TECH

Historical Operational Area J (Area J) –Final Assembly

Rocket motor casings with solid propellant were transported to Building 250 where final assembly of the rocket hardware was conducted. The building was used from 1970 to 1974 for final assembly and shipment of short range attack missile rocket motors. Rocket motor assembly operations included installation of the nozzle and headcap, pressure check of the motor, installation of electrical systems, and preparations for shipment. During plant closure in 1974, all usable parts of this facility were dismantled, taken off the Site, and sold (Radian, 1986a).

Historical Operational Area K (Area K) – Test Bays and Miscellaneous Facilities

The primary features included a large earthen structure known as the "Prism," conditioning chambers, a centrifuge, and four test bays and two associated bunkers.

The Prism was reportedly built between 1984 and 1990 and was used to test radar by General Dynamics (Tetra Tech, 2007a). Details concerning construction of the Prism are not available, but it appears to have been constructed with soils from near the test bays.

The conditioning chambers were used to examine the effects of extreme temperatures on rocket motors and to meet specification requirements (Radian, 1986a). A centrifuge was located in the northwestern portion of Area K, where rocket motors were tested in order to determine if the solid propellant would separate from its casing under increased gravitational forces.

Previously, only three test bays were known; however, a former employee reported during a recent interview that a fourth test bay, located north of the other three bays, was also previously used in Area K (Tetra Tech, 2009). The initial testing activities had a history of explosions that destroyed complete test areas, especially during the period when GCR operated at the Site (Radian, 1986a). While vestiges from three test bays are currently visible at the Site, the fourth was reportedly destroyed by such an explosion during testing. Also reportedly, after motor failure, the area was checked to recover unburned propellant.

Historical Operational Area L (Area L) – Propellant Burn Area

Solid propellant was reportedly transported to the burn area and set directly on the ground surface for burning (Radian, 1986a). No pits or trenches were dug as part of the burning process. The solid propellant was saturated with diesel fuel to initiate combustion. Reportedly, the solid propellant would burn rapidly. There is no evidence or physical features that identify the precise location of burning activities, and previous site investigations (Tetra Tech, 2005; Tetra Tech, 2010b) found no evidence of significant contamination in Area L.

Historical Operational Area M (Area M) – Garbage Disposal Site

A garbage disposal area was located adjacent to a small creek at the Site (Radian, 1986a). Scrap metal, paper, wood, and concrete materials were disposed of at the disposal site by LPC. Hazardous materials, including explosives and propellants, were never disposed of at the disposal site by LPC according to employee interviews. Ogden Labs, a company that tested valves and explosive items, also reportedly used this site for disposal of hazardous waste. In 1972, a Lockheed Safety Technician was exposed to toxic vapors of unsymmetrical dimethyl hydrazine (u-DMH) from a pressurized gas container located within the disposal site. Based on potential exposure risks to occupants, LPC's safety group required Ogden Labs to take measures to remove any potentially hazardous materials at the disposal site. Shortly thereafter, a disposal company was contracted by Ogden Labs to clean up the disposal site (Radian, 1986a).

Waste Discharge Area (WDA)

In 2007, LMC discovered the existence of Santa Ana River Basin Regional Water Pollution Control Board Resolution 62-24, dated September 14, 1962. Resolution 62-24 prescribed requirements for the "discharge of industrial wastes (rocket fuel residuum) to excavated pits." The discharge area was described as two shallow basins protected by two-foot berms, located in a small canyon on the western side of Laborde Canyon, in the SW ¼ of the NW ¼ of Section 19, Township 3 South, Range 1 West, San Bernardino Baseline and Meridian. Resolution 62-24 further describes the wastes to be discharged as "residue remaining after the manufacturing refuse is burned," and indicates that amount of material to be discharged was "approximately 5,000 gallons per year."

The exact nature of the waste proposed for discharge is not clear from the Resolution 62-24. The description of the waste material suggests that the area may have been used for burning propellant; but the description of the quantity of material to be discharged suggests that the waste may have been liquid rather than solid. A 1961 aerial photograph shows the WDA as a large cleared area with roads leading to two circular structures, suggesting that the WDA was in use by 1961 (Tetra Tech, 2009a). Investigation of this area (Tetra Tech, 2007c; 2008a) found evidence for perchlorate impacts in both soil and groundwater.

Features remaining at the WDA include two roughly circular depressions surrounded by earthen berms, at the location of the circular structures identified in the 1961 aerial photograph.

Section 2 Summary of Monitoring Activities

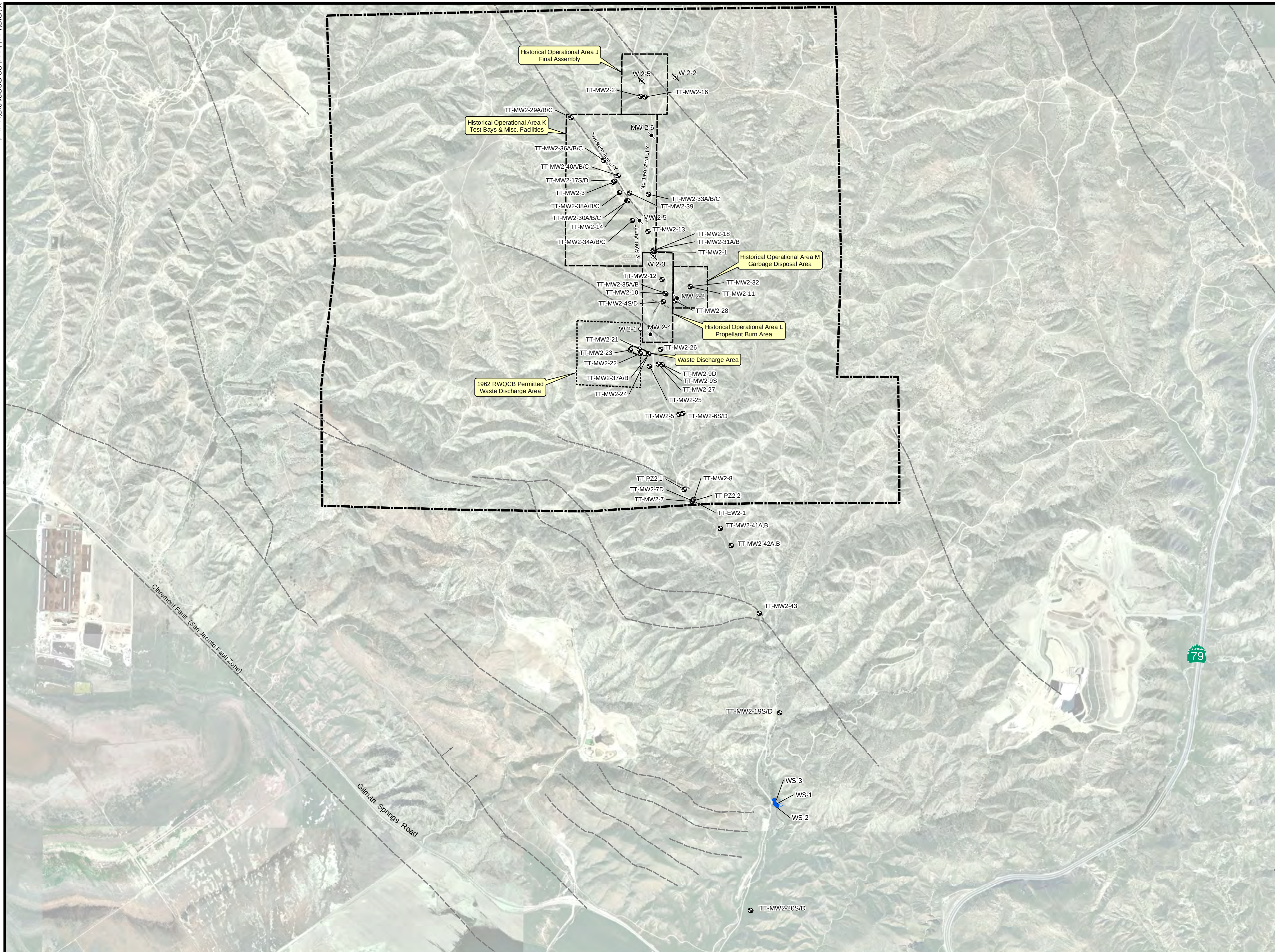
Section 2 summarizes the Second Quarter 2010 and Third Quarter 2010 groundwater monitoring events conducted at the Site. The results from these monitoring events are discussed in Section 3.

2.1 Groundwater Level Measurements

Groundwater level measurements are collected at the Site on a quarterly basis from all available wells. Water level measurements for 69 wells and two piezometers were proposed for Second Quarter 2010 and Third Quarter 2010. During Second Quarter 2010 groundwater level measurements were collected from 67 monitoring wells and two piezometers between 17 May 2010 and 18 May 2010. During Third Quarter 2010 groundwater level measurements were collected from 67 monitoring wells and two piezometers between 27 August 2010 and 30 August 2010. Two monitoring wells, TT-MW2-29A and TT-MW2-43, were found to be dry during both quarters. Figure 2-1 presents a site map showing the well locations. Copies of the 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 Groundwater Sampling

The GMP has a quarterly, semiannual, and annual frequency. Both groundwater and surface water are sampled as part of the GMP. The annual event is the major monitoring event and the quarterly and semiannual events are smaller, minor events. All new wells are sampled quarterly for one year, after which they are evaluated and reclassified. The semiannual event includes horizontal extent, vertical distribution, increasing contaminant, and guard wells and occurs during the second and fourth quarter of each year. The annual monitoring event includes background wells and takes place during the second quarter of each year. The groundwater monitoring schedule is reviewed and modified as necessary annually during the Second Quarter groundwater monitoring event. Modifications are done in accordance with the approved Groundwater Sampling and Analysis Plan (SAP) (Tetra Tech, 2007b). Second Quarter 2010 and Third Quarter 2010 follow the schedule proposed in the Second and Third Quarter 2009 monitoring report (Tetra Tech, 2010a) which was presented to the DTSC in March 2010 and approved with no comments to the proposed schedule.



0 1,000 2,000
Feet

Adapted from:

Faults from the, *Site 2 Lineament Study, Tetra Tech, 2009.*

LEGEND

- Spring Location
- Groundwater Monitoring Well Location
- Destroyed Production Well Location
- Destroyed Monitoring Well Location
- Reported Production Well Location
- Fault, Accurately Located Showing Dip
- Fault, Approximately Located
- Waste Discharge Area
- RWQCB Permitted Waste Discharge Area
- Historical Operational Area Boundary
- Beaumont Site 2 Property Boundary

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

Beaumont Site 2

Figure 2-1

Site Map

TETRA TECH

X:\GIS\Lockheed S2 Q2Q310\Site.mxd

During the Second Quarter 2010 monitoring event 62 groundwater monitoring well samples, five private production wells and/or spring samples, and three surface water samples were collected between 3 May 2010 and 19 July 2010. One private spring and two monitoring wells, TT-MW2-29A and TT-MW2-43, were dry and could not be sampled. Additionally, the pump in one private production well was not operational and could not be sampled. During the Third Quarter 2010 monitoring event, six groundwater samples and two surface water samples were collected between 8 September 2010 and 10 September 2010. Tables 2-1 and 2-2 list the locations monitored for the Second Quarter 2010 and Third Quarter 2010 monitoring events, analytical methods, sampling dates, and Quality Assurance/Quality Control (QA/QC) samples collected. Figures 2-2 and 2-3 illustrate the well locations sampled for the Second Quarter 2010 and Third Quarter 2010 monitoring events, respectively. Groundwater sampling, analytical, and QA/QC procedures for the monitoring event were described in the Groundwater Monitoring Well Installation Work Plan (Tetra Tech, 2004a) and the SAP.

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, dissolved oxygen (DO) and oxidation/reduction potential (ORP). Measurement of water quality parameters was initiated when at least one 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 was 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, and EC ± 3%, turbidity < 10 nephelometric turbidity units (NTUs) (or ± 10% if turbidity stabilizes at > 10 NTUs), DO ± 0.3 mg/L and ORP ± 10 mV. Sampling instruments and equipment were maintained, calibrated, and operated in accordance with the manufacturer’s specifications, guidelines, and recommendations. Groundwater monitoring wells were purged and sampled using low-flow purging and sampling techniques with dedicated double valve sampling pumps or a portable bladder pump.

For the Second Quarter 2010 and Third Quarter 2010 monitoring events, every effort was made to collect groundwater samples in order of increasing perchlorate and TCE concentration. Samples were placed in appropriate EPA method specified containers. A sample identification label was affixed to each sample container, and sample custody was maintained by a chain-of-custody record. Groundwater samples collected for the monitoring events were chilled and transported to E. S. Babcock & Sons, Inc., a state-accredited analytical laboratory, via courier, thus maintaining proper temperatures and sample integrity. Lockheed trip blanks (LTBs) were collected on each day of the monitoring events to assess potential cross-contamination of water samples while in transit. Lockheed equipment blanks (LEBs) were collected when sampling with non-dedicated equipment to assess cross-contamination potential of water samples via sampling equipment.

2.3 Surface Water Sampling

Storm water locations SW-01 through SW-07 are located in the ephemeral creek bed that runs through Laborde Canyon. Storm water runoff collects in the creek during periods of heavy precipitation and runs south through the Site and the former Wolfskill property, eventually crossing under Gilman Hot Springs Road. Water is present in the creek bed only during periods of heavy, prolonged precipitation. Surface water locations WS-1, WS-2 and WS-3 are spring locations on the former Wolfskill property. Water is generally present at one or more of these locations throughout the year.

During Second Quarter 2010, surface water samples were collected from three locations, WS-1, WS-2, and WS-3, and were analyzed for perchlorate. During Third Quarter 2010, surface water samples were collected from two locations, WS-1 and WS-2, and were analyzed for perchlorate. Surface water location WS-3 did not have flowing water so a sample was not collected during Third Quarter 2010. No other surface or storm water samples were collected during this reporting period. Figure 2-4 presents the surface and storm water sampling locations.

Table 2-1 Sampling Schedule and Analysis Method - Second Quarter 2010

Monitoring Well or Surface Water Location	Sample Date	VOCs (1)	1,4-Dioxane (2)	Per chlorate (3)	NDMA (4)	RDX (5)	CAM 17 Metals - Total (6)	CAM 17 Metals - Dissolved (6)	Natural Attenuation Parameters (7)	Expanded Natural Attenuation Parameters (8)	Comments and QA / QC Samples
WS-1	06/30/10	-	-	X	-	-	-	-	-	-	Spring Sample
WS-2	06/30/10	-	-	X	-	-	-	-	-	-	Spring Sample, Duplicate
WS-3	06/30/10	-	-	X	-	-	-	-	-	-	Spring Sample
PPW-1	05/03/10	-	-	X	-	-	-	-	-	-	Private Production Well
PPW-2	05/03/10	-	-	X	-	-	-	-	-	-	Private Production Well
PPW-3	05/05/10	-	-	X	-	-	-	-	-	-	Private Production Well
PPW-4	NA	-	-	NA	-	-	-	-	-	-	Private Production Well, Pump not operational
PPW-5	05/03/10	-	-	X	-	-	-	-	-	-	Private Spring
PPW-6	NA	-	-	NA	-	-	-	-	-	-	Private Spring, Dry
PPW-7	05/03/10	-	-	X	-	-	-	-	-	-	Private Spring
TT-MW2-1	07/15/10	X	-	X	-	X	X	-	X	X	Sample with Dedicated Pump, Duplicate
TT-MW2-2	07/02/10	X	-	X	-	-	X	-	-	X	Sample with Dedicated Pump
TT-MW2-4S	06/28/10	X	-	X	-	-	X	-	-	X	Sample with Dedicated Pump
TT-MW2-5	07/01/10	X	X	X	-	-	X	-	X	X	Sample with Dedicated Pump
TT-MW2-6S	06/25/10	X	-	X	-	-	X	-	-	X	Sample with Dedicated Pump
TT-MW2-6D	06/25/10	X	-	X	-	-	X	-	-	X	Sample with Dedicated Pump
TT-MW2-7	06/29/10	X	-	X	-	-	X	X	X	X	Sample with Dedicated Pump
TT-MW2-7D	06/29/10	X	-	X	-	-	X	-	-	X	Sample with Dedicated Pump
TT-MW2-8	06/29/10	X	-	X	-	-	X	X	-	X	Sample with Dedicated Pump, Duplicate
TT-MW2-9S	06/25/10	X	X	X	-	-	X	-	X	X	Sample with Dedicated Pump
TT-MW2-9D	06/25/10	X	-	X	-	-	X	-	-	X	Sample with Dedicated Pump
TT-MW2-10	06/28/10	X	-	X	-	-	X	-	X	X	Sample with Dedicated Pump
TT-MW2-11	06/28/10	X	-	X	-	-	X	-	-	X	Sample with Dedicated Pump
TT-MW2-12	06/29/10	X	-	X	-	-	X	-	X	X	Sample with Dedicated Pump
TT-MW2-13	07/15/10	X	-	X	-	X	X	-	-	X	Sample with Dedicated Pump
TT-MW2-14	07/19/10	X	-	X	-	X	X	-	X	X	Sample with Dedicated Pump
TT-MW2-16	07/15/10	X	-	X	-	X	X	-	-	X	Sample with Dedicated Pump
TT-MW2-17S	07/01/10	X	-	X	-	-	X	-	-	X	Sample with Dedicated Pump
TT-MW2-17D	07/01/10	X	-	X	-	-	X	-	X	X	Sample with Dedicated Pump, Duplicate
TT-MW2-18	06/28/10	X	-	X	-	-	X	-	-	X	Sample with Dedicated Pump
TT-MW2-19S	06/23/10	-	X	X	X	-	X	-	-	X	Sample with Portable Bladder Pump, NDMA Test Well
TT-MW2-19D	06/24/10	-	-	X	-	-	X	-	-	X	Sample with Dedicated Pump
TT-MW2-20S	06/30/10	-	X	X	X	-	X	-	-	X	Sample with Dedicated Pump
TT-MW2-20D	06/30/10	-	-	X	-	-	X	-	-	X	Sample with Dedicated Pump
TT-MW2-21	06/25/10	X	X	X	X	-	X	-	-	X	Sample with Dedicated Pump
TT-MW2-22	06/25/10	X	-	X	-	-	X	-	-	X	Sample with Dedicated Pump, Duplicate
TT-MW2-23	06/25/10	X	-	X	-	-	X	-	X	X	Sample with Dedicated Pump, MS/MSD
TT-MW2-24	07/16/10	X	X	X	X	X	X	-	X	X	Sample with Portable Bladder Pump, Duplicate, NDMA Test Well
TT-MW2-25	06/25/10	X	-	X	X	-	X	-	-	X	Sample with Dedicated Pump
TT-MW2-26	06/30/10	X	X	X	X	-	X	-	-	X	Sample with Portable Bladder Pump, NDMA Test Well
TT-MW2-27	06/25/10	X	-	X	-	-	X	-	-	X	Sample with Dedicated Pump
TT-MW2-28	06/21/10	X	-	X	X	-	X	-	-	X	Sample with Portable Bladder Pump, NDMA Test Well
TT-MW2-29A	NA	-	-	-	-	-	-	-	-	-	Dry
TT-MW2-29B	06/23/10	X	-	X	X	-	X	-	-	X	Sample with Portable Bladder Pump, NDMA Test Well
TT-MW2-29C	07/01/10	X	-	X	-	-	X	-	-	X	Sample with Dedicated Pump
TT-MW2-30A	07/01/10	X	-	X	-	-	X	-	-	X	Sample with Dedicated Pump
TT-MW2-30B	07/01/10	X	-	X	-	-	X	-	-	X	Sample with Dedicated Pump
TT-MW2-30C	07/01/10	X	-	X	-	-	X	-	-	X	Sample with Dedicated Pump
TT-MW2-31A	06/28/10	X	-	X	-	-	X	-	-	X	Sample with Dedicated Pump
TT-MW2-31B	07/02/10	X	-	X	-	-	X	-	-	X	Sample with Dedicated Pump
TT-MW2-32	06/28/10	X	-	X	-	-	X	-	-	X	Sample with Dedicated Pump
TT-MW2-33A	06/21/10	X	-	X	-	-	X	-	-	X	Sample with Dedicated Pump
TT-MW2-33B	06/21/10	X	-	X	-	-	X	-	-	X	Sample with Dedicated Pump
TT-MW2-33C	06/21/10	X	-	X	-	-	X	-	-	X	Sample with Dedicated Pump
TT-MW2-34A	06/29/10	X	-	X	-	-	X	-	-	X	Sample with Dedicated Pump
TT-MW2-34B	06/29/10	X	-	X	-	-	X	-	-	X	Sample with Dedicated Pump
TT-MW2-34C	06/29/10	X	-	X	-	-	X	-	-	X	Sample with Dedicated Pump
TT-MW2-35A	06/28/10	X	-	X	-	-	X	-	-	X	Sample with Dedicated Pump
TT-MW2-35B	06/28/10	X	-	X	-	-	X	-	-	X	Sample with Dedicated Pump
TT-MW2-36A	06/22/10	X	-	X	X	-	X	-	X	X	Sample with Portable Bladder Pump, NDMA Test Well
TT-MW2-36B	06/23/10	X	-	X	-	-	X	-	-	X	Sample with Dedicated Pump
TT-MW2-36C	06/23/10	X	-	X	-	-	X	-	-	X	Sample with Dedicated Pump
TT-MW2-37A	06/30/10	X	X	X	-	-	X	-	-	X	Sample with Dedicated Pump
TT-MW2-37B	06/30/10	X	-	X	-	-	X	-	-	X	Sample with Dedicated Pump
TT-MW2-38A	06/23/10	X	-	X	-	-	X	-	-	X	Sample with Dedicated Pump
TT-MW2-38B	07/01/10	X	-	X	-	-	X	-	-	X	Sample with Dedicated Pump
TT-MW2-38C	07/01/10	X	-	X	-	-	X	-	-	X	Sample with Dedicated Pump
TT-MW2-39	06/21/10	X	-	X	-	-	X	-	-	X	Sample with Dedicated Pump, Duplicate
TT-MW2-40A	06/23/10	X	-	X	-	-	X	-	-	X	Sample with Dedicated Pump
TT-MW2-40B	06/23/10	X	-	X	-	-	X	-	-	X	Sample with Dedicated Pump
TT-MW2-40C	06/23/10	X	-	X	-	-	X	-	-	X	Sample with Dedicated Pump
TT-MW2-41A	06/24/10	-	X	X	X	-	X	X	-	X	Sample with Dedicated Pump
TT-MW2-42A	06/22/10	-	X	X	X	-	X	X	X	X	Sample with Portable Bladder Pump
TT-MW2-43	NA	-	-	-	-	-	-	-	-	-	Dry

Total Sample Locations: 74
Total Samples Collected: 70

Notes:

(shaded)	Well not sampled or surface water sample not collected.	(1) -	VOCs analyzed by EPA Method 8260 B.
VOCs -	Volatile Organic Compounds	(2) -	1,4 - Dioxane analyzed by EPA Method 8270C SIM.
NDMA -	N-Nitrosodimethylamine	(3) -	Perchlorate analyzed by EPA Method 332.0.
RDX -	Hexahydro-1,3,5-trinitro-1,3,5-triazine	(4) -	NDMA analyzed by EPA Method 521.
QA/QC -	Quality assurance / quality control	(5) -	RDX analyzed by EPA Method 8330.
NA -	Not available.	(6) -	CAM 17 metals analyzed by EPA Methods 6020/200.8
"-"	Not analyzed	(7) -	Natural attenuation parameters by various methods
MS / MSD -	Matrix Spike / Matrix Spike Duplicate.	(8) -	Expanded natural attenuation parameters by various methods
EPA -	United States Environmental Protection Agency.		

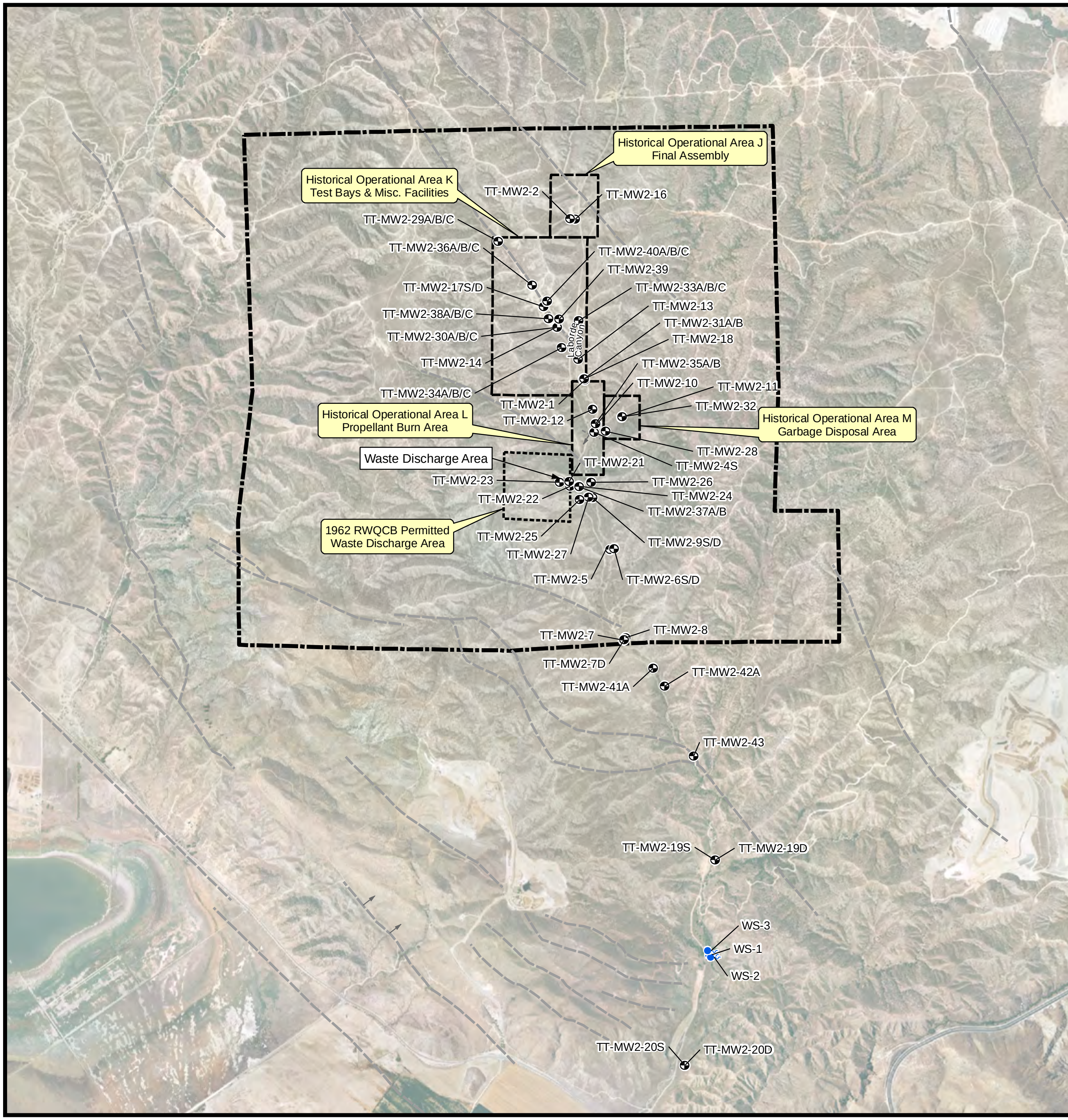
Table 2-2 Sampling Schedule and Analysis Method - Third Quarter 2010

Monitoring Well Location	Sample Date	Perchlorate (EPA 332.0)	Comments and QA /QC Samples
WS-1	9/10/2010	X	Spring Sample, MSMSD,
WS-2	9/10/2010	X	Spring Sample
WS-3	NA	-	Mud
TT-MW2-19S	09/08/10	X	Sample with Dedicated Pump, Duplicate
TT-MW2-19D	09/08/10	X	Sample with Dedicated Pump
TT-MW2-20S	09/08/10	X	Sample with Dedicated Pump, MS/MSD
TT-MW2-20D	09/08/10	X	Sample with Dedicated Pump
TT-MW2-41A	9/10/2010	X	Sample with Dedicated Pump
TT-MW2-42A	9/10/2010	X	Sample with Portable Bladder Pump
TT-MW2-43	NA	-	Dry
First Quarter 2010:	Total Sample Locations:		10
	Total Samples Collected:		8

Notes:

(shaded)	Well not sampled or surface water sample not collected.
EPA -	United States Environmental Protection Agency.
QA/QC -	Quality assurance / quality control
MS / MSD-	Matrix Spike / Matrix Spike Duplicate.
"-"	Not analyzed
NA -	Not available.

X:\GIS\Lockheed S2 Q2Q310\Samp_Points Q210.mxd



N

0 1,500 3,000
Feet

Adapted from:

April 2007 aerial photograph.

Faults from the, *Site 2 Lineament Study, Tetra Tech, 2009.*

LEGEND

Groundwater Monitoring Well Location

Surface Sample Location (Spring)

Fault, Accurately Located Showing Dip

Fault, Approximately Located

Waste Discharge Area

RWQCB Permitted
Waste Discharge Area

Historical Operational Area Boundary

Beaumont Site 2 Property Boundary

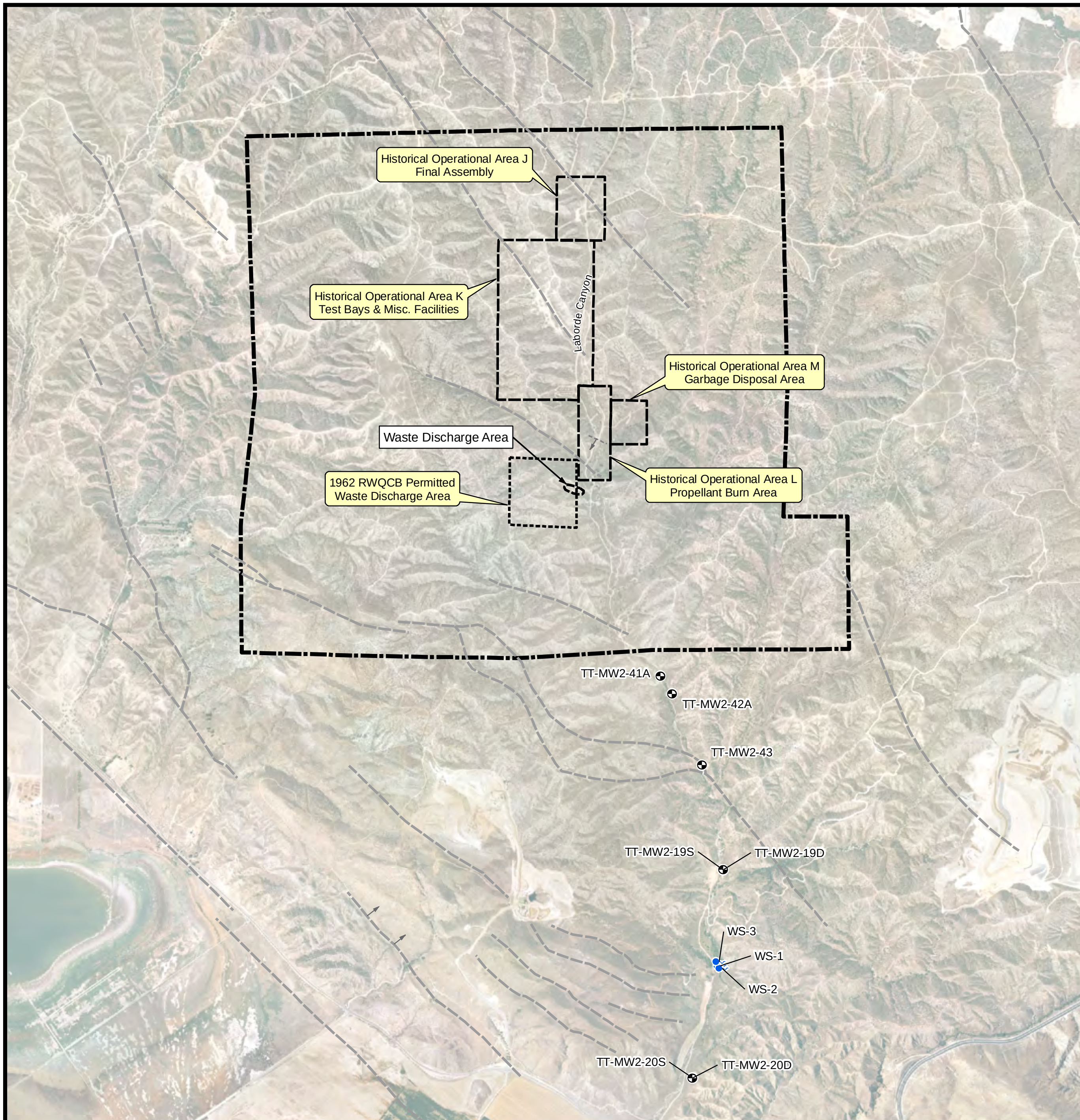
Note: Beaumont Site 2 property boundary from Hillwig-Goodrow survey, May 2004.

Beaumont Site 2

Figure 2-2
Second Quarter 2010
Sample Locations

TETRA TECH

X:\GIS\Lockheed S2 Q2Q310\Samp_Points Q310.mxd



Adapted from:

April 2007 aerial photograph.

Faults from the, *Site 2 Lineament Study, Tetra Tech, 2009.*

LEGEND

- Groundwater Monitoring Well Location
- Surface Sample Location (Spring)
- Fault, Accurately Located Showing Dip
- Fault, Approximately Located
- Waste Discharge Area
- RWQCB Permitted Waste Discharge Area
- Historical Operational Area Boundary
- Beaumont Site 2 Property Boundary

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

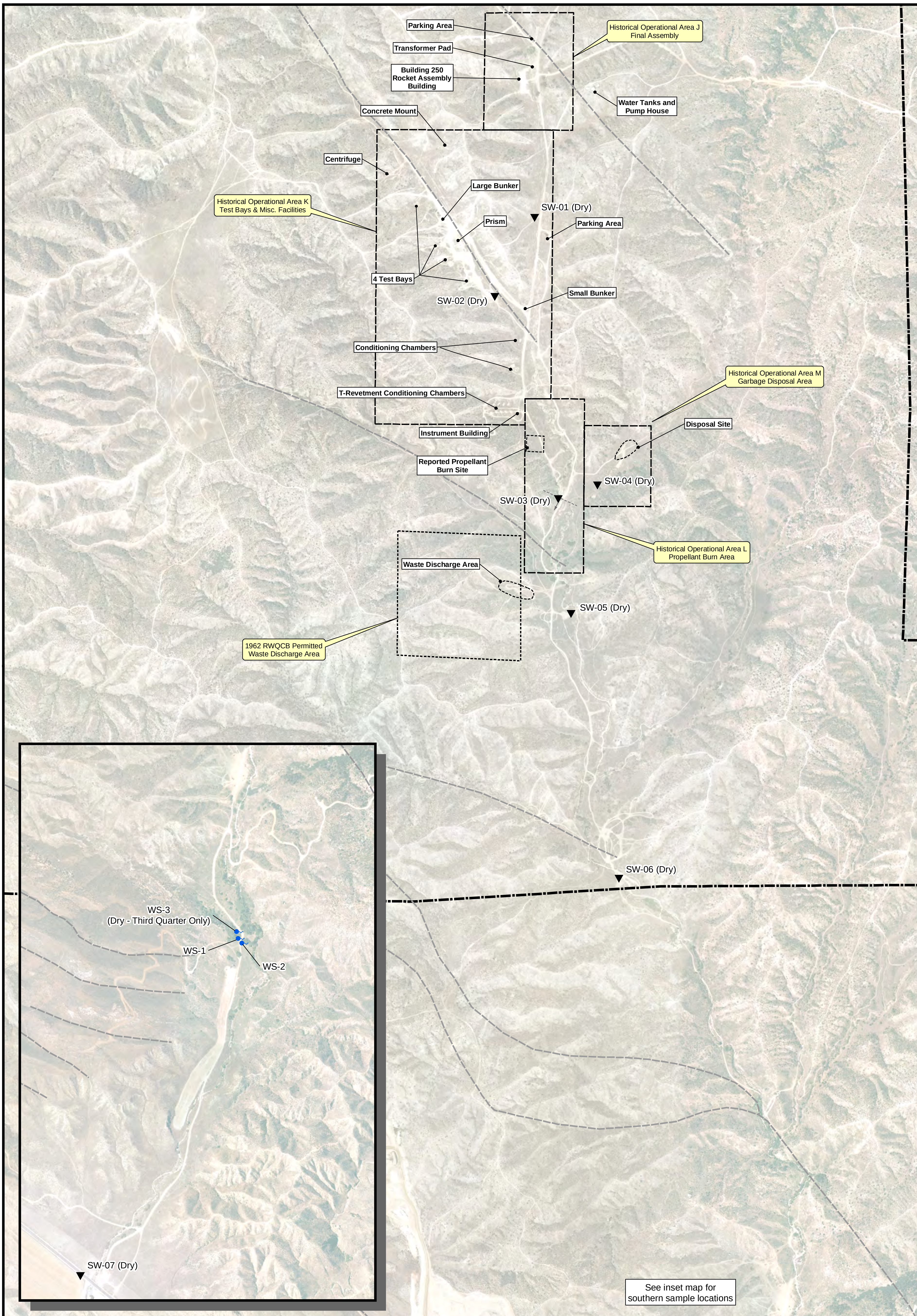
Beaumont Site 2

Figure 2-3

Third Quarter 2010 Sample Locations

TETRA TECH

X:\GIS\Lockheed S2 Q2Q310\Surf_Storm_Water.mxd



LEGEND

- ▼ Surface Water Sampling Location
- Spring Sampling Location
- Fault, Accurately Located Showing Dip
- Fault, Approximately Located
- RWQCB Permitted Waste Discharge Area
- Historical Operational Area Boundary
- Beaumont Site 2 Property Boundary

N

0 500 1,000 Feet

Adapted from: April 2007 aerial photograph.

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

Faults from the, *Site 2 Lineament Study, Tetra Tech, 2009.*

Beaumont Site 2

Figure 2-4

Surface and Storm Water Sampling Locations

TETRA TECH

2.4 Analytical Data QA/QC

The groundwater samples collected were analyzed using approved EPA methods. Since the analytical data were obtained by following EPA-approved method criteria, the data were validated using the EPA-approved evaluation methods described in the National Functional Guidelines (EPA, 2008 and EPA, 2010).

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 were supervised by a USFWS approved biologist as specified in the Low Effect HCP.

Section 3 Groundwater Monitoring Results

The results of the Second Quarter 2010 and Third Quarter 2010 groundwater monitoring events are presented in the following subsections. These subsections include tabulated summaries of the groundwater elevation and water quality data, groundwater elevation maps, and analyte results figures.

3.1 Groundwater Elevation

Based on the groundwater levels measured during the Second Quarter 2010 and Third Quarter 2010 monitoring events, groundwater elevations at the Site range from about 2,075 feet above mean seal level (msl) at TT-MW2-16, located in the northern portion of the Site, to about 1,819 feet msl at TT-MW2-8, located in the southern portion of the Site. Depth to first groundwater ranged from about 122 feet bgs at TT-MW2-29B to about 17 feet bgs at TT-MW2-8. A tabulated summary of groundwater depths and elevations is presented in Table 3-1. Changes in groundwater elevations from the previous monitoring event for wells monitored for the Second Quarter 2010 and Third Quarter 2010 monitoring events are shown on Figures 3-1 and 3-2, respectively, and hydrographs for individual wells are presented in Appendix D.

When compared to First Quarter 2010, groundwater elevations during Second Quarter 2010 decreased an average of 0.22 feet. When compared to Second Quarter 2010, groundwater elevations during Third Quarter 2010 increased an average of 0.30 feet. Average changes in groundwater elevations by area for wells monitored during the Second Quarter 2010 and Third Quarter 2010 monitoring events are shown in Table 3-2.

3.2 Groundwater Flow

Groundwater contour maps for first groundwater screened wells from Second Quarter 2010 and Third Quarter 2010 groundwater levels are presented in Figure 3-3 and Figures 3-4 respectively. Hydrographs for individual wells are presented in Appendix D.

Table 3-1 Groundwater Elevation Data - Second Quarter 2010 and Third Quarter 2010

		Second Quarter 2010				Third Quarter 2010			
Well ID	**Measuring Point Elevation (feet msl)**	**Date Measured**	**Depth to Water (from Measuring Point, feet)**	**Groundwater Elevation (feet msl)**	**Groundwater Elevation Change from First Quarter 2010 (feet)**	**Date Measured**	**Depth to Water (from Measuring Point, feet)**	**Groundwater Elevation (feet msl)**	**Groundwater Elevation Change from Second Quarter 2010 (feet)**
TT-EW2-1	1840.24	05/18/10	20.90	1819.34	NA	08/30/10	21.95	1818.29	1.05
TT-MW2-1	2035.21	05/18/10	58.47	1976.74	0.26	08/27/10	58.59	1976.62	0.12
TT-MW2-2	2137.75	05/17/10	70.43	2067.32	0.14	08/27/10	70.45	2067.30	0.02
TT-MW2-3	2094.66	05/18/10	70.63	2024.03	-0.02	08/27/10	70.44	2024.22	-0.19
TT-MW2-4S	1986.94	05/18/10	50.76	1936.18	-0.04	08/27/10	50.86	1936.08	0.10
TT-MW2-4D	1987.17	05/18/10	58.09	1929.08	0.29	08/27/10	58.32	1928.85	0.23
TT-MW2-5	1911.31	05/18/10	39.53	1871.78	-0.12	08/30/10	40.13	1871.18	0.60
TT-MW2-6S	1908.00	05/18/10	35.81	1872.19	0.18	08/30/10	36.54	1871.46	0.73
TT-MW2-6D	1908.07	05/18/10	36.88	1871.19	0.10	08/30/10	37.57	1870.50	0.69
TT-MW2-7	1839.25	05/18/10	19.54	1819.71	-0.68	08/30/10	20.41	1818.84	0.87
TT-MW2-7D	1838.96	05/18/10	17.87	1821.09	-0.08	08/30/10	18.64	1820.32	0.77
TT-MW2-8	1836.32	05/18/10	17.11	1819.21	0.21	08/30/10	17.84	1818.48	0.73
TT-MW2-9S	1938.38	05/18/10	39.12	1899.26	-0.18	08/30/10	39.61	1898.77	0.49
TT-MW2-9D	1938.78	05/18/10	43.05	1895.73	0.14	08/30/10	43.41	1895.37	0.36
TT-MW2-10	2001.57	05/18/10	57.77	1943.80	-0.01	08/27/10	57.83	1943.74	0.06
TT-MW2-11	2004.51	05/18/10	49.45	1955.06	-0.39	08/27/10	49.84	1954.67	0.39
TT-MW2-12	2016.26	05/18/10	51.12	1965.14	0.21	08/27/10	51.30	1964.96	0.18
TT-MW2-13	2049.39	05/18/10	65.06	1984.33	-1.63	08/27/10	65.76	1983.63	0.70
TT-MW2-14	2074.78	05/18/10	64.11	2010.67	-2.44	08/27/10	63.99	2010.79	-0.12
TT-MW2-16	2137.20	05/17/10	62.00	2075.20	-0.34	08/27/10	62.32	2074.88	0.32
TT-MW2-17S	2095.55	05/18/10	71.48	2024.07	0.09	08/27/10	71.31	2024.24	-0.17
TT-MW2-17D	2095.33	05/18/10	71.46	2023.87	0.08	08/27/10	71.31	2024.02	-0.15
TT-MW2-18	2035.32	05/18/10	58.37	1976.95	0.26	08/27/10	58.48	1976.84	0.11
TT-MW2-19S	1698.18	05/17/10	45.30	1652.88	-0.28	08/30/10	45.80	1652.38	0.50
TT-MW2-19D	1698.15	05/17/10	24.90	1673.25	0.30	08/30/10	25.09	1673.06	0.19
TT-MW2-20S	1587.10	05/17/10	34.51	1552.59	-0.37	08/30/10	33.64	1553.46	-0.87
TT-MW2-20D	1587.62	05/17/10	33.75	1553.87	-0.34	08/30/10	32.88	1554.74	-0.87
TT-MW2-21	1978.45	05/18/10	66.55	1911.90	0.19	08/30/10	66.48	1911.97	-0.07
TT-MW2-22	1975.86	05/18/10	65.35	1910.51	0.16	08/30/10	65.33	1910.53	-0.02
TT-MW2-23	1995.17	05/18/10	83.20	1911.97	0.24	08/30/10	83.14	1912.03	-0.06
TT-MW2-24	1964.26	05/18/10	53.82	1910.44	0.08	08/30/10	53.83	1910.43	0.01
TT-MW2-25	1966.96	05/18/10	64.15	1902.81	0.13	08/30/10	64.12	1902.84	-0.03
TT-MW2-26	1944.43	05/18/10	36.99	1907.44	-0.52	08/30/10	38.16	1906.27	1.17
TT-MW2-27	1948.27	05/18/10	50.10	1898.17	-0.05	08/30/10	50.66	1897.61	0.56
TT-MW2-28	1995.65	05/18/10	61.51	1934.14	-0.28	08/27/10	62.04	1933.61	0.53
TT-MW2-29A	2147.77	05/18/10	Dry	Dry	NA	08/27/10	Dry	Dry	NA

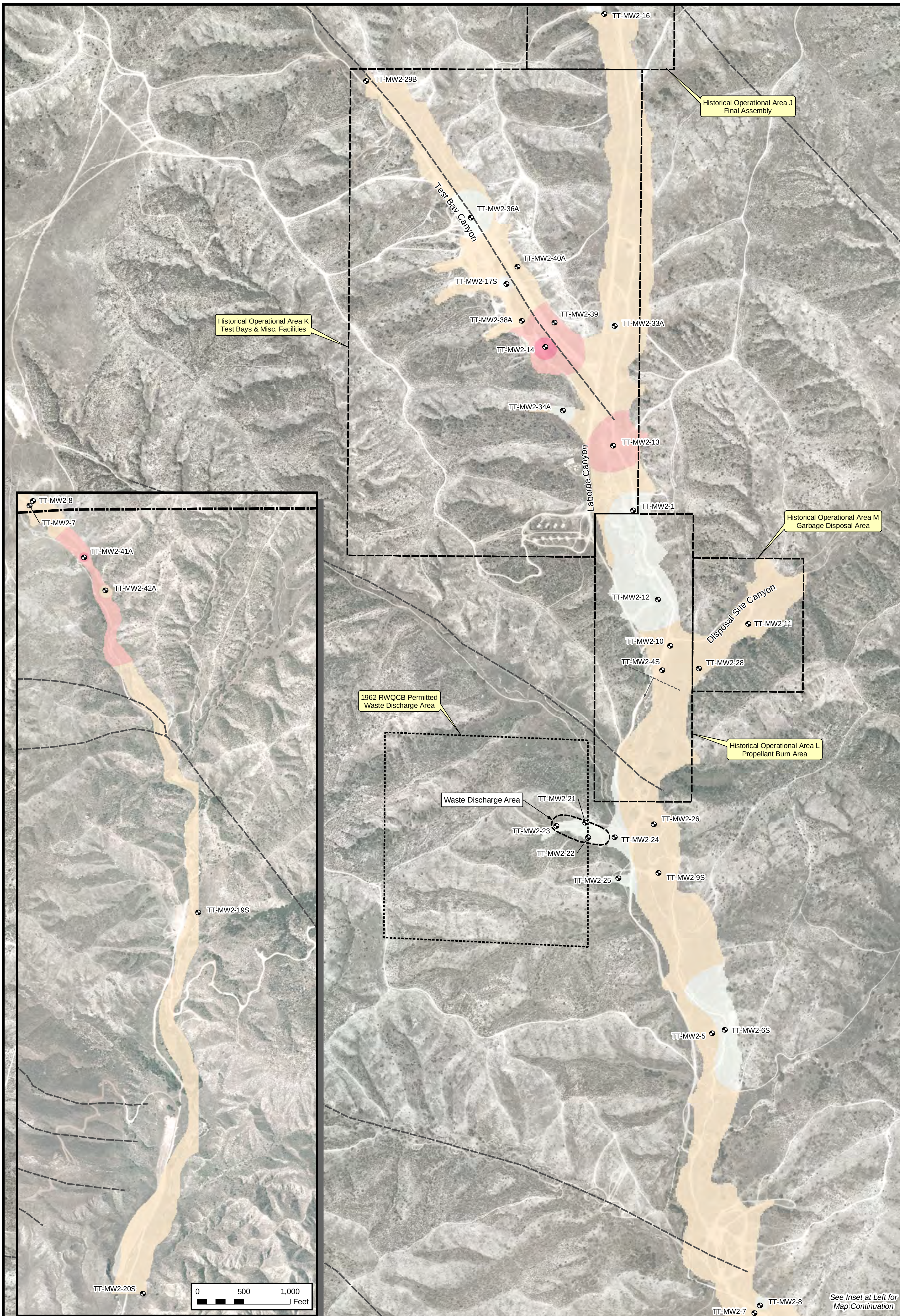
Notes:
NA - Not applicable
msl - Mean sea level
#.## - Denotes an increase in groundwater elevation
- #.## - Denotes a decrease in groundwater elevation

Table 3-1 Groundwater Elevation Data - Second Quarter 2010 and Third Quarter 2010 (Continued)

Well ID	Measuring Point Elevation (feet msl)	Second Quarter 2010				Third Quarter 2010			
		Date Measured	Depth to Water (from Measuring Point, feet)	Groundwater Elevation (feet msl)	Groundwater Elevation Change from First Quarter 2010 (feet)	Date Measured	Depth to Water (from Measuring Point, feet)	Groundwater Elevation (feet msl)	Groundwater Elevation Change from Second Quarter 2010 (feet)
TT-MW2-29B	2147.90	05/18/10	121.56	2026.34	-0.26	08/27/10	121.36	2026.54	-0.20
TT-MW2-29C	2147.83	05/18/10	127.81	2020.02	0.21	08/27/10	127.63	2020.20	-0.18
TT-MW2-30A	2074.37	05/18/10	71.59	2002.78	-1.34	08/27/10	71.76	2002.61	0.17
TT-MW2-30B	2074.41	05/18/10	74.31	2000.10	-0.97	08/27/10	74.39	2000.02	0.08
TT-MW2-30C	2074.35	05/18/10	77.06	1997.29	-0.57	08/27/10	76.98	1997.37	-0.08
TT-MW2-31A	2036.11	05/18/10	59.40	1976.71	0.36	08/30/10	59.49	1976.62	0.09
TT-MW2-31B	2036.15	05/18/10	66.83	1969.32	0.58	08/30/10	67.09	1969.06	0.26
TT-MW2-32	2004.87	05/18/10	53.40	1951.47	-0.18	08/27/10	53.56	1951.31	0.16
TT-MW2-33A	2070.54	05/18/10	61.24	2009.30	0.03	08/27/10	61.22	2009.32	-0.02
TT-MW2-33B	2070.54	05/18/10	65.73	2004.81	-0.22	08/27/10	65.80	2004.74	0.07
TT-MW2-33C	2070.54	05/18/10	63.94	2006.60	-0.08	08/27/10	63.88	2006.66	-0.06
TT-MW2-34A	2066.84	05/18/10	66.25	2000.59	0.21	08/27/10	66.13	2000.71	-0.12
TT-MW2-34B	2066.85	05/18/10	73.19	1993.66	0.08	08/27/10	73.06	1993.79	-0.13
TT-MW2-34C	2066.84	05/18/10	74.97	1991.87	0.27	08/27/10	74.84	1992.00	-0.13
TT-MW2-35A	2003.20	05/18/10	49.52	1953.68	0.44	08/27/10	49.91	1953.29	0.39
TT-MW2-35B	2003.20	05/18/10	54.99	1948.21	0.24	08/27/10	54.76	1948.44	-0.23
TT-MW2-36A	2100.99	05/18/10	79.12	2021.87	0.15	08/27/10	78.99	2022.00	-0.13
TT-MW2-36B	2101.04	05/18/10	79.90	2021.14	0.15	08/27/10	79.81	2021.23	-0.09
TT-MW2-36C	2100.88	05/18/10	79.87	2021.01	0.12	08/27/10	79.77	2021.11	-0.10
TT-MW2-37A	1963.62	05/18/10	63.26	1900.36	0.28	08/30/10	63.38	1900.24	0.12
TT-MW2-37B	1963.67	05/18/10	71.30	1892.37	0.36	08/30/10	71.42	1892.25	0.12
TT-MW2-38A	2084.56	05/18/10	58.65	2025.91	-0.98	08/27/10	58.71	2025.85	0.06
TT-MW2-38B	2084.42	05/18/10	80.33	2004.09	-1.02	08/27/10	80.38	2004.04	0.05
TT-MW2-38C	2084.63	05/18/10	88.44	1996.19	-0.32	08/27/10	88.79	1995.84	0.35
TT-MW2-39	2079.53	05/18/10	60.45	2019.08	-1.36	08/27/10	60.52	2019.01	0.07
TT-MW2-40A	2096.28	05/18/10	72.49	2023.79	-0.07	08/27/10	72.35	2023.93	-0.14
TT-MW2-40B	2096.24	05/18/10	83.42	2012.82	-0.35	08/27/10	83.25	2012.99	-0.17
TT-MW2-40C	2096.28	05/18/10	88.55	2007.73	-0.16	08/27/10	88.41	2007.87	-0.14
Tt-MW2-41A	1812.47	05/18/10	19.89	1792.58	-2.03	08/30/10	23.26	1789.21	3.37
Tt-MW2-41B	1812.22	05/18/10	17.41	1794.81	-1.15	08/30/10	20.44	1791.78	3.03
Tt-MW2-42A	1799.06	05/18/10	25.26	1773.80	-0.98	08/30/10	27.53	1771.53	2.27
Tt-MW2-42B	1799.07	05/18/10	23.44	1775.63	-0.88	08/30/10	24.93	1774.14	1.49
Tt-MW2-43	1771.44	05/18/10	Dry	Dry	NA	08/30/10	Dry	Dry	NA
TT-PZ2-1	1847.06	05/18/10	18.65	1828.41	-0.50	08/30/10	19.41	1827.65	0.76
TT-PZ2-2	1840.76	05/18/10	20.90	1819.86	-0.07	08/30/10	21.88	1818.88	0.98

Notes:
NA - Not applicable
msl - Mean sea level
#.## - Denotes an increase in groundwater elevation
- #.## - Denotes a decrease in groundwater elevation

X:\GIS\Lockheed S2 Q2Q310\GW_Change_Q210.mxd



LEGEND

- Well Location
- Fault, Accurately Located Showing Dip
- Fault, Approximately Located
- Waste Discharge Area
- RWQCB Permitted Waste Discharge Area
- Historical Operational Area Boundary
- Beaumont Site 2 Property Boundary

Groundwater Elevation Change in Feet
(from previous quarter)

- 0.01 - 1
- -0.99 - 0
- -1.99 - -1
- -3.99 - -2

0 300 600 Feet

Adapted from: April 2007 aerial photograph.

Faults from the, *Site 2 Lineament Study, Tetra Tech, 2009.*

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

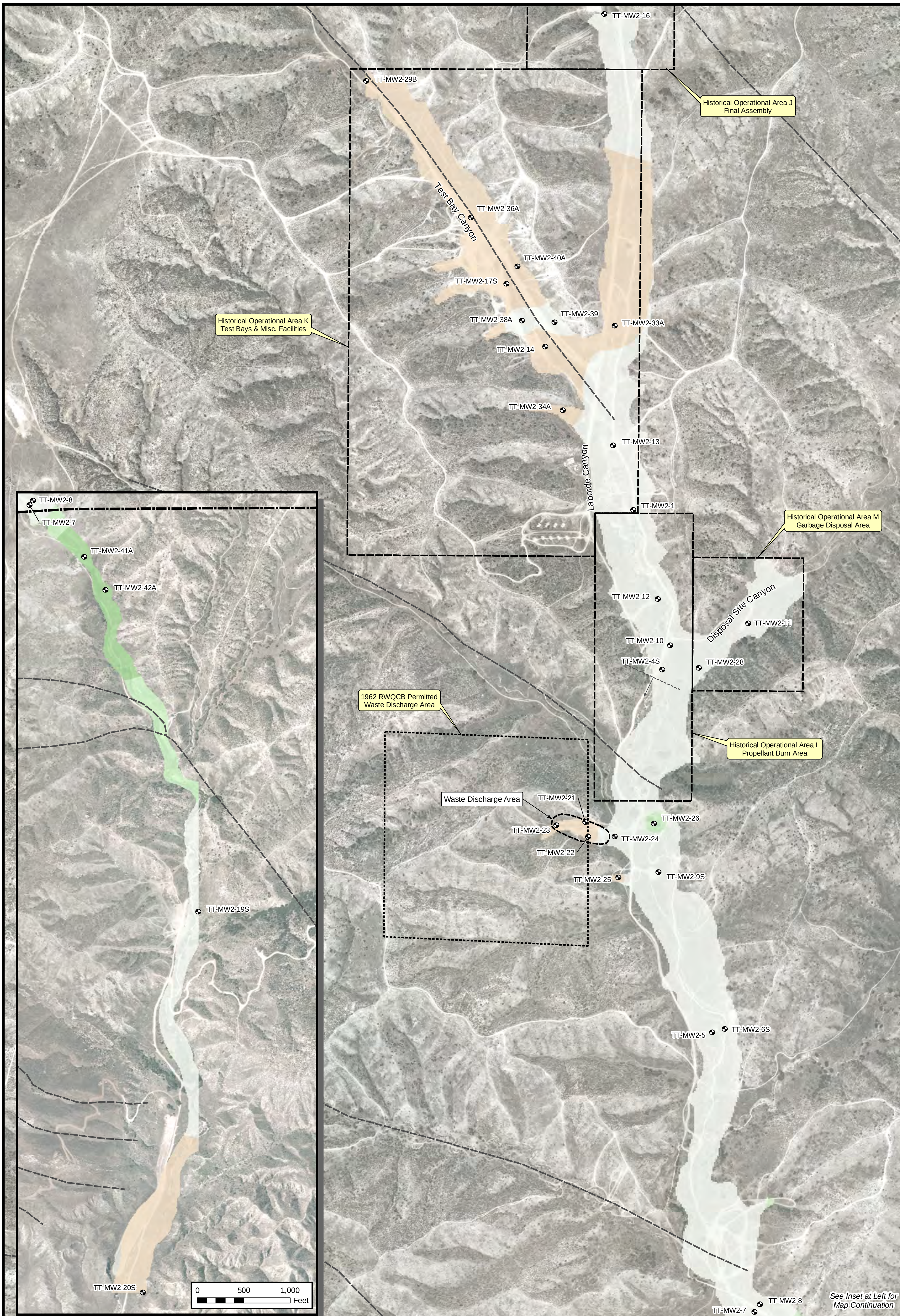
Beaumont Site 2

Figure 3-1

Changes in Groundwater Elevation - Second Quarter 2010

TETRA TECH

X:\GIS\Lockheed S2 Q2Q310\GW_Change_Q310.mxd



LEGEND

- Well Location
- Fault, Accurately Located Showing Dip
- Fault, Approximately Located
- Waste Discharge Area
- RWQCB Permitted Waste Discharge Area
- Historical Operational Area Boundary
- Beaumont Site 2 Property Boundary

Groundwater Elevation Change in Feet
(from previous quarter)

- 2.01 - 4
- 1.01 - 2
- 0.01 - 1
- -0.99 - 0

0 300 600 Feet

Adapted from: April 2007 aerial photograph.

Faults from the, *Site 2 Lineament Study, Tetra Tech, 2009.*

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

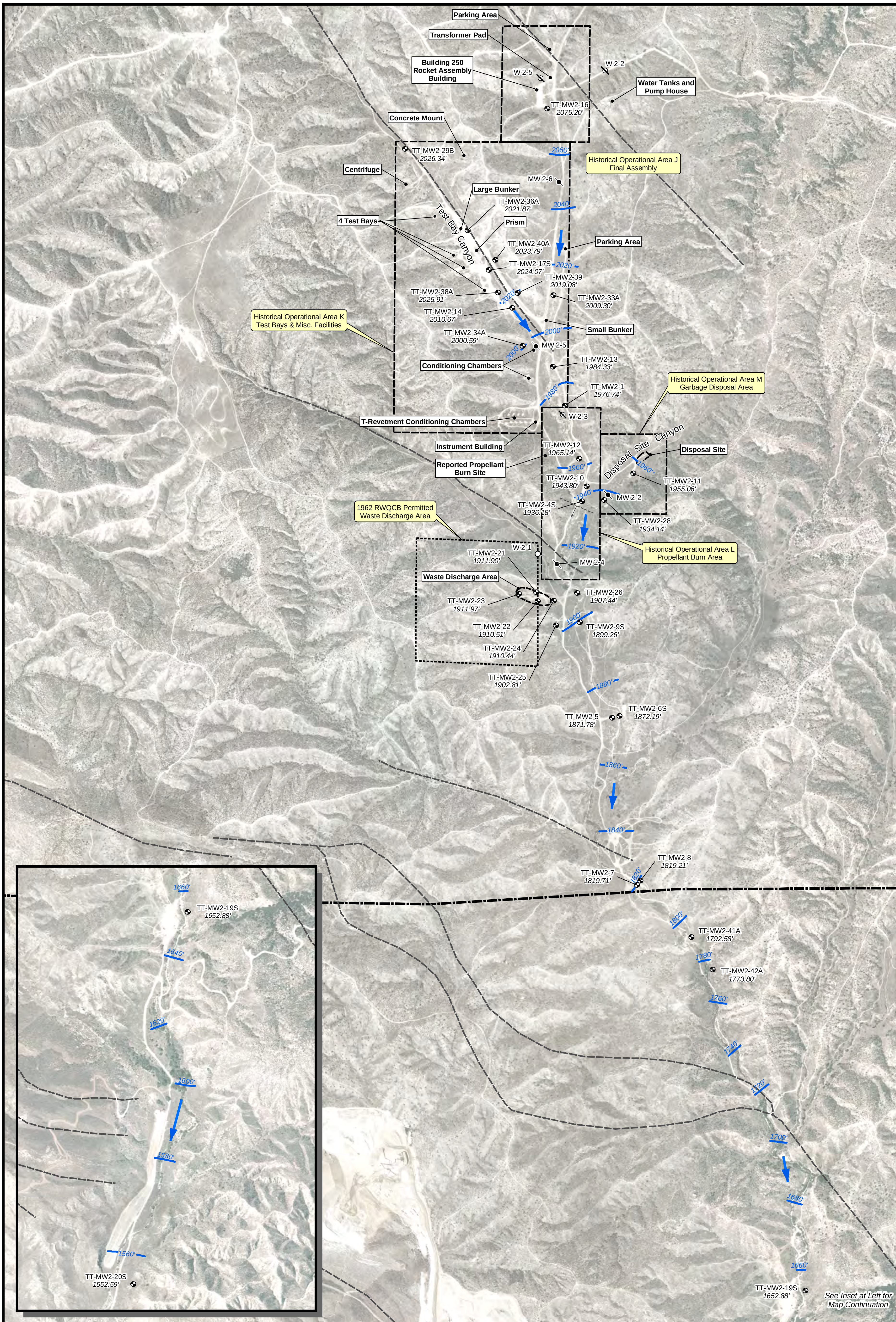
Beaumont Site 2

Figure 3-2

Changes in Groundwater Elevation - Third Quarter 2010

TETRA TECH

X:\GIS\Lockheed S2 Q2Q310GW_Elev_Q210.mxd



LEGEND

- Monitoring Well Location with Groundwater Elevation (feet msl)
- Destroyed Production Well Location
- Destroyed Monitoring Well Location
- Reported Production Well Location
- Groundwater Elevation Contour
- Groundwater Flow Direction
- Fault, Accurately Located Showing Dip
- Fault, Approximately Located
- RWQCB Permitted Waste Discharge Area
- Historical Operational Area Boundary
- Beaumont Site 2 Property Boundary

0 500 1,000 Feet

Adapted from: April 2007 aerial photograph.

Faults from the, *Site 2 Lineament Study, Tetra Tech, 2009.*

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

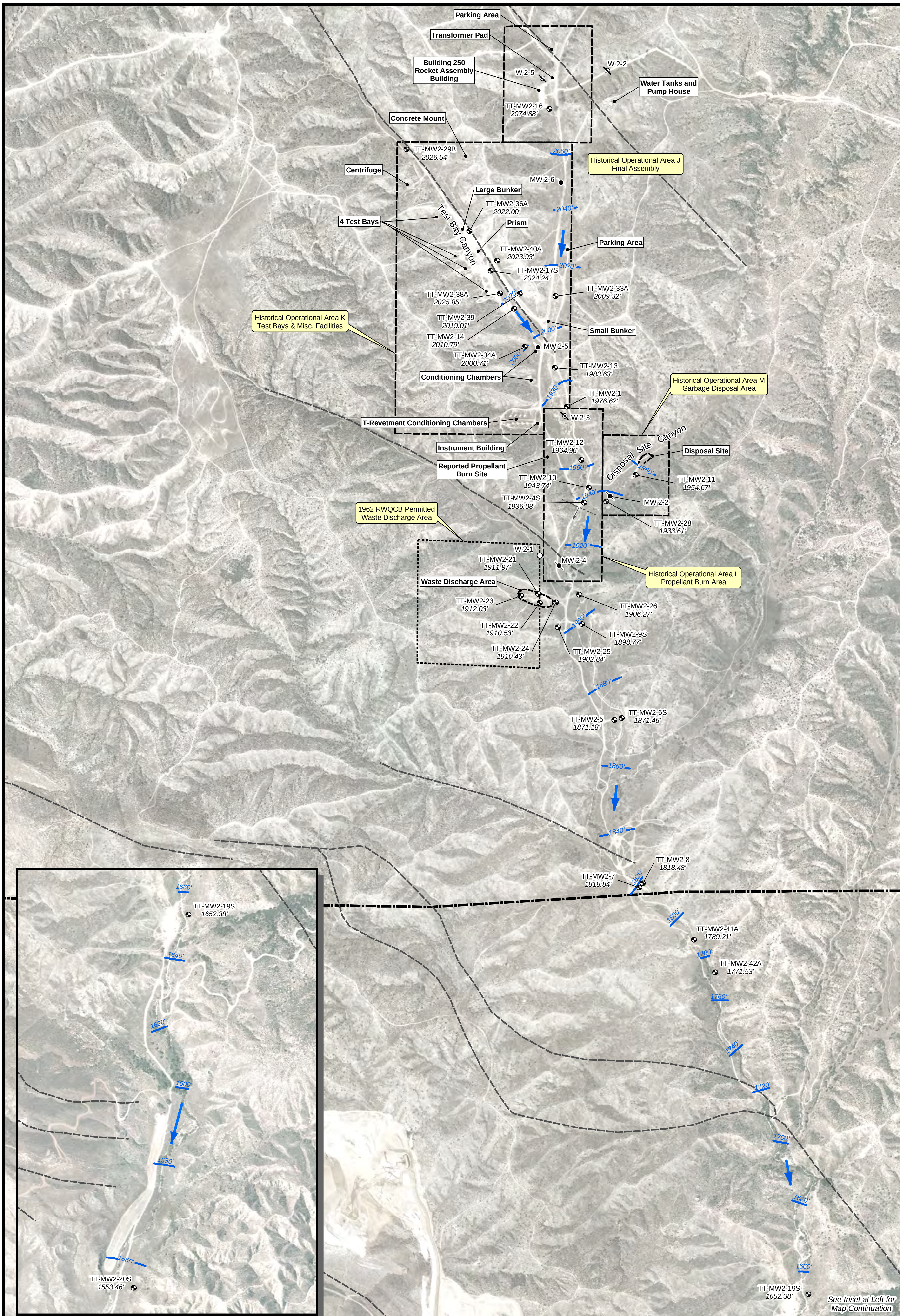
Beaumont Site 2

Figure 3-3

Groundwater Contours for First Groundwater - Second Quarter 2010

TETRA TECH

X:\GIS\Lockheed S2 Q2Q310GW_Elev_Q310.mxd



LEGEND

- Monitoring Well Location with Groundwater Elevation (feet msl)
- Destroyed Production Well Location
- Destroyed Monitoring Well Location
- Reported Production Well Location
- Groundwater Elevation Contour
- Groundwater Flow Direction
- Fault, Accurately Located Showing Dip
- Fault, Approximately Located
- RWQCB Permitted Waste Discharge Area
- Historical Operational Area Boundary
- Beaumont Site 2 Property Boundary

0 500 1,000 Feet

Adapted from: April 2007 aerial photograph.

Faults from the *Site 2 Lineament Study, Tetra Tech, 2009.*

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

Beaumont Site 2

Figure 3-4

Groundwater Contours for First Groundwater - Third Quarter 2010

TETRA TECH

Table 3-2 Groundwater Elevation Change - Second Quarter 2010 and Third Quarter 2010

Site Area	Range of Groundwater Elevation Change - Second Quarter 2010		Average Change By Area	Range of Groundwater Elevation Change - Third Quarter 2010		Average Change By Area
J	-0.34	0.14	-0.10	0.02	0.32	0.17
K	-2.44	0.58	-0.30	-0.20	0.70	-0.01
L	-0.04	0.44	0.19	-0.23	0.39	0.12
M	-0.39	-0.18	-0.28	0.16	0.53	0.36
WDA	0.08	0.36	0.22	-0.07	0.12	0.02
LC	-2.03	0.21	-0.38	-0.03	3.37	1.11
WS	-0.37	0.30	-0.17	-0.87	0.50	-0.26

Notes:

J - Final Assembly Area
K - Former Test Bay Area
L - Former Burn Area
M - Garbage disposal Area
WDA - Waste discharge area
LC - Lower Canyon
WS - Former Wolfskill property

3.3 Groundwater Gradients

Horizontal groundwater gradients are calculated using a segmented path from well to well that approximates the overall site flowline. The horizontal gradient is a measure of the change in the hydraulic head divided by the distance between wells (i.e., the slope of the water table). The average horizontal groundwater gradient calculated between TT-MW2-16 and TT-MW2-6S from the Second Quarter 2010 and Third Quarter 2010 groundwater monitoring events for the shallow Quaternary Alluvium and weathered San Timoteo Formation (QAL/wSTF) screened wells was 0.030 ft/ft. The horizontal groundwater gradient calculated between TT-MW2-2 and TT-MW2-6D for the Second Quarter 2010 and Third Quarter 2010 groundwater monitoring events for the deeper San Timoteo Formation (STF) screened wells was 0.029 ft/ft.

Vertical groundwater gradients are calculated from individual clusters of wells. Well clusters are used to measure the differences 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. Vertical groundwater gradients at the Site are generally downward. The vertical gradients range from negative 0.29 at well cluster TT-MW2-4S and 4D located in Area L, to positive 0.19 at well cluster TT-MW2-19S and 19D located on the former Wolfskill property. A summary of calculated horizontal and vertical groundwater gradients is presented in Table 3-3. A complete listing of historical horizontal and vertical groundwater gradients and associated calculations is presented in Appendix E.

Table 3-3 Summary of Horizontal and Vertical Groundwater Gradient

Horizontal Groundwater Gradients (feet / foot), approximating a flowline perpendicular to groundwater contours

-	**Overall**	**Overall**
-	STF	QAL/WSTF
-	**TT-MW2-2**	**TT-MW2-16**
	to	To
	TT-MW2-6D	**TT-MW2-6S**
Previous Quarter	0.029	0.030
Second Quarter (May) 2010	0.029	0.030
Third Quarter (August) 2010	0.029	0.030

Vertical Groundwater Gradients (feet / foot)

-	**Area J**	**Area K**	**Area K**	**Area L**	**Southern portion of Site 2**	**Southern portion of Site 2**	**Southern portion of Site 2**	**Former Wolfskill Property**	**Former Wolfskill Property**
deep screen	**TT-MW2-2** (STF)	**TT-MW2-17D** (QAL/WSTF)	**TT-MW2-18** (STF)	**TT-MW2-4D** (STF)	**TT-MW2-9D** (STF)	**TT-MW2-6D** (STF)	**TT-MW2-7D** (STF)	**TT-MW2-19D** (MEF)	**TT-MW2-20D** (MEF)
shallow screen	**TT-MW2-16** (QAL/WSTF)	**TT-MW2-17S** (QAL/WSTF)	**TT-MW2-1** (QAL / WSTF)	**TT-MW2-4S** (STF)	**TT-MW2-9S** (QAL/WSTF)	**TT-MW2-6S** (QAL/WSTF)	**TT-MW2-7** (QAL/WSTF)	**TT-MW2-19S** (QAL/MEF)	**TT-MW2-20S** (QAL)
Previous Quarter	-0.16	-0.01	0.01	-0.27	-0.12	-0.06	0.05	0.19	0.03
Second Quarter (May) 2010	-0.17	-0.01	0.01	-0.28	-0.13	-0.05	0.03	0.18	0.03
Third Quarter (August) 2010	-0.16	-0.01	0.01	-0.29	-0.13	-0.05	0.04	0.19	0.03

Notes:

STF - San Timoteo Formation
MEF - Mt. Eden Formation
QAL - Quaternary Alluvium
QAL/WSTF - Quaternary Alluvium and weathered San Timoteo Formation
QAL/MEF - Quaternary Alluvium and Mt. Eden Formation

3.4 Analytical Data Summary

Groundwater and spring samples collected during the Second Quarter 2010 monitoring event were analyzed for perchlorate. Select wells were also sampled for VOCs, NDMA, 1,4-dioxane, hexahydro-1,3,5-trinitro-1,3,5-triazine (RDX), total metals, dissolved metals, general minerals, and natural attenuation parameters. VOCs and perchlorate are contaminants of potential concern at the Site. During the Third Quarter 2010 monitoring event, groundwater and spring samples were analyzed for perchlorate.

Summaries of validated laboratory analytical results for analytes detected above their respective MDLs during the Second Quarter 2010 monitoring event are presented in Tables 3-4 through 3-6. Summaries of validated laboratory analytical results for analytes detected above their respective MDLs during the Third Quarter 2010 monitoring event are presented in Table 3-7. A complete list of the analytes tested along with validated sample results by analytical method are provided in Appendix F. VOC and perchlorate sample results above the published MCL (federal or state, whichever is lower) or DWNL are indicated by bold type in Tables 3-4 through 3-7. Tables 3-8 and 3-9 present summary statistics for validated organic and inorganic analytes detected during the monitoring events. Laboratory analytical data packages, which include all environmental, field QC, and laboratory QC results, are provided in Appendix G. A consolidated laboratory data summary table is presented in Appendix H.

3.4.1 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 E.S. Babcock & Sons, 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, 2008 and 2005).

Preservation criteria, holding times, field blanks, laboratory control samples (LCS), 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 SM2320B for alkalinity, Method SM4500B for nitrite, Method E200.7 for Manganese, Method AM23G for volatile fatty acids, Method AM20GAX for hydrogen, Method E300.0 for nitrate, sulfate, and chloride, Method E521 for low level NDMA, Method E332.0 for perchlorate and chlorate, Method SM5310 for total and dissolved organic carbon, Method RSK-175 for methane, ethane, ethene, Method SW8270C SIM for low level 1,4-dioxane, Method SW6010B for iron, Method SW6020 for metals and Method SW8260B for VOCs. Unless otherwise noted below, all data results met required criteria, are of known precision and accuracy, did not require qualification, and may be used as reported.

Method E521 for low level NDMA had surrogate recovery errors that affected two out of fourteen samples and qualified as estimated 15.4 percent of the total E521 data. The data qualified as estimated is usable for the intended purpose. Additional sample volumes will be collected for future E521 analyses so the laboratory can perform corrective action to mitigate surrogate recovery errors.

Method SW8260B for VOCs had laboratory blank contamination that caused 0.1 percent of the total SW8260B data to be qualified for blank contamination. Blank qualified data is generally considered not detected.

In addition to being detected by method SW8270C SIM, if high enough concentrations are encountered, 1,4-dioxane will also be detected by Method SW8260B. However, Method SW8270C SIM is a more reliable method for measuring 1,4-dioxane at the required detection limits than Method SW8260B. Therefore, where available, the SW8270C SIM result will be used in data presentation and analysis as the best and correct result for the analyte. All data is validated and reported in Appendix F

Method RSK-175 for methane, ethane, and ethene had method blank contamination that caused 6.5 percent of the total RSK-175 data to be qualified for blank contamination. Blank contaminated data should be considered not detected.

Method E300.0 for anions had errors that qualified as estimated in the data listed below

- Four out of 68 nitrate samples (5.9 percent) had holding time errors (samples were analyzed outside of the 48-hour holding time but less than twice the holding time). The holding time errors were due to laboratory errors.
- One out of 68 sulfate samples (1.5 percent) was qualified as estimated due to low matrix spike recovery.

The E300 data qualified as estimated are usable for the intended purpose.

Method AM23G for volatile fatty acids had matrix spike recovery errors that qualified as estimated 0.9 percent of the total AM23G data. The data qualified as estimated is usable for the intended purpose. Method blank contamination qualified 4.3 percent of the total AM23G data. Data qualified for blank contamination is generally considered not detected.

Method SM5310 for dissolved organic carbon had field duplicate errors that qualified 2.5 percent of the total SM5310 data. The estimated data is usable for the intended purpose. Field blank contamination qualified 4.9 percent of the total SM5310 data. Data qualified for blank contamination is generally considered not detected.

Method E332.0 for perchlorate had matrix spike recovery errors that qualified as estimated 1.3 percent of the total E332.0 data. Data qualified as estimated is usable for the intended purpose. Field blank contamination qualified 1.3 percent of the total E322.0 data. Data qualified for blank contamination is generally considered not detected.

Method SW6020 for metals had method blank contamination qualified 4.3 percent of the total SW6020 data. Data qualified for blank contamination is generally considered not detected.

Table 3-4 Summary of Validated Detected Organic Analytes - Second Quarter 2010

Sample Location	Sample Date	1,4-Dioxane	NDMA (ng/L)	RDX	Acetone	2-Butanone	Benzene	Carbon Disulfide	Chloro form	Chloro methane	1,1-Dichloro ethane	1,2-Dichloro ethane	1,1-Dichloro ethene	c-1,2-Dichloro ethene	Ethyl benzene	Methylene Chloride	Toluene	1,1,2-Trichloro ethane	Trichloro ethene	Tetrachloro ethene	m,p-Xylenes	o-Xylene
All results reported in µg/L unless otherwise stated																						
TT-MW2-1	7/15/2010	<31	NA	<0.20	<5.0	<1.2	<0.14	<0.36	<0.17	<0.36	<0.098	<0.21	<0.12	<0.18	<0.26	<0.15	<0.22	<0.31	<0.17	<0.17	<0.36	<0.41
TT-MW2-2	7/2/2010	<31	NA	NA	<5.0	<1.2	<0.14	0.76	<0.17	<0.36	<0.098	<0.21	<0.12	<0.18	<0.26	<0.15	<0.22	<0.31	<0.17	<0.17	<0.36	<0.41
TT-MW2-4S	6/28/2010	<31	NA	NA	<5.0	<1.2	<0.14	<0.36	<0.17	<0.36	<0.098	<0.21	<0.12	<0.18	<0.26	<0.15	<0.22	<0.31	<0.17	<0.17	<0.36	<0.41
TT-MW2-5	7/1/2010	0.92	NA	NA	<5.0	<1.2	<0.14	<0.36	<0.17	<0.36	<0.098	<0.21	<0.12	<0.18	<0.26	<0.15	<0.22	<0.31	<0.17	<0.17	<0.36	<0.41
TT-MW2-6S	6/25/2010	<31	NA	NA	<5.0	<1.2	<0.14	<0.36	<0.17	<0.36	<0.098	<0.21	<0.12	<0.18	<0.26	<0.15	<0.22	<0.31	<0.17	<0.17	<0.36	<0.41
TT-MW2-6D	6/25/2010	<31	NA	NA	<5.0	<1.2	<0.14	0.38 Jq	<0.17	<0.36	<0.098	<0.21	<0.12	<0.18	<0.26	<0.15	<0.22	<0.31	<0.17	<0.17	<0.36	<0.41
TT-MW2-7	6/29/2010	<31	NA	NA	<5.0	<1.2	<0.14	<0.36	<0.17	<0.36	<0.098	<0.21	<0.12	<0.18	<0.26	<0.15	<0.22	<0.31	<0.17	<0.17	<0.36	<0.41
TT-MW2-7D	6/29/2010	<31	NA	NA	<5.0	<1.2	<0.14	0.7	<0.17	<0.36	<0.098	<0.21	<0.12	<0.18	<0.26	<0.15	<0.22	<0.31	<0.17	<0.17	<0.36	<0.41
TT-MW2-8	6/29/2010	<31	NA	NA	<5.0	<1.2	<0.14	<0.36	<0.17	<0.36	<0.098	<0.21	<0.12	<0.18	<0.26	<0.15	<0.22	<0.31	<0.17	<0.17	<0.36	<0.41
TT-MW2-9S	6/25/2010	**8.5**	NA	NA	<5.0	<1.2	<0.14	<0.36	<0.17	<0.36	<0.098	<0.21	<0.12	<0.18	<0.26	<0.15	<0.22	<0.31	0.92	<0.17	<0.36	<0.41
TT-MW2-9D	6/25/2010	<31	NA	NA	<5.0	<1.2	<0.14	<0.36	<0.17	<0.36	<0.098	<0.21	<0.12	<0.18	<0.26	<0.15	<0.22	<0.31	<0.17	<0.17	<0.36	<0.41
TT-MW2-10	6/28/2010	<31	NA	NA	<5.0	<1.2	<0.14	<0.36	<0.17	<0.36	<0.098	<0.21	<0.12	<0.18	<0.26	<0.15	<0.22	<0.31	<0.17	<0.17	<0.36	<0.41
TT-MW2-11	6/28/2010	<31	NA	NA	<5.0	<1.2	<0.14	<0.36	<0.17	<0.36	<0.098	<0.21	<0.12	0.41 Jq	<0.26	<0.15	<0.22	<0.31	**11**	<0.17	<0.36	<0.41
TT-MW2-12	6/29/2010	<31	NA	NA	<5.0	<1.2	<0.14	<0.36	<0.17	<0.36	<0.098	<0.21	<0.12	<0.18	<0.26	<0.15	<0.22	<0.31	<0.17	<0.17	<0.36	<0.41
TT-MW2-13	7/15/2010	<31	NA	**0.32 Jq**	<5.0	<1.2	<0.14	<0.36	<0.17	<0.36	<0.098	<0.21	<0.12	<0.18	<0.26	<0.15	<0.22	<0.31	<0.17	<0.17	<0.36	<0.41
TT-MW2-14	7/19/2010	<31	NA	<0.20	<5.0	<1.2	<0.14	<0.36	<0.17	<0.36	<0.098	<0.21	<0.12	<0.18	<0.26	0.60 Jq	<0.22	<0.31	<0.17	<0.17	<0.36	<0.41
TT-MW2-16	7/15/2010	<31	NA	<0.20	<5.0	<1.2	<0.14	<0.36	<0.17	<0.36	<0.098	<0.21	<0.12	<0.18	<0.26	<0.15	<0.22	<0.31	<0.17	<0.17	<0.36	<0.41
TT-MW2-17S	7/1/2010	<31	NA	NA	<5.0	<1.2	<0.14	<0.36	<0.17	<0.36	<0.098	<0.21	<0.12	<0.18	<0.26	<0.15	<0.22	<0.31	0.35 Jq	<0.17	<0.36	<0.41
TT-MW2-17D	7/1/2010	<31	NA	NA	<5.0	<1.2	<0.14	<0.36	<0.17	<0.36	<0.098	<0.21	<0.12	<0.18	<0.26	<0.15	<0.22	<0.31	2.6	<0.17	<0.36	<0.41
TT-MW2-18	6/28/2010	<31	NA	NA	<5.0	<1.2	<0.14	<0.36	<0.17	<0.36	<0.098	<0.21	<0.12	<0.18	<0.26	<0.15	<0.22	<0.31	<0.17	<0.17	<0.36	<0.41
TT-MW2-19S	6/23/2010	<0.10	<0.7	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
TT-MW2-19D	6/24/2010	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
TT-MW2-20S	6/30/2010	<0.10	<0.7	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
TT-MW2-20D	6/30/2010	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
TT-MW2-21	6/25/2010	<0.10	1.8 Jbq	NA	<5.0	<1.2	<0.14	<0.36	<0.17	<0.36	<0.098	<0.21	<0.12	<0.18	<0.26	2.5 Jq	<0.22	<0.31	3.4	<0.17	<0.36	<0.41
TT-MW2-22	6/25/2010	**33 Jq**	NA	NA	<5.0	<1.2	0.86	<0.36	<0.17	<0.36	3.3	**1.3**	**26**	1.6	<0.26	4.5	<0.22	<0.31	**470**	0.24 Jq	<0.36	<0.41
TT-MW2-23	6/25/2010	<31	NA	NA	<5.0	<1.2	<0.14	<0.36	<0.17	<0.36	<0.098	<0.21	<0.12	<0.18	<0.26	<0.15	<0.22	<0.31	<0.17	<0.17	<0.36	<0.41
TT-MW2-24	7/15/2010	**250**	<0.7	**3.2**	<5.0	<1.2	0.20 Jq	<0.36	3.9	<0.36	0.86	**0.74**	2.8	<0.18	<0.26	0.85 BJaq	<0.22	0.54	**97**	<0.17	<0.36	<0.41
TT-MW2-25	6/25/2010	<31	1.5 Jq	NA	<5.0	<1.2	<0.14	<0.36	<0.17	<0.36	<0.098	<0.21	<0.12	<0.18	<0.26	<0.15	<0.22	<0.31	<0.17	<0.17	<0.36	<0.41
TT-MW2-26	6/30/2010	<0.10	<0.7	NA	<5.0	<1.2	<0.14	<0.36	<0.17	<0.36	<0.098	<0.21	<0.12	<0.18	<0.26	<0.15	<0.22	<0.31	<0.17	<0.17	<0.36	<0.41
TT-MW2-27	6/25/2010	<31	NA	NA	<5.0	<1.2	<0.14	1.2	<0.17	<0.36	<0.098	<0.21	<0.12	<0.18	<0.26	<0.15	<0.22	<0.31	<0.17	<0.17	<0.36	<0.41
Method Detection Limit		0.10	0.7	0.2	5	1.2	0.14	0.4	0.17	0.36	0.098	0.21	0.12	0.18	0.26	0.15	0.22	0.31	0.17	0.17	0.36	0.41
MCL (unless noted) / DWNL		1 (1)	10 (1)	0.3 (1)	-	-	1	160 (1)	-	-	5	0.5	6	6	300	5	150	5	5	5	1750	1750

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

µg/L - Micrograms per liter
ng/L - Nanograms per liter
NDMA - N-Nitrosodimethylamine
MCL - California Department of Public Health Maximum Contaminant Level.
DWNL - California Department of Public Health drinking water notification level.
(1) - DWNL
" - " MCL/DWNL not established.
Bold - MDL or DWNL exceeded.

NA - Not analyzed
< # - Method detection limit concentration is shown.
B - The sample result was less than 5 times blank contamination. Cross contamination is suspected.
J - The analyte was positively identified, but the concentration is an estimated value.
a - The analyte was found in the method blank.
b - The surrogate spike recovery was outside control limits.
q - The analyte detected was below the Practical Quantitation Limit (PQL).

Table 3-4 Summary of Validated Detected Organic Analytes - Second Quarter 2010 (continued)

Sample Location	Sample Date	1,4-Dioxane	NDMA (ng/L)	RDX	Acetone	2-Butanone	Benzene	Carbon Disulfide	Chloroform	Chloromethane	1,1-Dichloroethane	1,2-Dichloroethane	1,1-Dichloroethene	c-1,2-Dichloroethene	Ethylbenzene	Methylene Chloride	Toluene	1,1,2-Trichloroethane	Trichloroethene	Tetrachloroethene	m,p-Xylenes	o-Xylene
All results reported in µg/L unless otherwise stated																						
TT-MW2-28	6/21/2010	<0.10	1.5 Jbq	NA	<5.0	<1.2	<0.14	<0.36	<0.17	<0.36	<0.098	<0.21	<0.12	<0.18	<0.26	<0.15	<0.22	<0.31	<0.17	<0.17	<0.36	<0.41
TT-MW2-29B	6/23/2010	<31	<0.7	NA	<5.0	<1.2	<0.14	<0.36	<0.17	<0.36	<0.098	<0.21	<0.12	<0.18	<0.26	<0.15	<0.22	<0.31	<0.17	<0.17	<0.36	<0.41
TT-MW2-29C	7/1/2010	<31	NA	NA	<5.0	<1.2	<0.14	1.1	<0.17	<0.36	<0.098	<0.21	<0.12	<0.18	<0.26	<0.15	<0.22	<0.31	<0.17	<0.17	<0.36	<0.41
TT-MW2-30A	7/1/2010	<31	NA	NA	<5.0	<1.2	<0.14	<0.36	<0.17	<0.36	<0.098	<0.21	<0.12	<0.18	<0.26	<0.15	<0.22	<0.31	<0.17	<0.17	<0.36	<0.41
TT-MW2-30B	7/1/2010	<31	NA	NA	<5.0	<1.2	<0.14	0.71	<0.17	<0.36	<0.098	<0.21	<0.12	<0.18	<0.26	<0.15	<0.22	<0.31	<0.17	<0.17	<0.36	<0.41
TT-MW2-30C	7/1/2010	<31	NA	NA	<5.0	<1.2	<0.14	1.7	<0.17	<0.36	<0.098	<0.21	<0.12	<0.18	<0.26	<0.15	1.9	<0.31	<0.17	<0.17	<0.36	<0.41
TT-MW2-31A	6/28/2010	<31	NA	NA	<5.0	<1.2	<0.14	1.0	<0.17	<0.36	<0.098	<0.21	<0.12	<0.18	<0.26	<0.15	<0.22	<0.31	<0.17	<0.17	<0.36	<0.41
TT-MW2-31B	7/2/2010	<31	NA	NA	<5.0	<1.2	0.19 Jq	0.96	<0.17	<0.36	<0.098	<0.21	<0.12	<0.18	<0.26	<0.15	0.35 Jq	<0.31	<0.17	<0.17	<0.36	<0.41
TT-MW2-32	6/28/2010	<31	NA	NA	<5.0	<1.2	<0.14	1.3	<0.17	<0.36	<0.098	<0.21	<0.12	<0.18	<0.26	<0.15	<0.22	<0.31	<0.17	<0.17	<0.36	<0.41
TT-MW2-33A	6/21/2010	<31	NA	NA	<5.0	<1.2	<0.14	0.38 Jq	<0.17	<0.36	<0.098	<0.21	<0.12	<0.18	<0.26	<0.15	<0.22	<0.31	<0.17	<0.17	<0.36	<0.41
TT-MW2-33B	6/21/2010	<31	NA	NA	<5.0	<1.2	<0.14	1.3	<0.17	0.67	<0.098	<0.21	<0.12	<0.18	<0.26	<0.15	<0.22	<0.31	<0.17	<0.17	<0.36	<0.41
TT-MW2-33C	6/21/2010	<31	NA	NA	<5.0	<1.2	0.17 Jq	0.77	<0.17	<0.36	<0.098	<0.21	<0.12	<0.18	<0.26	<0.15	9.1	<0.31	<0.17	<0.17	<0.36	<0.41
TT-MW2-34A	6/29/2010	<31	NA	NA	<5.0	<1.2	<0.14	1.0	<0.17	<0.36	<0.098	<0.21	<0.12	<0.18	<0.26	0.21 Jq	<0.22	<0.31	<0.17	<0.17	<0.36	<0.41
TT-MW2-34B	6/29/2010	<31	NA	NA	<5.0	<1.2	<0.14	0.70	<0.17	<0.36	<0.098	<0.21	<0.12	<0.18	<0.26	<0.15	<0.22	<0.31	<0.17	<0.17	<0.36	<0.41
TT-MW2-34C	6/29/2010	<31	NA	NA	<5.0	<1.2	<0.14	1.2	<0.17	<0.36	<0.098	<0.21	<0.12	<0.18	<0.26	<0.15	<0.22	<0.31	<0.17	<0.17	<0.36	<0.41
TT-MW2-35A	6/28/2010	<31	NA	NA	<5.0	<1.2	<0.14	3.1	<0.17	0.37 Jq	<0.098	<0.21	<0.12	<0.18	<0.26	<0.15	0.33 Jq	<0.31	<0.17	<0.17	<0.36	<0.41
TT-MW2-35B	6/28/2010	<31	NA	NA	<5.0	<1.2	0.25 Jq	0.62	<0.17	<0.36	<0.098	<0.21	<0.12	<0.18	<0.26	<0.15	2.2	<0.31	<0.17	0.18 Jq	<0.36	<0.41
TT-MW2-36A	6/22/2010	<31	0.8 Jq	NA	<5.0	<1.2	<0.14	<0.36	<0.17	<0.36	<0.098	<0.21	<0.12	<0.18	<0.26	<0.15	0.35 Jq	<0.31	<0.17	<0.17	<0.36	<0.41
TT-MW2-36B	6/23/2010	<31	NA	NA	<5.0	<1.2	<0.14	<0.36	<0.17	<0.36	<0.098	<0.21	<0.12	<0.18	<0.26	<0.15	<0.22	<0.31	<0.17	<0.17	<0.36	<0.41
TT-MW2-36C	6/23/2010	<31	NA	NA	20	3.4	0.56	56	<0.17	<0.36	<0.098	<0.21	<0.12	<0.18	<0.26	<0.15	1.1	<0.31	<0.17	<0.17	<0.36	<0.41
TT-MW2-37A	6/30/2010	**13**	NA	NA	64	9.6	0.52	<0.36	<0.17	<0.36	<0.098	<0.21	<0.12	<0.18	<0.26	<0.15	0.46 Jq	<0.31	2.0	<0.17	<0.36	<0.41
TT-MW2-37B	6/30/2010	<31	NA	NA	<5.0	<1.2	<0.14	13	<0.17	<0.36	<0.098	<0.21	<0.12	<0.18	<0.26	<0.15	0.74	<0.31	<0.17	<0.17	<0.36	<0.41
TT-MW2-38A	6/23/2010	<31	NA	NA	<5.0	<1.2	<0.14	<0.36	<0.17	<0.36	<0.098	<0.21	<0.12	<0.18	<0.26	<0.15	<0.22	<0.31	<0.17	<0.17	<0.36	<0.41
TT-MW2-38B	7/1/2010	<31	NA	NA	<5.0	<1.2	<0.14	4.7	<0.17	<0.36	<0.098	<0.21	<0.12	<0.18	<0.26	<0.15	<0.22	<0.31	<0.17	<0.17	<0.36	<0.41
TT-MW2-38C	7/1/2010	<31	NA	NA	<5.0	<1.2	<0.14	1.2	<0.17	<0.36	<0.098	<0.21	<0.12	<0.18	<0.26	<0.15	<0.22	<0.31	<0.17	<0.17	<0.36	<0.41
TT-MW2-39	6/21/2010	<31	NA	NA	<5.0	<1.2	<0.14	<0.36	<0.17	<0.36	<0.098	<0.21	<0.12	<0.18	<0.26	<0.15	<0.22	<0.31	<0.17	<0.17	<0.36	<0.41
TT-MW2-40A	6/23/2010	<31	NA	NA	<5.0	<1.2	<0.14	<0.36	<0.17	<0.36	<0.098	<0.21	<0.12	<0.18	<0.26	<0.15	<0.22	<0.31	<0.17	<0.17	<0.36	<0.41
TT-MW2-40B	6/23/2010	<31	NA	NA	<5.0	<1.2	**16**	<0.36	<0.17	<0.36	<0.098	<0.21	<0.12	<0.18	1.3	<0.15	9.5	<0.31	<0.17	<0.17	1.9	1.3
TT-MW2-40C	6/23/2010	<31	NA	NA	8.3 Jq	3.0	0.48 Jq	1.4	<0.17	<0.36	<0.098	<0.21	<0.12	<0.18	<0.26	<0.15	0.36 Jq	<0.31	<0.17	<0.17	<0.36	<0.41
TT-MW2-41A	6/24/2010	<0.10	1.1 Jq	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
TT-MW2-42A	6/22/2010	<0.10	1.0 Jq	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Method Detection Limit		0.10	0.7	0.2	5	1.2	0.14	0.4	0.17	0.36	0.098	0.21	0.12	0.18	0.26	0.15	0.22	0.31	0.17	0.17	0.36	0.41
MCL (unless noted) / DWNL		1 (1)	10 (1)	0.3 (1)	-	-	1	160 (1)	-	-	5	0.5	6	6	300	5	150	5	5	5	1750	1750

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

µg/L - Micrograms per liter
ng/L - Nanograms per liter
NDMA - N-Nitrosodimethylamine
MCL - California Department of Public Health Maximum Contaminant Level.
DWNL - California Department of Public Health drinking water notification level.
(1) - DWNL
" - " MCL/DWNL not established.
Bold - MDL or DWNL exceeded.

NA - Not analyzed
< # - Method detection limit concentration is shown.
B - The sample result was less than 5 times blank contamination. Cross contamination is suspected.
J - The analyte was positively identified, but the concentration is an estimated value.
a - The analyte was found in the method blank.
b - The surrogate spike recovery was outside control limits.
q - The analyte detected was below the Practical Quantitation Limit (PQL).

Table 3-5 Summary of Validated Detected Inorganic Analytes - Second Quarter 2010

Sample Name	Sample Date	Filter Status	Perchlorate ug/L	Arsenic mg/L	Barium mg/L	Cadmium mg/L	Cobalt mg/L	Chromium mg/L	Copper mg/L	Iron ug/L	Lead mg/L	Mercury ug/L	Manganese ug/L	Molybdenum mg/L	Nickel mg/L	Selenium mg/L	Vanadium mg/L	Zinc mg/L
TT-MW2-1	7/15/2010	Unfiltered	**5,100**	0.0018 Jq	0.10	<0.000077	<0.00028	0.0028 BJaq	0.0029 Jq	22	<0.000084	<0.000032		0.0023 Jq	0.0031 Jq	0.0076	0.0072 Jq	<0.0014
TT-MW2-1-F	7/15/2010	Filtered	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<1.2	NA	NA	NA	NA	NA
TT-MW2-2	7/2/2010	Unfiltered	0.19	0.0035	0.0044 Jq	<0.000077	<0.00028	0.0071 Jq	0.0030 Jq	NA	0.000099 Jq	<0.000032	NA	0.0020 Jq	0.0040 Jq	<0.0025	0.011	0.0025 BJaq
TT-MW2-2-F	7/2/2010	Filtered	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<1.2	NA	NA	NA	NA	NA
TT-MW2-4S	6/28/2010	Unfiltered	0.61	**0.039**	0.0079 Jq	<0.000077	<0.00028	0.0044 Jq	0.0031 Jq	NA	0.00038 Jq	<0.000032	NA	0.015	0.0018 Jq	<0.0025	0.065	0.0050 Jq
TT-MW2-4S-F	6/28/2010	Filtered	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<2.5	NA	NA	NA	NA	NA
TT-MW2-5	7/1/2010	Unfiltered	**1,300**	0.0018 Jq	0.060 Jq	<0.000077	<0.00028	0.0010 Jq	0.0086 Jq	38	<0.000084	<0.000032	NA	0.012	0.0042 Jq	0.0081	0.0063 Jq	0.0083 Jq
TT-MW2-5-F	7/1/2010	Filtered	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<1.2	NA	NA	NA	NA	NA
TT-MW2-6S	6/25/2010	Unfiltered	**140**	<0.0016	0.040 Jq	<0.000077	<0.00028	<0.00050	0.0035 Jq	NA	0.00022 Jq	<0.000032	NA	0.019	0.0040 Jq	0.0068	0.0046 Jq	0.0019 Jq
TT-MW2-6S-F	6/25/2010	Filtered	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<2.5	NA	NA	NA	NA	NA
TT-MW2-6D	6/25/2010	Unfiltered	0.34	0.0058	0.0069 Jq	<0.000077	<0.00028	<0.00050	0.0027 Jq		<0.000084	<0.000032	NA	0.0034 Jq	<0.0015	<0.0025	0.0030 Jq	0.0043 Jq
TT-MW2-6D-F	6/25/2010	Filtered	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	3.2 Jq	NA	NA	NA	NA	NA
TT-MW2-7	6/29/2010	Unfiltered	**370**	0.0025	0.038 Jq	<0.000077	<0.00028	<0.00050	0.0036 Jq	<12	<0.000084	<0.000032	NA	0.022	0.0041 Jq	0.011	0.0056 Jq	0.0026 BJaq
TT-MW2-7-F	6/29/2010	Filtered	NA	0.0019 Jq	0.034 Jq	<0.000077	<0.00028	0.015	0.0034 Jq	NA	<0.000084	<0.000032	<1.2	0.020	0.0039 Jq	0.010	0.011	0.0016 BJaq
TT-MW2-7D	6/29/2010	Unfiltered	<0.071	**0.013**	0.0038 Jq	<0.000077	<0.00028	0.0019 BJaq	0.0020 Jq	NA	<0.000084	<0.000032	NA	0.015	0.0015 Jq	<0.0025	0.0068 Jq	0.0041 BJaq
TT-MW2-7D-F	6/29/2010	Filtered	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	1.2 Jq	NA	NA	NA	NA	NA
TT-MW2-8	6/29/2010	Unfiltered	**270**	0.0032	0.047 Jq	<0.000077	<0.00028	0.00067 BJaq	0.0032 Jq	NA	<0.000084	<0.000032	NA	0.019	0.0034 Jq	0.0077	0.024	0.0016 BJaq
TT-MW2-8-F	6/29/2010	Filtered	NA	0.003	0.042 Jq	<0.000077	<0.00028	0.012	0.0029 Jq	NA	<0.000084	<0.000032	<1.2	0.017	0.0030 Jq	0.0080	0.025	<0.0014
TT-MW2-9S	6/25/2010	Unfiltered	**6,600**	<0.0016	0.069 Jq	<0.000077	<0.00028	<0.00050	0.0071 Jq	25	0.00018 Jq	<0.000032	NA	0.0083 Jq	0.0069 Jq	0.0090	<0.0027	0.0060 Jq
TT-MW2-9S-F	6/25/2010	Filtered	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<2.5	NA	NA	NA	NA	NA
TT-MW2-9D	6/25/2010	Unfiltered	<0.071	0.0083	0.0066 Jq	<0.000077	<0.00028	0.00051 Jq	0.0020 Jq	NA	0.00010 Jq	<0.000032	NA	0.022	0.0018 Jq	<0.0025	0.0041 Jq	0.0028 Jq
TT-MW2-9D-F	6/25/2010	Filtered	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<2.5	NA	NA	NA	NA	NA
TT-MW2-10	6/28/2010	Unfiltered	<0.071	0.0016 Jq	0.075 Jq	<0.000077	<0.00028	<0.00050	0.0029 Jq	30	<0.000084	<0.000032	NA	0.0030 Jq	0.0042 Jq	0.0025 Jq	0.0083 Jq	0.0014 Jq
TT-MW2-10-F	6/28/2010	Filtered	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<2.5	NA	NA	NA	NA	NA
TT-MW2-11	6/28/2010	Unfiltered	**230**	0.0026	0.047 Jq	<0.000077	<0.00028	0.020	0.0036 Jq	NA	<0.000084	<0.000032	NA	<0.00090	0.0032 Jq	0.013	0.0098 Jq	0.0022 Jq
TT-MW2-11-F	6/28/2010	Filtered	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<2.5	NA	NA	NA	NA	NA
TT-MW2-12	6/29/2010	Unfiltered	<0.071	0.0055	0.019 Jq	<0.000077	<0.00028	0.00084 BJaq	0.0034 Jq	120	<0.000084	<0.000032	NA	0.0022 Jq	0.0019 Jq	0.0028 Jq	0.0084 Jq	0.0057 BJaq
TT-MW2-12-F	6/29/2010	Filtered	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<1.2	NA	NA	NA	NA	NA
TT-MW2-13	7/15/2010	Unfiltered	**4,200**	0.0018 Jq	0.13	<0.000077	<0.00028	0.0023 BJaq	0.0032 Jq	NA	<0.000084	<0.000032	NA	0.0022 Jq	0.0032 Jq	0.0093	0.011	0.0026 Jq
TT-MW2-13-F	7/15/2010	Filtered	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<1.2	NA	NA	NA	NA	NA
TT-MW2-14	7/19/2010	Unfiltered	**47,000**	0.0031	0.10	<0.000077	<0.00028	0.0018 BJaq	0.0059 Jq	<12	<0.000084	<0.000032	NA	0.0069 Jq	0.0068 Jq	0.014	0.0081 Jq	0.0055 Jq
TT-MW2-14-F	7/19/2010	Filtered	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<1.2	NA	NA	NA	NA	NA
TT-MW2-16	7/15/2010	Unfiltered	3.6	<0.0016	0.36	<0.000077	<0.00028	0.0013 BJaq	0.0025 Jq	NA	0.000097 Jq	<0.000032	NA	<0.00090	0.0059 Jq	0.0035 Jq	0.0071 Jq	0.059
TT-MW2-16-F	7/15/2010	Filtered	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<1.2	NA	NA	NA	NA	NA
TT-MW2-17S	7/1/2010	Unfiltered	**3,100**	<0.0016	0.027 Jq	<0.000077	<0.00028	0.0012 BJaq	0.0021 Jq	NA	<0.000084	<0.000032	NA	0.0087 Jq	0.0035 Jq	<0.0025	<0.0027	0.0065 BJaq
TT-MW2-17S-F	7/1/2010	Filtered	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	1.8 Jq	NA	NA	NA	NA	NA
TT-MW2-17D	7/1/2010	Unfiltered	**57,000**	0.0021	0.041 Jq	<0.000077	0.00033 Jq	<0.00050	0.0029 Jq	36	<0.000084	<0.000032	NA	0.0022 Jq	0.024	0.0079	0.0043 Jq	0.0018 BJaq
TT-MW2-17D-F	7/1/2010	Filtered	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	25	NA	NA	NA	NA	NA
TT-MW2-18	6/28/2010	Unfiltered	**11,000**	0.0067	0.0087 Jq	<0.000077	<0.00028	<0.00050	0.0051 Jq	NA	<0.000084	<0.000032	NA	0.012	0.0028 Jq	<0.0025	0.035	0.0039 Jq
TT-MW2-18-F	6/28/2010	Filtered	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<2.5	NA	NA	NA	NA	NA
TT-MW2-19S	6/23/2010	Unfiltered	5.0	0.0067	0.0035 Jq	0.000080 Jq	<0.00028	0.00058 BJkq	0.0049 Jq	NA	0.00054 BJakq	0.000036 Jq	NA	0.030	0.0031 Jq	0.0034 Jq	0.0044 Jq	0.013
TT-MW2-19S-F	6/23/2010	Filtered	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<2.5	NA	NA	NA	NA	NA
TT-MW2-19D	6/24/2010	Unfiltered	<0.071	**0.011**	0.0057 Jq	0.00021 Jq	<0.00028	<0.00050	0.0058 Jq	NA	0.00080 Jq	0.00012 BJaq	NA	0.065	0.0021 Jq	<0.0025	<0.0027	0.033
TT-MW2-19D-F	6/24/2010	Filtered	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<2.5	NA	NA	NA	NA	NA
Method Detection Limit			0.071	0.0016	0.000056	0.000077	0.00028	0.0005	0.0019	12	0.000084	0.000032	1.2	0.0009	0.0015	0.0025	0.0027	0.0014
MCL (unless noted) / DWNL			6	0.01	1	0.005	-	0.05	1.3	300	0.015	2	500 (1)	-	0.1	0.05	0.05 (1)	5

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

- μg/L - Micrograms per liter
- mg/L - Milligrams per liter
- MCL - California Department of Public Health Maximum Contaminant Level.
- DWNL - California Department of Public Health drinking water notification level.
- (1) - DWNL
- " - " MCL/DWNL not established.
- NA - Not analyzed.

- **Bold** - MCL or DWNL exceeded.
- < # - Method detection limit concentration is shown.
- B - The sample result was less than 5 times blank contamination. Cross contamination is suspected.
- J - The analyte was positively identified, but the concentration is an estimated value.
- a - The analyte was found in the method blank.
- k - The analyte was found in a field blank.
- q - The analyte detected was below the Practical Quantitation Limit (PQL).

Table 3-5 Summary of Validated Detected Inorganic Analytes - Second Quarter 2010 (continued)

Sample Name	Sample Date	Filter Status	Perchlorate ug/L	Arsenic mg/L	Barium mg/L	Cadmium mg/L	Cobalt mg/L	Chromium mg/L	Copper mg/L	Iron ug/L	Lead mg/L	Mercury ug/L	Manganese ug/L	Molybdenum mg/L	Nickel mg/L	Selenium mg/L	Vanadium mg/L	Zinc mg/L
TT-MW2-20S	6/30/2010	Unfiltered	<0.071	<0.0016	0.023 Jq	<0.000077	<0.00028	0.0013 BJaq	0.0028 Jq	NA	<0.000084	<0.000032	NA	0.016	0.0031 Jq	<0.0025	0.0041 Jq	<0.0014
TT-MW2-20S-F	6/30/2010	Filtered	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<1.2	NA	NA	NA	NA	NA
TT-MW2-20D	6/30/2010	Unfiltered	<0.071	<0.0016	0.00068 Jq	<0.000077	<0.00028	0.0020 BJaq	<0.0019	NA	<0.000084	0.000083 Jq	NA	0.0024 Jq	<0.0015	<0.0025	<0.0027	0.0020 BJaq
TT-MW2-20D-F	6/30/2010	Filtered	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<1.2	NA	NA	NA	NA	NA
TT-MW2-21	6/25/2010	Unfiltered	5.0	**0.017**	0.0027 Jq	<0.000077	<0.00028	<0.00050	0.0026 Jq	NA	0.00097 Jq	0.000057 BJaq	NA	0.017	0.011	0.0028 Jq	0.0067 Jq	0.0017 Jq
TT-MW2-21-F	6/25/2010	Filtered	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<2.5	NA	NA	NA	NA	NA
TT-MW2-22	6/25/2010	Unfiltered	<0.071	**0.012**	0.0021 Jq	<0.000077	<0.00028	<0.00050	0.0021 Jq	NA	<0.000084	<0.000032	NA	0.011	0.0015 Jq	<0.0025	<0.0027	<0.0014
TT-MW2-22-F	6/25/2010	Filtered	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	4.9 Jq	NA	NA	NA	NA	NA
TT-MW2-23	6/25/2010	Unfiltered	<0.071	0.0076	0.011 Jq	<0.000077	0.00037 Jq	0.0017 Jq	0.0027 Jq	**850**	0.00038 Jq	<0.000032	NA	0.0072 Jq	0.0027 Jq	<0.0025	0.0084 Jq	0.0033 Jq
TT-MW2-23-F	6/25/2010	Filtered	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<2.5	NA	NA	NA	NA	NA
TT-MW2-24	7/15/2010	Unfiltered	**140,000 Jf**	0.0029	0.086 Jq	<0.000077	0.00030 Jq	<0.00050	0.0082 BJkq	65	<0.000084	<0.000032	NA	0.0099 Jq	0.0067 Jq	0.011	0.0042 Jq	0.0059 BJkq
TT-MW2-24-F	7/15/2010	Filtered	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	3.3 Jq	NA	NA	NA	NA	NA
TT-MW2-25	6/25/2010	Unfiltered	<0.071	0.0066	0.0010 Jq	<0.000077	0.00085 Jq	0.012	0.0027 Jq	NA	0.000098 Jq	0.000040 BJaq	NA	0.011	0.098	<0.0025	0.0034 Jq	<0.0014
TT-MW2-25-F	6/25/2010	Filtered	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	11 Jq	NA	NA	NA	NA	NA
TT-MW2-26	6/30/2010	Unfiltered	**100**	<0.0016	0.038 Jq	<0.000077	0.0017 Jq	0.043	0.0070 Jq	NA	<0.000084	<0.000032	NA	0.0032 Jq	**0.35**	0.0059	<0.0027	0.0046 BJakq
TT-MW2-26-F	6/30/2010	Filtered	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	39	NA	NA	NA	NA	NA
TT-MW2-27	6/25/2010	Unfiltered	**240**	0.0019 Jq	0.0086 Jq	<0.000077	0.0014 Jq	0.0053 Jq	0.0039 Jq	NA	<0.000084	<0.000032	NA	0.0080 Jq	**0.16**	<0.0025	0.0075 Jq	<0.0014
TT-MW2-27-F	6/25/2010	Filtered	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	36	NA	NA	NA	NA	NA
TT-MW2-28	6/21/2010	Unfiltered	**11**	0.0042	0.0093 Jq	<0.000077	0.0015 Jq	0.0022 BJkq	0.0090 Jq	NA	<0.000084	<0.000032	NA	0.038	**0.12**	0.0034 Jq	0.0036 Jq	0.21
TT-MW2-28-F	6/21/2010	Filtered	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	49	NA	NA	NA	NA	NA
TT-MW2-29B	6/23/2010	Unfiltered	0.42 Bk	**0.01**	0.0032 Jq	<0.000077	<0.00028	0.0026 BJkq	0.0036 Jq	NA	0.00022 BJakq	<0.000032	NA	0.0049 Jq	<0.0015	0.0026 Jq	0.018	0.13
TT-MW2-29B-F	6/23/2010	Filtered	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	3.5 Jq	NA	NA	NA	NA	NA
TT-MW2-29C	7/1/2010	Unfiltered	3.5	0.0081	0.0048 Jq	<0.000077	<0.00028	0.0014 Jq	0.0021 Jq	NA	0.00010 Jq	<0.000032	NA	0.019	<0.0015	<0.0025	<0.0027	<0.0014
TT-MW2-29C-F	7/1/2010	Filtered	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	46	NA	NA	NA	NA	NA
TT-MW2-30A	7/1/2010	Unfiltered	**2,000**	**0.012**	0.0034 Jq	<0.000077	<0.00028	0.0046 Jq	0.0066 Jq	NA	<0.000084	<0.000032	NA	0.0024 Jq	<0.0015	<0.0025	**0.082**	0.0016 BJaq
TT-MW2-30A-F	7/1/2010	Filtered	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	1.3 Jq	NA	NA	NA	NA	NA
TT-MW2-30B	7/1/2010	Unfiltered	**1,400**	0.0051	0.0097 Jq	<0.000077	<0.00028	<0.00050	0.0058 Jq	NA	<0.000084	<0.000032	NA	0.070	0.0040 Jq	<0.0025	<0.0027	0.0029 BJaq
TT-MW2-30B-F	7/1/2010	Filtered	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	25	NA	NA	NA	NA	NA
TT-MW2-30C	7/1/2010	Unfiltered	1.3	0.0037	0.015 Jq	0.00012 Jq	<0.00028	0.00060 Jq	0.0038 Jq	NA	<0.000084	<0.000032	NA	0.090	0.0017 Jq	<0.0025	<0.0027	0.0038 BJaq
TT-MW2-30C-F	7/1/2010	Filtered	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	27	NA	NA	NA	NA	NA
TT-MW2-31A	6/28/2010	Unfiltered	<0.071	0.0089	0.023 Jq	<0.000077	<0.00028	<0.00050	0.0032 Jq	NA	<0.000084	<0.000032	NA	0.057	0.0038 Jq	<0.0025	<0.0027	0.0015 Jq
TT-MW2-31A-F	6/28/2010	Filtered	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	75	NA	NA	NA	NA	NA
TT-MW2-31B	7/2/2010	Unfiltered	<0.071	**0.014**	0.0048 Jq	<0.000077	<0.00028	0.0047 Jq	0.0071 Jq	NA	<0.000084	<0.000032	NA	0.019	<0.0015	<0.0025	<0.0027	0.0043 BJaq
TT-MW2-31B-F	7/2/2010	Filtered	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	21	NA	NA	NA	NA	NA
TT-MW2-32	6/28/2010	Unfiltered	<0.071	**0.046**	0.0060 Jq	<0.000077	<0.00028	0.0015 Jq	<0.0019	NA	0.00026 Jq	<0.000032	NA	0.012	<0.0015	<0.0025	**0.058**	0.0043 Jq
TT-MW2-32-F	6/28/2010	Filtered	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<2.5	NA	NA	NA	NA	NA
TT-MW2-33A	6/21/2010	Unfiltered	0.63	0.0071	0.0017 Jq	<0.000077	<0.00028	0.0023 Jq	<0.0019	NA	<0.000084	<0.000032	NA	0.0064 Jq	0.0020 Jq	0.0026 Jq	0.0040 Jq	0.0015 Jq
TT-MW2-33A-F	6/21/2010	Filtered	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	40	NA	NA	NA	NA	NA
TT-MW2-33B	6/21/2010	Unfiltered	<0.071	0.0075	0.0039 Jq	<0.000077	<0.00028	0.0027 Jq	<0.0019	NA	0.00011 BJaq	<0.000032	NA	0.016	<0.0015	<0.0025	<0.0027	0.0030 Jq
TT-MW2-33B-F	6/21/2010	Filtered	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	2.6 Jq	NA	NA	NA	NA	NA
TT-MW2-33C	6/21/2010	Unfiltered	<0.071	0.0096	0.0028 Jq	<0.000077	<0.00028	0.00088 Jq	<0.0019	NA	0.00016 BJaq	0.000033 Jq	NA	0.034	<0.0015	<0.0025	<0.0027	<0.0014
TT-MW2-33C-F	6/21/2010	Filtered	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	9.0 Jq	NA	NA	NA	NA	NA
TT-MW2-34A	6/29/2010	Unfiltered	<0.071	0.0065	0.020 Jq	<0.000077	<0.00028	<0.00050	0.010	NA	<0.000084	<0.000032	NA	0.0033 Jq	0.0095 Jq	0.011	<0.0027	0.0023 BJaq
TT-MW2-34A-F	6/29/2010	Filtered	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	16	NA	NA	NA	NA	NA
Method Detection Limit			0.071	0.0016	0.000056	0.000077	0.00028	0.0005	0.0019	12	0.000084	0.000032	1.2	0.0009	0.0015	0.0025	0.0027	0.0014
MCL (unless noted) / DWNL			6	0.01	1	0.005	-	0.05	1.3	300	0.015	2	500 (1)	-	0.1	0.05	0.05 (1)	5

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

- µg/L - Micrograms per liter
- mg/L - Milligrams per liter
- MCL - California Department of Public Health Maximum Contaminant Level.
- DWNL - California Department of Public Health drinking water notification level.
- (1) - DWNL
- " - " MCL/DWNL not established.
- NA - Not analyzed.

- **Bold** - MCL or DWNL exceeded.
- < # - Method detection limit concentration is shown.
- B - The sample result was less than 5 times blank contamination. Cross contamination is suspected.
- J - The analyte was positively identified, but the concentration is an estimated value.
- a - The analyte was found in the method blank.
- k - The analyte was found in a field blank.
- q - The analyte detected was below the Practical Quantitation Limit (PQL).

Table 3-5 Summary of Validated Detected Inorganic Analytes - Second Quarter 2010 (continued)

Sample Name	Sample Date	Filter Status	Perchlorate ug/L	Arsenic mg/L	Barium mg/L	Cadmium mg/L	Cobalt mg/L	Chromium mg/L	Copper mg/L	Iron ug/L	Lead mg/L	Mercury ug/L	Manganese ug/L	Molybdenum mg/L	Nickel mg/L	Selenium mg/L	Vanadium mg/L	Zinc mg/L
TT-MW2-34B	6/29/2010	Unfiltered	<0.071	0.0026	0.014 Jq	<0.000077	<0.00028	<0.00050	0.0037 Jq	NA	<0.000084	<0.000032	NA	0.0025 Jq	0.0022 Jq	<0.0025	<0.0027	0.0018 BJaq
TT-MW2-34B-F	6/29/2010	Filtered	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	25	NA	NA	NA	NA	NA
TT-MW2-34C	6/29/2010	Unfiltered	<0.071	**0.017**	0.0025 Jq	<0.000077	<0.00028	0.00080 BJaq	<0.0019	NA	<0.000084	<0.000032	NA	0.0044 Jq	<0.0015	<0.0025	0.038	0.0027 BJaq
TT-MW2-34C-F	6/29/2010	Filtered	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<1.2	NA	NA	NA	NA	NA
TT-MW2-35A	6/28/2010	Unfiltered	<0.71	0.0053	0.037 Jq	<0.000077	<0.00028	<0.00050	0.0058 Jq	NA	<0.000084	<0.000032	NA	0.060	0.0054 Jq	<0.0025	<0.0027	0.0036 Jq
TT-MW2-35A-F	6/28/2010	Filtered	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	**660**	NA	NA	NA	NA	NA
TT-MW2-35B	6/28/2010	Unfiltered	<0.071	**0.019**	0.0047 Jq	0.000081 Jq	<0.00028	0.0020 Jq	<0.0019	NA	0.00095 Jq	<0.000032	NA	0.029	<0.0015	<0.0025	<0.0027	0.0092 Jq
TT-MW2-35B-F	6/28/2010	Filtered	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	5.1 Jq	NA	NA	NA	NA	NA
TT-MW2-36A	6/22/2010	Unfiltered	<0.071	**0.012**	0.016 Jq	<0.000077	0.0011 Jq	0.0079 Jq	0.0072 Jq	**2700**	0.0032 BJaq	<0.000032	NA	0.0060 Jq	0.0054 Jq	<0.0025	0.0063 Jq	0.041
TT-MW2-36A-F	6/22/2010	Filtered	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	4.7 Jq	NA	NA	NA	NA	NA
TT-MW2-36B	6/23/2010	Unfiltered	<0.071	**0.011**	0.0028 Jq	<0.000077	<0.00028	0.0030 Jq	<0.0019	NA	0.00025 BJaq	<0.000032	NA	0.0059 Jq	<0.0015	<0.0025	<0.0027	0.0030 Jq
TT-MW2-36B-F	6/23/2010	Filtered	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	4.3 Jq	NA	NA	NA	NA	NA
TT-MW2-36C	6/23/2010	Unfiltered	1.1	**0.033**	0.12	<0.000077	<0.00028	0.0015 Jq	0.0029 Jq	NA	0.00047 BJaq	0.00011 Jq	NA	0.017	0.011	<0.0025	**0.15**	0.0017 Jq
TT-MW2-36C-F	6/23/2010	Filtered	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<2.5	NA	NA	NA	NA	NA
TT-MW2-37A	6/30/2010	Unfiltered	**7,500**	<0.0016	**1.4**	<0.000077	0.0015 Jq	0.018	0.0061 Jq	NA	0.00048 Jq	<0.000032	NA	0.0068 Jq	0.025	<0.0025	<0.0027	0.0057 BJaq
TT-MW2-37A-F	6/30/2010	Filtered	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<1.2	NA	NA	NA	NA	NA
TT-MW2-37B	6/30/2010	Unfiltered	0.38	**0.023**	0.0093 Jq	0.00010 Jq	<0.00028	<0.00050	0.0028 Jq	NA	<0.000084	<0.000032	NA	0.090	0.0037 Jq	<0.0025	<0.0027	0.0026 BJaq
TT-MW2-37B-F	6/30/2010	Filtered	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	5.2 Jq	NA	NA	NA	NA	NA
TT-MW2-38A	6/23/2010	Unfiltered	**200,000**	0.0038	0.14	<0.000077	0.00040 Jq	0.0039 Jq	0.0028 Jq	NA	0.00040 BJaq	<0.000032	NA	0.0026 Jq	0.0076 Jq	0.0098	<0.0027	0.0020 Jq
TT-MW2-38A-F	6/23/2010	Filtered	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	8.9 Jq	NA	NA	NA	NA	NA
TT-MW2-38B	7/1/2010	Unfiltered	**9,700**	0.0071	0.012 Jq	0.000079 Jq	<0.00028	0.00053 BJaq	0.0019 Jq	NA	<0.000084	<0.000032	NA	0.046	0.0019 Jq	<0.0025	<0.0027	0.0027 BJaq
TT-MW2-38B-F	7/1/2010	Filtered	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<1.2	NA	NA	NA	NA	NA
TT-MW2-38C	7/1/2010	Unfiltered	**61,000**	0.0086	0.0049 Jq	<0.000077	<0.00028	<0.00050	0.0025 Jq	NA	<0.000084	<0.000032	NA	0.010	0.0031 Jq	0.0025 Jq	0.019	0.0022 BJaq
TT-MW2-38C-F	7/1/2010	Filtered	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	10	NA	NA	NA	NA	NA
TT-MW2-39	6/21/2010	Unfiltered	**73,000**	0.004	0.19	<0.000077	0.00085 Jq	<0.00050	0.0044 Jq	NA	<0.000084	<0.000032	NA	0.014	**0.10**	0.018	<0.0027	<0.0014
TT-MW2-39-F	6/21/2010	Filtered	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	27	NA	NA	NA	NA	NA
TT-MW2-40A	6/23/2010	Unfiltered	<0.071	0.0076	0.014 Jq	<0.000077	<0.00028	0.0024 Jq	<0.0019	NA	0.00052 BJaq	<0.000032	NA	0.012	0.0029 Jq	<0.0025	<0.0027	<0.0014
TT-MW2-40A-F	6/23/2010	Filtered	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	210	NA	NA	NA	NA	NA
TT-MW2-40B	6/23/2010	Unfiltered	1.9	0.0077	0.010 Jq	<0.000077	<0.00028	0.0024 Jq	0.0024 Jq	NA	<0.000084	<0.000032	NA	0.036	<0.0015	0.0044 Jq	<0.0027	<0.0014
TT-MW2-40B-F	6/23/2010	Filtered	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	45	NA	NA	NA	NA	NA
TT-MW2-40C	6/23/2010	Unfiltered	<0.071	**0.012**	0.011 Jq	0.00014 Jq	<0.00028	0.0055 Jq	0.0021 Jq	NA	0.00093 BJaq	<0.000032	NA	0.11	0.0030 Jq	<0.0025	<0.0027	0.0045 Jq
TT-MW2-40C-F	6/23/2010	Filtered	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	5.9 Jq	NA	NA	NA	NA	NA
TT-MW2-41A	6/24/2010	Unfiltered	<0.071	0.0051	0.018 Jq	0.00012 Jq	0.00072 Jq	0.0055 Jq	0.0070 Jq	NA	0.0010 BJaq	<0.000032	NA	0.021	0.0031 Jq	<0.0025	0.0057 Jq	0.0087 Jq
TT-MW2-41A-F	6/24/2010	Filtered	NA	0.0045	0.0082 Jq	<0.000077	<0.00028	0.010	0.0022 Jq	NA	<0.000084	<0.000032	4.6 Jq	0.018	<0.0015	<0.0025	0.0041 Jq	<0.0014
TT-MW2-42A	6/22/2010	Unfiltered	<0.071	**0.013**	0.0039 Jq	<0.000077	<0.00028	0.0029 BJkq	0.0019 Jq	**440**	0.00030 BJaq	0.000037 Jq	NA	0.013	<0.0015	<0.0025	<0.0027	0.073
TT-MW2-42A-F	6/22/2010	Filtered	NA	0.0084	0.0018 BJaq	<0.000077	<0.00028	0.0066 BJkq	<0.0019	NA	<0.000084	<0.000032	77	0.0089 Jq	<0.0015	<0.0025	<0.0027	0.0020 BJkq
WS-1	6/30/2010	Unfiltered	<0.071	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
WS-2	6/30/2010	Unfiltered	<0.071	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
WS-3	6/30/2010	Unfiltered	<0.071	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PPW-1	5/3/2010	Unfiltered	<0.071	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PPW-2	5/3/2010	Unfiltered	<0.071	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PPW-3	5/3/2010	Unfiltered	<0.071	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PPW-5	5/3/2010	Unfiltered	<0.071	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PPW-7	5/3/2010	Unfiltered	<0.071	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Method Detection Limit			0.071	0.0016	0.000056	0.000077	0.00028	0.0005	0.0019	12	0.000084	0.000032	1.2	0.0009	0.0015	0.0025	0.0027	0.0014
MCL (unless noted) / DWNL			6	0.01	1	0.005	-	0.05	1.3	300	0.015	2	500 (1)	-	0.1	0.05	0.05 (1)	5

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

µg/L - Micrograms per liter
mg/L - Milligrams per liter
MCL - California Department of Public Health Maximum Contaminant Level.
DWNL - California Department of Public Health drinking water notification level.
(1) - DWNL
" - " MCL/DWNL not established.
NA - Not analyzed.

Bold - MCL or DWNL exceeded.
< # - Method detection limit concentration is shown.
B - The sample result was less than 5 times blank contamination. Cross contamination is suspected.
J - The analyte was positively identified, but the concentration is an estimated value.
a - The analyte was found in the method blank.
k - The analyte was found in a field blank.
q - The analyte detected was below the Practical Quantitation Limit (PQL).

Table 3-6 Summary of Validated Detected Inorganic, Natural Attenuation, and General Minerals Analytes - Second Quarter 2010

Sample Location	Sample Date	Dissolved Manganese (ug/L)	Chloride (mg/L)	Nitrite (mg/L) (2)	Nitrate (mg/L) (2)	Sulfate (mg/L)	Alkalinity,Total (mg/L) (1)	Bicarbonate (mg/L) (1)	Carbonate (mg/L) (1)	Hydroxide (mg/L) (1)	Dissolved Organic Carbon (mg/L)	Total Organic Carbon (mg/L)	Chlorate (ug/L)	Ethene (ug/L)	Ethane (ug/L)	Methane (ug/L)
TT-MW2-1	7/15/2010	<1.2	170	<0.017	7.3	31	190.0	230.0	<1.7	<1.7	0.84 Jf	0.68 Jq	<1000	<0.02	<0.01	0.05 Jq
TT-MW2-2	7/2/2010	<1.2	49	<0.017	0.16 Jq	20	140.0	160.0	2.4 Jq	<1.7	1.4		<1.0	0.07 Jq	<0.01	0.07 BJaq
TT-MW2-4S	6/28/2010	<2.5	34	<0.017	0.80	49	130.0	160.0	<1.7	<1.7	0.60 Jq		<1.0	0.04 Jq	<0.01	0.08 BJaq
TT-MW2-5	7/1/2010	<1.2	170	<0.017	10	140	230.0	280.0	<1.7	<1.7	1.0	0.68 Jq	<1000	0.03 Jq	<0.01	0.05 BJaq
TT-MW2-6S	6/25/2010	<2.5	120	<0.017	8.2	120	230.0	280.0	<1.7	<1.7	0.87		<100	0.04 Jq	<0.01	0.06 BJaq
TT-MW2-6D	6/25/2010	3.2 Jq	100	<0.017	<0.11	130	150.0	180.0	<1.7	<1.7	1.9		<1.0	0.12	0.02 Jq	0.89
TT-MW2-7	6/29/2010	<1.2	160	<0.017	6.2	190	280.0	340.0	<1.7	<1.7	1.0	1.1	<100	82	89	48
TT-MW2-7D	6/29/2010	1.2 Jq	24	<0.017	<0.11	20	91.0	110.0	<1.7	<1.7	2.3		<1.0	0.28	0.21	1600
TT-MW2-8	6/29/2010	<1.2	140	<0.017	7.2	180	220.0	310.0	<1.7	<1.7	1.6		<100	<0.02	<0.01	0.05 Jq
TT-MW2-9S	6/25/2010	<2.5	230	<0.017	12	130	310.0	370.0	<1.7	<1.7	1.9	1.1	<1000	0.04 Jq	<0.01	0.09 BJaq
TT-MW2-9D	6/25/2010	<2.5	32	<0.017	<0.11	58	110.0	130.0	<1.7	<1.7	0.88		<1.0	<0.02	<0.01	0.09 BJaq
TT-MW2-10	6/28/2010	<2.5	190	<0.017	<0.11	75	160.0	200.0	<1.7	<1.7	1.2	1.4	<1.0	<0.02	<0.01	0.07 BJaq
TT-MW2-11	6/28/2010	<2.5	240	<0.017	16	62	180.0	220.0	<1.7	<1.7	0.91		<100	0.03 Jq	<0.01	0.09 BJaq
TT-MW2-12	6/29/2010	<1.2	180	<0.017	<0.11	53	130.0	130.0	16	<1.7	1.2	1.2	<1.0	<0.02	<0.01	0.3
TT-MW2-13	7/15/2010	<1.2	180	<0.017	7.9	42 Jcf	200.0	240.0	<1.7	<1.7	0.93		<1000	77	84	46
TT-MW2-14	7/19/2010	<1.2	**320**	<0.017	14	170	180.0	210.0	<1.7	<1.7	2.0	1.6	<5000	<0.02	<0.01	0.18
TT-MW2-16	7/15/2010	<1.2	69	<0.017	27 Je	30	340.0	410.0	<1.7	<1.7	2.7		<1.0	<0.02	<0.01	0.03 Jq
TT-MW2-17S	7/1/2010	1.8 Jq	22	<0.017	27 Je	25	260.0	310.0	<1.7	<1.7	1.5		<1000	0.04 Jq	<0.01	0.09 BJaq
TT-MW2-17D	7/1/2010	25	**290**	0.040 Jq	8.7	54	85.0	100.0	<1.7	<1.7	1.1	1.0	<10000	0.08 Jq	0.06 Jq	0.49
TT-MW2-18	6/28/2010	<2.5	86	<0.017	0.75	44	200.0	250.0	<1.7	<1.7	0.89		<10000	0.03 Jq	<0.01	0.08 BJaq
TT-MW2-19S	6/23/2010	<2.5	190	<0.017	4.8	100	180.0	230.0	<1.7	<1.7	1.1 Bk		<1.0	<0.02	<0.01	0.06 BJakq
TT-MW2-19D	6/24/2010	<2.5	67	<0.017	<0.11	33	140.0	170.0	<1.7	<1.7	2.1		<1.0	0.14	<0.01	0.64
TT-MW2-20S	6/30/2010	<1.2	73	<0.017	<0.11	210	230.0	280.0	<1.7	<1.7	0.48 Jq		<1.0 UJc	82	89	48
TT-MW2-20D	6/30/2010	<1.2	52	<0.017	<0.11	170	55.0	67.0	<1.7	<1.7	0.80		<1.0	0.24	<0.01	520
TT-MW2-21	6/25/2010	<2.5	130	<0.017	0.11 Jq	43	72.0	88.0	<1.7	<1.7	0.68 Jq		<1.0	0.04 Jq	0.03 Jq	0.17
TT-MW2-22	6/25/2010	4.9 Jq	140	<0.017	<0.11	15	140.0	170.0	<1.7	<1.7	2.1		<1.0	0.26	0.11	0.67
TT-MW2-23	6/25/2010	<2.5	130	<0.017	<0.11	26	61.0	72.0	<1.7	<1.7	<0.14	0.24 Jq	<1.0 UJc	84	90	67
TT-MW2-24	7/15/2010	3.3 Jq	**430**	<0.017	**55 Je**	95	220.0	270.0	<1.7	<1.7	7.2	7.0	<100000	0.08 Jq	0.03 Jq	0.21 Bk
TT-MW2-25	6/25/2010	11 Jq	55	<0.017	<0.11	26	92.0	110.0	2.4 Jq	<1.7	1.6		<1.0	<0.02	<0.01	0.14 Ba
TT-MW2-26	6/30/2010	39	160	<0.017	3.6	88	320.0	390.0	<1.7	<1.7	0.94		<1.0	<0.02	<0.01	0.09 BJakq
TT-MW2-27	6/25/2010	36	120	<0.017	<0.11	76	240.0	290.0	<1.7	<1.7	2.2		<100	0.03 Jq	0.02 Jq	0.15
Method Detection Limit		1.2	0.50	0.017	0.11	0.37	1.7	1.7	1.7	1.7	0.14	0.16	1.0	0.02	0.01	0.01
MCL/DWNL		500 (3)	250	1	45	250	-	-	-	-	-	-	800 (3)	-	-	-

Notes:

Only analytes positively detected in samples are presented in this table. For a complete list of constituents analyzed, refer to the laboratory data package.

(1) - As calcium carbonate (CaCO3).
(2) - As nitrogen (N).
(3) - DWNL
mg/L - Milligrams per liter.
µg/L - Micrograms per liter
MCL - California Department of Public Health Maximum Contaminant Level.
DWNL - California Department of Public Health state drinking water notification level.
"-" - MCL or DWNL not available.
Bold - MCL or DWNL exceeded.
< # - Method detection limit concentration is shown.

B - The result is < 5 times the blank contamination. Cross contamination is suspected and the data is considered unusable
J - The analyte was positively identified, but the analyte concentration is an estimated value.
U - The analyte was not detected above the MDL.
a - The analyte was found in the method blank.
c - The Matrix Spike (MS) and/or Matrix Spike Duplicate (MSD) recoveries were outside control limits.
e - a holding time violation occurred.
f - The duplicate Relative Percent Difference (RPD) was outside the control limit
k - The analyte was found in a field blank.
q - The analyte detection was below the Practical Quantitation Limit (PQL).

Table 3-6 Summary of Validated Detected Inorganic, Natural Attenuation, and General Minerals Analytes - Second Quarter 2010 (continued)

Sample Location	Sample Date	Dissolved Manganese (ug/L)	Chloride (mg/L)	Nitrite (mg/L) (2)	Nitrate (mg/L) (2)	Sulfate (mg/L)	Alkalinity,Total (mg/L) (1)	Bicarbonate (mg/L) (1)	Carbonate (mg/L) (1)	Hydroxide (mg/L) (1)	Dissolved Organic Carbon (mg/L)	Total Organic Carbon (mg/L)	Chlorate (ug/L)	Ethene (ug/L)	Ethane (ug/L)	Methane ug/L)
TT-MW2-28	6/21/2010	49	180	<0.017	0.29	79	640.0	770.0	3.6	<1.7	2.3 Bk		<10	<0.02	0.02 Jq	1.2
TT-MW2-29B	6/23/2010	3.5 Jq	150	<0.017	<0.11	28	43.0	52.0	<1.7	<1.7	1.3 Bk		<1.0	0.16 Bk	0.1	0.68
TT-MW2-29C	7/1/2010	46	44	<0.017	<0.11	17	150.0	180.0	<1.7	<1.7	4.3		<1.0	2.7	0.63	9400
TT-MW2-30A	7/1/2010	1.3 Jq	58	<0.017	0.58	17	79.0	84.0	6.0	<1.7	1.3		<1000	0.08 Jq	0.02 Jq	0.81
TT-MW2-30B	7/1/2010	25	170	<0.017	<0.11	**460**	100.0	120.0	<1.7	<1.7	2.7		<1000	0.05 Jq	1.5	7.4
TT-MW2-30C	7/1/2010	27	210	<0.017	<0.11	110	160.0	190.0	<1.7	<1.7	20		<1.0	20	1.7	9600
TT-MW2-31A	6/28/2010	75	150	<0.017	<0.11	230	110.0	130.0	<1.7	<1.7	2.4		<1.0	1.3	0.57	29
TT-MW2-31B	7/2/2010	21	57	<0.017	<0.11	220	170	200	<1.7	<1.7	2.4		<1.0	0.47	2.2	1600
TT-MW2-32	6/28/2010	<2.5	15	<0.017	<0.11	21	71	55	16	<1.7	1.5		<1.0	0.08 Jq	0.08 Jq	60
TT-MW2-33A	6/21/2010	40	110	<0.017	0.17 Jq	20	130	160	<1.7	<1.7	3.6		<1.0	<0.02	0.5	81
TT-MW2-33B	6/21/2010	2.6 Jq	53	<0.017	<0.11	11	91	110	<1.7	<1.7	2.0		<1.0	0.16	0.04 Jq	200
TT-MW2-33C	6/21/2010	9.0 Jq	50	<0.017	<0.11	1.8	100	130	<1.7	<1.7	16		<1.0	2.3	5.5	3300
TT-MW2-34A	6/29/2010	16	**1,400**	<0.017	<0.11	15	42	51	<1.7	<1.7	1.6		<1.0	0.07 Jq	0.36	190
TT-MW2-34B	6/29/2010	25	230	<0.017	<0.11	44	150	180	<1.7	<1.7	1.5		<1.0	0.1	0.02 Jq	6.6
TT-MW2-34C	6/29/2010	<1.2	110	<0.017	<0.11	17	34	12	14	<1.7	1.3		<1.0	0.21	0.02 Jq	230
TT-MW2-35A	6/28/2010	**660**	71	<0.017	<0.11	**1,200**	57	70	<1.7	<1.7	5.8		<10	0.33	1.9	7.1
TT-MW2-35B	6/28/2010	5.1 Jq	29	<0.017	<0.11	13	140	170	<1.7	<1.7	3.1		<1.0	4.9	0.77	7200
TT-MW2-36A	6/22/2010	4.7 Jq	50	<0.017	<0.11	17	85	89	7.2	<1.7	1.3	0.59 Jq	<1.0	0.54	0.29	16
TT-MW2-36B	6/23/2010	4.3 Jq	56	<0.017	<0.11	86	65	79	<1.7	<1.7	0.71		<1.0	0.2	0.14	2.5
TT-MW2-36C	6/23/2010	<2.5	21	<0.017	<0.11	11	650	<6.8	100	160	11		<1.0	13	1.7	34
TT-MW2-37A	6/30/2010	<1.2	35	0.040 Jq	<0.11	5	1800	<17	48	590	14		<1000	5.1	2	15
TT-MW2-37B	6/30/2010	5.2 Jq	89	<0.017	<0.11	240	130	130	16	<1.7	4.1		<1.0	18	9.5	49
TT-MW2-38A	6/23/2010	8.9 Jq	**400**	<0.017	15	39	110	130	<1.7	<1.7	1.3		<100000	0.03 Jq	0.02 Jq	0.29
TT-MW2-38B	7/1/2010	<1.2	110	<0.017	0.14 Jq	120	46	32	12	<1.7	4.8		<10000	4.3	1.1	170
TT-MW2-38C	7/1/2010	10	180	0.91	0.94	61	120	140	<1.7	<1.7	6.9		<1000	3.8	1.3	48
TT-MW2-39	6/21/2010	27	**670**	<0.017	23	65	120	140	<1.7	<1.7	2.1		<10000	<0.02	<0.01	3
TT-MW2-40A	6/23/2010	210	97	<0.017	<0.11	150	200	250	<1.7	<1.7	1.9		<1.0	0.48	1.1	250
TT-MW2-40B	6/23/2010	45	200	<0.017	<0.11	53	170	210	<1.7	<1.7	1.8		<1.0	22	24	1500
TT-MW2-40C	6/23/2010	5.9 Jq	81	<0.017	<0.11	1.3	97	120	<1.7	<1.7	11		<1.0	15	9.9	2200
TT-MW2-41A	6/24/2010	4.6 Jq	53	<0.017	<0.11	97	210	260	<1.7	<1.7	1.9		<1.0	<0.02	<0.01	0.18
TT-MW2-42A	6/22/2010	77	48	<0.017	<0.11	33	140	170	<1.7	<1.7	0.60 BJkq	1.5	<1.0	0.07 BJkq	0.06 Jq	3.6
Method Detection Limit		1.2	0.50	0.017	0.11	0.37	1.7	1.7	1.7	1.7	0.14	0.16	1.0	0.02	0.01	0.01
MCL/DWNL		500 (3)	250	1	45	250	-	-	-	-	-	-	800 (3)	-	-	-

Notes:

Only analytes positively detected in samples are presented in this table. For a complete list of constituents analyzed, refer to the laboratory data package.

(1) - As calcium carbonate ($CaCO_3$).
(2) - As nitrogen (N).
(3) - DWNL
mg/L - Milligrams per liter.
µg/L - Micrograms per liter
MCL - California Department of Public Health Maximum Contaminant Level.
DWNL - California Department of Public Health state drinking water notification level.
"-" - MCL or DWNL not available.
Bold - MCL or DWNL exceeded.
< # - Method detection limit concentration is shown.

B - The result is < 5 times the blank contamination. Cross contamination is suspected and the data is considered unusable
J - The analyte was positively identified, but the analyte concentration is an estimated value.
U - The analyte was not detected above the MDL.
a - The analyte was found in the method blank.
c - The Matrix Spike (MS) and/or Matrix Spike Duplicate (MSD) recoveries were outside control limits.
e - a holding time violation occurred.
f - The duplicate Relative Percent Difference (RPD) was outside the control limit
k - The analyte was found in a field blank.
q - The analyte detection was below the Practical Quantitation Limit (PQL).

Table 3-7 Summary of Validated Detected Inorganic Analytes - Third Quarter 2010

Sample Name	Sample Date	Perchlorate -ug/L
WS-1	9/10/2010	<0.071
WS-2	9/10/2010	<0.071
TT-MW2-19S	9/8/2010	4.8
TT-MW2-19D	9/8/2010	0.29
TT-MW2-20S	9/8/2010	<0.071
TT-MW2-20D	9/8/2010	<0.071
TT-MW2-41A	9/10/2010	<0.071
TT-MW2-42A	9/10/2010	7.4 Bk
	Method Detection Limit	0.071
	MCL	6

Notes:

µg/L - Micrograms per liter

MCL - California Department of Public Health Maximum Contaminant Level.

< # - Method detection limit concentration is shown.

B - The sample result was less than 5 times blank contamination. Cross contamination is suspected.

k - The analyte was found in a field blank.

Table 3-8 Summary Statistics of Validated Detected Organic and Inorganic Analytes - Second Quarter 2010

Organic Analytes Detected	Total Number of Samples Analyzed	Total Number of Detections (1)	Number of Detections Exceeding MCL or DWNL (1)	MCL / DWNL		Minimum Concentration Detected		Maximum Concentration Detected	
1,4-Dioxane	60	5	4	1 (2)	µg/L	0.92	µg/L	250	µg/L
NDMA	11	6	0	10 (2)	ng/L	0.80	ng/L	1.8	ng/L
RDX	5	2	2	0.3 (2)	µg/L	0.32	µg/L	3.2	µg/L
Acetone	56	3	0	-	µg/L	8.3	µg/L	64	µg/L
2-Butanone	56	3	0	-	µg/L	3.0	µg/L	9.6	µg/L
Benzene	56	9	1	1	µg/L	0.17	µg/L	16	µg/L
Carbon Disulfide	56	23	0	160 (2)	µg/L	0.38	µg/L	56	µg/L
Chloroform	56	1	0	-	µg/L	3.9	µg/L	3.9	µg/L
Chloromethane	56	2	0	-	µg/L	0.37	µg/L	0.67	µg/L
1, 1-Dichloroethane	56	2	0	5	µg/L	0.86	µg/L	3.3	µg/L
1, 2-Dichloroethane	56	2	2	0.5	µg/L	0.74	µg/L	1.3	µg/L
1, 1-Dichloroethene	56	2	1	6	µg/L	2.8	µg/L	26	µg/L
cis-1, 2-Dichloroethene	56	2	0	6	µg/L	0.41	µg/L	1.6	µg/L
Ethylbenzene	56	1	0	300	µg/L	1.3	µg/L	1.3	µg/L
Methylene Chloride	56	4	0	5	µg/L	0.21	µg/L	4.5	µg/L
Toluene	56	11	0	150	µg/L	0.35	µg/L	9.5	µg/L
1, 1, 2-Trichloroethane	56	1	0	5	µg/L	0.54	µg/L	0.54	µg/L
Trichloroethene	56	8	3	5	µg/L	0.35	µg/L	470	µg/L
Tetrachloroethene	56	2	0	5	µg/L	0.18	µg/L	0.24	µg/L
m,p-Xylenes	56	1	0	1750	µg/L	1.9	µg/L	1.9	µg/L
o-Xylene	56	1	0	1750	µg/L	1.3	µg/L	1.3	µg/L
Inorganic Analytes Detected	**Total Number of Samples Analyzed**	**Total Number of Detections (1)**	**Number of Detections Exceeding MCL or DWNL (1)**	**MCL / DWNL**		**Minimum Concentration Detected**		**Maximum Concentration Detected**	
Perchlorate	68	35	23	6	µg/L	0.19	µg/L	200,000	µg/L
Arsenic (total)	62	54	17	0.01	mg/L	0.0016	mg/L	0.046	mg/L
Arsenic (dissolved)	4	4	0	0.01	mg/L	0.0019	mg/L	0.0084	mg/L
Barium (total)	62	62	1	1	mg/L	0.00068	mg/L	1.4	mg/L
Barium (dissolved)	4	3	0	1	mg/L	0.0082	mg/L	0.034	mg/L
Cadmium (total)	62	8	0	0.005	mg/L	0.000079	mg/L	0.00021	mg/L
Cobalt (total)	62	12	0	-	mg/L	0.00030	mg/L	0.0017	mg/L
Chromium (total)	62	27	0	0.05	mg/L	0.00051	mg/L	0.043	mg/L
Chromium (dissolved)	4	3	0	0.05	mg/L	0.010	mg/L	0.015	mg/L
Copper (total)	62	52	0	1.3	mg/L	0.0019	mg/L	0.010	mg/L
Copper (dissolved)	4	3	0	1.3	mg/L	0.0022	mg/L	0.0034	mg/L
Iron (total)	12	10	3	300	µg/L	22	µg/L	2,700	µg/L
Lead (total)	62	14	0	0.015	mg/L	0.000097	mg/L	0.00097	mg/L
Manganese (dissolved)	62	35	1	500	µg/L	1.2	µg/L	660	µg/L
Mercury (total)	62	5	0	2	µg/L	0.000033	µg/L	0.00011	µg/L
Molybdenum (total)	62	60	0	-	mg/L	0.0020	mg/L	0.11	mg/L
Molybdenum (dissolved)	4	4	0	-	mg/L	0.0089	mg/L	0.020	mg/L
Nickel (total)	62	48	4	0.1	mg/L	0.0015	mg/L	0.35	mg/L
Nickel (dissolved)	4	2	0	0.1	mg/L	0.0030	mg/L	0.0039	mg/L
Selenium (total)	62	25	0	0.05	mg/L	0.0080	mg/L	0.010	mg/L
Selenium (dissolved)	4	2	0	0.05	mg/L	0.0080	mg/L	0.010	mg/L
Vanadium (total)	62	35	4	0.05 (2)	mg/L	0.0030	mg/L	0.15	mg/L
Vanadium (dissolved)	4	3	0	0.05 (2)	mg/L	0.0041	mg/L	0.025	mg/L
Zinc (total)	62	31	0	5	mg/L	0.0014	mg/L	0.21	mg/L

Notes: Only analytes positively detected in groundwater or surface water samples are presented in this table. For a complete list of constituents analyzed, refer to the laboratory data package.

(1) - Number of detections exclude sample duplicates, trip blanks, and equipment blanks.
(2) - California Department of Public Health state drinking water notification level.
MCL - California Department of Public Health Maximum Contaminant Level.
DWNL - California Department of Public Health state drinking water notification level.
" - " MCL/DWNL not established.
RDX - Hexahydro-1,3,5-trinitro-1,3,5-triazine
µg/L - Micrograms per liter.
NDMA - N-Nitrosodimethylamine
mg/L - Milligrams per liter
ng/L - Nanograms per liter

Table 3-9 Summary Statistics of Validated Detected Inorganic Analytes - Third Quarter 2010

Inorganic Analytes Detected	Total Number of Samples Analyzed	Total Number of Detections (1)	Number of Detections Exceeding MCL (1)	MCL		Minimum Concentration Detected		Maximum Concentration Detected	
Perchlorate	8	2	0	6	µg/L	0.29	µg/L	4.8	µg/L

Notes: Only analytes positively detected in groundwater or surface water samples are presented in this table.
For a complete list of constituents analyzed, refer to the laboratory data package.
(1) - Number of detections exclude sample duplicates, trip blanks, and equipment blanks.
MCL - California Department of Public Health Maximum Contaminant Level.
µg/L - Micrograms per liter.

3.5 Chemicals of Potential Concern

The identification of COPCs is an ongoing process that takes place annually as part of the Second Quarter sampling. 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 two groups, organic and inorganic analytes, and divided into primary and secondary COPCs. Table 3-10 presents a summary of the Site 2 COPCs. Laboratory analytical results from the Second Quarter 2010 and Third Quarter 2010 monitoring events are presented in the following two subsections. Tables 3-4 through 3-7 present a summary of validated organic and inorganic analytes detected during the Second Quarter 2010 and Third Quarter 2010 monitoring events. Data which are B qualified because of association with either laboratory or field contamination is not included in the COPC evaluation.

Table 3-10 Groundwater Chemicals of Potential Concern

Analyte	Classification
Perchlorate	Primary
Trichloroethene	Primary
1,4-Dioxane	Primary
Benzene	Secondary
Methylene Chloride	Secondary
RDX	Secondary
Notes:	
RDX - Hexahydro-1,3,5-trinitro-1,3,5-triazine	

3.5.1 Organic Analytes

Six organic analytes (1,4-dioxane, 1,2-DCA, 1,1-DCE, benzene, RDX, and TCE) were detected above a published MCL or DWNL during the Second Quarter 2010 monitoring event. Table 3-4 presents a summary of validated organic analyte concentrations reported in groundwater samples collected during the Second Quarter 2010 groundwater monitoring event.

1,4-Dioxane was reported in groundwater samples collected from five monitoring wells, TT-MW2-5, TT-MW2-9S, TT-MW2-22, TT-MW2-24, and TT-MW2-37A, during the Second Quarter 2010 monitoring event at concentrations ranging from 0.92 µg/L to 250 µg/L. All wells are located within or just downgradient of the former WDA. The DWNL for 1,4-dioxane is 1 µg/L. Figure 3-5 presents a 1,4-dioxane isoconcentration map for groundwater samples collected during the Second Quarter 2010 monitoring event.

1,2-DCA was reported in groundwater samples collected from two monitoring wells, TT-MW2-22 and TT-MW2-24, located in the former WDA, during the Second Quarter 2010 monitoring event at concentrations of 1.3 µg/L and 0.74 µg/L respectively. The MCL for 1,2-DCA is 0.5 µg/L.

1,1-DCE was reported in groundwater samples collected from two monitoring wells, TT-MW2-22 and TT-MW2-24, located in the former WDA during the Second Quarter 2010 monitoring event at concentrations of 26 µg/L and 2.8 µg/L respectively. The MCL for 1,1-DCE is 6 µg/L.

Benzene was reported in groundwater samples collected from nine monitoring wells during the Second Quarter 2010 monitoring event, at concentrations ranging from 0.17 µg/L to 16 µg/L. TT-MW2-31B, TT-MW2-33C, TT-MW2-36C, TT-MW2-40B, and TT-MW2-40C located in Area K, TT-MW2-35B located in Area L, and TT-MW2-22, TT-MW2-24, and TT-MW2-37A, located within the former WDA. The highest benzene detection, 16 µg/L, was from monitoring well TT-MW2-40B. This well has historically had benzene detections ranging from 8 µg/L to 26 µg/L. The remaining benzene detections, both historic and recent, have been below the MCL of 1 µg/L. The source of the benzene detected in TT-MW2-40B is unknown, but may be a result of difficulties encountered during drilling operations when the drill rig jaw retaining bolts sheared off and the jaws fell into the borehole.

RDX was reported in groundwater samples collected from two monitoring wells in two locations during the Second Quarter 2010 monitoring event: TT-MW2-13, located in Area K; and TT-MW2-24, located in the former WDA, at concentrations of 0.32 µg/L and 3.2 µg/L respectively. The DWNL for RDX is 0.3 µg/L. These results are consistent with historic data.

TCE was reported in groundwater samples collected from four monitoring wells (TT-MW2-21, TT-MW2-22, TT-MW2-24, and TT-MW2-37A) located in the former WDA during the Second Quarter 2010 monitoring event, at concentrations of 3.4 µg/L, 470 µg/L, 97 µg/L, and 2.0 µg/L respectively. TCE was also detected in monitoring well TT-MW2-9S, located downgradient of the former WDA, at a concentration of 0.92 µg/L. TCE was also reported in monitoring wells TT-MW2-17S and TT-MW2-17D, located in Area K at concentrations of 0.35 µg/L and 2.6 µg/L respectively; and in monitoring well TT-MW2-11, located in Area M at a concentration of 11 µg/L. The MCL for TCE is 5 µg/L. Figure 3-6 presents a TCE isoconcentration map for groundwater samples collected during the Second Quarter 2010 monitoring event. Time-series graphs of TCE are provided in Appendix I.

Methylene chloride was not detected above the MCL during the Second or Third Quarter 2010 sampling events. Previously, methylene chloride has been detected as high as 380 µg/L in monitoring well TT-MW2-14, located in Area K, and as high as 220 µg/L in monitoring well TT-MW2-21, located in the former WDA. Methylene chloride has not been detected at concentrations above the MDL in monitoring well TT-MW2-14, but continues to be detected at concentrations above the MDL but below the MCL in TT-MW2-21.

Other organic analytes detected at low levels and below their respective MCLs or DWNLs during the Second Quarter 2010 groundwater monitoring event were NDMA, acetone, 2-butanone, carbon disulfide, chloromethane, chloroform, 1,1-DCA, cis-1,2-DCE, ethylbenzene, toluene, 1,1,2-trichloroethane, tetrachloroethene (PCE), and m,p-xylenes and o-xylene. None of these compounds exceeded their MCL or DWNL, and generally they are not detected consistently from monitoring event to event.

Due to the scattered nature of the locations where NDMA has been detected, the potential for cross-contamination from an outside source was investigated. The majority of NDMA detections, both historic and recent, occurred in wells sampled with the site-approved dedicated pump. Therefore, a leach test was conducted on the pump to determine if the pump was a source of the NDMA detections. A new pump with attached hoses and safety cables of the type used on the Site was obtained for leach testing. The pump was placed in a section of well casing which was filled with deionized water. The pump was then operated until water was flowing through the pump. A second section of blank well casing was filled with deionized water as a control sample. Both sections of pipe were covered and allowed to stand for three days. The water in the casing with the pump was pumped into sample bottles and the control sample was poured into sample bottles. All samples were then submitted to Babcock Laboratories Inc for analysis by EPA Method 521.

Sample results showed detections of 20 nanograms per liter (ng/L) and 10 ng/L in the primary and duplicate sample, respectively. NDMA was not detected above the method detection limit of 0.7 ng/L in the control sample. These results suggest that NDMA may be introduced into environmental samples by leaching from the dedicated sampling pumps.

As a follow up to the leach testing, the dedicated pumps from six monitoring wells that have had recent NDMA detections were removed at the conclusion of the Fourth Quarter 2009 groundwater monitoring event. The wells were allowed to equilibrate until Second Quarter 2010 at which time they were sampled for NDMA with a portable bladder pump. The data was compared to previous results obtained by purging and sampling with the dedicated pumps to determine the potential for the dedicated pumps being a possible source for the NDMA. NDMA was not detected above the MDL in four of the six wells. The remaining two wells had significantly lower detections than the previous sample results. Table 3-11 presents a summary of the Second Quarter 2010 and historical NDMA sample results for those six wells.

Several lines of evidence strongly suggest that NDMA detections at the Site are not due to environmental contamination:

- the initial NDMA detections in the second quarter 2009 were all at relatively low concentrations and were scattered across the Site rather than associated with one or more possible source areas;
- the results of the leach testing described above indicate that low levels of NDMA may be introduced into the environmental samples by leaching from the dedicated sampling pumps; and
- the NDMA sampling results summarized in Table 3-11 indicate that purging with a different type of sampling pump resulted in non-detectable NDMA in four of six wells, and much lower concentrations (which are well below the DWNL of 10 ng/L) in the two remaining wells.

Based on these lines of evidence, we conclude that the NDMA detections at the Site are not due to environmental contamination. No further sampling for NDMA will be conducted during future groundwater monitoring events.

Table 3-11 NDMA Pump Comparison Summary

Sample Location	Date Sampled	NDMA (ng/L)	Analytical Method	Pump Type
TT-MW2-19S	05/22/09	8.1	E1625C	Dedicated Blatypus Pump
TT-MW2-19S	06/15/09	<0.48	E1625C	Dedicated Blatypus Pump
TT-MW2-19S	06/15/09	**17**	SW8270C SIM	Dedicated Blatypus Pump
TT-MW2-19S	08/24/09	**20 Jdf**	E521	Dedicated Blatypus Pump
TT-MW2-19S	09/23/09	4.0	E521	Dedicated Blatypus Pump
TT-MW2-19S	06/23/10	<0.7	E521	Portable QED Bladder Pump
TT-MW2-24	05/29/09	**18**	E1625C	Dedicated Blatypus Pump
TT-MW2-24	09/01/09	**93 Jf**	SW8270C SIM	Dedicated Blatypus Pump
TT-MW2-24	09/25/09	<0.7	E521	Dedicated Blatypus Pump
TT-MW2-24	07/15/10	<0.7	E521	Portable QED Bladder Pump
TT-MW2-26	05/20/09	**11**	E1625C	Dedicated Blatypus Pump
TT-MW2-26	09/02/09	**52**	SW8270C SIM	Dedicated Blatypus Pump
TT-MW2-26	09/25/09	5.0	E521	Dedicated Blatypus Pump
TT-MW2-26	06/30/10	<0.7	E521	Portable QED Bladder Pump
TT-MW2-28	05/27/09	9.5	E1625C	Dedicated Blatypus Pump
TT-MW2-28	09/01/09	**42**	SW8270C SIM	Dedicated Blatypus Pump
TT-MW2-28	09/25/09	5.0 Jb	E521	Dedicated Blatypus Pump
TT-MW2-28	06/21/10	1.5 Jbq	E521	Portable QED Bladder Pump
TT-MW2-29B	05/21/09	**19**	E1625C	Dedicated Blatypus Pump
TT-MW2-29B	08/31/09	<1	SW8270C SIM	Dedicated Blatypus Pump
TT-MW2-29B	09/24/09	8.0	E521	Dedicated Blatypus Pump
TT-MW2-29B	06/23/10	<0.7	E521	Portable QED Bladder Pump
TT-MW2-36A	05/29/09	8.6	E1625C	Dedicated Blatypus Pump
TT-MW2-36A	08/31/09	<1	SW8270C SIM	Dedicated Blatypus Pump
TT-MW2-36A	09/24/09	**10 Jf**	E521	Dedicated Blatypus Pump
TT-MW2-36A	06/22/10	0.8 Jq	E521	Portable QED Bladder Pump

Notes:

NDMA - N-Nitrosodimethylamine
ng/L - Nanograms per liter
Bold - California Department of Public Health drinking water notification level of 10 ng/L exceeded.
< # - Method detection limit concentration is shown.
J - The analyte was positively identified, but the concentration is an estimated value.
b - The surrogate spike recovery was 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).

Five additional wells, TT-MW2-20S, TT-MW2-21, TT-MW2-25, TT-MW2-41A, and TT-MW2-42A, were sampled for NDMA during the Second Quarter 2010 monitoring event. Four wells, TT-MW2-20S, TT-MW2-21, TT-MW2-25, and TT-MW2-41A were sampled using the site approved dedicated sampling pump and the remaining well; TT-MW2-42A was sampled using a portable bladder pump. NDMA was detected in for wells at concentrations ranging from 1.0 ng/L to 1.8 ng/L. Table 3-12 presents a summary of the Second Quarter 2010 and historical NDMA sample results for those six wells.

Table 3-12 NDMA Detection Summary

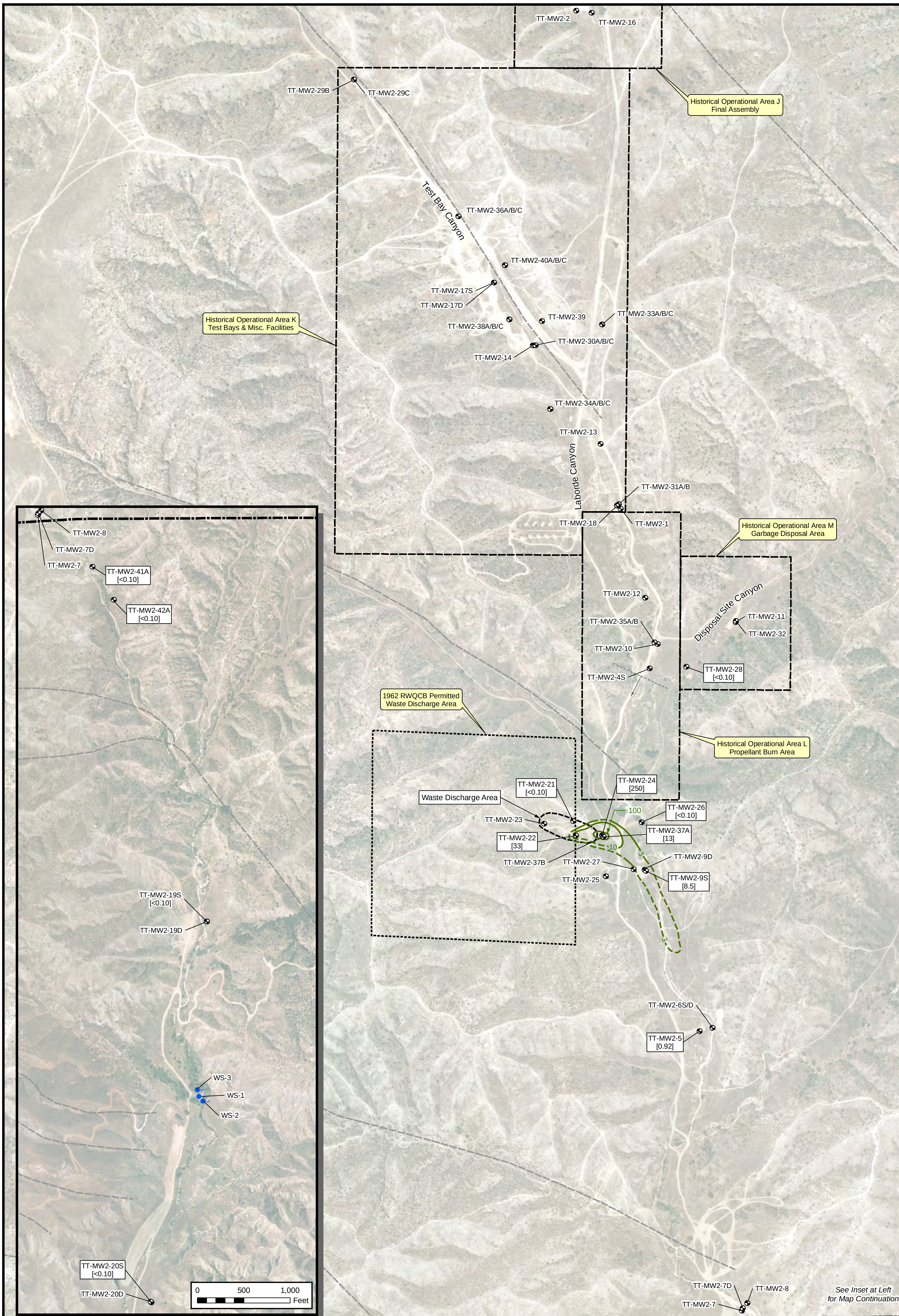
Sample Name	Date Sampled	NDMA (µg/L)	Analytical Method	Pump Type
TT-MW2-20S	05/22/09	<0.48	E1625C	Dedicated Blatypus Pump
TT-MW2-20S	08/24/09	0.9 Jdq	E521	Dedicated Blatypus Pump
TT-MW2-20S	09/23/09	<0.7 UJbc	E521	Dedicated Blatypus Pump
TT-MW2-20S	06/30/10	<0.7	E521	Dedicated Blatypus Pump
TT-MW2-21	05/20/09	**12**	E1625C	Dedicated Blatypus Pump
TT-MW2-21	09/02/09	5.4 Ba	SW8270C SIM	Dedicated Blatypus Pump
TT-MW2-21	09/25/09	2	E521	Dedicated Blatypus Pump
TT-MW2-21	06/25/10	1.8 Jbq	E521	Dedicated Blatypus Pump
TT-MW2-25	05/20/09	7.8	E1625C	Dedicated Blatypus Pump
TT-MW2-25	09/02/09	**10**	SW8270C SIM	Dedicated Blatypus Pump
TT-MW2-25	09/25/09	<0.7	E521	Dedicated Blatypus Pump
TT-MW2-25	06/25/10	1.5 Jq	E521	Dedicated Blatypus Pump
TT-MW2-41A	06/24/10	1.1 Jq	E521	Dedicated Blatypus Pump
TT-MW2-42A	06/22/10	1.0 Jq	E521	Portable QED Bladder Pump

Notes:
NDMA - N-Nitrosodimethylamine
ng/L - Nanograms per liter
Bold - California Department of Public Health drinking water notification level of 10 ng/L exceeded.
< # - Method detection limit concentration is shown.
J - The analyte was positively identified, but the concentration is an estimated value.
U - The analyte was analyzed for , but was not detected above the MDL.
b - The surrogate spike recovery was outside control limits.
d - The Laboratory Control Sample (LCS) recovery was outside control limits.
q - The analyte detection was below the Practical Quantitation Limit (PQL).

3.5.2 Organic COPCs

Based on the analysis above and the concentrations detected during previous groundwater monitoring events, TCE, and 1,4-dioxane have been identified as primary organic COPCs and benzene, methylene chloride, and RDX have been identified as secondary COPCs at the Site. Based on the available data, NDMA detections are consistent with cross-contamination from the dedicated sampling pumps, and it is proposed that further sampling for NDMA be discontinued in future groundwater monitoring events. The remaining 15 organic analytes were either detected below their respective MCL or DWNL or at relatively low concentrations. Their distribution and concentrations in groundwater will continue to be monitored and the results evaluated. Figures 3-7 and 3-8 presents sampling results for methylene chloride and RDX for groundwater samples collected during the Second Quarter 2010 monitoring event.

X:\GIS\Lockheed S2 Q2Q310\DIOX_Isocon.mxd



LEGEND

- Well Sample Location with 1,4-Dioxane Concentration [µg/L]
- Spring Sample Location with 1,4-Dioxane Concentration [µg/L]
- 1,4-Dioxane Isoconcentration Contour (Dashed where inferred)
- Fault, Accurately Located Showing Dip
- Fault, Approximately Located
- Waste Discharge Area
- RWQCB Permitted Waste Discharge Area
- Historical Operational Area Boundary
- Beaumont Site 2 Property Boundary

0 300 600 Feet

Adapted from: April 2007 aerial photograph.

Faults from the *Site 2 Lineament Study, Tetra Tech, 2009.*

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

Results shown for sampled locations only.

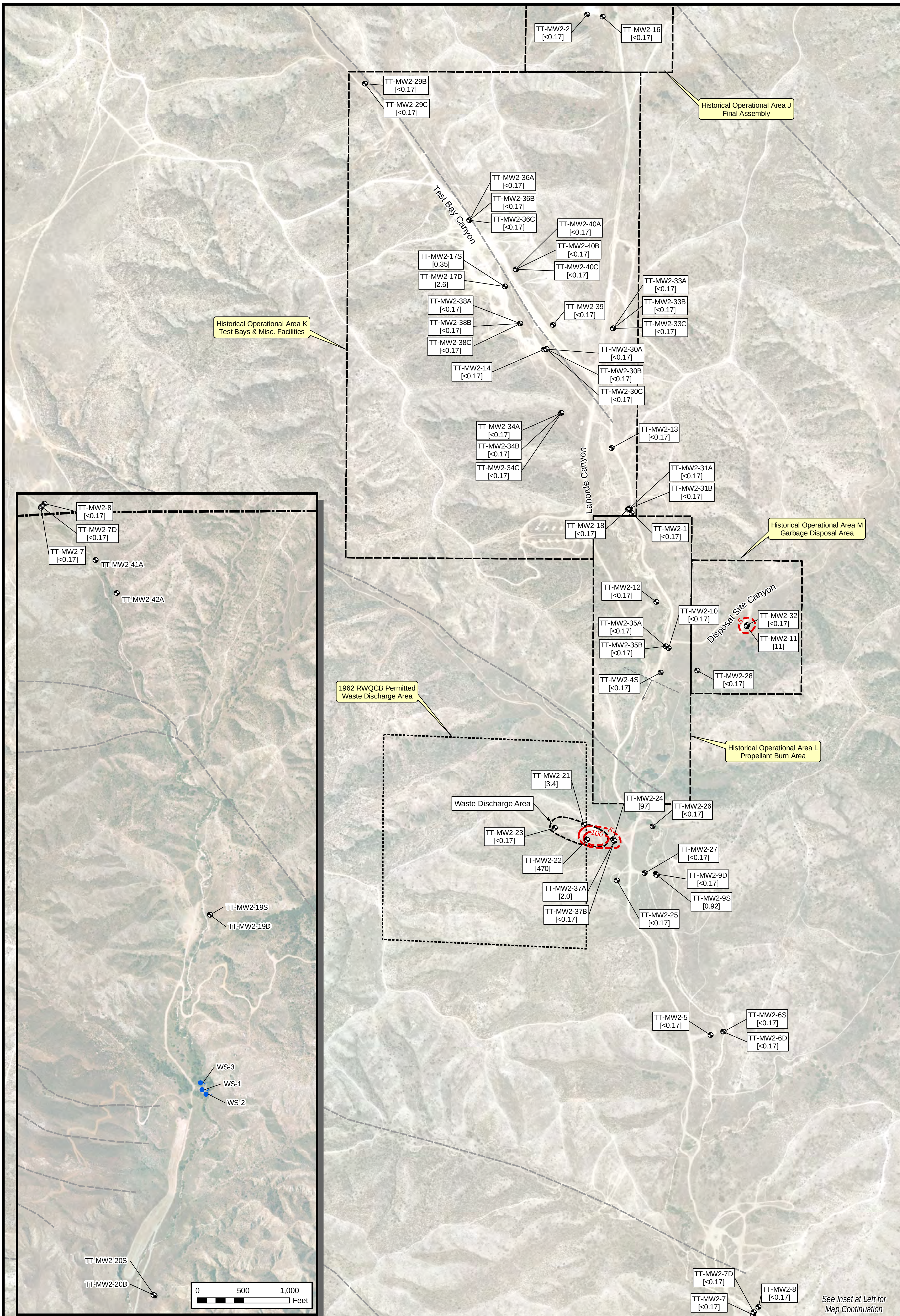
Beaumont Site 2

Figure 3-5

1,4-Dioxane Isoconcentration Map (µg/L) Second Quarter 2010

TETRA TECH

X:\GIS\Lockheed S2 Q2Q310\TCE_Isocon.mxd



LEGEND

- Well Sample Location with TCE Concentration [µg/L]
- Spring Sample Location with TCE Concentration [µg/L]
- Trichloroethene Isoconcentration Contour (Dashed where inferred)
- Fault, Accurately Located Showing Dip
- Fault, Approximately Located
- Waste Discharge Area
- RWQCB Permitted Waste Discharge Area
- Historical Operational Area Boundary
- Beaumont Site 2 Property Boundary

0 300 600 Feet

Adapted from: April 2007 aerial photograph.

Faults from the, *Site 2 Lineament Study, Tetra Tech, 2009.*

Notes: Beaumont Site 2 property boundary from Hilwig-Goodrow survey, May 2004.

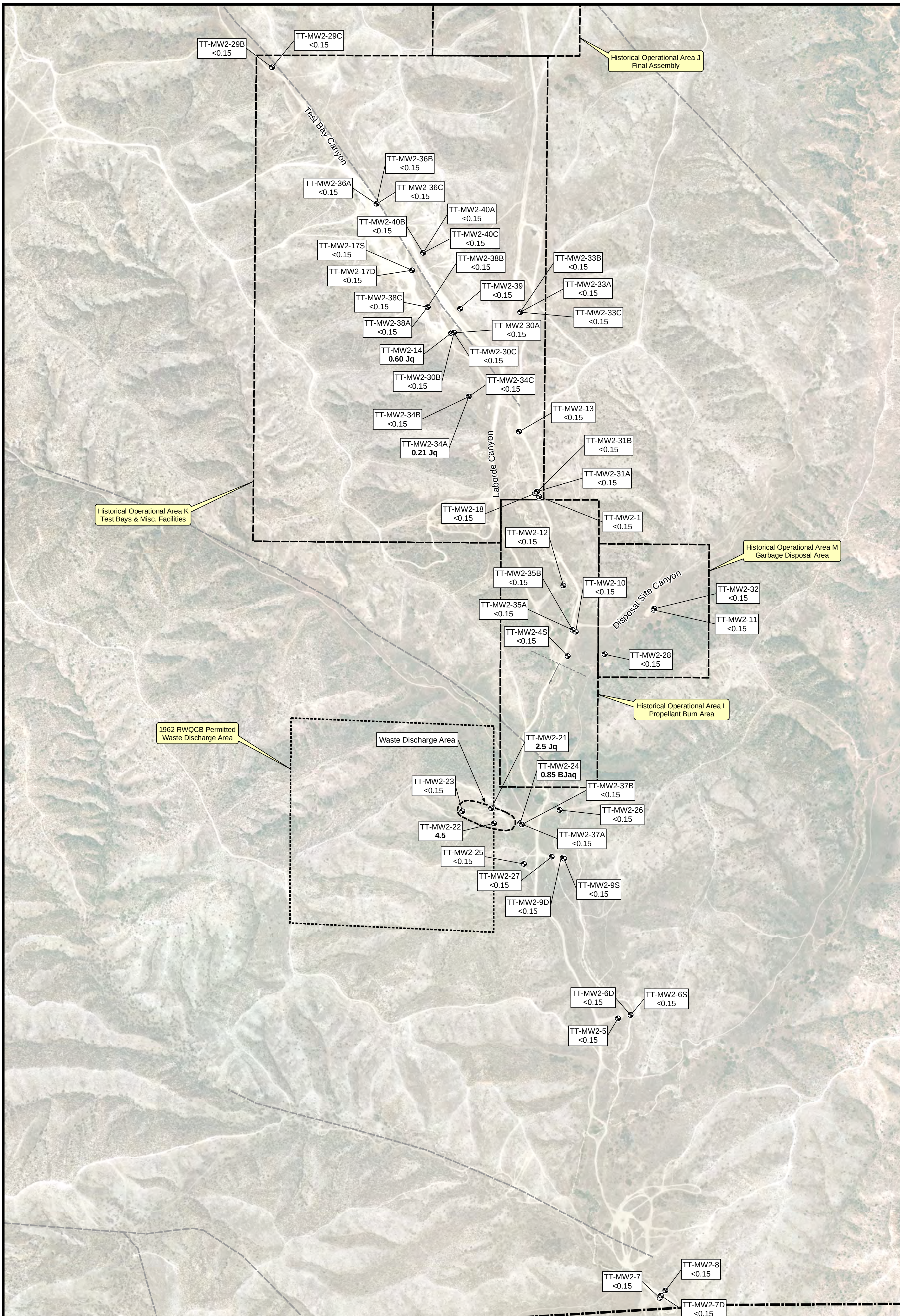
Results shown for sampled locations only.

Beaumont Site 2

Figure 3-6
Trichloroethene (TCE) Isoconcentration Map (µg/L) Second Quarter 2010

TETRA TECH

X:\GIS\Lockheed S2 Q2Q310\Methylene_Q210.mxd



LEGEND

- Groundwater Monitoring Well Location
- Fault, Accurately Located Showing Dip
- Fault, Approximately Located
- Waste Discharge Area
- RWQCB Permitted Waste Discharge Area
- Historical Operational Area Boundary
- Beaumont Site 2 Property Boundary

Adapted from: April 2007 aerial photograph.

Faults from the *Site 2 Lineament Study, Tetra Tech, 2009.*

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

Bold indicates corresponding MCL or DWNL exceeded.

Concentration shown are in micrograms per liter (µg/L)

MCL - Maximum Contamination Level.

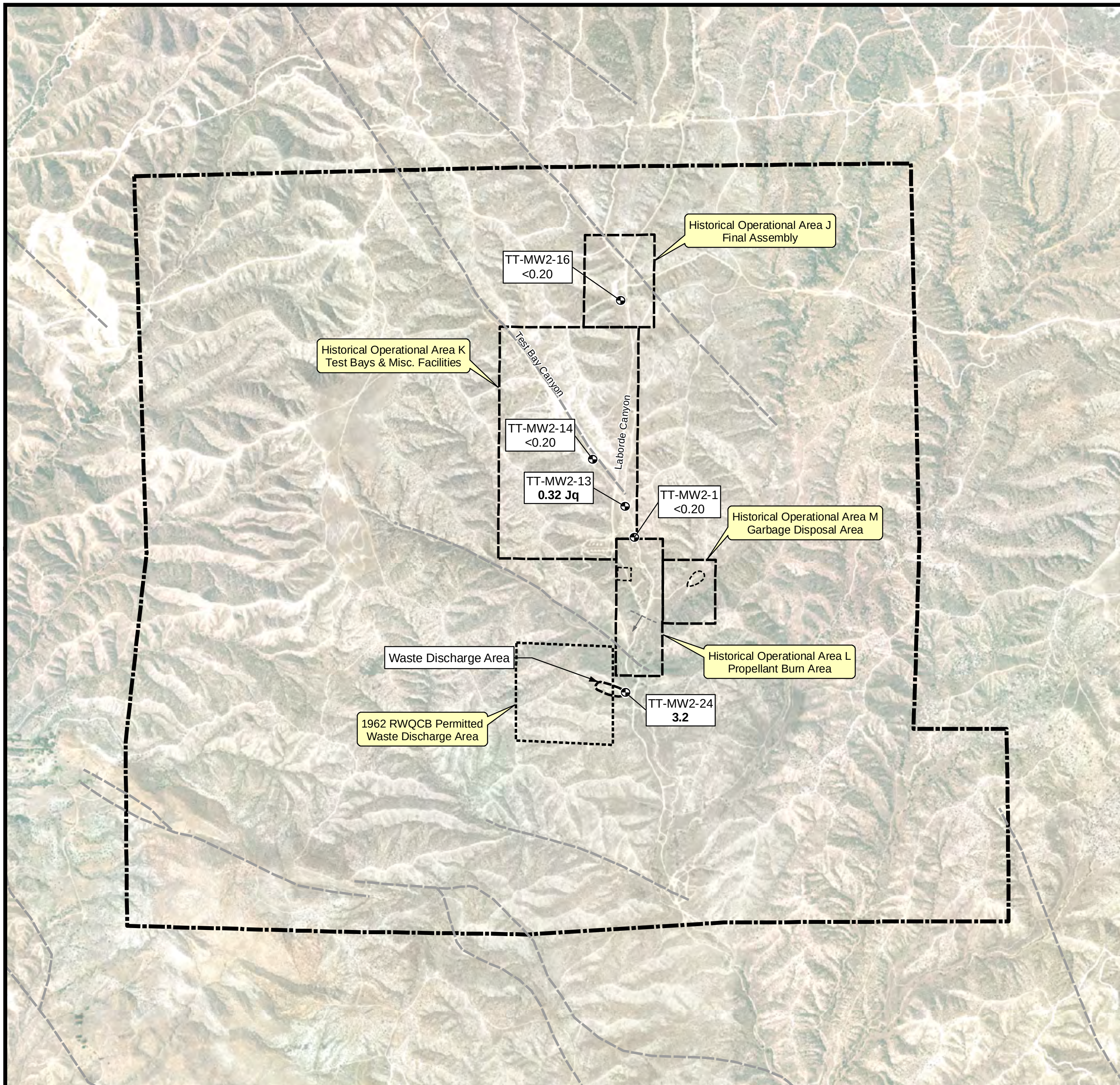
0 300 600 Feet

Beaumont Site 2

Figure 3-7
Methylene Chloride
Sampling Results-
Second Quarter 2010

TETRA TECH

X:\GIS\Lockheed S2 Q2Q310RDX_Q210.mxd



Adapted from:

March 2007 aerial photograph.

Faults from the, *Site 2 Lineament Study, Tetra Tech, 2009.*

LEGEND

- Groundwater Monitoring Well Location
- Fault, Accurately Located Showing Dip
- Fault, Approximately Located
- Waste Discharge Area
- RWQCB Permitted Waste Discharge Area
- Historical Operational Area Boundary
- Beaumont Site 2 Property Boundary

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

Disposal and Propellent Burn Site perimeters are estimated (Radian, 1986a).

Beaumont Site 2

Figure 3-8

RDX Sampling Results-Second Quarter 2010

TETRA TECH

3.5.3 Inorganic Analytes

Seven inorganic analytes (perchlorate, total arsenic, total barium, total iron, total nickel, total vanadium, and dissolved manganese) were detected in groundwater above a published MCL or DWNL. Tables 3-5 and 3-7 present a summary of validated inorganic analyte concentrations reported in groundwater samples collected during the Second Quarter 2010 and Third Quarter 2010 groundwater monitoring events.

Perchlorate was reported in groundwater samples collected from 35 of 68 locations sampled during the Second Quarter 2010 groundwater monitoring event at concentrations up to 200,000 µg/L; and 2 of 8 locations sampled during the Third Quarter 2010 monitoring event, at concentrations up to 4.8 µg/L. The California MCL for perchlorate is 6 µg/L. Figure 3-9 presents a perchlorate isoconcentration map for groundwater samples collected for the Second Quarter 2010. Time-series graphs of perchlorate are provided in Appendix I.

Total arsenic was detected in 54 of 62 unfiltered samples collected from groundwater monitoring wells during the Second Quarter 2010 groundwater monitoring event. The concentrations ranged from 0.0016 to 0.046 mg/L. Seventeen of the wells had concentrations that exceeded the 0.01 mg/L MCL for arsenic.

Generally, concentrations of arsenic in wells screened in the STF are elevated, while those screened in the QAL/wSTF are not. Groundwater in many of these same wells, including those with arsenic concentrations above the MCL, exhibit low DO and low ORP. Oxidizing conditions favor the formation of As(V) (arsenate) oxyanions, which sorb strongly to iron and aluminum oxides minerals in the aquifer, whereas reducing conditions favor the formation of As(III) (arsenite) oxyanions, which are not as strongly sorbed to iron and aluminum oxides. These sorption reactions are the dominant control on arsenic solubility and transport in the environment. Therefore, it is possible that the elevated arsenic concentrations observed in more reduced wells may be naturally occurring.

Total barium was detected in 62 of 62 unfiltered samples collected from groundwater monitoring wells during the Second Quarter 2010 groundwater monitoring event. The concentrations ranged from 0.00068 to 1.4 mg/L. One well, TT-MW2-37A, had a concentration that exceeded the 1.0 mg/L MCL for barium.

Total iron was detected in 10 of 12 unfiltered samples collected from groundwater monitoring wells during the Second Quarter 2010 groundwater monitoring event. The concentrations ranged from 22 to 2,700 µg /L. Three of the wells had concentrations that exceeded the 300 µg /L MCL for iron.

Total nickel was detected in 48 of 62 unfiltered samples collected from groundwater monitoring wells during the Second Quarter 2010 groundwater monitoring event. The concentrations ranged from 0.0015 to 0.35 mg/L. Four wells had concentrations that exceeded the 0.1 mg/L MCL for nickel.

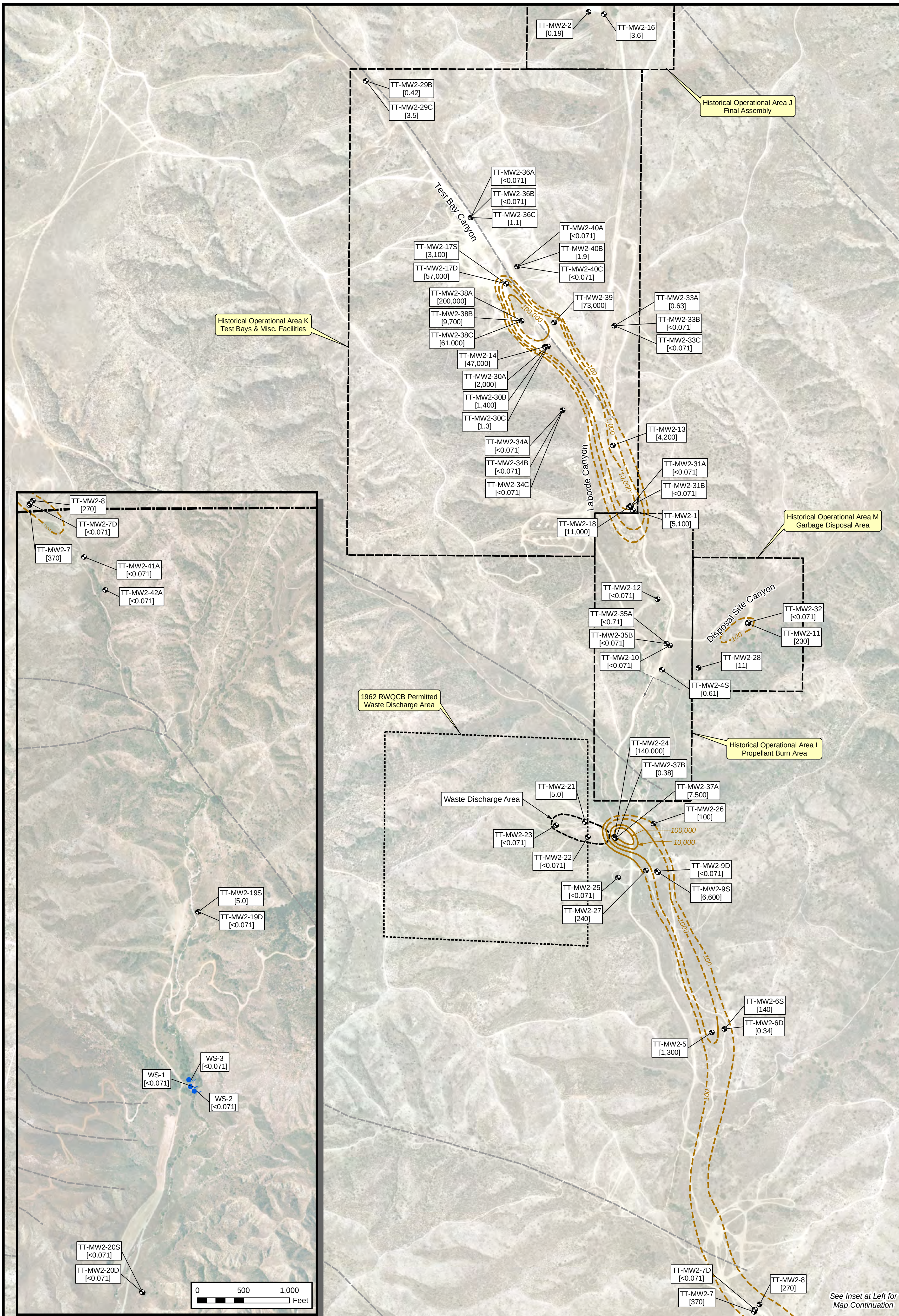
Total vanadium was detected in 35 of 62 unfiltered samples collected from groundwater monitoring wells during the Second Quarter 2010 groundwater monitoring event. The concentrations ranged from 0.0030 to 0.15 mg/L. Four wells had concentrations that exceeded the 0.05 mg/L DWNL for vanadium.

Dissolved manganese was analyzed as part of the expanded site-wide natural attenuation study. Dissolved manganese was detected in 35 of 62 filtered samples collected from groundwater monitoring wells during the Second Quarter 2010 groundwater monitoring event. The concentrations ranged from 1.2 to 660 µg /L. One well, TT-MW2-35A, had a concentration that exceeded the 500 µg /L MCL for manganese.

3.5.4 Inorganic COPCs

Based on the analysis above and the concentrations detected during previous groundwater monitoring events, perchlorate is the only inorganic primary COPC identified at the Site. No secondary COPCs were identified. Metals will be evaluated as part of the upcoming human health and ecological risk assessments; any metal COPCs will be identified based on the results of those studies.

X:\GIS\Lockheed S2 Q2Q310Perc_Isocon.mxd



LEGEND

- Well Sample Location with Perchlorate Concentration [µg/L]
- Spring Sample Location with Perchlorate Concentration [µg/L]
- Perchlorate Isoconcentration Contour (Dashed where inferred)
- Fault, Accurately Located Showing Dip
- Fault, Approximately Located
- Waste Discharge Area
- RWQCB Permitted Waste Discharge Area
- Historical Operational Area Boundary
- Beaumont Site 2 Property Boundary

0 300 600 Feet

Adapted from: April 2007 aerial photograph.

Faults from the, *Site 2 Lineament Study, Tetra Tech, 2009.*

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

Results shown for sampled locations only.

Beaumont Site 2

Figure 3-9

Perchlorate Isoconcentration Map (µg/L) Second Quarter 2010

TETRA TECH

3.6 Private Production Wells and Springs

Four offsite private production wells and three offsite springs were scheduled to be sampled for perchlorate by Method 332.0 during the Second Quarter 2010 sampling event. One production well could not be sampled because the pump was not in operation, and one spring was not sampled because it was dry. The remaining three production wells and two springs were sampled on 5 May 2010. Perchlorate was not detected in any samples during the Second Quarter 2010 sampling event.

3.7 Surface Water Sampling Results

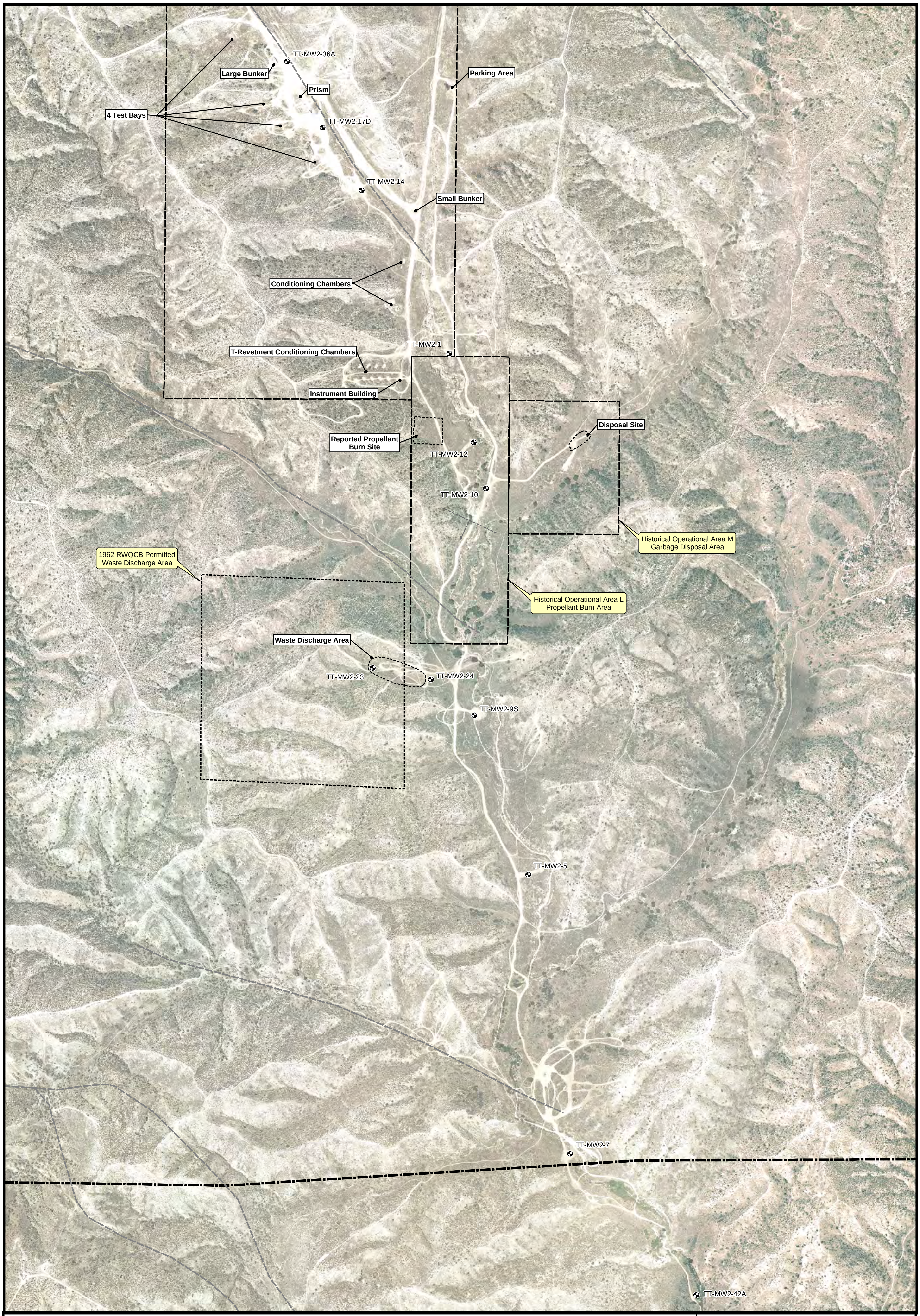
Surface water samples were collected for perchlorate at three locations, WS-1, WS-2 and WS-3, from a spring on the former Wolfskill property during the Second Quarter 2010 and at two locations, WS-1 and WS-2, during Third Quarter 2010 (Figure 2-4). Perchlorate was not detected in any samples during the Second Quarter 2010 and Third Quarter 2010 sampling events.

3.8 Monitored Natural Attenuation Sampling

Eleven monitoring wells, six associated with the groundwater perchlorate plume originating from the former Test Bay Area (TT-MW2-36A, TT-MW2-17D, TT-MW2-14, TT-MW2-1, TT-MW2-12 and TT-MW2-10), and five associated with the groundwater perchlorate plume originating from the former WDA (TT-MW2-23, TT-MW2-24, TT-MW2-9S, TT-MW2-5, and TT-MW2-7) were sampled and analyzed for monitored natural attenuation parameters (MNA) during the Second Quarter 2010 monitoring event. Samples for laboratory analysis were analyzed for total organic carbon (TOC), dissolved organic carbon (DOC), total iron, sulfate, methane, hydrogen, and volatile fatty acids (VFAs). Due to the short laboratory holding times associated with ferrous iron and sulfide, ferrous iron and sulfide were analyzed in the field just prior to sampling using a field instrument. Additionally, DO and ORP were monitored with field instruments during purging and sampling. Figure 3-10 presents monitoring well locations sampled for MNA during the Second Quarter 2010 monitoring event. Table 3-13 presents a summary of detected analytes and field measurements.

As part of a site-wide natural attenuation study, all monitored site wells were sampled for alkalinity, chlorate, chloride, DOC, methane, ethane, ethene, nitrate, nitrite, sulfate, and dissolved manganese during the Second Quarter 2010 sampling event. The site-wide data will be used to help determine which areas of the site may be conducive to natural biodegradation of perchlorate, chlorinated solvents, and 1,4-dioxane and will help guide additional work planned for future monitoring events. The results of the MNA parameter sampling will be discussed in the upcoming Contaminant Attenuation Conceptual Site Model Technical Memorandum.

X:\GIS\Lockheed S2 Q2Q310MNA_Samp.mxd



LEGEND

- Groundwater Monitoring Well Locations
- Fault, Accurately Located Showing Dip
- Fault, Approximately Located
- RWQCB Permitted Waste Discharge Area
- Historical Operational Area Boundary
- Beaumont Site 2 Property Boundary

Adapted from: April 2007 aerial photograph.

Faults from the, *Site 2 Lineament Study, Tetra Tech, 2009.*

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

0 300 600 Feet

Beaumont Site 2

Figure 3-10

MNA Sample Locations-
Second Quarter 2010

TETRA TECH

Table 3-13 Summary of Validated Detected Natural Attenuation Analytes and Field Measurements – Second Quarter 2010

		Field Parameters				Analytes																
Sample Location	**Sample Date**	**DO - mg/L**	**ORP - mVs**	**Sulfide - mg/L**	**Ferrous Iron - mg/L**	**Perchlorate - ug/L**	**Acetic Acid - mg/L**	**Butyric Acid - mg/L**	**Hexanoic Acid - mg/L**	**i-Hexanoic Acid - mg/L**	**i-Pentanoic Acid - mg/L**	**Lactic Acid and HIBA - mg/L**	**Pentanoic Acid - mg/L**	**Propionic Acid - mg/L**	**Pyruvic Acid - mg/L**	**Dissolved Organic Carbon - mg/L**	**Total Organic Carbon - mg/L**	**Hydrogen - nM**	**Methane - ug/L**	**Nitrate (as N) - mg/L**	**Sulfate - mg/L**	**Iron - mg/L**
TT-MW2-1	7/15/2010	5.74	33.1	0.01	0.07	**5,100**	0.26	<0.004	<0.006	<0.006	<0.044	<0.01	<0.012	0.045 Jq	<0.033	0.84 Jf	0.68 Jq	2.2	0.05 Jq	7.3	31	0.022
TT-MW2-5	7/1/2010	4.11	213.7	0.01	0.04	**1,300**	0.23 Ba	<0.004	<0.006	<0.006	<0.044	<0.01	<0.012	0.15 Ba	<0.033	1.0	0.68 Jq	7.2	0.05 BJaq	**10**	140	0.038
TT-MW2-7	6/29/2010	1.02	107.1	0.00	0.08	**370**	<0.006	<0.004	<0.006	<0.006	<0.044	<0.01	<0.012	<0.007	<0.033	1.0	1.1	6.7	48	6.2	190	<0.012
TT-MW2-9S	6/25/2010	0.80	128.2	0.00	0.08	**6,600**	0.13	<0.004	<0.006	<0.006	<0.044	<0.01	<0.012	<0.007	<0.033	1.9	1.1	2.6	0.09 BJaq	**12**	130	0.025
TT-MW2-10	6/28/2010	2.60	-4.6	0.00	0.01	<0.071	0.078	<0.004	<0.006	<0.006	<0.044	<0.01	<0.012	<0.007	<0.033	1.2	1.4	3.2	0.07 BJaq	<0.11	75	0.030
TT-MW2-12	6/29/2010	3.00	8.0	0.03	0.02	<0.071	0.044 Jq	<0.004	<0.006	<0.006	<0.044	<0.01	<0.012	<0.007	<0.033	1.2	1.2	3.8	0.3	<0.11	53	0.120
TT-MW2-14	7/19/2010	4.42	106.0	0.01	0.03	**47,000**	0.072	<0.004	<0.006	<0.006	<0.044	<0.01	<0.012	0.1 Ba	<0.033	2.0	1.6	3.2	0.18	**14**	170	<0.012
TT-MW2-17D	7/1/2010	0.40	-79.7	0.01	0.08	**57,000**	0.067 BJaq	<0.004	<0.006	<0.006	<0.044	<0.01	<0.012	0.055 Ba	<0.033	1.1	1.0	6.1	0.49	8.7	54	0.036
TT-MW2-23	6/25/2010	0.47	120.8	0.06	0.02	<0.071	2.3	2	2	2	1.9	2.8 Jc	1.9	2	2	<0.14	0.24 Jq	2.6	67	<0.11	26	**0.850**
TT-MW2-24	7/15/2010	0.69	53.9	0.03	0.09	**140,000 Jf**	30	0.88	<0.006	<0.006	<0.044	19	<0.012	1.6	0.76 Jq	7.2	7.0	1.9	0.21 Bk	**55 Je**	95	0.065
TT-MW2-36A	6/22/2010	0.20	-91.3	0.39	0.29	<0.071	<0.006	<0.004	<0.006	<0.006	<0.044	0.33	<0.012	<0.007	<0.033	1.3	0.59 Jq	2.7	16	<0.11	17	**2.700**
TT-MW2-42A	6/22/2010	0.69	97.5	0.06	0.27	<0.071	<0.006	<0.004	<0.006	<0.006	<0.044	0.51	<0.012	<0.007	<0.033	0.60 BJkq	1.5	64	3.6	<0.11	33	**0.440**
Method Detection Limit		-	-	-	-	0.071	0.006	0.004	0.006	0.006	0.044	0.01	0.012	0.007	0.033	0.14	0.16	0.6	0.01	0.11	0.37	0.012
MCL/DWNL (µg/L)		-	-	-	-	6	-	-	-	-	-	-	-	-	-	-	-	-	-	10	250	0.3

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

mg/L - milligrams per liter
µg/L - micrograms per liter.
nM - nanomoles
mV - millivolts
MCL - California Department of Public Health Maximum Contaminant Level.
DWNL - California Department of Public Health state drinking water notification level.
"-" - Not available.
<# - Analyte not detected, method detection limit concentration is shown.

Bold - MCL or DWNL exceeded.
B - The sample result was less than 5 times blank contamination. Cross contamination is suspected.
J - The analyte was positively identified, but the concentration is an estimated value.
a - The analyte was found in the method blank.
c - The Matrix Spike (MS) and/or Matrix Spike Duplicate (MSD) recoveries were outside control limits.
f - The duplicate Relative Percent Difference (RPD) was outside the control limit.
k - The analyte was found in a field blank.
q -The analyte detected was below the Practical Quantitation Limit (PQL).

3.9 Temporal Trends in Groundwater Chemical Concentrations

All groundwater and surface water monitoring locations sampled and tested in 2010 were included in the trend analyses. Samples were collected from 64 monitoring wells and 8 fixed surface water locations. Temporal trend analyses were performed on the Site COPCs perchlorate, TCE, methylene chloride, 1,4-dioxane, and RDX. The temporal trend analyses were performed using data from September 2004 through September 2010. Statistical trend analyses were conducted for the entire period of record to evaluate the long-term trends at the Site, and to assess the variability observed in the data since many locations fluctuate considerably from quarter to quarter.

Time trend analysis was conducted using the Monitoring and Remediation Optimization System (MAROS) developed by the Air Force Center for Environmental Excellence (AFCEE, 2006). MAROS is a statistical database application developed to assist with groundwater quality data trend analysis and long-term monitoring optimization at contaminated groundwater sites. The software performs parametric and nonparametric trend analyses to evaluate temporal and spatial contaminant trends using Mann-Kendall and linear regression methods. Brief descriptions of the methods follow:

- MannKendall 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 do 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 trends 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 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 statistical concentration trend types derived from Mann-Kendall analysis: 1) decreasing, 2) increasing 3) no trend [displaying two sets of conditions], 4) probably decreasing, 5) probably increasing, 6) stable, 7) non-detect (all sample results are below the detection limit), and 8) insufficient data (less than four quarters of data). These statistical concentration trend types are determined by the following conditions summarized in Table 3-14.

Table 3-14 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
NA	NA	Non-detect

Notes:

> - Greater than.
< - Less than.
≤ - Less than or equal to.
COV - Coefficient of Variation.
S - Mann-Kendall statistic
NA - Not applicable to non-detect trend.

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).

The Site COPCs were analyzed for temporal trends at up to 64 monitoring wells and eight surface water or spring sample locations. If there is insufficient data (less than four sampling events) then not applicable (NA) would be applied to the results.

Any one location may have a different trend for each of the five analytes evaluated. For the monitoring well locations 279 trends were evaluated. Of the 279 trends evaluated, three had insufficient data, 59 had no trend, 176 were non-detect, ten had a decreasing trend, four had a probably decreasing trend, 14 had a stable trend, one had a probably increasing trend, and 12 had a increasing trend. A summary of the Mann-Kendall trend analysis is presented in Table 3-15.

Table 3-15 Summary of Mann-Kendall Trend Analysis of COPCs for 2010 Sampled Monitoring Wells

Analyte	Locations Tested	Insufficient Data	No Trend	Non Detect	Decreasing Trend	Probably Decreasing Trend	Stable Trend	Probably Increasing Trend	Increasing Trend
Trichloroethene	59	0	5	50	0	0	0	0	4
Methylene Chloride	59	0	17	32	4	3	2	0	1
Perchlorate	64	2	31	7	5	1	10	1	7
1,4-Dioxane	62	0	6	55	0	0	1	0	0
RDX	35	1	0	32	1	0	1	0	0
Total Analysis	279	3	59	176	10	4	14	1	12
Notes: COPC - Chemicals of Potential Concern.									

The 13 probably increasing or increasing trends were detected in 11 groundwater monitoring locations. The portion of the Site where they are located, the location identification, and the COPC that has the increasing or probably increasing trend are listed below:

Four wells located in Area K:

- TT-MW2-1: perchlorate,
- TT-MW2-14: perchlorate,
- TT-MW2-17S: TCE, and
- TT-MW2-29C: perchlorate.

One well located in Area M:

- TT-MW2-11: TCE.

Three wells located in the former WDA:

- TT-MW2-21: perchlorate, TCE, and methylene chloride,
- TT-MW2-22: TCE, and
- TT-MW2-37A: perchlorate.

Two wells located just downgradient and crossgradient, respectively, of the former WDA:

- TT-MW2-9S: perchlorate, and
- TT-MW2-26: perchlorate.

One well located on the former Wolfskill property:

- TT-MW2-19S: perchlorate,

Table 3-16 provides a summary of the magnitude of the trend changes (ug/L/yr) and the percent change with respect to the mean experienced at the Site through Third Quarter 2010. These trends were generated using the MAROS software. Figures 3-11 through 3-15 present a spatial representation of the results of the trend analysis for monitoring well locations.

Table 3-16 Magnitude of Trends Detected for COPC for 2010 Sampled Monitoring Wells

	Decreasing Trend		Probably Decreasing Trend		Probably Increasing Trend				Increasing Trend			
	Number	Magnitude	Number	Magnitude	Number	Location	Magnitude		Number	Location	Magnitude	
Analyte		(ug/L/yr)		(ug/L/yr)			(ug/L/yr)	(%/yr)			(ug/L/yr)	(%/yr)
Trichloroethene	0	NA	0	NA	0	NA	NA		4	TT-MW2-11	0.59	8.4
										TT-MW2-17S	0.13	10.8
										TT-MW2-21	0.76	58.4
										TT-MW2-22	118.63	47.5
Methylene Chloride	4	0.27 to 204.40	3	0.34 to 0.55	0	NA	NA		1	TT-MW2-21	1.08	40.2
Perchlorate	6	0.09 to 4,507.75	1	182.32	1	TT-MW2-37A	2,628.00	109.50	7	TT-MW2-1	444.57	7.7
										TT-MW2-9S	51.1	51.1
										TT-MW2-14	1,177.13	2.7
										TT-MW2-19S	1.41	40.2
										TT-MW2-21	0.79	49.3
										TT-MW2-26	26.92	45.6
										TT-MW2-29C	1	100.4
1,4-Dioxane	0	NA	0	NA	0			NA	0	NA	NA	NA
RDX	1	0.23	0	NA	0			NA	0	NA	NA	NA

Notes:

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

%/yr - Percent change per year with respect to the sample mean.

NA - Not applicable.

COPC - Chemicals of Potential Concern.

For the eight surface water locations, 18 trends were evaluated. Of the 18 trends that were evaluated: 6 had insufficient data, 0 had no trend, 10 were non-detect, 1 had a decreasing trend, 0 had a probably decreasing trend, 1 had a stable trend, 0 had a probably increasing trend, and 0 had an increasing trend. A summary of the Mann-Kendall trend analysis is presented in Table 3-17.

Table 3-17 Summary of Mann-Kendall Trend Analysis of COPCs for 2010 Sampled Surface Water and Spring Locations

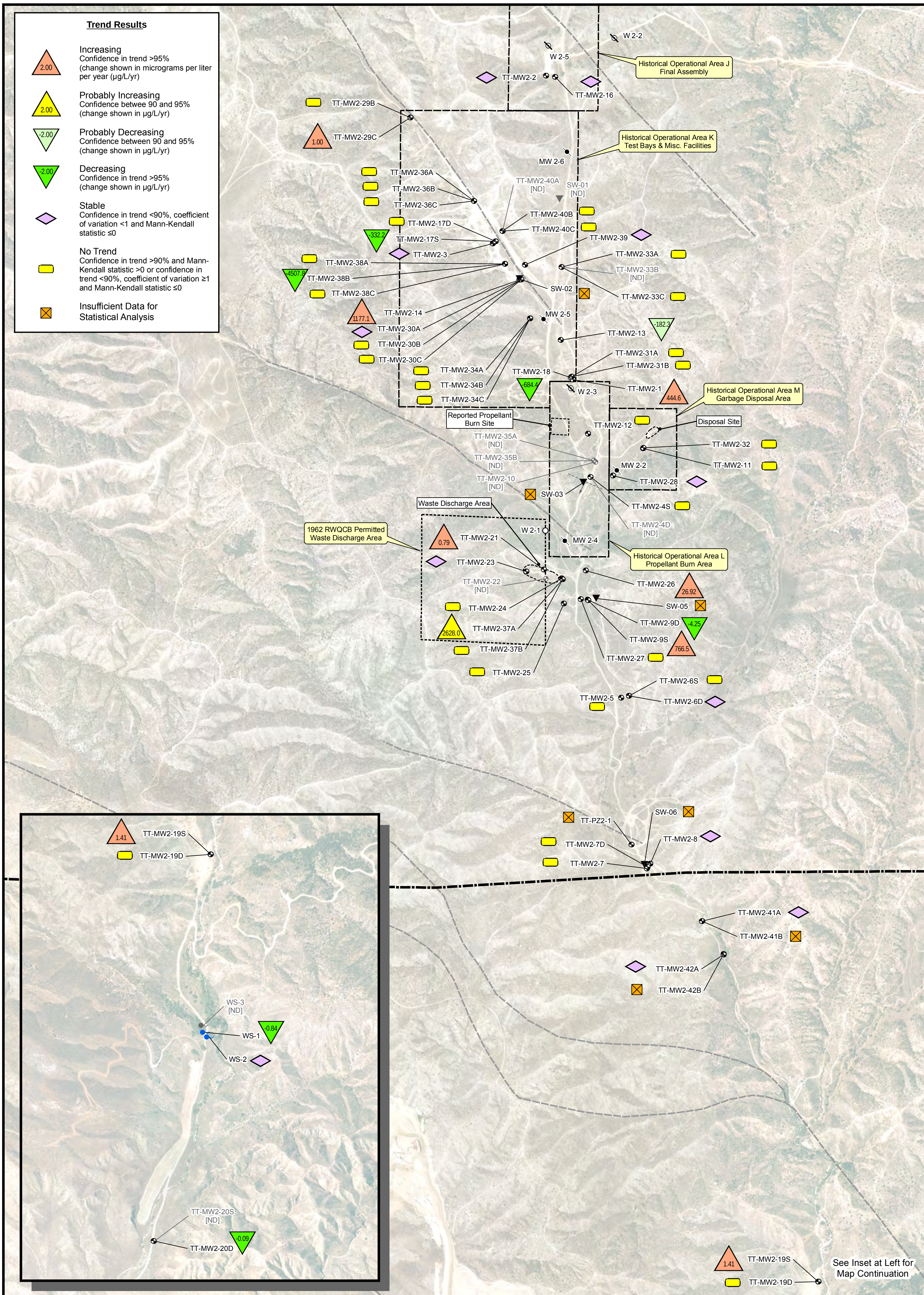
Analyte	Locations Tested	Insufficient Data	No Trend	Non Detect	Decreasing Trend	Probably Decreasing Trend	Stable Trend	Probably Increasing Trend	Increasing Trend
Trichloroethene	5	0	0	5	0	0	0	0	0
Methylene Chloride	5	1	0	4	0	0	0	0	0
Perchlorate	8	5	0	1	1	0	1	0	0
1,4-Dioxane	0	0	0	0	0	0	0	0	0
RDX	0	0	0	0	0	0	0	0	0
Total Analysis	18	6	0	10	1	0	1	0	0

Notes:

COPC - Chemicals of Potential Concern.

Surface water location WS-1 had a decreasing trend for perchlorate. The remaining surface water locations had either stable or ND trends, or had insufficient data for Mann-Kendall trend analysis. Appendix J presents a summary of the results of the Mann-Kendall and linear regression analyses and a comparison of the historical TCE and perchlorate trend analyses.

X:\GIS\Lockheed S2 Q2Q310\Trend_Perc.mxd



LEGEND

- Monitoring Well Location
- Surface Water Sample Location
- Spring Sample Location
- Monitoring Well Location (non-detect)
- Surface Water Sample Location (non-detect)
- Spring Sample Location (non-detect)
- Destroyed Production Well Location
- Destroyed Monitoring Well Location
- Reported Production Well Location
- Fault, Accurately Located Showing Dip
- Fault, Approximately Located
- RWQCB Permitted Waste Discharge Area
- Historical Operational Area Boundary
- Beaumont Site 2 Property Boundary

Adapted from:

April 2007 aerial photograph.

Faults from the *Site 2 Lineament Study, Tetra Tech, 2009.*

Note:

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

[ND] - Non-detect

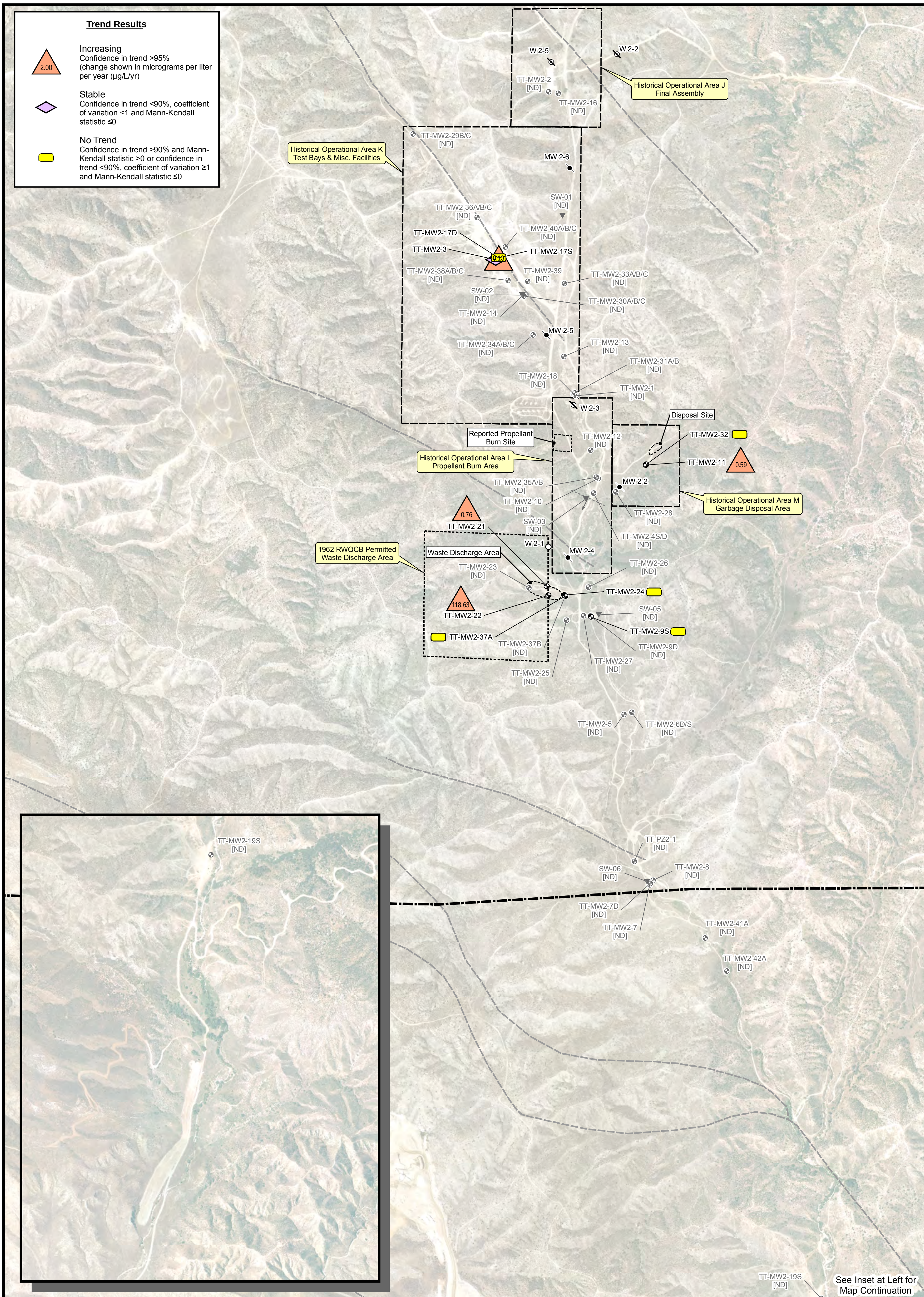
0 500 1,000 Feet

Beaumont Site 2

Figure 3-11

Perchlorate Statistical Analysis Summary Results

TETRA TECH



X:\GIS\Lockheed S2 Q2Q310\Trend_TCE.mxd

LEGEND

- Monitoring Well Location
- Monitoring Well Location (non-detect)
- Surface Water Sample Location (non-detect)
- Destroyed Production Well Location
- Destroyed Monitoring Well Location
- Reported Production Well Location
- Fault, Accurately Located Showing Dip
- Fault, Approximately Located
- RWQCB Permitted Waste Discharge Area
- Historical Operational Area Boundary
- Beaumont Site 2 Property Boundary

Adapted from:

April 2007 aerial photograph.

Faults from the, *Site 2 Lineament Study, Tetra Tech, 2009.*

Note:

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

[ND] - Non-detect

0 500 1,000 Feet

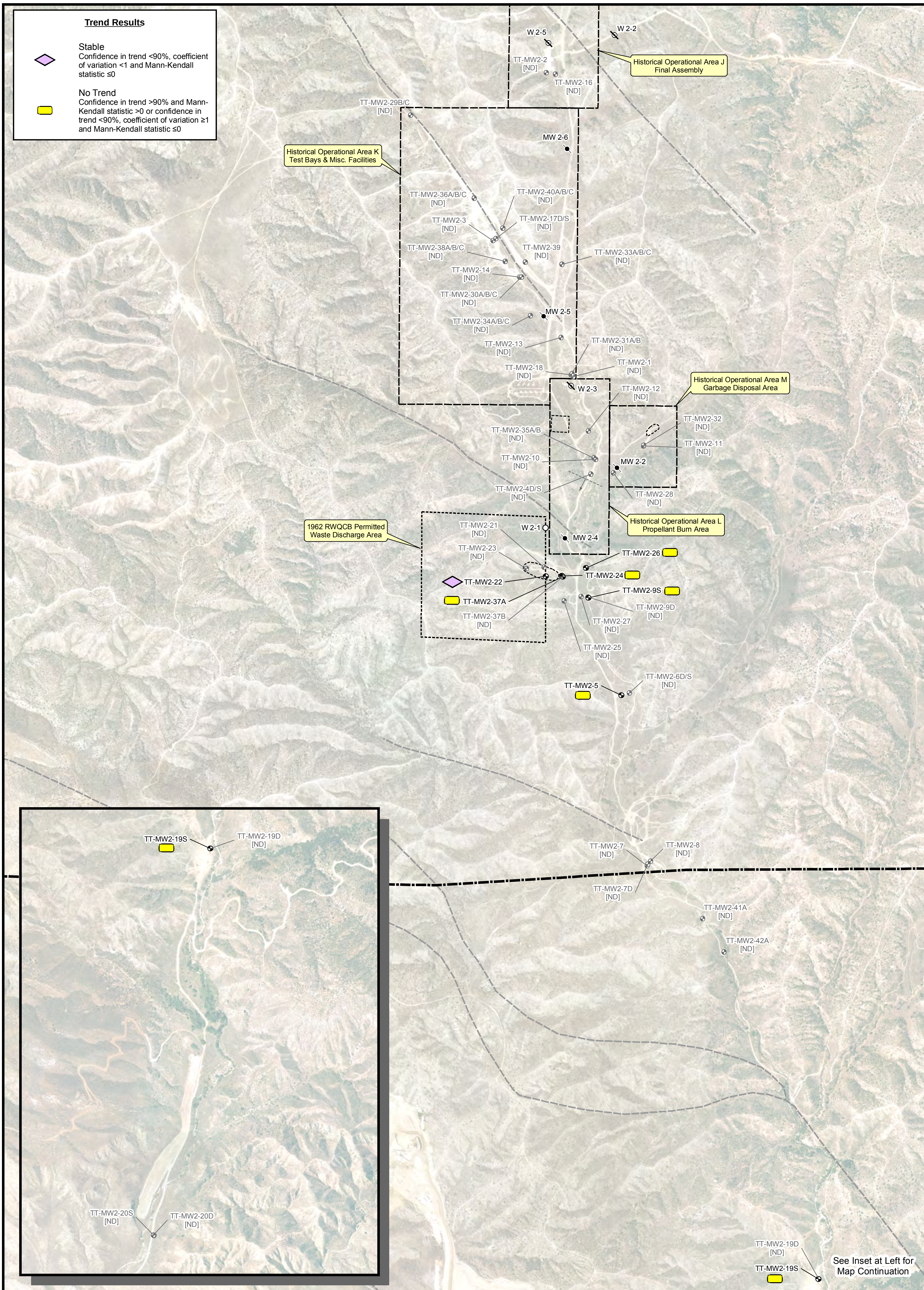
Beaumont Site 2

Figure 3-12

TCE Statistical Analysis Summary Results

TETRA TECH

X:\GIS\Lockheed S2 Q2Q310\Trend_DIOX.mxd



LEGEND

- Monitoring Well Location
- Monitoring Well Location (non-detect)
- Destroyed Production Well Location
- Destroyed Monitoring Well Location
- Reported Production Well Location
- Fault, Accurately Located Showing Dip
- Fault, Approximately Located
- RWQCB Permitted Waste Discharge Area
- Historical Operational Area Boundary
- Beaumont Site 2 Property Boundary

Adapted from:

April 2007 aerial photograph.

Faults from the, *Site 2 Lineament Study, Tetra Tech, 2009.*

Note:

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

[ND] - Non-detect

0 500 1,000 Feet

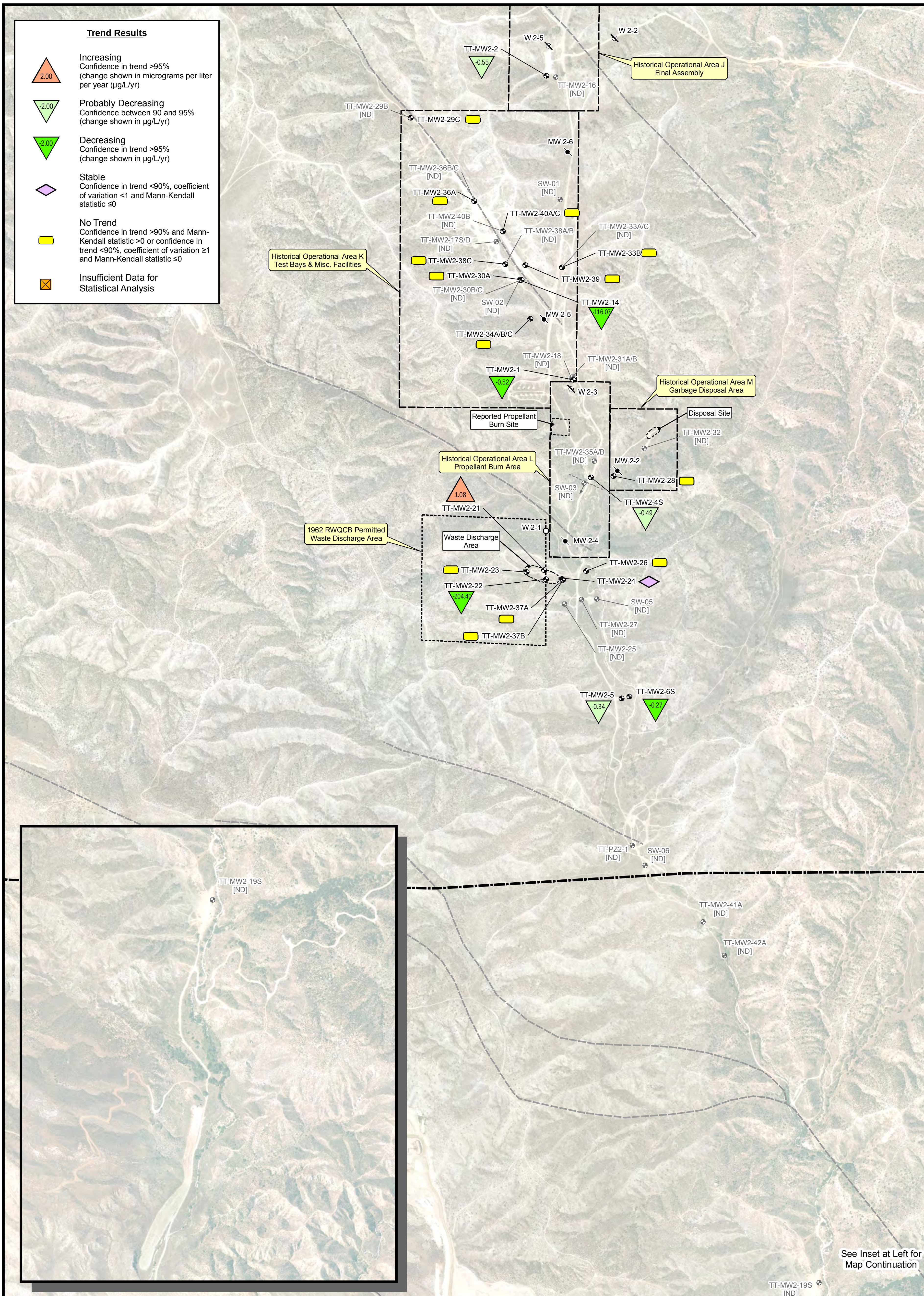
Beaumont Site 2

Figure 3-13

1,4-Dioxane Statistical Analysis Summary Results

TETRA TECH

X:\GIS\Lockheed S2 Q2Q310\Trend_MCL.mxd



LEGEND

- Monitoring Well Location
- Surface Water Sample Location
- Monitoring Well Location (non-detect)
- Destroyed Production Well Location
- Destroyed Monitoring Well Location
- Reported Production Well Location
- Fault, Accurately Located Showing Dip
- Fault, Approximately Located
- RWQCB Permitted Waste Discharge Area
- Historical Operational Area Boundary
- Beaumont Site 2 Property Boundary

Adapted from:

April 2007 aerial photograph.

Faults from the, *Site 2 Lineament Study, Tetra Tech, 2009.*

Note:

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

[ND] - Non-detect

0 500 1,000 Feet

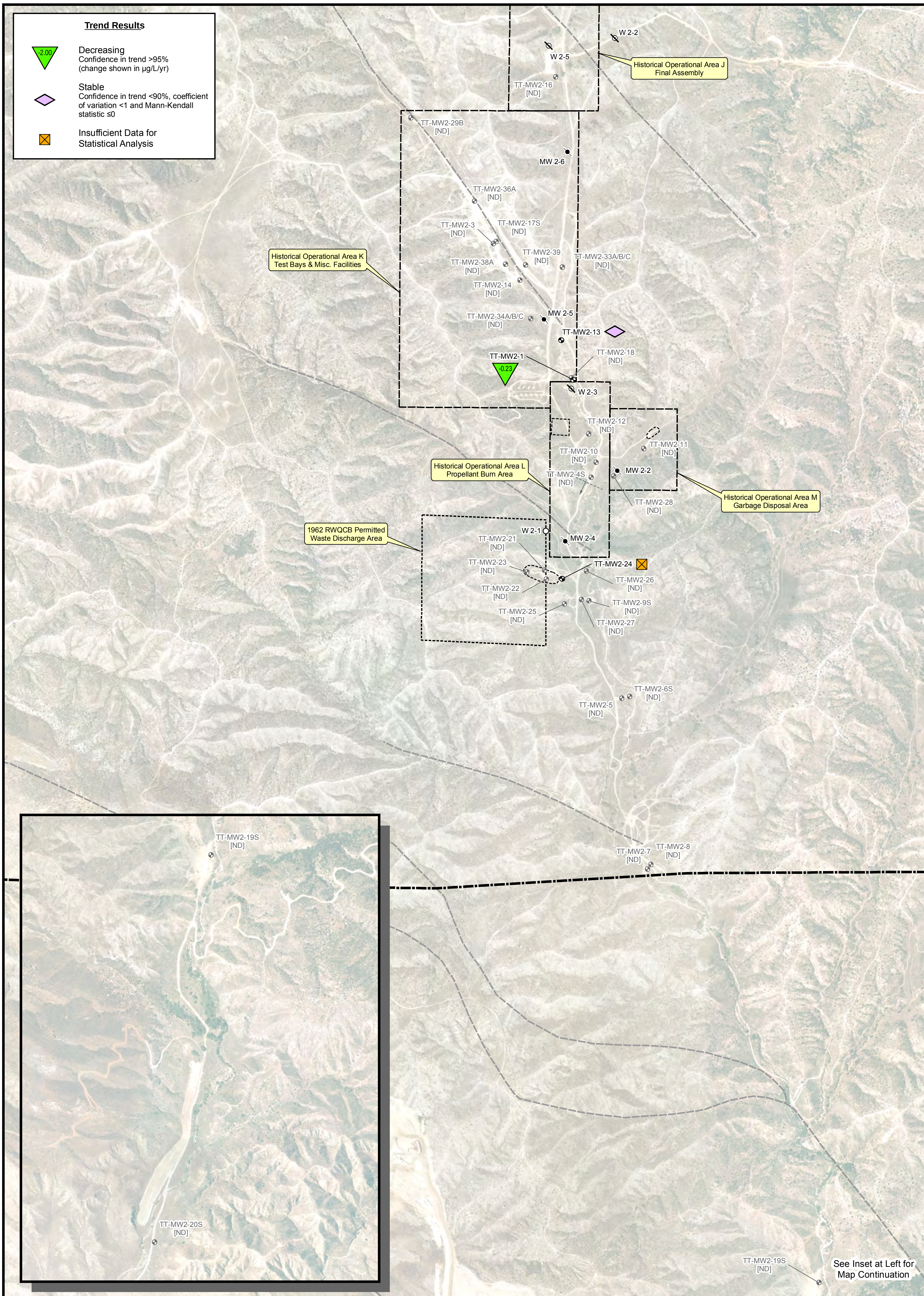
Beaumont Site 2

Figure 3-14

Methylene Chloride Statistical Analysis Summary Results

TETRA TECH

X:\GIS\Lockheed S2 Q2Q310\Trend_RDX.mxd



LEGEND

- Monitoring Well Location
- Monitoring Well Loaction (non-detect)
- Destroyed Production Well Location
- Destroyed Monitoring Well Location
- Reported Production Well Location
- Fault, Accurately Located Showing Dip
- Fault, Approximately Located
- RWQCB Permitted Waste Discharge Area
- Historical Operational Area Boundary
- Beaumont Site 2 Property Boundary

Adapted from:

April 2007 aerial photograph.

Faults from the, *Site 2 Lineament Study, Tetra Tech, 2009.*

Note:

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

[ND] - Non-detect

0 500 1,000 Feet

Beaumont Site 2

Figure 3-15

RDX Statistical Analysis Summary Results

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, field activities were performed under the supervision of a USFWS approved biologist. As a result, no impact to SKR occurred during the performance of the field activities related to the Second Quarter 2010 and Third Quarter 2010 monitoring events.

Section 4 Summary and Conclusions

This section summarizes the results of the Second Quarter 2010 and Third Quarter 2010 groundwater monitoring events. During the Second Quarter 2010 monitoring event 67 monitoring well locations and two piezometers were measured for groundwater levels and 62 monitoring wells, five private production wells or springs and three surface water locations were sampled for groundwater quality. Two monitoring wells, TT-MW2-29A and TT-MW2-43, were dry during the Second Quarter 2010 monitoring event. During the Third Quarter 2010 monitoring event 67 monitoring well locations and two piezometers were measured for groundwater levels and six monitoring wells, and two surface water locations were sampled for groundwater quality. Two monitoring wells, TT-MW2-29A and TT-MW2-43, and one surface water location, WS-3, were found to be dry during the Third Quarter 2010 monitoring event.

4.1 Groundwater Elevation and Flow

During the Second Quarter 2010 and Third Quarter 2010 monitoring events, groundwater elevations at the Site ranged from about 2075 feet msl in the northern portion of the Site, to about 1819 feet msl in the southern portion of the Site. Depth to groundwater ranged from about 122 feet bgs to about 17 feet bgs.

Based on the measured groundwater elevations, the current CSM, and the southward sloping topography at the Site, groundwater flow in the QAL/wSTF and STF screened wells appears to be southerly and generally follows the topography of Laborde Canyon. The overall groundwater elevation at the Site has decreased four to six feet since Fourth Quarter 2005 with the greatest decrease over time seen in monitoring well TT-MW2-1 (5.91 feet). Limited seasonal fluctuations can be seen to varying degrees following periods of precipitation.

Generally, the seasonal fluctuations in the northern portion of the Site are less pronounced and have a three to four month delay before a change in groundwater elevation is noticeable. The wells in Test Bay Canyon, however, appear to respond faster and have a greater change in elevation than the wells in the main portion of Laborde canyon.

In the southern portion of the Site between the former WDA and the southern Site boundary the seasonal fluctuations tend to be more pronounced with a shorter response time. This is most noticeable in the shallow wells located near the southern property boundary and in the riparian area just south of the property boundary.

On the former Wolfskill property the groundwater elevation has remained relatively stable with noticeable seasonal fluctuations.

Although the data are limited in many of the newer wells, the overall long-term decreasing trend in groundwater elevation appears to correspond to the long-term precipitation pattern.

4.1.1 Groundwater Gradients

Horizontal groundwater gradients across the Site are relatively constant. The horizontal groundwater gradients calculated between TT-MW2-16 and TT-MW2-6S from the Second Quarter 2010 and Third Quarter 2010 groundwater monitoring events for the QAL/wSTF screened wells averaged 0.030 ft/ft. The horizontal groundwater gradients calculated between TT-MW2-2 and TT-MW2-6D for the Second Quarter 2010 and Third Quarter 2010 groundwater monitoring events for the deeper STF screened wells averaged 0.029 ft/ft.

Generally the vertical gradients are downward on site and upward from the Site boundary south. The vertical gradients range from negative 0.29 to positive 0.19. A summary of calculated horizontal and vertical groundwater gradients is presented in Table 3-3 and in Appendix E.

4.2 Water Quality Monitoring

Both groundwater and surface water are collected and sampled as part of the GMP. The GMP has a quarterly/semiannual/annual frequency. The annual events are larger major monitoring events and the quarterly and semiannual events are smaller minor events. All new wells are sampled quarterly for one year. The semiannual wells are sampled second and fourth quarter of each year, and the annual wells are sampled second quarter of each year.

Groundwater samples collected during the Second Quarter 2010 and Third Quarter 2010 monitoring events were analyzed for perchlorate. Select locations were analyzed for VOCs, natural attenuation parameters, general minerals, 1,4-dioxane, and NDMA. Based on the historical operations at the Site and groundwater monitoring results, perchlorate, TCE, and 1,4-dioxane were identified as a primary COPCs. Benzene, methylene chloride and RDX were identified as secondary COPCs. NDMA appears to be related to cross-contamination from the dedicated sampling pumps. Sampling for NDMA will be discontinued in future monitoring events.

4.2.1 Private Production Wells and Springs

Samples from select offsite private production wells and springs were collected as part of the Second Quarter 2010 monitoring event. Wells and springs were selected that are in close proximity to the Site boundary to monitor for potential impact to offsite water supplies from groundwater leaving the Site. No COPCs were detected in the private production wells or springs that were sampled. The private production wells will continue to be monitored annually during the second quarter sampling event.

4.2.2 Surface Water

Surface water samples are collected from seven surface water sample locations within the Laborde Canyon creek bed and three spring locations at the Site located on the former Wolfskill property. Water is generally present in the Laborde Canyon creek bed only during periods of heavy, prolonged precipitation.

During the Second Quarter 2010 sampling event, surface water samples were collected from the three spring locations located on the former Wolfskill property. The samples were analyzed for perchlorate. The remaining seven surface water locations in Laborde Canyon were dry at the time of sampling.

During the Third Quarter 2010 sampling event, surface water samples were collected from two of the three spring locations located on the former Wolfskill property. The samples were analyzed for perchlorate. The remaining spring location and the seven surface water locations in Laborde Canyon were dry at the time of sampling.

Perchlorate was not detected in surface water samples collected during the Second Quarter 2010 or Third Quarter 2010 monitoring events.

4.2.3 Groundwater

Area J – Final Assembly Area

Site COPCs have not been detected above their respective MCLs or DWNLs in Area J. Perchlorate was detected in monitoring TT-MW2-16 at a concentration of 3.6 µg/L during the Second Quarter of 2010, and has previously been detected at concentrations up to 4.94 µg/L. A source of perchlorate in Area J has not been identified.

Area K – Test Bays and Miscellaneous Facilities

Perchlorate, TCE, methylene chloride, and RDX have been detected in Area K. Previously, perchlorate was detected as high as 190,000 µg/L in Area K. During Second Quarter 2010 perchlorate was detected at concentrations ranging from below the MDL to 200,000 µg/L. Area K has been identified as a source of perchlorate in groundwater.

TCE has been detected consistently in TT-MW2-17D at concentrations ranging from 0.46 µg/L to 1.2 µg/L. TCE has not been detected in other wells located in Area K. The source of the TCE is unknown.

Methylene chloride has been detected at concentrations ranging from 380 µg/L in Fourth Quarter 2006 to 0.60 µg/L in Second Quarter 2010 in monitoring well TT-MW2-14. Methylene chloride has not been detected consistently in other monitoring wells located in Area K. The source of the methylene chloride is unknown.

Previously, RDX has been detected in two monitoring wells, TT-MW2-1 and TT-MW2-13, at concentrations up to 1.6 µg/L in Area K. Additional sampling has been conducted for RDX in select monitoring wells located upgradient, downgradient, and in wells screened in deeper intervals in comparison to TT-MW2-1 and TT-MW2-13 and it has not been detected above the MDL. RDX continues to be detected in TT-MW2-13 but has not been detected in TT-MW2-1 since October 2007. The source of the RDX has been investigated (Tetra Tech, 2010B; 2010e) but remains unknown.

Area L – Propellant Burn Area

Perchlorate is the only Site COPC to be detected in Area L. Area L is located downgradient of operational areas K. Previously, perchlorate was detected at concentrations up to 9.98 µg/L. During Second Quarter 2010, perchlorate was detected only in monitoring well TT-MW2-4S at a concentration of 0.61 µg/L. There are currently no indications that a source of perchlorate is present in Area L; the perchlorate detected in Area L groundwater appears to have originated in Area K.

Area M - Garbage Disposal Area

Perchlorate and TCE have been detected in Area M. Previously, perchlorate was detected at concentrations up to 469 µg/L in well TT-MW2-11. During Second Quarter 2010, perchlorate was detected at concentrations ranging from below the MDL to 230 µg/L. Area M has been identified as a source of perchlorate in groundwater.

TCE has been consistently detected in groundwater samples collected from monitoring well TT-MW2-11 at concentrations up to 9.2 µg/L. During Second Quarter 2010, TCE was detected at a concentration of 11 µg/L. TCE has not been detected in other wells in Area M.

Waste Discharge Area (WDA)

Perchlorate, TCE, methylene chloride, 1,4-dioxane, and RDX have been detected in the former WDA. The former WDA is located downgradient of operational areas J, K, L, and M. Previously, perchlorate was detected as high as 190,000 µg/L. Perchlorate in the groundwater was detected at concentrations ranging from below the MDL to 140,000 µg/L during Second Quarter 2010. The former WDA has been identified as a source of perchlorate in groundwater.

Previously, TCE was detected at concentrations as high as 460 µg/L in monitoring wells located in the former WDA. During Second Quarter 2010, TCE was detected in monitoring wells TT-MW2-21, TT-MW2-22, TT-MW2-24, and TT-MW2-37A at concentrations of 3.4 µg/L, 470 µg/L, 97 µg/L, and 2.0 µg/L, respectively. The former WDA has been identified as a source of TCE in groundwater. TCE has not been detected consistently, or above the MCL in monitoring wells downgradient of the former WDA.

Previously, methylene chloride was detected as high as 220 µg/L in monitoring well TT-MW2-22 during Second Quarter 2008. Since that time the concentration of methylene chloride has dropped to a concentration of 4.5 µg/L during Second Quarter 2010. During this same time period, methylene chloride was reported in groundwater samples collected from monitoring wells TT-MW2-21 at concentrations ranging from below the detection limit to 7.7 µg/L. Methylene chloride has not been detected in monitoring wells downgradient of the former WDA.

Previously, 1,4-dioxane was detected as high as 320 µg/L in monitoring wells located in the former WDA. 1,4-dioxane was detected in monitoring wells TT-MW2-22, TT-MW2-24, and TT-MW2-37A at concentrations of 33 µg/L, 250 µg/L, and 13 µg/L, respectively during the Second Quarter 2010. The former WDA has been identified as a source of 1,4-dioxane in groundwater. 1,4-dioxane has been detected in downgradient monitoring wells. The 1,4-dioxane DWNL is 1 µg/L.

Previously, RDX was reported in groundwater samples collected from monitoring well TT-MW2-24 located at the former WDA at concentrations as high as 5.9 µg/L. During Second Quarter 2010 RDX was detected in TT-MW2-24 at a concentration of 3.2 µg/L. RDX has not been detected in other wells located in or downgradient of the former WDA. The DWNL for RDX is 0.3 µg/L.

Lower Canyon and Riparian Corridor

Perchlorate and 1,4-dioxane have been detected in the lower portion of Laborde Canyon downgradient from the former WDA. Perchlorate has also been detected in the riparian corridor south of the property boundary. In the lower section of Laborde Canyon, perchlorate was detected at concentrations as high as 4,700 µg/L, up to 519 µg/L at the southern Site boundary, and up to 0.18 µg/L in the riparian corridor south of the southern Site boundary. During Second Quarter 2010 and Third Quarter 2010 perchlorate in the groundwater was detected at concentrations ranging from 6,600 µg/L in the lower section of Laborde Canyon to below the MDL in the riparian corridor. No source of perchlorate has been identified in the lower canyon or at the southern Site boundary; the perchlorate appears to have originated in the former WDA.

1,4-dioxane was reported in groundwater samples collected from monitoring wells TT-MW2-5 and TT-MW2-9S, which are located in or downgradient of the former WDA, at concentrations of 0.92 µg/L to 8.5 µg/L respectively during Second Quarter 2010. These detections are consistent with previous detections in these wells. 1,4-dioxane has not been detected in other wells located in the lower canyon or riparian corridor area. The source of the 1,4-dioxane appears to be the former WDA.

Former Wolfskill Property

On the former Wolfskill property, south of the southern Site boundary, perchlorate was detected in TT-MW1-19S during Second Quarter 2010 and Third Quarter 2010 at concentrations of 5.0 µg/L and 4.8 µg/L respectively. These results are consistent with historic results. Perchlorate has not been detected in monitoring well TT-MW2-20S or TT-MW2-20D, located approximately one half mile south of TT-MW2-19S.

Based on the data available at this time, the extent of the TCE, methylene chloride, and RDX plumes in groundwater appear to be isolated to small areas and do not extend offsite. The 1,4-dioxane plume is limited to the WDA and lower Laborde Canyon and does not appear to extend offsite. The perchlorate plume does appear to extend offsite, but the offsite extent of perchlorate appears to be limited by naturally-occurring phytoremediation or biodegradation in the riparian corridor south of the southern Site boundary. The perchlorate detected in monitoring well TT-MW2-19S located on the former Wolfskill property appears to be an isolated impact resulting from preferential flow in higher-conductivity alluvium during a prolonged period of heavy precipitation in the past.

4.3 Natural Attenuation Sampling

The objective of the MNA sampling and analyses effort is to understand the geochemical characteristics upgradient, within and downgradient from the Test Bay Area and WDA perchlorate plumes. A preliminary evaluation of MNA suggests that there is limited potential for natural perchlorate biodegradation, except within the riparian area downgradient of the WDA perchlorate plume.

The data obtained from the MNA sampling will be combined with the data obtained during the Second Quarter 2010 site-wide natural attenuation study to develop a contaminant attenuation CSM to identify areas of the Site where conditions may be conducive to natural attenuation of perchlorate, chlorinated solvents, and 1,4-dioxane.

4.4 Temporal Trend Analysis

Groundwater sampling results from the 64 wells and 8 surface water locations sampled in 2010 were included in the temporal trend analyses. Temporal trend analysis of perchlorate, TCE, methylene chloride, 1,4-dioxane, and RDX (the Site COPCs) were performed using data from Second Quarter 2004 to Third Quarter 2010. This temporal trend analysis updates the analysis performed following completion of the Third Quarter 2009 monitoring event (Tetra Tech, 2010a). The temporal trends were analyzed using Mann-Kendall and linear regression methods. The magnitude of the trends is presented as a change in concentration per year.

The number of increasing or probably increasing trend wells has increased from 6 wells in 2009 to 11 wells in the 2010 temporal trend analyses. This increase is attributed to the relatively large number of new wells that have been installed in the last several years (41 new wells since 2008), and the number of wells that have historically yielded no trend. The number of decreasing trend, probably decreasing trend, and stable trend wells has increased during this period as well. Tables 4-1 and 4-2 display a summary of the historic trend analyses for TCE and perchlorate.

Table 4-1 Historic TCE Trend Summary

	Locations Tested				
Trend Category	2006	2007	2008	2009	2010
"N/A"-Insufficient Data	3	0	6	31	0
"ND" - Non Detect (new designation)	--	--	--	--	50
"NT" - No Trend	1	1	2	1	5
"S" - Stable	4	20	16	24	0
"I" - Increasing	0	0	1	1	4
"PI" -Probably Increasing	0	0	0	1	0
"D" - Decreasing	0	0	0	0	0
"PD" -Probably Decreasing	0	0	0	0	0
Total Locations Tested	8	21	25	58	59
Notes: -- ND (non-detect) was not a category designation prior to the 2010 statistics					

Table 4-2 Historic Perchlorate Trend Summary

	Locations Tested				
Trend Category	2006	2007	2008	2009	2010
"N/A"-Insufficient Data	3	0	6	30	2
"ND" - Non Detect (new designation)	--	--	--	--	7
"NT" - No Trend	5	5	2	12	31
"S" - Stable	0	8	7	11	10
"I" - Increasing	0	4	5	3	7
"PI" -Probably Increasing	0	0	1	1	1
"D" - Decreasing	0	4	3	3	5
"PD" -Probably Decreasing	0	0	1	1	1
Total Locations Tested	8	21	25	61	64
Notes: -- ND (non-detect) was not a category designation prior to the 2010 statistics					

A summary of the trend analysis results for the 11 increasing or probably increasing trend locations is presented in Table 4-3. The Second Quarter 2010 concentrations and percent change that these increases represent with respect to the mean of the data used to calculate each trend is also presented in Table 4-3. The increasing trend in monitoring wells TT-MW2-1, TT-MW2-11, TT-MW2-14, and TT-MW2-17S represent less than a 20 percent change.

Table 4-3 Summary of Increasing COPC Trends – Second Quarter 2010

Analyte:	Perchlorate				Trichloroethene				Methylene Chloride				1,4-Dioxane		RDX			
Well Location	Q2 - 2010 Results (µg/L)	Trend	Magnitude (µg/L/yr)	Magnitude (%/yr)	Q2 - 2010 Results (µg/L)	Trend	Magnitude (µg/L/yr)	Magnitude (%/yr)	Q2 - 2010 Results (µg/L)	Trend	Magnitude (µg/L/yr)	Magnitude (%/yr)	Q2 - 2010 Results (µg/L)	Trend	Q2 - 2010 Results (µg/L)	Trend	Magnitude (µg/L/yr)	Magnitude (%/yr)
Area K																		
TT-MW2-1	**5,100**	**Increasing**	**444.57**	**7.7**	<0.17	Non Detect			<0.15	Decreasing	-0.52	-27.38	<31	Non Detect	<0.20	Decreasing	-0.23	-36.50
TT-MW2-14	**47,000**	**Increasing**	**1177.13**	**2.7**	<0.17	Non Detect			0.60 Jq	Decreasing	-116.07	-96.73	<31	Non Detect	<0.20	Non Detect		
TT-MW2-17S	**3,100**	Decreasing	-332.15	-11.9	0.35 Jq	**Increasing**	**0.13**	**10.8**	<0.15	Non Detect			<31	Non Detect	<0.20	Non Detect		
TT-MW2-29C	3.5	**Increasing**	**1.00**	**100.4**	<0.17	Non Detect			<0.15	No Trend			<31	Non Detect	NA	NA		
Area M																		
TT-MW2-11	**230**	No Trend			**11**	**Increasing**	**0.59**	**8.4**	<0.15	Stable			<31	Non Detect	<0.20	Non Detect		
Former Waste Discharge Area																		
TT-MW2-21	5.0	**Increasing**	**0.79**	**49.3**	3.4	**Increasing**	**0.76**	**58.4**	2.5 Jq	**Increasing**	**1.08**	**40.15**	<0.10	Non Detect	<0.20	Non Detect		
TT-MW2-22	<0.071	Non Detect			**470**	**Increasing**	**118.63**	**47.5**	4.50	Decreasing	-204.4	-102.20	**33 Jq**	Stable	<0.20	Non Detect		
TT-MW2-37A	**7,500**	Probably Increasing	2628.00	109.5	2.0	No Trend			<0.15	No Trend			**13**	No Trend	NA	NA		
Lower Canyon (Downgradient and Crossgradient of the Former Waste Discharge Area)																		
TT-MW2-9S	**6,600**	**Increasing**	**766.50**	**51.1**	0.92	No Trend			<0.15	Non Detect			**8.5**	No Trend	<0.20	Non Detect		
TT-MW2-26	**100**	**Increasing**	**26.92**	**45.6**	<0.17	Non Detect			<0.15	No Trend			<0.10	No Trend	<0.20	Non Detect		
Former Wolfskill Property																		
TT-MW2-19S	5.0	**Increasing**	**1.41**	**40.2**	<0.17	Non Detect			<0.15	Non Detect			<0.10	No Trend	<0.20	Non Detect		
MCL / DWNL	6.0				5.0				5.0				3 (1)		0.3 (1)			

Notes:

%/yr - Percent change per year with respect to the sample mean.
µg/L - Micrograms per liter
MCL - California Department of Public Health Maximum Contaminant Level.
DWNL - California Department of Public Health drinking water notification level.
(1) - DWNL

Bold - MDL or DWNL exceeded.
NA - Not analyzed
< # - Method detection limit concentration is shown.
J - The analyte was positively identified, but the concentration is an estimated value.
q - The analyte detected was below the Practical Quantitation Limit (PQL).

Area K – Area K is one of the primary source areas for the Site COPCs. Four of the 11 wells identified with increasing trends were from monitoring wells located in this area. Of these four wells, two (TT-MW2-17S and TT-MW2-29C) are wells which have low-level detections of the increasing concentration analyte. Three of the wells in Area K had decreasing or probably decreasing trends. The remaining 22 wells located in Area K were either non-detect for all analytes or displayed no trend or a stable trend.

Area M – Area M is a secondary source area for the Site COPCs. One of the 11 wells identified with increasing trends was from a monitoring well located in this area. The remaining two wells located in Area M were either non-detect for all analytes or displayed no trend or a stable trend.

Former Waste Discharge Area – The former WDA is one of the primary source areas for the Site COPCs. Three of the 11 wells identified with increasing trends were from monitoring wells located in this area. Of these three wells, one (TT-MW2-21) one only has low-level detections of the increasing concentration analytes. The remaining three wells located in the former WDA were either non-detect for all analytes or displayed no trend or a stable trend.

Lower Canyon Area (Downgradient or Crossgradient of the Former Waste Discharge Area) – There are no known contaminant sources in the lower canyon area. Two of the 11 wells with increasing trends identified were from monitoring wells located in this area. Three of the wells in the lower canyon had decreasing or probably decreasing trends. The remaining 10 wells located in lower canyon were either non-detect for all analytes or displayed no trend or a stable trend. Two of the Sites guard wells are located in this area. Guard wells TT-MW2-41A and TT-MW2-42A are located approximately 600 feet and 1,000 feet south of the Site boundary respectively, and displayed non-detect or stable COPC trends. It is believed that natural attenuation of perchlorate may be occurring in the riparian area between the Site boundary and the guard wells. The COPC plumes diminish significantly through this area.

Former Wolfskill Property – There are no known contaminant sources on the former Wolfskill Property. One of the 11 wells with increasing trends identified was from monitoring wells located in this area. One of the wells in the lower canyon had a decreasing trend. The remaining two wells located in the lower canyon were either non-detect for all samples analyzed or displayed either no trend or a stable trend. The remaining Site guard wells are located in this area. Guard wells TT-

MW2-19S and D and TT-MW2-20 S and D are located approximately 0.9 miles and 1.7 miles south of the Site boundary respectively. Guard wells TT-MW2-19S, TT-MW2-19D, TT-MW2-20S and TT-MW2-20D primarily displayed non-detect, no trend or decreasing COPC trends, with the exception of TT-MW2-19S, which had an increasing perchlorate trend.

The relatively short time frame represented by the data analyzed, (half of the wells have less than two years of data), makes it difficult to know the reason for the trends observed. The trends may represent plume migration or seasonal fluctuations in concentration due to the continuing drought conditions experienced at the site. As the period of record grows, and the number of data points increases, the trends should become better defined and more reliable long term trends should emerge from the data. In general, the plume morphology has not changed and the majority of the wells and the surface water locations display a stable trend, no trend, or are non-detect.

4.5 Groundwater Monitoring Program and the Groundwater Quality Monitoring Network

4.5.1 Groundwater Sampling Frequency

The primary criterion utilized in determining the sampling frequency of a monitoring well is the well classification (i.e., function of each well; Tetra Tech, 2007b). Groundwater monitoring well classifications are based on the evaluation of the temporal trends, spatial distribution analyses, and other qualitative criteria. During the previous reporting period, horizontal extent wells, vertical distribution wells, increasing contaminant trend wells, background wells, guard wells, and new wells were sampled. Table 4-4 presents a summary of the frequency of groundwater sampling by well classification.

Table 4-4 Well Classification and Sampling Frequency

Well Classification	Frequency
Horizontal Extent Wells	Semiannual
Vertical Distribution Wells	Semiannual
Increasing Contaminant Trend Wells	Semiannual
Background Wells	Annual
Remedial Monitoring Wells	Varies, based on remedial action proposed
Guard Wells	Semiannual
New Wells	4 Quarters then reclassify
Redundant Wells	Suspend (no sampling)
Groundwater Sampling and Analysis Plan, Lockheed Martin Corporation, Beaumont Site 2, Beaumont, California, May, 2007 (Tetra Tech 2007b).	

4.5.2 Proposed Changes

Twenty-four quarters of water quality monitoring have been conducted at the Site since the September 2004 well installation activities. Groundwater samples have been routinely analyzed for VOCs and perchlorate. Selected testing for CAM 17 metals, general minerals, 1,4-dioxane, RDX, NDMA, 1,2,3-TCP and hexavalent chromium has also been performed. A groundwater monitoring SAP was prepared to optimize and better define the GMP at the Site (Tetra Tech, 2007b). In concurrence with the DTSC, groundwater monitoring will be performed in accordance with the SAP.

Monitoring wells TT-MW2-25 through TT-MW2-43 have now been sampled for a year, and reclassifications are proposed. Unless otherwise specified below, these changes are listed in Table 4-5.

The sampling frequency for wells with an increasing trend may be increased to semiannual if the magnitude of the trend and the wells location warrant an increased frequency. Regardless of the outcome of the trend analysis, guard wells will continue to be sampled semiannually. The monitoring frequency of all other wells exhibiting an increasing trend will be evaluated on a case-by-case basis, with particular attention given to the magnitude of the trend and the location of the well.

Based on the results of the temporal trend analysis and the magnitude of their trends, continued semiannual sampling for increasing or probably increasing concentration trend wells TT-MW2-29C located in Area K, TT-MW2-21, TT-MW2-22 and TT-MW2-37A located in the former WDA, TT-MW2-9S and TT-MW2-26 located in the lower canyon area, and TT-MW2-19S located on the former Wolfskill Property is proposed.

Due to the limited magnitude of their trends it is proposed that monitoring wells TT-MW2-1, and TT-MW2-14 located in Area K, and TT-MW2-11 located in Area M return to their previously approved sampling frequencies and TT-MW2-17S located in Area K remain at its previously approved sampling frequency.

The analytical scheme is evaluated annually during the Second Quarter of each year and changes may be proposed to accommodate expanded site knowledge or changing Site conditions. The classifications of the wells in the network and the corresponding sampling frequency is also evaluated annually during the Second Quarter of each year and modified to accommodate expanded site knowledge or changing site conditions.

The proposed groundwater analytical program includes the following suite of analysis:

1. Perchlorate semiannually or annually in all monitored wells by EPA Method E332.0,

2. VOCs, including oxygenates, for all new wells and semiannually or annually for select wells by EPA Method SW 8260B,

3. 1,4-dioxane semiannually or annually for select wells by EPA Method SW 8270 SIM,

4. CAM 17 Metals (total), for all monitored wells with historic detections above the MCL by EPA Method SW 6010B and SW 7470A annually until background concentrations for metals have been evaluated and the nature of the metals concentrations detected in the groundwater have been determined by the human health risk assessment,

5. CAM 17 Metals (dissolved), for all water table wells where the water level and the well screen are both less than 25 feet below ground surface, and with historic detections above the MCL by EPA Method SW 6010B and SW 7470A annually until the nature of the metals concentrations have been evaluated in the ecological risk assessment,

6. RDX annually for select wells by EPA Method SW 8330,

Natural attenuation parameter analyses will be discontinued pending the results of the Site-wide natural attenuation study, which is currently underway. Recommendations for future natural attenuation parameter sampling will be discussed in the upcoming natural attenuation study report.

As previously noted, sampling for NDMA will be discontinued for future groundwater monitoring events.

General mineral analyses will be performed on selected wells to determine cation and anion geochemistry for the aquifer. General minerals analysis will not be performed on new wells for a minimum of six months after installation to allow the aquifer to stabilize. The following suite of general mineral analysis will be performed during selected groundwater sampling events:

1. Total Dissolved Solids (TDS) by EPA Method E160.1,

2. Chloride, nitrate (as nitrogen) and sulfate by EPA Method E300.0, and

3. Carbonate and bicarbonate (as calcium carbonate) by EPA Method E310.1,

4. Calcium, manganese, potassium, and sodium by EPA Method SW6010.

Table 4-5 summarizes the proposed monitoring well sampling schedule and frequency.

Table 4-5 Monitoring Well Sampling Schedule and Frequency

Monitoring Well Location	Well Classification	VOCs (EPA 8260B)	Per chlorate (EPA 332.0)	Metals (EPA 6010B / 7470A)	1,4-Dioxane (EPA 8270 SIM)	RDX (EPA 8330)	Proposed 2011 Monitoring Frequency	2010 Monitoring Frequency
TT-MW2-1	Horizontal Extent	-	X	-	-	-	Semiannual – Perchlorate	Semiannual – Perchlorate, Nat Att Annual – RDX, metals
TT-MW2-2	Redundant	-	-	-	-	-	Suspend (no sampling)	Annual – metals
TT-MW2-3	Redundant	-	-	-	-	-	Suspend (no sampling)	Suspend (no sampling)
TT-MW2-4S	Horizontal Extent	-	X	X	-	-	Semiannual – Perchlorate Annual – metals	Semiannual – Perchlorate Annual – metals
TT-MW2-4D	Redundant	-	-	-	-	-	Suspend (no sampling)	Suspend (no sampling)
TT-MW2-5	Horizontal Extent	X	X	-	X	-	Semiannual – Perchlorate, 1,4-dioxane Annual – VOCs	Semiannual – Perchlorate, Nat Att, 1,4-dioxane Annual – VOCs, metals
TT-MW2-6S	Horizontal Extent	X	X	-	X	-	Semiannual – Perchlorate, 1,4-dioxane Annual – VOCs	Semiannual – Perchlorate Annual – VOCs, metals
TT-MW2-6D	Vertical Distribution	-	X	X	-	-	Semiannual – Perchlorate Annual – metals	Semiannual – Perchlorate Annual – metals
TT-MW2-7	Horizontal Extent	-	X	-	X	-	Semiannual – Perchlorate Annual – 1,4-dioxane	Semiannual – Perchlorate, Nat Att Annual – metals
TT-MW2-7D	Vertical Distribution	-	X	X	-	-	Semiannual – Perchlorate Annual – metals	Semiannual – Perchlorate Annual – metals
TT-MW2-8	Horizontal Extent	-	X	-	X	-	Semiannual – Perchlorate Annual – 1,4-dioxane	Semiannual – Perchlorate Annual – metals
TT-MW2-9S	Increasing Contaminant Trend Perchlorate	X	X	-	X	-	Semiannual – Perchlorate, 1,4-dioxane Annual – VOCs	Semiannual – Perchlorate, Nat Att, 1,4-dioxane Annual – VOCs, metals
TT-MW2-9D	Vertical Distribution	-	X	-	X	-	Semiannual – Perchlorate Annual – 1,4-dioxane	Semiannual – Perchlorate Annual – metals
TT-MW2-10	Horizontal Extent	-	X	-	-	-	Semiannual – Perchlorate	Semiannual – Perchlorate, Nat Att Annual – metals
TT-MW2-11	Horizontal Extent	X	X	-	-	-	Semiannual – Perchlorate, VOCs	Semiannual – Perchlorate, VOCs Annual – metals
TT-MW2-12	Horizontal Extent	-	X	-	-	-	Semiannual – Perchlorate	Semiannual – Perchlorate, Nat Att Annual – metals
TT-MW2-13	Horizontal Extent	-	X	-	-	X	Semiannual – Perchlorate Annual – RDX	Semiannual – Perchlorate Annual – VOCs, RDX, metals
TT-MW2-14	Horizontal Extent	X	X	-	-	-	Semiannual – Perchlorate Annual – VOCs	Semiannual – Perchlorate, Nat Att Annual – VOCs, metals
TT-MW2-16	Background	-	X	-	-	-	Annual – Perchlorate	Annual – Perchlorate, metals
TT-MW2-17S	Horizontal Extent	X	X	-	-	-	Semiannual – Perchlorate Annual – VOCs,	Semiannual – Perchlorate Annual – VOCs, metals
TT-MW2-17D	Vertical Distribution	X	X	-	-	-	Semiannual – Perchlorate Annual – VOCs	Semiannual – Perchlorate, Nat Att Annual – VOCs, metals
TT-MW2-18	Vertical Distribution	-	X	-	-	-	Semiannual – Perchlorate	Semiannual – Perchlorate Annual – metals
TT-MW2-19S	Increasing Contaminant Trend Perchlorate	-	X	-	-	-	Semiannual – Perchlorate	Quarterly – Perchlorate Semiannual – 1,4-dioxane, NDMA
TT-MW2-19D	Vertical Distribution	-	X	-	-	-	Semiannual – Perchlorate	Quarterly – Perchlorate
TT-MW2-20S	Guard	-	X	-	-	-	Semiannual – Perchlorate	Quarterly – Perchlorate Semiannual – 1,4-dioxane, NDMA
TT-MW2-20D	Redundant	-	-	-	-	-	Suspend (no sampling)	Quarterly – Perchlorate
TT-MW2-21	Increasing Contaminant Trend Perchlorate, TCE and Methylene Chloride	X	X	X	X	-	Semiannual – Perchlorate, VOCs Annual – 1,4-dioxane, metals	Semiannual – Perchlorate, VOCs, 1,4-dioxane, NDMA Annual – metals
TT-MW2-22	Increasing Contaminant Trend TCE	X	X	X	X	-	Semiannual – Perchlorate, VOCs, 1,4-dioxane Annual – metals	Semiannual – Perchlorate, VOCs Annual – metals
TT-MW2-23	Redundant	-	-	-	-	-	Suspend (no sampling)	Semiannual – Perchlorate, VOCs, Nat Att Annual – metals
TT-MW2-24	Horizontal Extent	X	X	-	X	X	Semiannual – Perchlorate, VOCs, 1,4-dioxane Annual – RDX	Semiannual – Perchlorate, VOCs, 1,4-dioxane, NDMA, Nat Att Annual – metals
TT-MW2-25	Horizontal Extent	X	X	-	X	-	Semiannual – Perchlorate Annual – VOCs, 1,4-dioxane	Quarterly – Perchlorate, VOCs Semiannual - NDMA Annual – metals
TT-MW2-26	Increasing Contaminant Trend Perchlorate	X	X	X	X	-	Semiannual – Perchlorate Annual – VOCs, 1,4-dioxane, metals	Quarterly – Perchlorate, VOCs Annual – metals
TT-MW2-27	Horizontal Extent	X	X	X	X	-	Semiannual – Perchlorate Annual – VOCs, 1,4-dioxane, metals	Quarterly – Perchlorate, VOCs Semiannual - 1,4-dioxane Annual – metals

Notes:

EPA - United States Environmental Protection Agency
RDX - Hexahydro-1,3,5-trinitro-1,3,5-triazine
1,4-dioxane - Analyte added to monitoring schedule
VOCs - Volatile organic compounds
Nat Att - Natural Attenuation
Metals - Analyte deleted from monitoring schedule
NDMA - N-Nitrosodimethylamine

Table 4-5 Monitoring Well Sampling Schedule and Frequency (continued)

Monitoring Well Location	Well Classification	VOCs (EPA 8260B)	Per chlorate (EPA 332.0)	Metals (EPA 6010B / 7470A)	1,4-Dioxane (EPA 8270 SIM)	RDX (EPA 8330)	Proposed 2011 Monitoring Frequency	2010 Monitoring Frequency
TT-MW2-28	Horizontal Extent	X	X	X	-	-	Semiannual – Perchlorate, VOCs Annual – metals	Quarterly – Perchlorate, VOCs Semiannual – NDMA Annual – metals
TT-MW2-29A	Background	-	X	X	-	-	Annual – Perchlorate, metals	Quarterly – Perchlorate, VOCs Annual – metals
TT-MW2-29B	Background	-	X	X	-	-	Annual – Perchlorate, metals	Quarterly – Perchlorate, VOCs Semiannual – NDMA Annual – metals
TT-MW2-29C	Increasing Contaminant Trend Perchlorate	-	X	X	-	-	Semiannual – Perchlorate	Quarterly – Perchlorate, VOCs Annual – metals
TT-MW2-30A	Vertical Distribution	X	X	X	-	-	Semiannual – Perchlorate Annual – VOCs, metals	Quarterly – Perchlorate, VOCs Annual – metals
TT-MW2-30B	Vertical Distribution	-	X	X	-	-	Semiannual – Perchlorate	Quarterly – Perchlorate, VOCs Annual – metals
TT-MW2-30C	Vertical Distribution	-	X	X	-	-	Semiannual – Perchlorate	Quarterly – Perchlorate, VOCs Annual – metals
TT-MW2-31A	Vertical Distribution	-	X	X	-	-	Semiannual – Perchlorate	Quarterly – Perchlorate, VOCs Annual – metals
TT-MW2-31B	Redundant	-	-	-	-	-	Suspend (no sampling)	Quarterly – Perchlorate, VOCs Annual – metals
TT-MW2-32	Vertical Distribution	X	X	X	-	-	Semiannual – Perchlorate Annual – VOCs, metals	Quarterly – Perchlorate, VOCs Annual – metals
TT-MW2-33A	Horizontal Extent	-	X	X	-	-	Semiannual – Perchlorate	Quarterly – Perchlorate, VOCs Annual – metals
TT-MW2-33B	Redundant	-	-	-	-	-	Suspend (no sampling)	Quarterly – Perchlorate, VOCs Annual – metals
TT-MW2-33C	Redundant	-	-	-	-	-	Suspend (no sampling)	Quarterly – Perchlorate, VOCs Annual – metals
TT-MW2-34A	Horizontal Extent	-	X	X	-	-	Semiannual – Perchlorate	Quarterly – Perchlorate, VOCs Annual – metals
TT-MW2-34B	Redundant	-	-	-	-	-	Suspend (no sampling)	Quarterly – Perchlorate, VOCs Annual – metals
TT-MW2-34C	Redundant	-	-	-	-	-	Suspend (no sampling)	Quarterly – Perchlorate, VOCs Annual – metals
TT-MW2-35A	Vertical Distribution	-	X	X	-	-	Semiannual – Perchlorate Annual – metals	Quarterly – Perchlorate, VOCs Annual – metals
TT-MW2-35B	Redundant	-	-	-	-	-	Suspend (no sampling)	Quarterly – Perchlorate, VOCs Annual – metals
TT-MW2-36A	Horizontal Extent	-	X	X	-	-	Semiannual – Perchlorate Annual – metals	Quarterly – Perchlorate, VOCs Semiannual - NDMA, Nat Att Annual – metals
TT-MW2-36B	Redundant	-	-	-	-	-	Suspend (no sampling)	Quarterly – Perchlorate, VOCs Annual – metals
TT-MW2-36C	Redundant	-	-	-	-	-	Suspend (no sampling)	Quarterly – Perchlorate, VOCs Annual – metals
TT-MW2-37A	Increasing Contaminant Trend Perchlorate	X	X	X	X	-	Semiannual – Perchlorate Annual – VOCs, 1,4-dioxane, metals	Quarterly – Perchlorate, VOCs Semiannual - 1,4-dioxane Annual – metals
TT-MW2-37B	Vertical Distribution	X	X	X	X	-	Semiannual – Perchlorate Annual – VOCs, 1,4-dioxane, metals	Quarterly – Perchlorate, VOCs Annual – metals
TT-MW2-38A	Horizontal Extent	-	X	X	-	-	Semiannual – Perchlorate	Quarterly – Perchlorate, VOCs Annual – metals
TT-MW2-38B	Vertical Distribution	-	X	X	-	-	Semiannual – Perchlorate Annual – metals	Quarterly – Perchlorate, VOCs Annual – metals
TT-MW2-38C	Vertical Distribution	-	X	X	-	-	Semiannual – Perchlorate Annual – metals	Quarterly – Perchlorate, VOCs Annual – metals
TT-MW2-39	Horizontal Extent	-	X	X	-	-	Semiannual – Perchlorate Annual – metals	Quarterly – Perchlorate, VOCs Annual – metals
TT-MW2-40A	Horizontal Extent	X	X	X	-	-	Semiannual – Perchlorate Annual – VOCs	Quarterly – Perchlorate, VOCs Annual – metals
TT-MW2-40B	Vertical Distribution	X	X	X	-	-	Semiannual – Perchlorate Annual – VOCs	Quarterly – Perchlorate, VOCs Annual – metals
TT-MW2-40C	Redundant	-	-	-	-	-	Suspend (no sampling)	Quarterly – Perchlorate, VOCs Annual – metals
TT-MW2-41A	Horizontal Extent	-	X	X	-	-	Semiannual – Perchlorate	Quarterly – Perchlorate, VOCs Annual – metals
TT-MW2-42A	Guard	-	X	X	-	-	Semiannual – Perchlorate Annual – metals	Quarterly – Perchlorate, VOCs Annual – metals

Notes:

EPA - United States Environmental Protection Agency
RDX - Hexahydro-1,3,5-trinitro-1,3,5-triazine
1,4-dioxane - Analyte added to monitoring program
VOCs - Volatile organic compounds
Nat Att - Natural Attenuation
Metals - Analyte deleted from monitoring program
NDMA - N-Nitrosodimethylamine

Section 5 References

1. Air Force Center for Environmental Excellence (AFCEE), 2006. *Monitoring and Remediation Optimization System (MAROS) Software Version 2.2 User's Guide*, March, 2006.

2. Bartos, T. T. and Ogle, K. M, 2002. *Water Quality and Environmental Analyses of Ground-Water Samples Collected from the Wasatch and Fort Union Formations in Areas of Coalbed Methane Development – Implications to Recharge and Ground-Water Flow, Eastern Powder River Basin, Wyoming, in Water – Resources Investigation Report 02-4045* Cheyenne, Wyoming, 2002.

3. California Department of Health Services (CDHS), 1989. *Lockheed Beaumont Consent Order*, June 16, 1989.

4. California Groundwater Bulletin (CGB), 2004. *Upper Santa Ana Valley Groundwater Basin, San Timoteo Subbasin*, updated February 27, 2004.

5. Department of Water Resources (DWR). 1959. *Effects of Differences in Water Quality, Upper Santa Ana Valley and Coastal San Diego County*, Pasadena, CA November 1959.

6. Dibblee, T.W., 1981. *Geologic Map of Banning (15 minute) Quadrangle, California*, South Coast Geologic Society Map 2.

7. Dibblee, T.W., 1981. 2003. *Geologic Map of the San Jacinto Quadrangle (7.5-minute), Riverside County, California*, Santa Barbara Museum of Natural History.

8. Domenico, P. A. and Schwartz, F. W., 1990. *Physical and Chemical Hydrogeology*, John Wiley & Sons, New York, New York, 1990.

9. Eastern Municipal Water District (EMWD), 2005. Urban water Management Plan.

10. United States Environmental Protection Agency, 2008. *Contract Laboratory Program National Functional Guidelines for Superfund Organic Methods Data Review*, OSWER 9240.1-48, EPA-540-R-08-01, June 2008.

11. United States Environmental Protection Agency, 2010. *USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Superfund Data Review,* OSWER 9240.1-51, EPA-540-R-10-011, January 2010.

12. United States Environmental Protection Agency, 2007. *USEPA Monitored Natural Attenuation of Inorganic Contaminants in Ground Water, Volume 2 Assessment for Non-Radionuclides Including Arsenic, Cadmium, Chromium, Copper, Lead, Nickel, Nitrate, Perchlorate, and Selenium*, EPA/600/R-07/140, October 2007.

13. Guay, Joel R., 2002. *Rainfall–Runoff Characteristics and Effects of Increased Urban Density on Streamflow and Infiltration in the Eastern Part of the San Jacinto River Basin, Riverside County, California*, U.S. Geological Survey, Water-Resources Investigations Report 02-4090, 2002.

14. Harden, Deborah R., 1998, *California Geology*. Prentice Hall, Inc., Upper Saddle River, New Jersey. 1998.

15. ITRC (Interstate Technology & Regulatory Council), 2005. *Perchlorate: Overview of Issues, Status, and Remedial Options.* PERCHLORATE-1. Washington, D.C.: Interstate Technology & Regulatory Council, Perchlorate Team. Available on the Internet at ://www.itrcweb.org.

16. Leighton and Associates, Inc., 1983. *Hydrogeologic Investigation for Water Resources Development, Potrero Creek, Riverside County, California*, October, 1983.

17. Lockheed Martin Corporation (LMC), 1995. *Monitoring Well Destruction Report, Former Lockheed Propulsion Company, Beaumont No. 2 Facility, Beaumont, California*, November 15, 1995.

18. Lockheed Martin Corporation (LMC), 2006a. *Clarification of Effects on Stephens' Kangaroo Rat from Characterization Activities at Beaumont Site 1 (Potrero Creek) and Site 2 (Laborde Canyon)*, August 3, 2006.

19. Lockheed Martin Corporation (LMC), 2006b. *Clarification of Mapping Activities Proposed under the Low-Effect Habitat Conservation Plan for the Federally-Endangered Stephens' Kangaroo Rat at Beaumont Site 1 (Potrero Creek) and Site 2 (Laborde Canyon) Riverside County, California (mapping methodology included),* December 8, 2006.

20. Radian Corporation (Radian), 1986a. *Lockheed Propulsion Company Beaumont Test Facilities Historical Report*, September 1986.

21. Radian Corporation (Radian), 1986b. *Preliminary Remedial Investigation, Lockheed Propulsion Company Beaumont Test Facilities*, December 1986.

22. Radian Corporation (Radian), 1990. *Source and Hydrogeologic Investigation – Final, Lockheed Propulsion Company Beaumont Test Facilities*, February 19, 1990.

23. Radian Corporation (Radian), 1992. *Hydrogeologic Study, Lockheed Propulsion Company Beaumont Test Facilities*, December 1992.

24. Radian Corporation (Radian), 1993. *Disposal Area Removal Action, Lockheed Propulsion Company, Beaumont No. 2 Site*, June 1993.

25. Rewis, Diane L., Allen H. Christensen, Jonathan Matti, Joseph A. Hevesi, Tracy Nishikawa, and Peter Martin, 2006. *Geology, Ground-Water Hydrology, Geochemistry, and Ground-Water Simulation of the Beaumont and Banning Storage Units, San Gorgonio Pass Area, Riverside County, California, U.S. Geological Survey Scientific Investigations Report*, 2006–5026, 173 p.

26. Sharp, R. P., 1975. *Geology Field Guide to Southern California*, Kendall/Hunt Geology Field Guide Series, Second Edition, 1975.

27. Tetra Tech, Incorporated (Tetra Tech), 2003. *Groundwater Sampling Results, Former Production Well W2-3, Beaumont Site 2*, February 5, 2003.

28. Tetra Tech, Incorporated (Tetra Tech), 2004b. *Final Lockheed Martin Beaumont Site 2 Groundwater Monitoring Well Installation Report Beaumont, California*, November 15, 2004.

29. Tetra Tech, Incorporated (Tetra Tech), 2005. *Lockheed Martin Third Quarter 2005 Groundwater Monitoring Report Beaumont Site 2, Beaumont, California*, December 2005.

30. Tetra Tech, Incorporated (Tetra Tech), 2006a. *Lockheed Martin Fourth Quarter 2005 Groundwater Monitoring Report Beaumont Site 2, Beaumont, California*, March 2006.

31. Tetra Tech, Incorporated (Tetra Tech), 2006b. *Groundwater Monitoring Well Installation Work Plan*, April 2006.

32. Tetra Tech, Incorporated (Tetra Tech), 2006c. *Installation and Sampling of Downgradient Groundwater Monitoring Wells (TT-MW2-5 and TT-MW2-6S/D) Letter Report and Revised Supplemental Downgradient Well Installation Letter Work Plan*, April 2006.

33. Tetra Tech, Incorporated (Tetra Tech), 2006d. *Lockheed Martin First Quarter 2006 Groundwater Monitoring Report Beaumont Site 2, Beaumont, California*, June 2006.

34. Tetra Tech, Incorporated (Tetra Tech), 2007a. *Semiannual Groundwater Monitoring Report Second Quarter and Third Quarter 2006, Beaumont Site 2, Beaumont, California*, February 2007.

35. Tetra Tech, Incorporated (Tetra Tech), 2007b. *Groundwater Sampling and Analysis Plan, Lockheed Martin Corporation, Beaumont Site 2, Beaumont, California*, May, 2007.

36. Tetra Tech, Incorporated (Tetra Tech), 2007c. *Site Investigation Report for Soil Investigations at the Earthen Prism Shaped Structure and Possible Liquid Waste Discharge Ponds at Lockheed Martin Beaumont Site 2*, October 2007.

37. Tetra Tech, Incorporated (Tetra Tech), 2007d. *Semiannual Groundwater Monitoring Report Fourth Quarter 2006 and First Quarter 2007, Beaumont Site 2*, Beaumont, California, December 2007.

38. Tetra Tech, Incorporated (Tetra Tech), 2008a. *Semiannual Groundwater Monitoring Report Second Quarter and Third Quarter 2007, Beaumont Site 2, Beaumont, California*, March 2008.

39. Tetra Tech, Incorporated (Tetra Tech), 2008b. *Groundwater Monitoring Well Installation and Sampling Report, Beaumont Site 2, Beaumont, California*, May 2008.

40. Tetra Tech, Incorporated (Tetra Tech), 2008c *Former Production Well Destruction Report, Beaumont Site 2, Beaumont, California*, June 2008.

41. Tetra Tech, Incorporated (Tetra Tech), 2008d. *Supplemental Site Characterization Report, Former Waste Discharge Ponds and Southern Property Boundary, Beaumont Site 2, Beaumont, California*, July 2008.

42. Tetra Tech, Incorporated (Tetra Tech), 2008e. *Semiannual Groundwater Monitoring Report Fourth Quarter 2007 and First Quarter 2008, Beaumont Site 2, Beaumont, California*, October 2008.

43. Tetra Tech, Incorporated (Tetra Tech), 2009a. *Historical Research Summary Report, Potential Munitions and Explosives of Concern (MEC) Issues, Lockheed Martin Corporation, Beaumont Site 2 and the Gateway Property, Beaumont, Califonia*, January 2009.

44. Tetra Tech, Incorporated (Tetra Tech), 2009b. *Semiannual Groundwater Monitoring Report Second Quarter and Third Quarter 2008, Beaumont Site 2, Beaumont, California*, March 2009.

45. Tetra Tech, Incorporated (Tetra Tech), 2009d. *Semiannual Groundwater Monitoring Report Fourth Quarter 2008 and First Quarter 2009, Beaumont Site 2, Beaumont, California*, September 2009.

46. Tetra Tech, Incorporated (Tetra Tech), 2010a. *Semiannual Groundwater Monitoring Report Second Quarter and Third Quarter 2009, Beaumont Site 2, Beaumont, California*, March 2010.

47. Tetra Tech, Incorporated (Tetra Tech), 2010b. *Dynamic Site Investigation and Summary Remedial Investigation Report, Beaumont Site 2*, *Beaumont*, *California*, April 2010.

48. Tetra Tech, Incorporated (Tetra Tech), 2010c. *Semiannual Groundwater Monitoring Report Fourth Quarter 2009 and First Quarter 2010*, *Beaumont Site 2, Beaumont, California*, June 2010.

49. Tetra Tech, Incorporated (Tetra Tech), 2010d. *Programmatic Sampling and Analysis Plan, Lockheed Martin Corporation, Beaumont Sites 1 & 2, Beaumont, California*, September 2010.

50. Tetra Tech, Incorporated (Tetra Tech), 2010e. *Supplemental Soil Sampling for Risk Assessment, Lockheed Martin Corporation, Beaumont Site 2, Beaumont, California*, October 2010.

51. United States Fish and Wildlife Service (USFWS), 2005. *Endangered Species Act Incidental Take Permit for Potrero Creek and Laborde Canyon Properties Habitat Conservation Plan*, October 14, 2005.

52. Wiedemeier, Todd H., John T. Wilson, Dr. Donald H. Kampbell, Ross N. Miller and Jerry E. Hansen, 1999. *Technical Protocol for Implementing Intrinsic Remediation with Long-Term Monitoring For Natural Attenuation of Fuel Contamination Dissolved In Groundwater*, Volume I, AFCEE, March 1999.