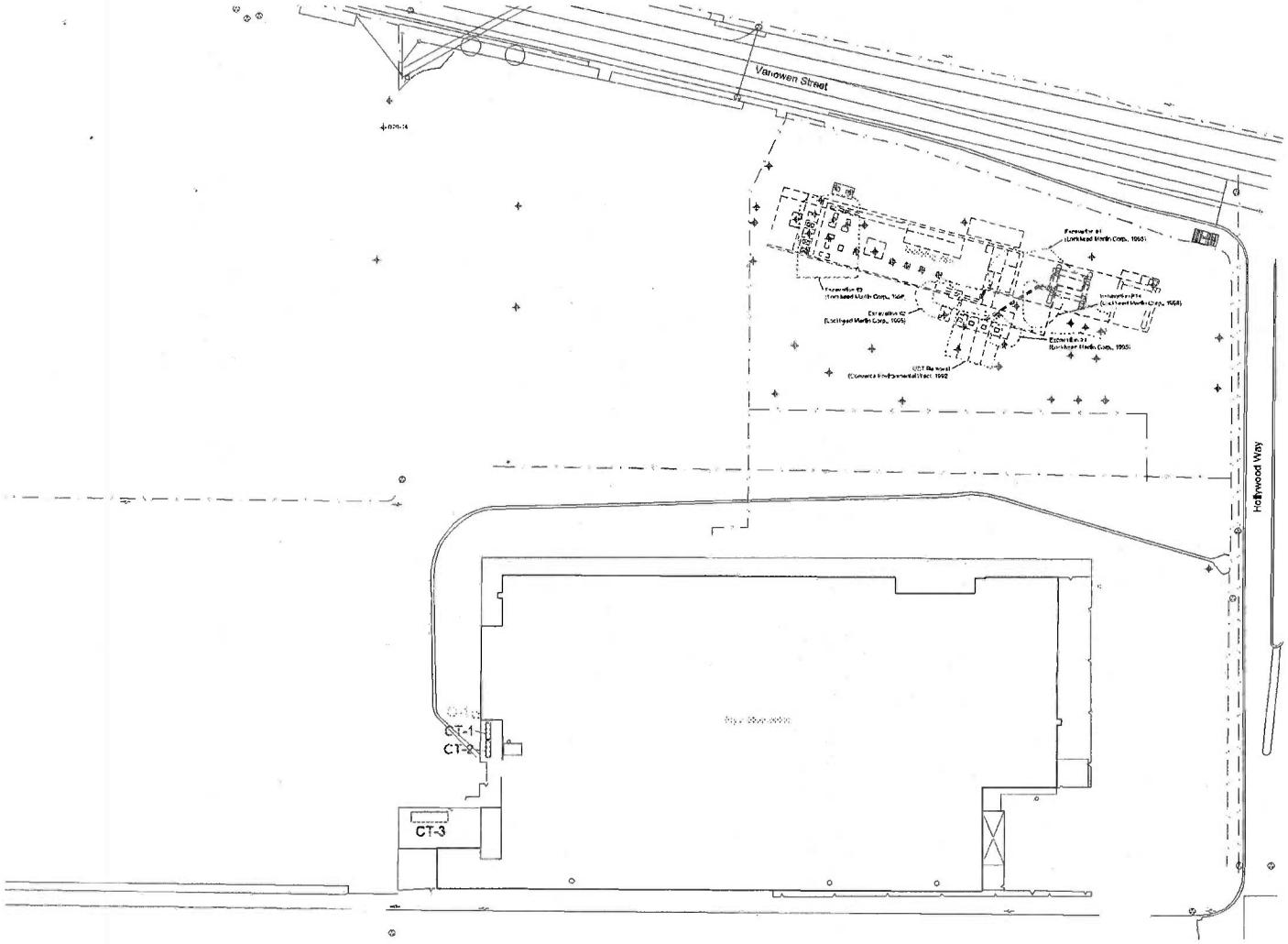
PLATE 2

TOTAL CHROMIUM EXCEEDING NATIVE SOIL CONCENTRATION[1]: PLANT A-1 SOUTH



Excavation References

(Converse Environmental West 1992) *Tank Closure Report, Plant A-1 South*, March 31, 1992.

(Lockheed Martin Corporation 1995) *Final Report of Soil Remediation for Building 76A, Lockheed Plant A-1 South*, May, 1995.

[1] Average concentrations of total chromium in the San Fernando Valley as defined by the Los Angeles Regional Water Quality Control Board for this exercise:

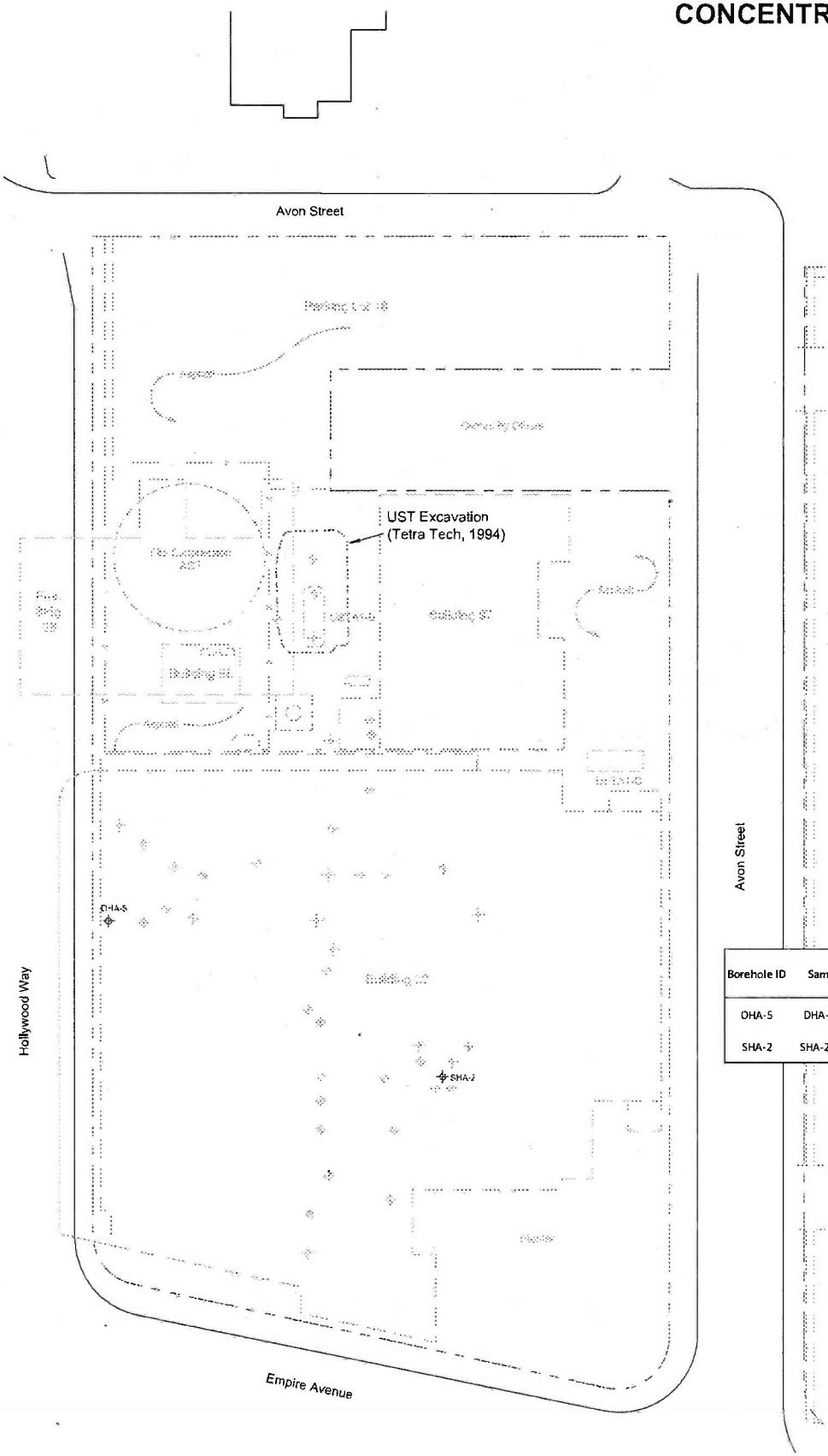
-Total chromium 13 mg/kg

Borehole ID	Sample ID	Sample Depth (ft bgs)	Chromium Concentration (mg/kg)	Sample Date	Reference Number
876-14	876-14-1'	1	14.00		1

Reference Number	Reference	Author
1	Site Investigation and Characterization Report for Plant A-1 South, August 12, 1992	ABL Consulting Converse Environmental West

TETRA TECH

PLATE 3
TOTAL CHROMIUM EXCEEDING NATIVE SOIL CONCENTRATION[1]: PLANT A-1 EAST



NORTH
SCALE: 1"=30'

LEGEND

- DHA-5 ⊕ Soil Boring Location with Cr > Native Soil Concentration
- ⊕ Soil Boring Location with Cr ≤ Native Soil Concentration
- Extent of Excavation
- Existing Building
- Previous Building
- Previous Features
- Previous Fence
- Property Boundary

Excavation References

(Tetra Tech 1994) *Tank Closure Report, Removal of Tank A-1B, Plant A-1 East,* December 13, 1994.

[1] Average concentrations of total chromium in the San Fernando Valley as defined by the Los Angeles Regional Water Quality Control Board for this exercise:

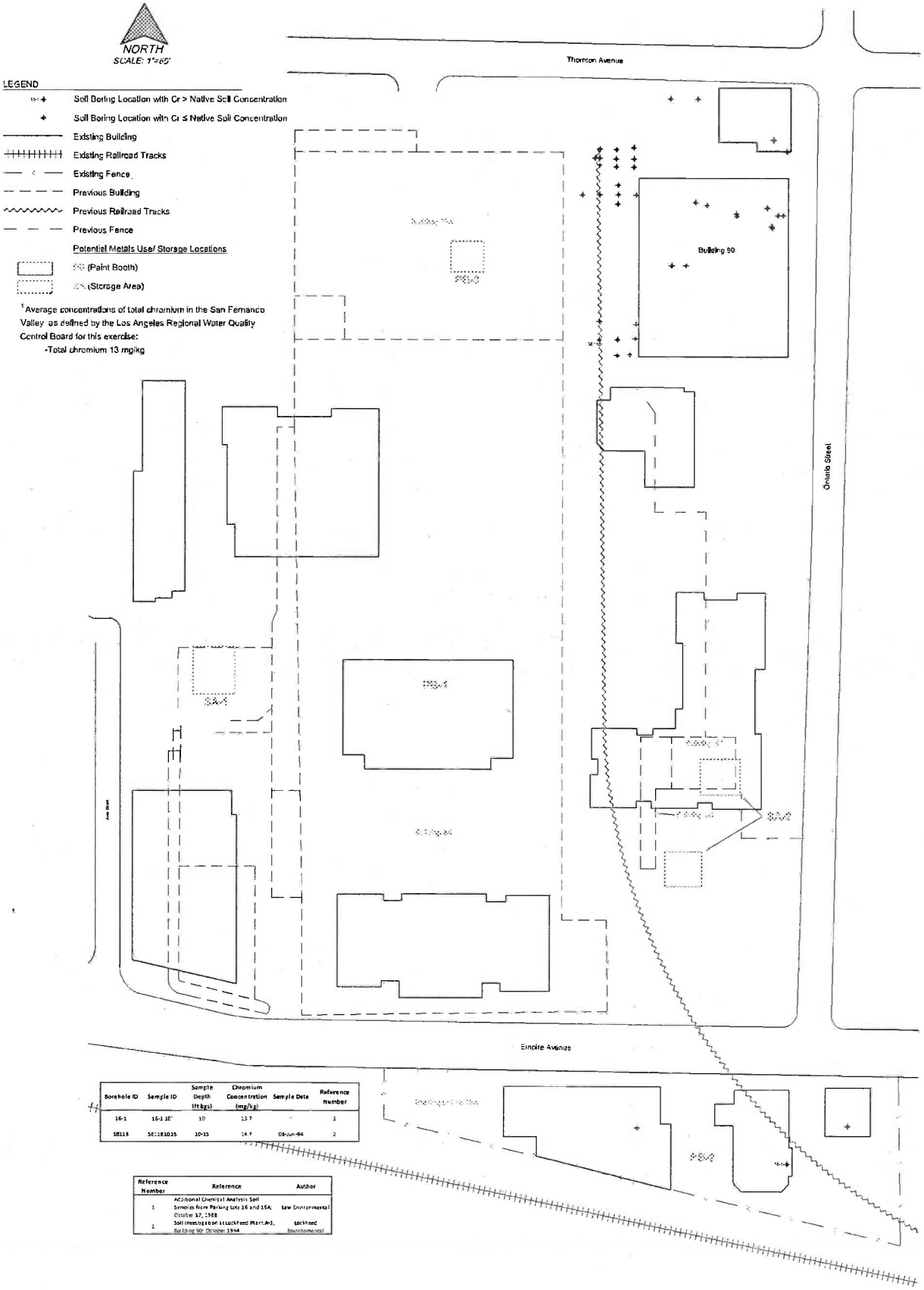
-Total chromium 13 mg/kg

Borehole ID	Sample ID	Sample Depth (ft bgs)	Chromium Concentration (mg/kg)	Sample Date	Reference Number
DHA-5	DHA-5, 11.5'	11.5	14	19-Feb-96	1
SHA-2	SHA-2 @ 12.5'	12.5	14	20-Feb-96	1

Reference Number	Reference	Author
1	A-1 East Site Investigation Report; July 3, 1996	Emcon

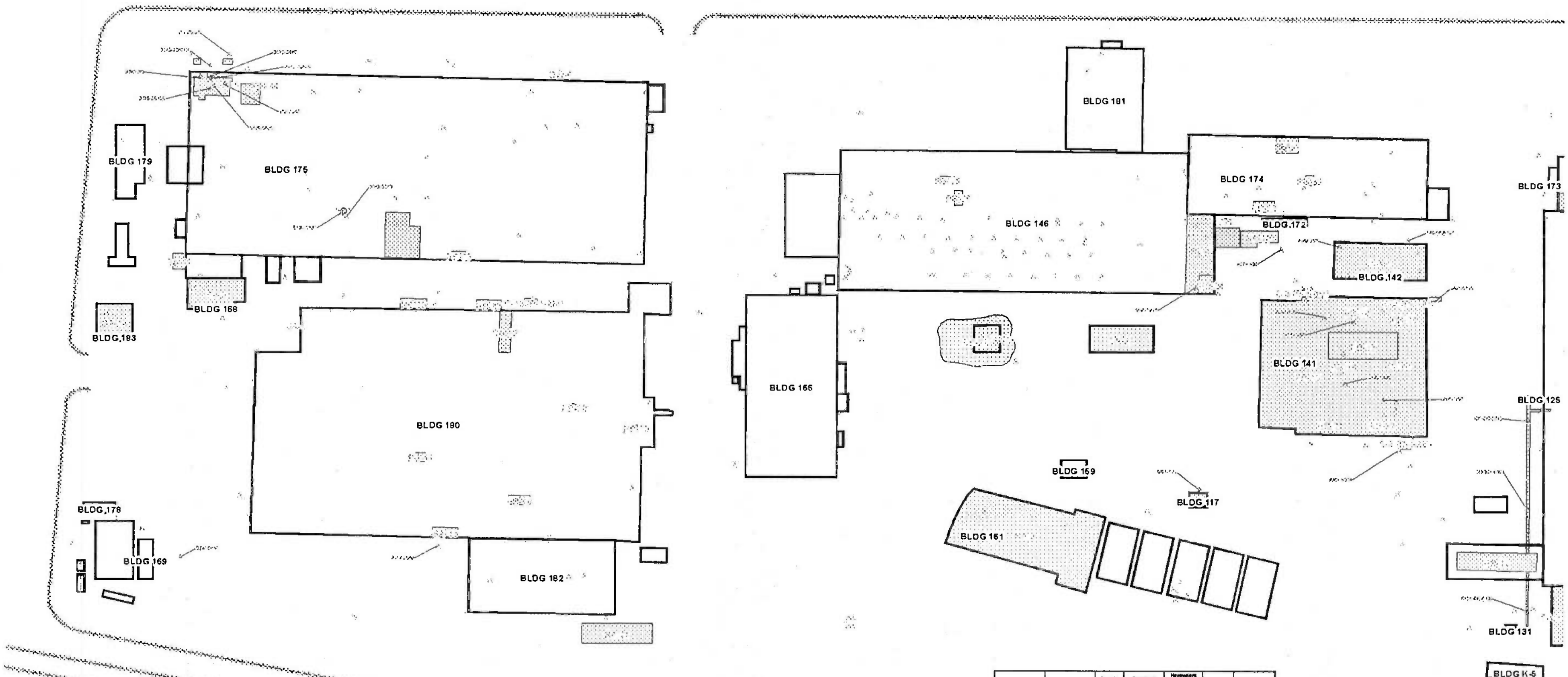
TETRA TECH

PLATE 4
TOTAL CHROMIUM EXCEEDING NATIVE SOIL CONCENTRATION[1]: BUILDING 85 COMPLEX



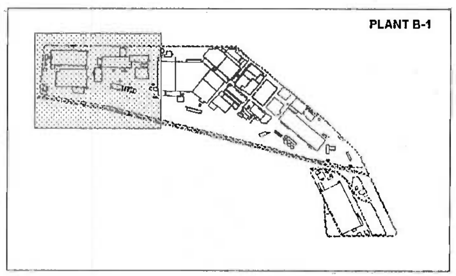
TETRA TECH

PLATE 5A
TOTAL AND HEXAVALENT CHROMIUM EXCEEDING NATIVE SOIL CONCENTRATIONS[1]: PLANT B-1 (EASTERN PORTION)



Borehole ID	Sample ID	Sample Depth (ft bgs)	Chromium Concentration (mg/kg)	Hexavalent Chromium Concentration (mg/kg)	Sample Date	Reference Number
[illegible]	[illegible]	5	[illegible]	-	07-May-93	1
[illegible]	[illegible]	5	29	-	23-May-93	[illegible]
[illegible]	[illegible]	6	75	-	16-Jan-94	1
180-5545	180-5545-30	30	280	-	03-May-95	[illegible]
A137-SB3	A137-SB3-20	20	16	-	17-Apr-92	2
A146-SB3	A141-SB3-5	5	37	-	15-Apr-92	2
A143-SB3	A143-SB3-5	5	44	-	19-Apr-92	2
A141-SB6	A141-SB6-5	5	16	-	15-Apr-92	2
A141-SB10	A141-SB10-20	20	25	-	16-Apr-92	2
A143-SB12	[illegible]	5	34	-	15-Apr-92	2
A143-SB14	A143-SB14-5	5	16	-	17-Apr-92	2
A142-SB[illegible]	[illegible]	20	190	-	20-Apr-92	2
A146-SB18	A146-SB18-5	5	16	-	18-Feb-92	2
A176-SB7	A176-SB7-20	20	16	-	20-Apr-92	2
B175-[illegible]	[illegible]-30	30	220.0	-	03-May-98	6
	[illegible]-35	35	390	-	08-May-98	6
B175-[illegible]	[illegible]-15	15	251.0	-	10-Oct-98	7
	[illegible]-20	20	400.0	-	10-Oct-98	7
	[illegible]-25	25	180.0	-	10-Oct-98	7
B175-[illegible]	[illegible]-30	30	200.0	-	05-May-98	7
	[illegible]-35	35	[illegible]	-	06-May-98	7
B175-[illegible]	[illegible]-15	15	270.0	-	10-Oct-98	7
	[illegible]-20	20	[illegible]	2.9	10-Oct-98	7
	[illegible]-25	25	73.6	-	10-Oct-98	7
[illegible]	[illegible]	15	280	2.9	25-Jun-98	7
[illegible]	[illegible]	11	36	-	26-Apr-95	5
[illegible]	[illegible]	30	34	-	05-May-95	[illegible]
[illegible]	[illegible]	30	[illegible]	-	08-Jun-94	4
[illegible]	[illegible]	30	34	-	08-Jun-94	4
[illegible]	[illegible]	5	75	-	08-Jun-94	4
[illegible]	[illegible]-30	30	[illegible]	-	27-May-93	3
	[illegible]-40	40	14.6	-	27-May-93	3
[illegible]	[illegible]	7	[illegible]	-	[illegible]	[illegible]

Reference Number	Reference Document	Author
1	Results of Underground Tank Leak Detection Program for Plant B-1, May 5, 1993	Gregg & Associates, Inc
2	Final Report: Subsurface Soil Investigation Lockheed Plant B-1, May 24, 1993.	Tetra Tech, Inc.
3	Foundation and Infrastructure Demolition Monitoring Lockheed Plant B-1, April 6, 1994	Tetra Tech, Inc.
4	Building 180 Tee Subsurface Soil Investigation Lockheed Plant B-1, May 12, 1994.	Tetra Tech, Inc.
5	Infrastructure Demolition Oversight Project Documentation Building 180 Site Plant B-1 West, September 15, 1995	Tetra Tech, Inc.
6	Additional Soil Gas Survey and Soil Borings Lockheed Martin Building 175, June 29, 1998	Tetra Tech, Inc.
7	Subsurface Investigation Area 15/16 Building 175 Site Lockheed Martin Former Plant B-1 West, December 18, 1998	Tetra Tech, Inc.



Legend

- Soil Boring Location with Cr and/or Cr6 > Native Soil Concentrations
- Soil Boring Location with Cr and/or Cr6 = Native Soil Concentrations
- Building
- Buildings_Facility_Polyline
- Plating Lines Region
- Paint Booths
- Drywells
- Cooling Tower
- Clarifiers
- Chemical Processing
- Storage Area
- Other Region

NORTH
1 inch = 40 feet

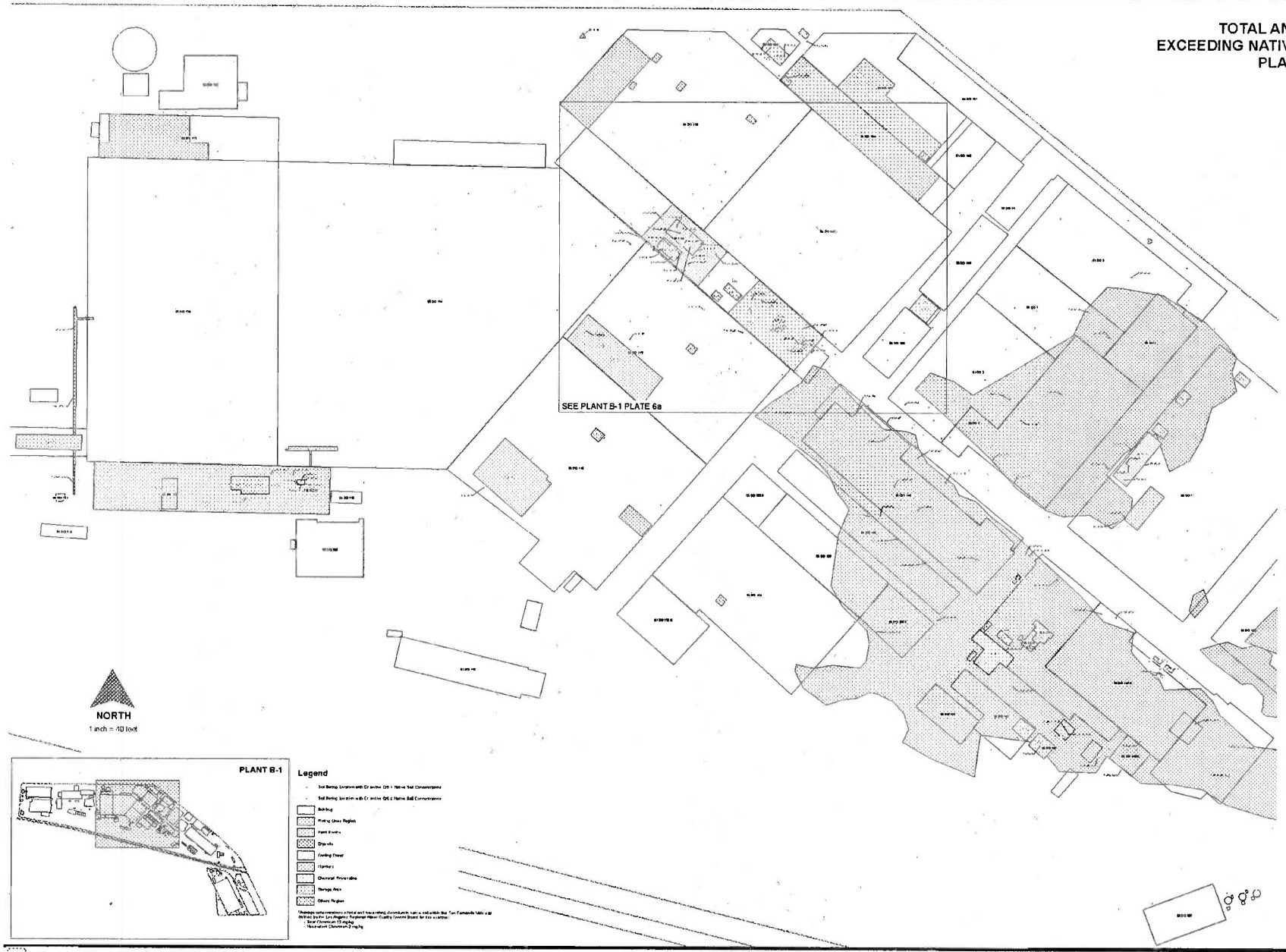
[1] Average concentrations of total and hexavalent chromium in native soil within the San Fernando Valley as defined by the Los Angeles Regional Water Quality Control Board for this exercise:
- Total Chromium 13 mg/kg
- Hexavalent Chromium 2 mg/kg

CONFIDENTIAL

LMC-PET-00002932

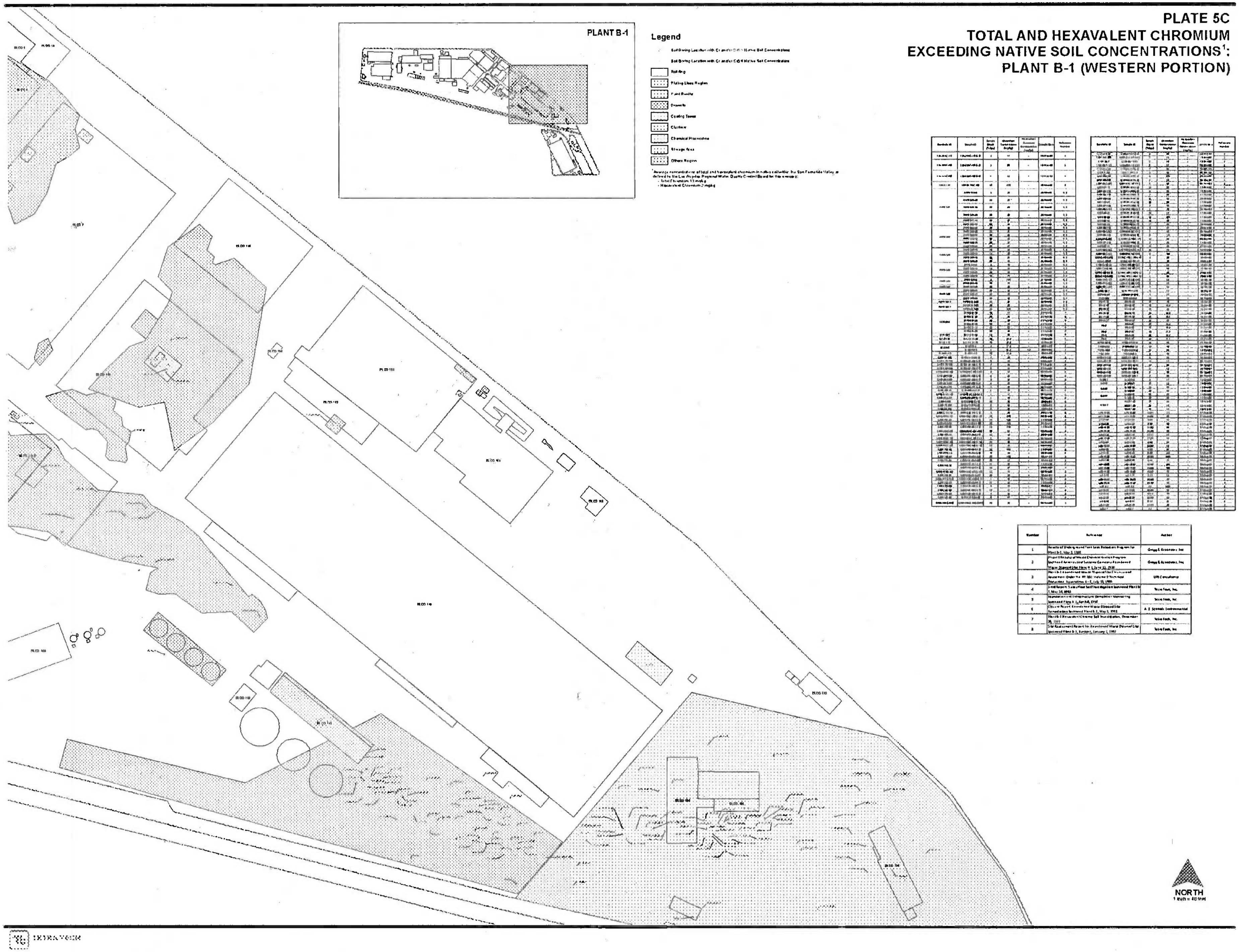
CONFIDENTIAL

PLATE 5B
TOTAL AND HEXAVALENT CHROMIUM EXCEEDING NATIVE SOIL CONCENTRATIONS[1]: PLANT B-1 (CENTRAL PORTION)



LMC-PET-0002933

PLATE 5C
TOTAL AND HEXAVALENT CHROMIUM EXCEEDING NATIVE SOIL CONCENTRATIONS[1]: PLANT B-1 (WESTERN PORTION)

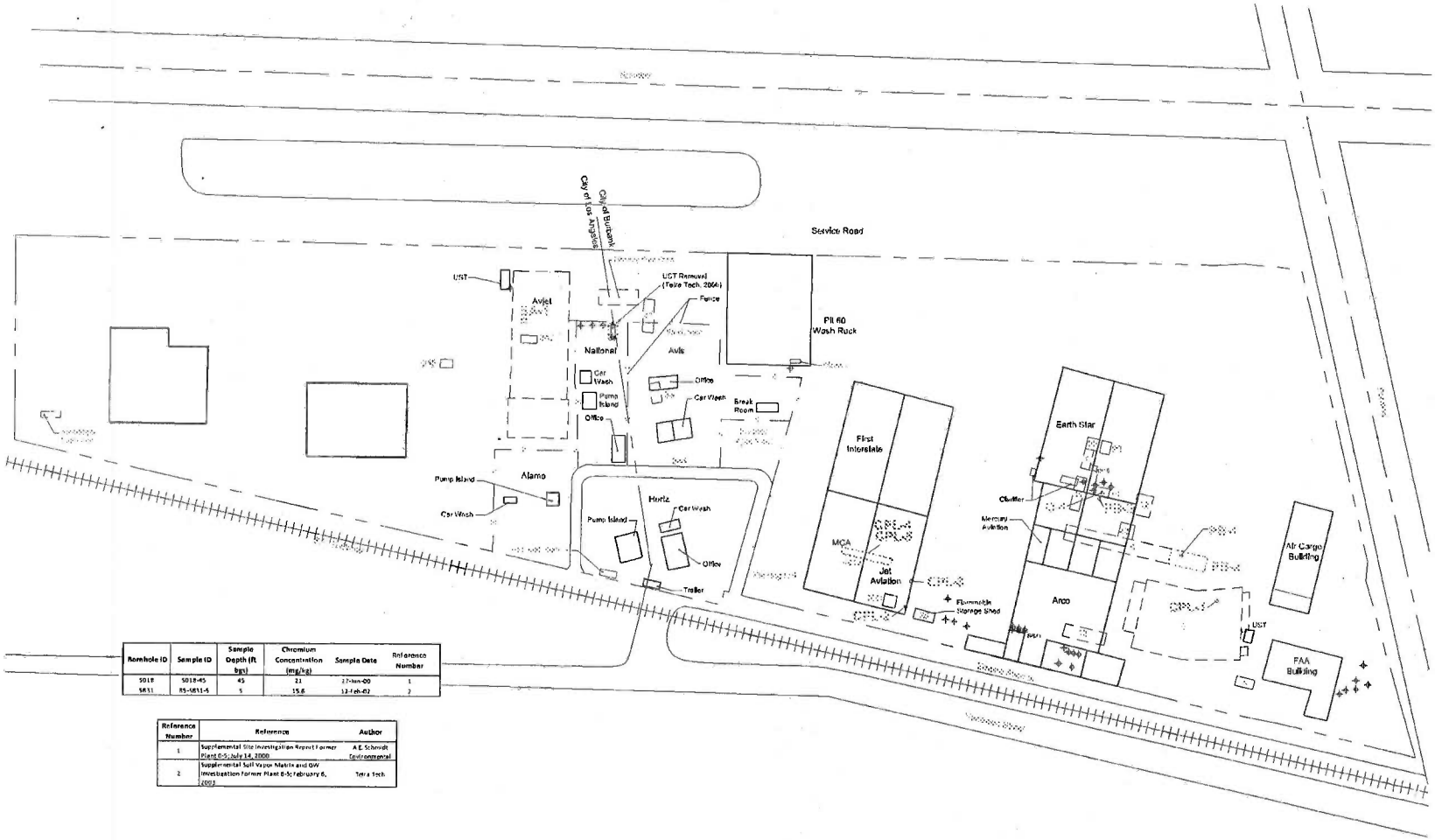


[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

Number	Reference	Author
1	[illegible]	Gregg & Associates, Inc.
2	[illegible]	Gregg & Associates, Inc.
3	[illegible]	URS Consultants
4	[illegible]	Tetra Tech, Inc.
5	[illegible]	Tetra Tech, Inc.
6	[illegible]	A. E. Schmidt Environmental
7	[illegible]	Tetra Tech, Inc.
8	[illegible]	Tetra Tech, Inc.

PLATE 6
TOTAL CHROMIUM EXCEEDING NATIVE SOIL CONCENTRATION[1]: PLANT B-5



Borehole ID	Sample ID	Sample Depth (ft bgs)	Chromium Concentration (mg/kg)	Sample Date	Reference Number
SB19	SB19-45	45	21	27-Nov-00	1
SB11	MS-SB11-5	5	15.6	12-Feb-02	2

Reference Number	Reference	Author
1	Supplemental Site Investigation Report Former Plant B-5; July 14, 2000	A.E. Schmidt Environmental
2	Supplemental Soil Vapor Matrix and GW Investigation Former Plant B-5; February 6, 2003	Tetra Tech

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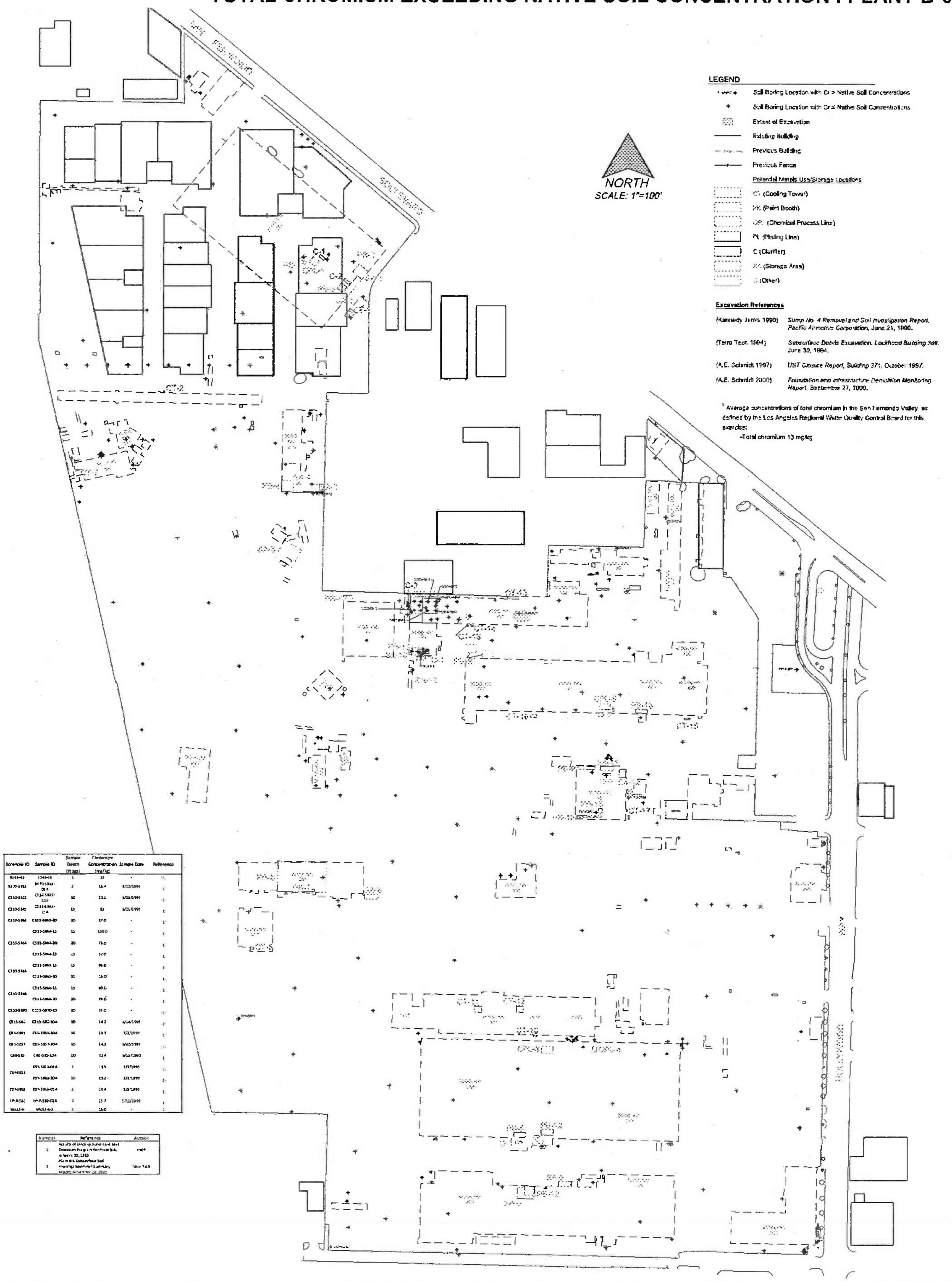
PLATE 7
TOTAL CHROMIUM EXCEEDING NATIVE SOIL CONCENTRATION[1]: PLANT B-6



LEGEND

- Soil Boring Location with Cr > Native Soil Concentrations
- Soil Boring Location with Cr ≤ Native Soil Concentrations
- Extent of Excavation
- Existing Building
- Previous Building
- Previous Fence

Potential Metals Use/Storage Locations

- CT (Cooling Tower)
- PB (Paint Booth)
- CPL (Chemical Process Line)
- PL (Plating Line)
- C (Clarifier)
- SA (Storage Area)
- O (Other)

Excavation References

(Kennedy Jenks 1990) *Sump No. 4 Removal and Soil Investigation Report, Pacific Airmotive Corporation*, June 21, 1990.

(Tetra Tech 1994) *Subsurface Debris Excavation, Lockheed Building 369*, June 30, 1994.

(A.E. Schmidt 1997) *UST Closure Report, Building 371*, October 1997.

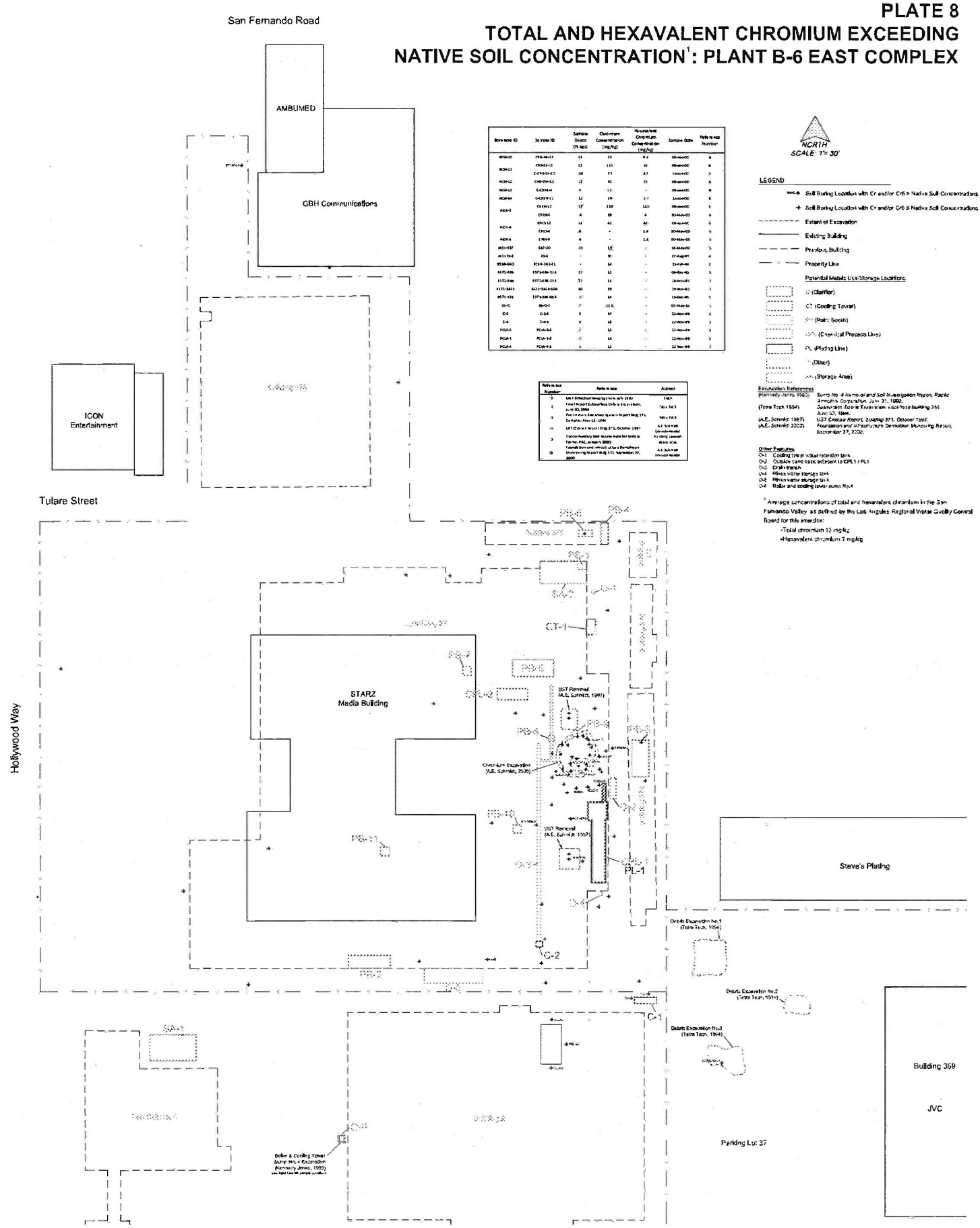
(A.E. Schmidt 2000) *Foundation and Infrastructure Demolition Monitoring Report*, September 27, 2000.

[1] Average concentrations of total chromium in the San Fernando Valley as defined by the Los Angeles Regional Water Quality Control Board for this exercise:
-Total chromium 13 mg/kg

Borehole ID	Sample ID	Sample Depth (ft bgs)	Chromium Concentration (mg/kg)	Sample Date	Reference
[illegible]	[illegible]	1	18	-	[illegible]
[illegible]	[illegible]	5	15.4	8/22/1995	1
[illegible]	[illegible]	10	21.1	8/23/1995	1
[illegible]	[illegible]	15	15	8/21/1995	2
[illegible]	[illegible]	20	17.0	-	2
	[illegible]	15	130.0	-	2
[illegible]	[illegible]	20	76.0	-	2
	[illegible]	15	17.0	-	2
[illegible]	[illegible]	15	96.0	-	2
	[illegible]	20	16.0	-	2
[illegible]	[illegible]	15	30.0	-	2
	[illegible]	20	[illegible]	-	2
[illegible]	[illegible]	20	37.0	-	2
[illegible]	[illegible]	10	14.2	[illegible]	2
[illegible]	[illegible]	10	13.3	[illegible]	2
[illegible]	[illegible]	10	14.1	[illegible]	2
[illegible]	[illegible]	10	11.4	[illegible]	2
[illegible]	[illegible]	5	[illegible]	[illegible]	2
	[illegible]	10	13.2	[illegible]	2
[illegible]	[illegible]	5	[illegible]	[illegible]	2
[illegible]	[illegible]	2	13.7	[illegible]	2
[illegible]	[illegible]	3	16.0	-	2

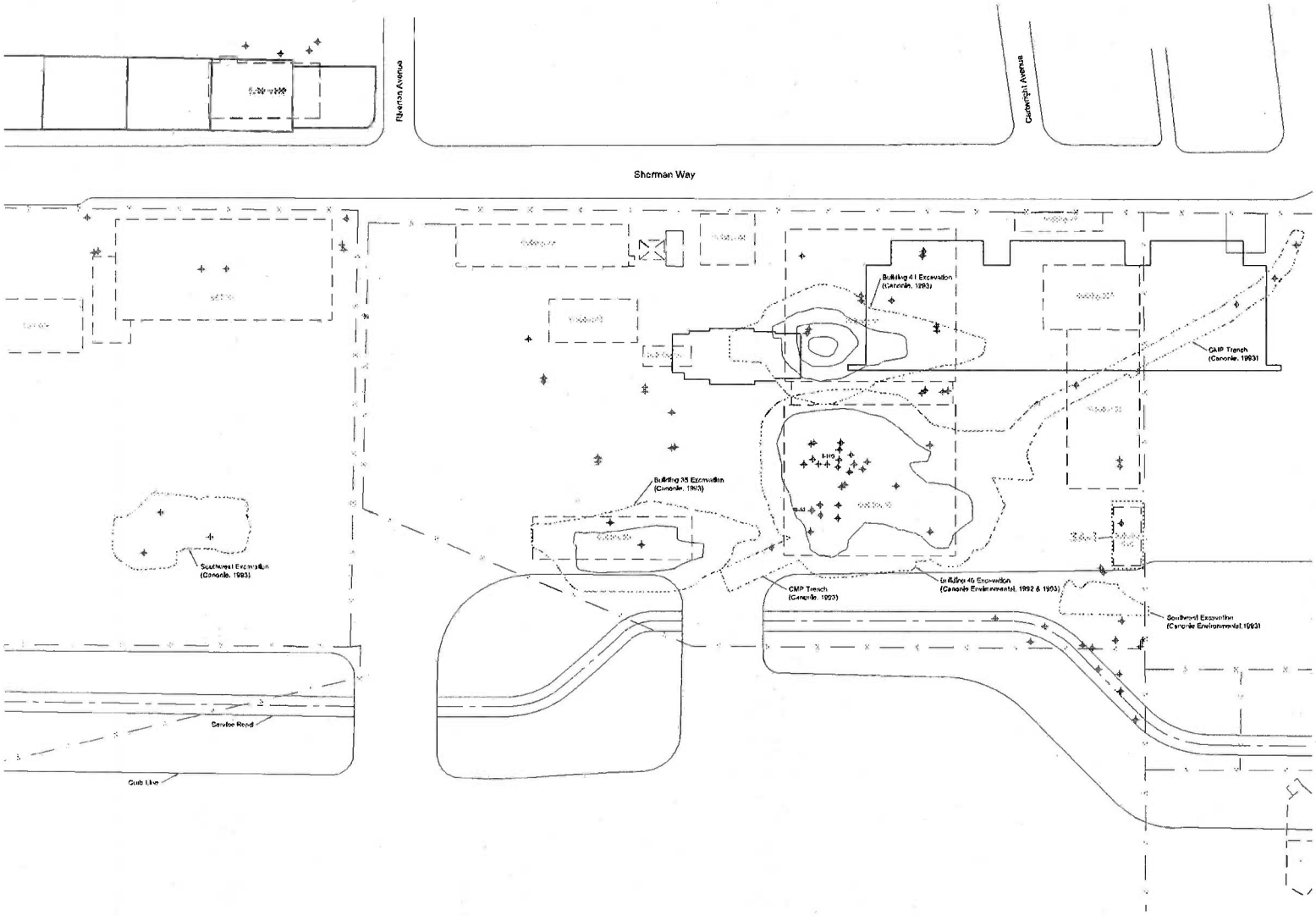
Number	Reference	Author
1	Results of Underground Tank Leak Detection Program for Plant B-6, [illegible]	[illegible]
2	Plant B-6 Subsurface Soil Investigation Final Summary Report, [illegible]	[illegible]

PLATE 8
TOTAL AND HEXAVALENT CHROMIUM EXCEEDING NATIVE SOIL CONCENTRATION[1]: PLANT B-6 EAST COMPLEX



TETRA TECH

PLATE 9
TOTAL CHROMIUM EXCEEDING NATIVE SOIL CONCENTRATION[1]: PLANT C-1



[1]Average concentrations of total chromium in the San Fernando Valley as defined by the Los Angeles Regional Water Quality Control Board for this exercise:
-Total chromium 13 mg/kg

Borehole ID	Sample ID	Sample Depth (ft bgs)	Chromium Concentration (mg/kg)	Sample Date	Reference Number
I-109	I-109-48	48	14	-	1
III-44	III-44-61	61	17	-	1

Reference Number	Reference	Author
1	Final Report Lockheed Plant C-1 Site Remediation (7 Volumes); September 16, 1993	Canonie Environmental

TETRA TECH

PLATE 5Ba
TOTAL AND HEXAVALENT CHROMIUM EXCEEDING NATIVE SOIL CONCENTRATIONS[1]: PLANT B-1 (CENTRAL PORTION, SUBSET)

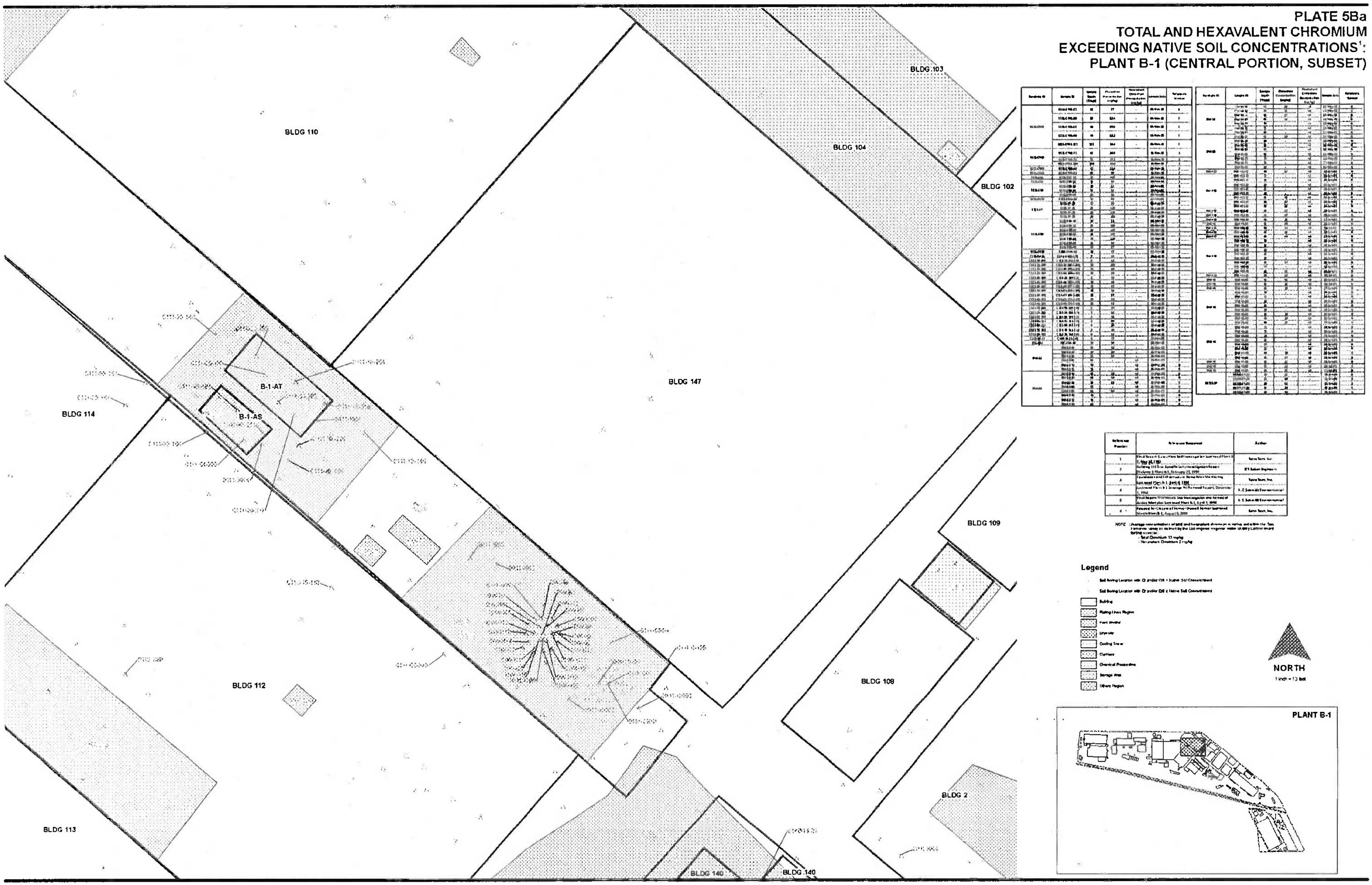
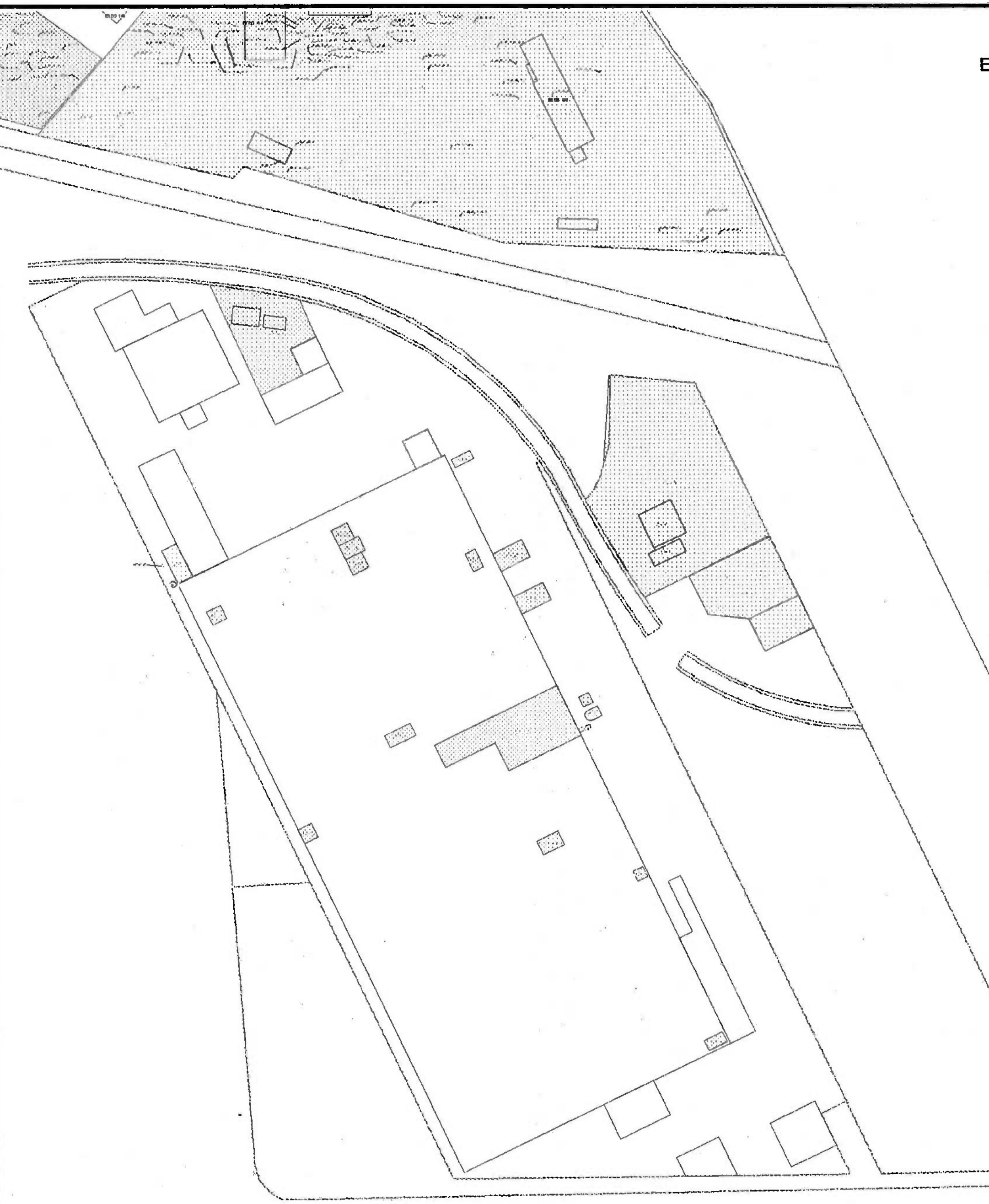


PLATE 5D
TOTAL AND HEXAVALENT CHROMIUM EXCEEDING NATIVE SOIL CONCENTRATIONS[1]: PLANT B-1 (SOUTHWESTERN PORTION)

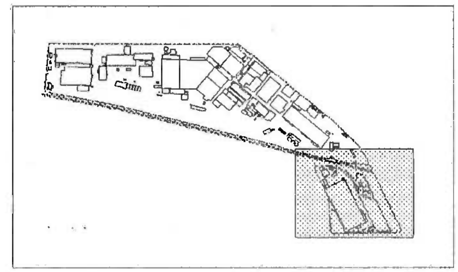


Legend

- Soil Boring Location with Cr and/or Cr6 > Native Soil Concentrations
- Soil Boring Location with Cr and/or Cr6 ≤ Native Soil Concentrations
- Building
- Plating Lines Region
- Paint Booths
- Drywells
- Cooling Tower
- Clarifiers
- Chemical Processing
- Storage Area
- Other Region

NORTH
1 inch = 40 feet

[1] Average concentrations of total and hexavalent chromium in native soil within the San Fernando Valley as defined by the Los Angeles Regional Water Quality Control Board for this purpose:
- Total Chromium 13 mg/kg
- Hexavalent Chromium 2 mg/kg



Borehole ID	Sample ID	Sample Depth (ft bgs)	Total Chromium Concentration (mg/kg)	Hexavalent Chromium Concentration (mg/kg)	Sample Date	Reference Number
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

Number	Reference	Author
16	[illegible]	Gregg & Associates, Inc.
17	[illegible]	Gregg & Associates, Inc.
[illegible]	[illegible]	Gregg & Associates, Inc.
[illegible]	[illegible]	URS Consultants
[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	Tetra Tech, Inc.
[illegible]	[illegible]	Tetra Tech, Inc.
[illegible]	[illegible]	A. C. Schmidt Environmental
[illegible]	[illegible]	Tetra Tech, Inc.
[illegible]	[illegible]	Tetra Tech, Inc.

TETRA TECH

Exhibit 11
April 2012 Technical Report

Lockheed Martin Corporation, Shared Services
Energy, Environment, Safety and Health
2950 North Hollywood Way, Suite 125 Burbank, CA 91505
Telephone: 818 847-0197 Facsimile 818-847-0256

LOCKHEED MARTIN

April 12, 2012

Mr. Samuel Unger, P.E.
Executive Officer
California Regional Water Quality Control Board – Los Angeles Region
320 West Fourth Street, Suite 200
Los Angeles, CA 90013

Subject: Response to Order No. R4-2012-0011
Order to Provide a Technical Report on Subsurface Soil and Groundwater Contamination

Enclosures: 1) *Technical Report – Soils Data for Former Lockheed Martin Plants in Burbank,*
2) Presentation by Lockheed Martin to the LA RWQCB, March 6, 2012

Dear Mr. Unger:

Please find the enclosed Lockheed Martin Corporation *Technical Report – Soils Data for Former Lockheed Martin Plants in Burbank*, prepared in response to Order No. R4-2012-0011. The response complies with the requirements of the Order, and while Lockheed Martin does not dispute the Regional Water Quality Control Board's (RWQCB) request for the data summary and associated documents, we were admittedly disappointed that our years of responsiveness, compliance, and coordination with RWQCB did not prevent the use of unnecessary, inappropriate, and critical language in both the Order and the accompanying cover letter. Over the past 25 years, Lockheed Martin has performed extensive characterization and remediation under both the United States Environmental Protection Agency (USEPA) and the RWQCB direction and oversight. We have excavated contaminated soil, partnered with the City of Burbank to ensure safe drinking water for its citizens, and returned the former Lockheed Martin properties to beneficial use.

Through our detailed site characterizations and risk assessments, we have determined that exposure to and risk from contaminants that remain in the soil and groundwater are fully controlled. Much of the remaining contamination continues to be removed at the Burbank Operable Unit (BOU) water treatment facility, which removes approximately 5,000 pounds of volatile organic compounds (VOCs) per year. The former Plant B-1 soil vapor extraction (SVE) system was removing approximately 350 pounds of VOCs per year, prior to its shutdown for rebound testing. The fact that the VOC mass removed at both facilities continues to decline indicates that source areas have been addressed. Soil that contains residual contaminants is covered with pavement or structures. This redevelopment isolates the contamination and makes

excavation unfeasible. Additional controls are in place through the use of deed restrictions and RWQCB notification requirements to ensure that future land usage is appropriate.

Lockheed Martin has been integral to the development and growth of the City of Burbank. And although we no longer have manufacturing facilities in the area and no longer contribute to environmental contamination in the San Fernando Valley (SFV), we remain a presence in the SFV due to our ongoing participation in remedial activities. It is this participation that allows us to state with authority that there are no other major sites in the valley of the same vintage as the Lockheed Martin plants that have made such significant progress in improving conditions and removing contaminants. In fact, all of the former Lockheed Martin plants have been granted No Further Action from the RWQCB, with the exception of two. A site-wide NFA for former Plant A-1N is pending RWQCB review and finalization of restrictive covenants. At former Plant B-1 there is a soil vapor extraction system in place. We believe that with the significant remediation that has been performed to-date that Lockheed Martin, while not finished with its responsibilities and still a major player in remediation activities, is no longer the biggest environmental concern in the valley with regard to either VOCs or metals such as chromium.

As mentioned before, we do not disagree with RWQCB's requirement for data evaluation. However, specific statements within the Order and cover letter that are inaccurate are discussed below.

From Finding No. 1 on the first page of the Order:

> "Based on our review of available data, we have determined that many former Lockheed Martin Corporation (Lockheed) facilities, which are subject to soil investigations and remedial excavation activities, were performed using cleanup goals that are no longer scientifically defensible nor are they protective of human health and the environment and protective of groundwater."

This sentence states that current conditions, i.e., following remediation and closure, are neither protective of human health and the environment nor protective of groundwater. While there may be soil that contains residual contaminants at concentrations greater than the current default screening levels that trigger investigation and remediation, this does not mean that they are not protective of human health and that further investigation or cleanup is necessary. As detailed in the attached report, residual contaminated soils in Burbank are isolated from any direct or indirect human exposure, including via groundwater consumption. Further, beneficial use of the groundwater by the City of Burbank has been continuous since 1996. The purveyed water meets or exceeds all state and federal drinking water standards and is compliant with the City's policy of maintaining hexavalent chromium concentrations at or below 5 ppb.

From Finding No. 3 on the first page of the Order:

> "In order to evaluate the completeness of the investigations of the various facilities formerly operated by Lockheed, it is important to evaluate the existing data for the presence of any heavy metals including Cr^{6+} that may remain in the soil at each facility."

This statement implies that the investigations which led to the removal actions did not address heavy metals or hexavalent chromium contamination. The historic investigations, which are and were considered complete and were used to develop the remedial action plans, focused on VOCs, metals (including chromium), and other constituents such as SVOCs and PCBs.

From Page 3 of the Order, second paragraph of section a) Plant A1-North:

> "Therefore, the Regional Board requires that the areas of undelineated and non-remediated Cr and Cr^{6+} soil contamination be investigated for significant remaining soil contaminants."

The information provided in the attached technical report documents that there has been considerable investigation and that there are sufficient data to support the assertion that there are no human health risks or complete exposure pathways. Therefore, there is no need for additional investigation.

From Finding 4 on Page 3 of the Order:

> "The information is necessary to assure adequate cleanup of the Lockheed site, which as described in Cleanup and Abatement Order No. 87-161, incorporated herein by reference, poses significant threats to public health and the environment and to groundwater."

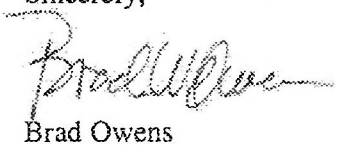
Order No. 87-161 was issued 25 years ago prior to all the investigations and remediation work at the Lockheed sites. It is incorrect and without basis for this Order to state that the conditions that currently exist represent the same threats to public health and the environment and to groundwater that existed prior to any characterization and remediation. Further, there are clearly no significant threats to public health and the environment, or to groundwater, posed by conditions at the site.

RWQCB and Lockheed Martin representatives met on March 6th to discuss the language and requirements of the Order and Lockheed Martin's history of manufacturing operations and subsequent soil and groundwater investigation and remediation in Burbank. A copy of Lockheed Martin's presentation is included as an enclosure to this letter. A March 14th follow up meeting was held with RWQCB staff to provide assistance in understanding the previously submitted data and discuss technical aspects of the data. In that meeting, it was agreed that the Technical Report submitted with this letter, including graphics and data, would be uploaded to the State Water Resources GeoTracker website and that assistance would be provided to the RWQCB as needed in locating copies of previously submitted documents.

Lockheed Martin takes its responsibilities to the environment and to the residents of Burbank very seriously. We will continue to play a major active role in remediation of groundwater and soil in the San Fernando Valley for the foreseeable future and look forward to continued cooperation with RWQCB.

I, Brad Owens, certify under penalty of law that this document and all attachments were prepared by me, or under my direction or supervision, in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Sincerely,



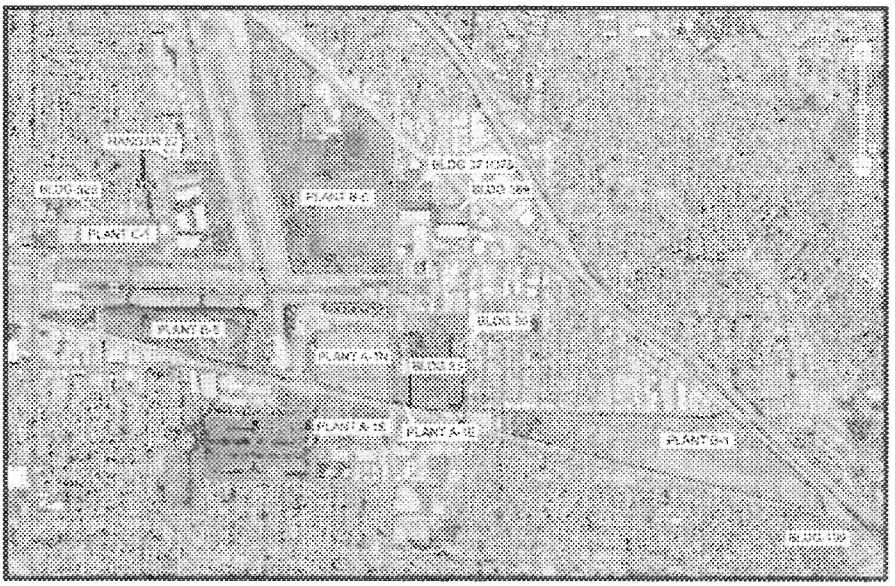
Brad Owens
Director, Environmental Remediation

cc: Mr. Larry Moore, RWQCB LA Region – with enclosures: 2 printed copies and 4 on CDs
Art Heath, RWQCB LA Region – without enclosures
Ms. Lisa Hanusiak, USEPA Region IX – without enclosures
Ms. ZiZi Searles, USEPA Region IX – without enclosures
Mr. Fred Schauffler, USEPA Region IX– without enclosures
Mr. Richard Slade, ULARA Watermaster – without enclosures
Mr. Leighton Fong, City of Glendale – without enclosures
Mr. Bill Mace, City of Burbank – without enclosures
Mr. Vahe Dabbaghian, Los Angeles Dept. of Water and Power – without enclosures

BUR089

Technical Report
Soils Data for Former Lockheed Martin Plants in Burbank

Issued in Response to RWQCB Cleanup and Abatement Order No. 87-161



For:
Lockheed Martin Corporation

Prepared by:
Strategic Engineering & Science, Inc.
17701 Cowan, Suite 210
Irvine, CA 92614

And
Tetra Tech, Inc.
3475 East Foothill Boulevard
Pasadena, CA 91107-6024

April 2012

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1.0 INTRODUCTION

This Technical Report has been prepared in response to an Order issued by the California Regional Water Quality Control Board (RWQCB) under the requirements of Section 13267(b) of the California Water Code. The Order was issued to Lockheed Martin Corporation (Lockheed Martin) on February 7, 2012. The Order requires the following:

- A Technical Report presenting accurate and correct soil data for Lockheed Martin's Former Plants B-1, B-6, and A-1 North. The soil data must contain reference to the reports originally submitted to the RWQCB which contained the data so that those critical areas at each Lockheed Martin facility can be reviewed to determine and/or confirm soil sampling depths.

- Maps of each Lockheed Martin facility which presents all locations where chromium and hexavalent chromium results are greater than observed average native soils in the San Fernando Valley, as defined by the RWQCB.

- Clarification must be provided regarding why single samples address multiple features, and each of these sample locations must be plotted on maps in their unique location along with the date and depth at which they were collected.

Each of these requirements is addressed in this Technical Report, and maps are provided with clear presentation of the data. In order to provide context of the data requested, this Technical Report also includes details regarding the history of investigation and remediation at Lockheed Martin's former Burbank facilities, a review of current conditions, and data from the former Lockheed Martin Plant Sites B-1, B-6 and A-1 North as well as the other former Plant Sites and facilities shown on Figure 1. In addition, discussion for clarification regarding previous data submittals is provided.

2.0 SUMMARY HISTORY OF INVESTIGATION AND REMEDIATION

Lockheed Martin began aircraft manufacturing in Burbank in 1928. At the time and for quite a period afterwards, the plants were the only industrial or commercial facilities in the area. The surrounding land use was principally agricultural. The Lockheed Martin facilities ultimately expanded and the City of Burbank grew and Burbank developed around the facilities, with Lockheed Martin being the principal employer in the area.

At its peak, the Lockheed Martin facilities were comprised of approximately 350 acres, surrounding the Bob Hope Airport (formerly the Burbank-Glendale-Pasadena Airport). There were five main plants: A-1, B-1, B-5, B-6, and C-1. The locations of these former plants and associated support buildings are shown in Figure 1.

Aircraft manufacturing continued until the mid 1990's when closure of the facilities began. Closure and decommissioning activities included demolition of the plants and buildings, extensive soil and groundwater investigation, remediation of soil contamination, and ultimately sale of the land. All of the land has been restored to

beneficial use and is primarily developed as commercial and industrial. Additionally, portions of the former Lockheed Martin facilities were purchased and developed by the Bob Hope Airport. Lockheed Martin has had no active facilities in Burbank since approximately 1995, and no longer owns any property in Burbank.

2.1 Soils Investigation and Remediation

In 1979, the Los Angeles Department of Water and Power discovered elevated levels of solvents in groundwater in the San Fernando Valley, which is used as a drinking water supply. This prompted investigations to identify and eliminate sources of solvent contamination in the Valley.

In 1984, Lockheed Martin initiated an underground tank leak detection program. This program identified a number of sources of solvent contamination at the manufacturing plants, and resulted in the removal or abandonment of numerous tanks and other equipment along with the repair or replacement of others.

In 1985, Lockheed Martin initiated a groundwater monitoring program as requested by the RWQCB. The groundwater monitoring program identified solvents beneath the Lockheed Martin Plants (in particular, A-1, B-1, B-6 and C-1). This led to additional requirements by the RWQCB including investigation of soils, remedial action planning, and interim measures.

In 1987, the RWQCB issued Cleanup and Abatement Order (CAO) 87-161 which required investigation of contaminant conditions under all the Lockheed Martin Plants in addition to performing remediation at locations that had already been identified as sources of groundwater contamination. This CAO has been used since then by the RWQCB and Lockheed Martin to address soils contamination at the former Plants. While the CAO specifically addresses volatile organic compounds (VOCs) and solvent contamination, it has also been used to direct investigation and remediation of other contaminants such as heavy metals including chromium.

As part of investigation, remediation, and plant decommissioning, there has been considerable characterization and remediation of soils. There have been several thousands of samples collected (6,177 of which were analyzed for metals) from 1984 to the present to characterize conditions and residual contamination at all of the former Lockheed Martin Plant Sites.

The characterization led to substantial remediation requirements. Soils remediation at all the former Lockheed Martin Plant Sites is summarized in Table 1. As indicated in the table, approximately 341,400 tons of contaminated soil were excavated and transported offsite for disposal and 212,000 pounds of VOCs have been removed from soils using soil vapor extraction (SVE). The excavations were backfilled with clean soil. All but two of the sites have been granted a designation of No Further Requirements (NFR). The two sites that are pending closure are Plant A-1, which has received 130 No Further Action letters and will be granted a designation of site-wide NFR pending finalization of

the land use covenant, and Plant B-1 where there is an SVE system currently undergoing rebound testing that recently was removing on the order of one pound per day of VOCs.

2.2 Groundwater Investigation and Remediation

The soils remediation has been directed by the RWQCB to control sources of contaminants to groundwater. The remediation of groundwater is under the direction of the US Environmental Protection Agency (USEPA). In 1984, the USEPA proposed four sites in the San Fernando Valley for inclusion on the National Priorities List. One of the four sites, referred to as Area 1, included the area of Burbank where the former Lockheed Martin facilities are located. In 1986, Area 1 was added to the list of Superfund Sites by the USEPA. Ultimately, Area 1 was divided into two Operable Units: the North Hollywood Operational Unit (NHOU) and Burbank Operable Unit (BOU). The BOU is where the former Lockheed Martin Plant Sites are located.

In October 1988, the BOU groundwater remedial investigation and feasibility study to select a remedy were completed. The Record of Decision (ROD) describing the remedy selected for the BOU was signed in June 1989. An Explanation of Significant Difference (ESD) was signed in November 1990 and a second ESD was signed in February 1997. As described in the ROD and ESDs, the interim remedial action selected for the BOU was designed to achieve two objectives:

- To partially control the movement and spread of groundwater contaminants in the Burbank OU area, while contributing to aquifer restoration.
- To address the public health threat posed by contamination of the City of Burbank's public water supply wells by providing residents in the area with a water supply that meets state and federal drinking water standards.

Specifically, groundwater was to be pumped from 8 extraction wells to a treatment plant where the VOCs would be removed by air stripping and then liquid phase granulated activated carbon. The treated water is used by the City of Burbank according to their water right after blending to control nitrate concentrations. Phase I of the BOU treatment system (with an initial operation at 6,000 gallons per minute [gpm]) began operation in 1996. Phase II (increase in capacity to 9,000 gpm) began operation in 1998.

Figure 2 presents the data showing the performance of the BOU treatment system over the years. As of the middle of 2011, there have been over 45 billion gallons of water treated to remove 234,000 pounds of VOCs. As shown in the figure, the VOC removal rate was as high as 40,000 pounds per year (in 1999), but has decreased to less than 5,000 pounds per year (i.e., on the order of 10 pounds per day) as conditions have improved.

As stated above, one of the goals of the BOU remediation system is containment of the VOC plumes. Figure 3 presents a summary of capture at various extraction rates, including the design rate, and analyses demonstrating that the BOU has successfully contained the BOU groundwater since startup.

Throughout the investigation and remediation period, groundwater monitoring has been performed over the entire basin to characterize contaminant conditions and evaluate performance of the remedy and evolution of conditions throughout the Valley. Within the BOU, Lockheed Martin performs the monitoring. There are over 120 groundwater monitoring wells in the BOU network covering all the hydrostratigraphic units. Figures 4 through 11 present maps of TCE and PCE concentrations throughout the basin developed from the monitoring database maintained by the USEPA. These plume maps indicate that conditions have improved over time within the BOU, but have remained largely unchanged in adjacent areas of the basin (i.e., to the south and east).

Chromium and hexavalent chromium conditions in groundwater, in addition to other metals, were also investigated as part of the BOU remedial investigation and continue to be monitored. Figure 12 presents a map of the chromium concentrations throughout the basin based on 2006 data. As shown, chromium contamination in groundwater is not as extensive in BOU and peak concentrations are not as high as they are to the east in North Hollywood and to the south in Glendale. Further, as with the VOCs, the chromium contamination in BOU groundwater has been contained by the BOU remediation system and migration of chromium out of BOU has essentially been cut off since 1996.

Figures 13 and 14 present the total and hexavalent chromium concentrations in the BOU groundwater extraction wells, respectively. Figure 15 presents the total and hexavalent chromium concentrations the BOU treatment system effluent. The wells at the east end of the extraction system line (i.e., VO-1 and VO-2) historically have had somewhat higher chromium concentrations, and the concentrations at these wells are typically less than 30 µg/L (i.e., well below the MCL of 50 µg/L). In general, the effluent concentration is less than 10 µg/L[1], and there appears to be a slight decrease in concentration over time. Finally, unlike in soils as further discussed in Section 4.2 below, the total chromium and hexavalent chromium concentrations are, on a practical basis, the same, so hexavalent chromium represents one hundred percent of the dissolved total chromium in groundwater.

3.0 CURRENT CONDITIONS

The above discussion indicates that there has been considerable soil and groundwater remediation undertaken by Lockheed Martin, and that conditions are improved substantially over conditions when closure of the plants was initiated. With respect to VOCs, the concentrations in groundwater are decreasing and are expected to continue decreasing into the future. With respect to metals, elevated concentrations in the shallow soils have been excavated and the remaining deeper contamination is inaccessible due in part to the thickness of the vadose zone (which ranges from roughly 150 to 200 feet in the BOU) and because the sites have been developed. Chromium concentrations in the

[1] Note that the effluent concentrations in Figure 15 are prior to the blending that is performed to reduce nitrate concentrations. After blending, the concentrations shown in Figure 15 are reduced by about a factor of two.

groundwater are relatively low and are not changing significantly. Additionally, containment and treatment will be continued for decades, the sources (i.e., residual contamination in the soil) have been controlled to the extent feasible, and migration of contamination out of the BOU has been eliminated. The groundwater is treated to meet the water quality requirements for the City of Burbank (i.e., effluent concentrations less than the MCLs for VOCs and less than a target of 5 µg/L of hexavalent chromium following blending, which is required to reduce nitrate concentration), so there are no current or potential future risks via the groundwater exposure pathway.

Figures 16 through 21 present recent aerial photos at the former Lockheed Martin Plant Sites to indicate current land uses. As can be seen in these Figures, the properties have been restored to new beneficial uses, principally commercial and industrial uses. The photos indicate that the soils are isolated from surface exposure by asphalt pavement and concrete building foundations. The two exceptions to this are portions of the former Plant B-6 site, which is vacant land owned by the BGPA authority (the airport), and former Plant A-1 East, also owned by BGPA. Currently access to Plant B-6 is restricted, but will likely be developed into parking or other commercial or airport-related uses in the future. With respect to the former Plant A-1 East, the land is also inaccessible to the general public; the future use of the property is unknown, but will likely be used for commercial purposes or parking lot for the airport.

It is also important to note that the conditions of the purchase and sales agreements for Plant B-1 and Plant A-1 North (where much of the soils remediation occurred; Table 1) required that the soils be free of all contamination down to a depth of 10 feet. The site B-1 agreement also requires the owner to contact the RWQCB and Lockheed Martin if any redevelopment activities in the upper 10 feet are planned by the owners. This further isolates any residual soil contamination from any potential future direct human or environmental contact.

Based on the soils remediation previously performed plus the resurfacing and access restrictions resulting from redevelopment, there is no potential for direct exposure to any residual contamination in soils. Further, the residual contamination in soils is isolated from contact with runoff and surface water. Therefore, there are no current or potential future risks via direct exposures to contaminated soils, and surface water and stormwater is protected.

4.0 PRESENTATION OF SOILS DATA AS REQUIRED BY THE ORDER

The Order from the RWQCB requests a summary of the site soils data for metals, particularly chromium and hexavalent chromium. All such data has been previously submitted to the RWQCB during cooperative investigation, risk characterization, and remediation.

RWQCB had previously issued correspondence and an Order to Lockheed Martin dated October 20, 2001 also requesting technical data that had been previously been submitted, in particular for Plant B-1. While Lockheed Martin appealed that Order, the requested

data was assembled and submitted to the RWQCB in 2004 in the form of maps with data locations and an electronic database. The database indicated coordinates for sample locations, sample depths, sample collection dates, the results of analysis, the feature(s) that each sample was used to characterize, a reference to the report where the data was originally presented, and a note as to whether the sample was representative of current conditions (i.e., soil not removed) or only historic conditions (i.e., the soil was removed during remediation).

There were a couple of technical exchanges between the RWQCB and Lockheed Martin with questions, updates, and corrections to the database between 2004 and the present. Further, the database evolved to include soils data for metals representative of current conditions (i.e., soil not removed) at all the former Lockheed Martin Plants. However, there were still some unresolved questions and issues with the database, and as the RWQCB states in the current Order, they were concerned that the existing dataset may not adequately characterize conditions and the methods that they previously approved to establish cleanup goals are no longer scientifically defensible.

As required in the Order dated February 7, 2012, Lockheed Martin has prepared this Technical Report with an update to the former Plant B-1 database[2] (see attached CD) and revised maps presenting the data for all plants. This information is further discussed below.

4.1 Maps of Each Plant Showing Where Chromium Exceeds Typical Background

The second requirement of the Order (the first being preparation of this Technical Report) is to provide maps that show the locations of soil samples collected from soil remaining in the ground (i.e., not removed) where the chromium and/or hexavalent chromium concentration(s) exceed 13 mg/kg and 2 mg/kg, respectively. The values of 13 and 2 mg/kg were selected by the RWQCB as being representative of typical average native soil concentrations for the San Fernando Valley. It should be noted that the RWQCB did not include the Lockheed Martin database provided herein as part of their analysis of average background values.

The required maps are included with this report as Plates 1 through 9. The maps present the data for all the former Lockheed Martin facilities in Burbank. The maps indicate the sample ID, sample location, date, depth, concentrations, and reference to the report that the concentration data were originally submitted to the RWQCB in. While the maps highlight locations where soil that remains in place exceeds the average native soil values, they also indicate (using different colored symbols) sampling locations where chromium concentrations were less than the RWQCB average native background concentrations. As shown, the majority of the data points represent locations where

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[2] Only the portion of the database that contains B-1 data required update. There are no corrections or updates to any of the data for the other Plant sites in the previous database submittals to the RWQCB.

chromium did not exceed background (note also that multiple depths were tested at many of these locations). The broad distribution of the lower concentration results attest to the extensive characterization of the lateral and/or vertical extent of chromium impacts.

4.1.1 Total versus Hexavalent Chromium

The Order requires both chromium and hexavalent chromium data. Most of the data collected as part of characterization was for total chromium. Total chromium in soils is comprised of both trivalent chromium and hexavalent chromium. Because the Lockheed Martin characterization and remediation activities were performed in a more timely manner than at other sites discovered at approximately the same time (many of which are still undergoing remediation) and because at that time the methods for quantifying hexavalent chromium were less reliable than those for total chromium, there is relatively little hexavalent chromium data for the Lockheed Martin Plant Sites.

To help understand background levels and the speciation of chromium, a plot of hexavalent chromium versus total chromium for all samples at the former Lockheed Martin Plants where both forms were measured is presented in Figure 22. The chart in Figure 22 indicates that for total chromium concentrations less than approximately 17 mg/kg, there is generally no detectable hexavalent chromium. This suggests that at concentrations less than around 17 mg/kg, all the chromium is naturally-occurring since hexavalent chromium is relatively rare in nature and not expected to be naturally occurring in San Fernando soils. This is in reasonable agreement with the RWQCB value of 13 mg/kg for total chromium, and also with 2 mg/kg for hexavalent chromium (which is near the historic detection limits for hexavalent chromium in soil).

Further, in almost all cases, the hexavalent chromium concentration is less than a general concentration of 20 mg/kg no matter how high the total chromium concentration is. This is not to say that the very high concentrations of total chromium in the database are naturally-occurring. However, it is consistent with the expected behavior of acidic solutions containing hexavalent chromium that are released to soil: hexavalent chromium is thermodynamically unstable in terrestrial soils and can be reduced to trivalent chromium by a variety of naturally-occurring reductants like minerals and organic matter (Palmer and Puls, 1994). Exceptions to this trend are observed in five specific samples shown in Figure 22 where the hexavalent chromium was a significant percentage of total chromium; these five samples were all collected at Plant B-6 Building 371/375. These five samples had the highest chromium concentrations at that site. It is presumed that the reason why the hexavalent chromium was high relative to the total chromium is because the contamination was relatively fresh at the time of characterization and/or the samples were located close to the release point where the reducing capacity of the soils may have been overwhelmed.

4.1.2 Background versus Site-Specific Cleanup Goals

It is important to distinguish naturally-occurring or background levels from "health protective" levels. While the maps show that many of the samples are above what the

RWQCB has characterized as typical natural background levels, this does not imply that the levels represent a potential threat to human health and the environment. Typically, Regional Screening Levels (RSLs) developed by Region 9 of the USEPA are used as trigger levels of concern for health protection. RSLs are developed using default exposure scenarios and fate and transport factors, and by design are intended for use as a screening tool in identifying if contaminant conditions at a newly discovered site warrant further investigation. RSLs are not cleanup goals. The industrial-setting RSL for trivalent chromium is 1,500,000 mg/kg and for hexavalent chromium the industrial RSL is 5.6 mg/kg.

By comparison of the data in Figure 22 and in Plates 1 through 9 with the trivalent chromium RSL, it is clear that the fraction of total chromium which is not hexavalent chromium does not represent a human health risk. In fact, the value of the RSL for trivalent chromium, the main component of total chromium, is greater than 100% of the sample mass (i.e., the RSL of 1,500,000 mg/kg is equivalent to 1.5 kg of chromium per kg of soil). However, hexavalent chromium likely exceeds the RSL of 5.6 mg/kg at several of the sites based on the total and hexavalent chromium concentrations presented in the Plates and the results plotted in Figure 22.

Typically, if RSLs are exceeded, investigation is triggered wherein site-specific data are generated to establish site-specific risks. The site-specific data can include extent, mass, fate and transport analyses, release history, and measurement of concentrations in the receiving media (i.e., groundwater or air) including concentration trends. The site specific data are used to develop site-specific cleanup goals. This has all been done in the past for the Lockheed Martin Plant Sites in Burbank, and has continued as toxicity values evolve. The results of these evaluations indicate that there are no direct contact exposures to soils, and the chromium concentrations in groundwater, which reflect the result of 30 to 50 years of migration from the vadose zone, are health protective and meet the water quality requirements of the City of Burbank.

4.2 Data Tables

The third requirement of the Order is to provide clarification regarding why single samples address multiple features and to submit a revised data table to the RWQCB. An updated database for former Plant B-1 is included as a CD attached to this Technical Report. This updated database contains the same data as the previous submittals to the RWQCB (i.e., the data have not changed and are the same as what was in the previous versions of the metals database). However, as part of QA/QC review, a few of the reference date data fields in the database have been corrected to address the comments provided in the Order. The specific request for rectification of the multiple locations results from one of several misunderstandings regarding the data tables, which are clarified in the subsection below.

4.2.1 Clarification of Data Issues

Finding No. 3 of the Order describes several concerns that the RWQCB identified in their review of the data tables. While these concerns have been discussed and largely resolved at technical meetings between Lockheed Martin and the RWQCB on March 6 and March 20, 2012, they are also described here for completeness.

First, Finding 3 of the Order identifies that the B-1 Metals Database included many sample identification numbers that were attributed to multiple facility structures or source features. The association of samples with multiple nearby features was specifically included in the database at the request of RWQCB so that a query of the database for all samples which may pertain to a specific source feature would result in a table of complete data. For the specific example provided in the Order, sample 111-11-251-(-3) was located near four paint booths, two dry wells, a clarifier, a plating line, and a chemical process line, and a query for samples associated with any one of these features would result in a table that including sample 111-11-251-(-3). In fact, there is only one sample result, one sample date, and one reference for any particular sample, but that sample result may be relevant to multiple source features in the vicinity. The database continues to be set up this way.

Finding 3 also indicated that sample dates on several of the collected samples did not correspond to the dates presented in the referenced reports. A thorough review of the database was performed and several instances of this error were discovered, but only for Plant B-1. The errors were corrected and the table updated; the updated table is included on a CD provided with this Technical Report.

Finally in Finding 3, it was noted that there was no mention of whether further sampling occurred at any particular location where chromium concentrations appeared higher than background. In general, since background levels in soil were not relevant to the potential for human health impacts or potential threat to groundwater quality (see Section 4.1.2 above), there were no comparisons with background and further sampling was not triggered by exceedance of background.

With regard to lateral and vertical delineation (which is also mentioned in the findings of the Order), lateral and vertical delineation and confirmatory sampling was performed according to the procedures and methods developed for the Former Lockheed Martin Plant Sites remediation program as approved by the RWQCB. As discussed in Section 4.1, the broad distribution of the sample locations having chromium concentrations below RWQCB background levels, as shown with different colored symbols on the attached maps, reveal the extensive delineation of the lateral and/or vertical extent of chromium impacts that occurred in many locations.

4.3 Electronic Submittal of Information

The Order also indicates that, according to State Water Board Regulations, a discharger is required to upload all reports and correspondence prepared to date on the GeoTracker

data management system. Lockheed Martin uploads all electronic submittals (including the present report) in accordance with this program. However, there is a vast amount of historic information that was not submitted electronically prior to promulgation of these regulations in 2004. Historic reports (i.e., those prepared and submitted prior to the development of these regulations) will be uploaded to GeoTracker on an as-needed basis to facilitate special requests by the RWQCB for locating and reviewing the historic information. Routine uploading of current submittals by Lockheed Martin will continue.

5.0 CONCLUSIONS

As established in the previous sections, the potential threats to human health and the environment due to chromium and hexavalent chromium at the former Lockheed Martin Plant Sites have been investigated as part of previous characterization activities and potential threats have been mitigated through the remediation activities. The remediation activities have included extensive soils remediation and ongoing groundwater containment and treatment. Groundwater remediation will continue under the supervision of the USEPA through the Superfund Program for the foreseeable future. Based on the body of available data for these sites, including the soils and groundwater concentrations, fate and transport evaluations, and assessment of exposure pathways, potential uptake, and risks, the conditions at the former Lockheed Martin Plant Sites are protective of human health and the environment.

Although, there are residual chromium concentrations greater than the RWQCB's referenced native soil concentrations in the unsaturated zone under the former Lockheed Martin Plant Sites, removal/remediation of these soils is infeasible based on implementability and/or effectiveness because of the depth of contamination (much of the residual chromium in soils is located between 15 and 200 feet below ground surface), and because the land has been turned over to new owners and has subsequently been redeveloped.

The data and maps provided with this report are responsive to the requirements of the RWQCB Order, and together with the additional data included in this report, Lockheed Martin believes that sufficient information have been provided for the RWQCB to establish that no further investigation of chromium or hexavalent chromium in soils at the former Lockheed Martin Plant Sites is necessary.

6.0 REFERENCES

CRWQCB, 2002b; *Comments on the Semiannual Groundwater Monitoring Report, Fourth Quarter 2001 and First Quarter 2002, Burbank Operable Unit.* Letter to Lockheed Martin Corporation dated November 18, 2002.

CRWQCB, 2003; *Requirement for a Technical Report on Emergent Chemicals Sampling, Pursuant to California Water Code Section 13267, Burbank Operable Unit.* Letter to Lockheed Martin Corporation dated December 16, 2003.

CRWQCB, 2004b; *Comments on the Technical Report on Emergent Chemicals within the Burbank Operable Unit, Burbank, California.* Letter to Lockheed Martin dated December 8, 2004.

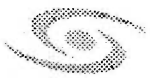
CRWQCB, 2008; *A Compilation of Water Quality Goals.* California Regional Water Quality Control Board, Central Valley Region. July.

Palmer, C.D. and R.W. Puls, October 1994; *Natural Attenuation of Hexavalent Chromium in Groundwater and Soils.* USEPA/540/5-94/505.

TABLES

Table 1
Summary of Remediation at Burbank Plant Sites

Site	Remedial Action	Status
A-1	1997, 1999-2009: SVE systems remove 32,000 lbs of VOCs 1989-1996: 13,000 tons of impacted soil removed	130 NFR letters; overall site closure pending Land-Use Covenant
B-1	2007-2009: SVE system removed 180,000 lbs of VOCs 1989-1996: 212,000 tons impacted soil removed	Final Closure Report submitted; RWQCB determination pending
B-5	2000: 400 tons of impacted soil removed	NFR for soils (2004)
B-6	1989-1996: 6,000 tons of impacted soil removed	12 NFR letters for soils; soils closed since 1996
C-1	1989-1996: 1 10,000 tons of impacted soil removed	2 NFR letters for soils (1990 and 1994)



FIGURES

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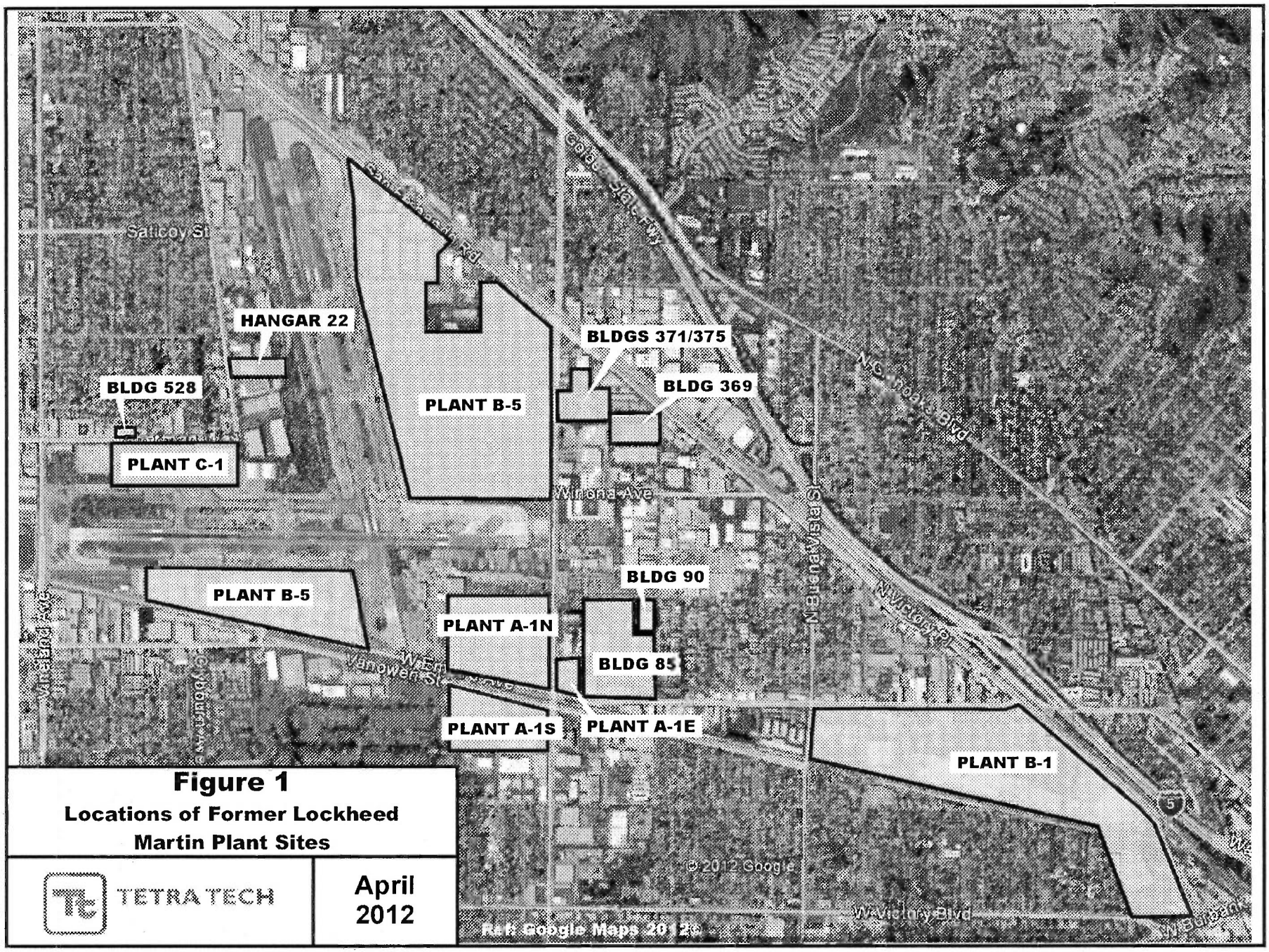

Figure 1

Locations of Former Lockheed Martin Plant Sites

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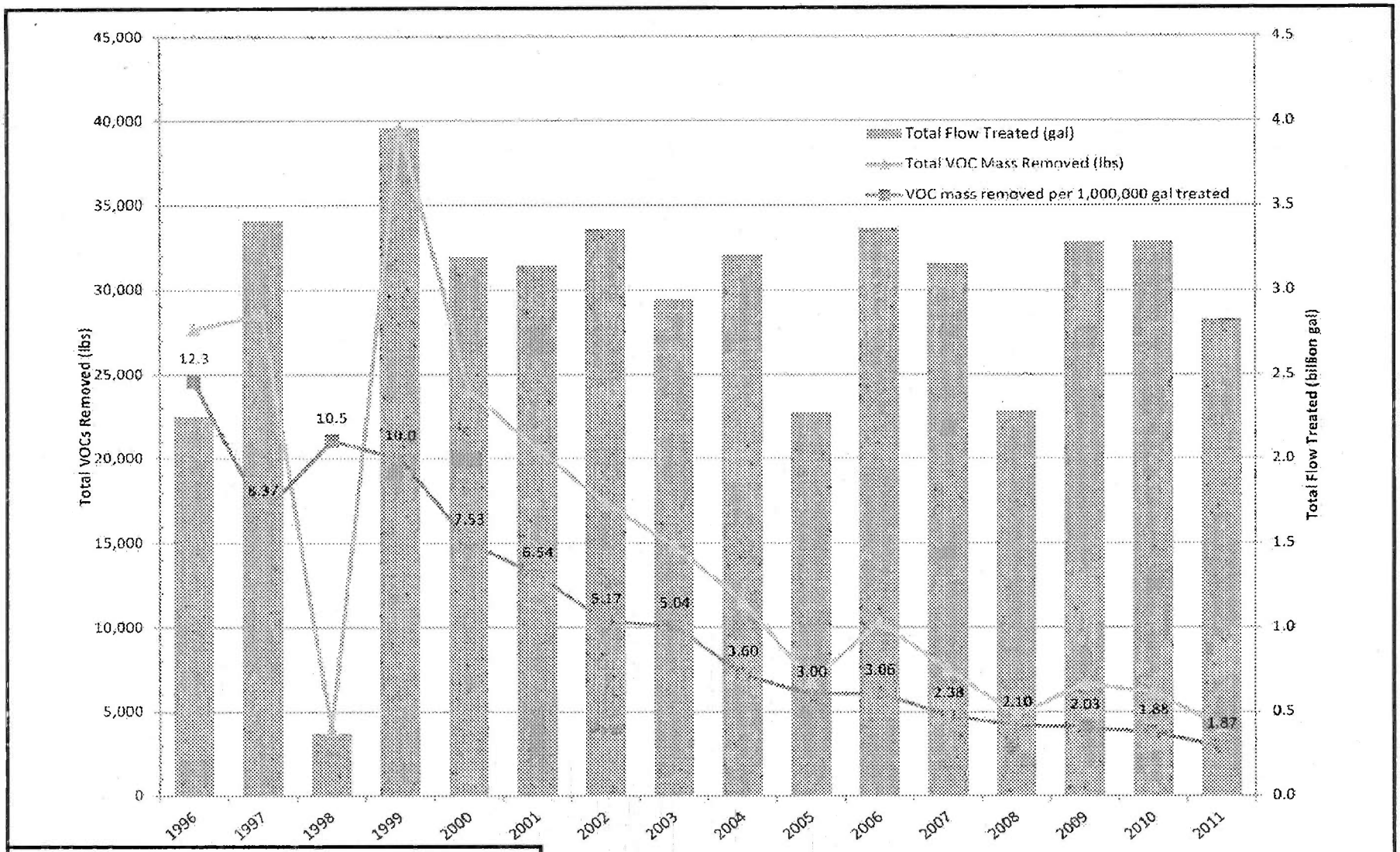

Figure 2
BOU Mass Removed and Volume Treated
(1996 - July 2011)

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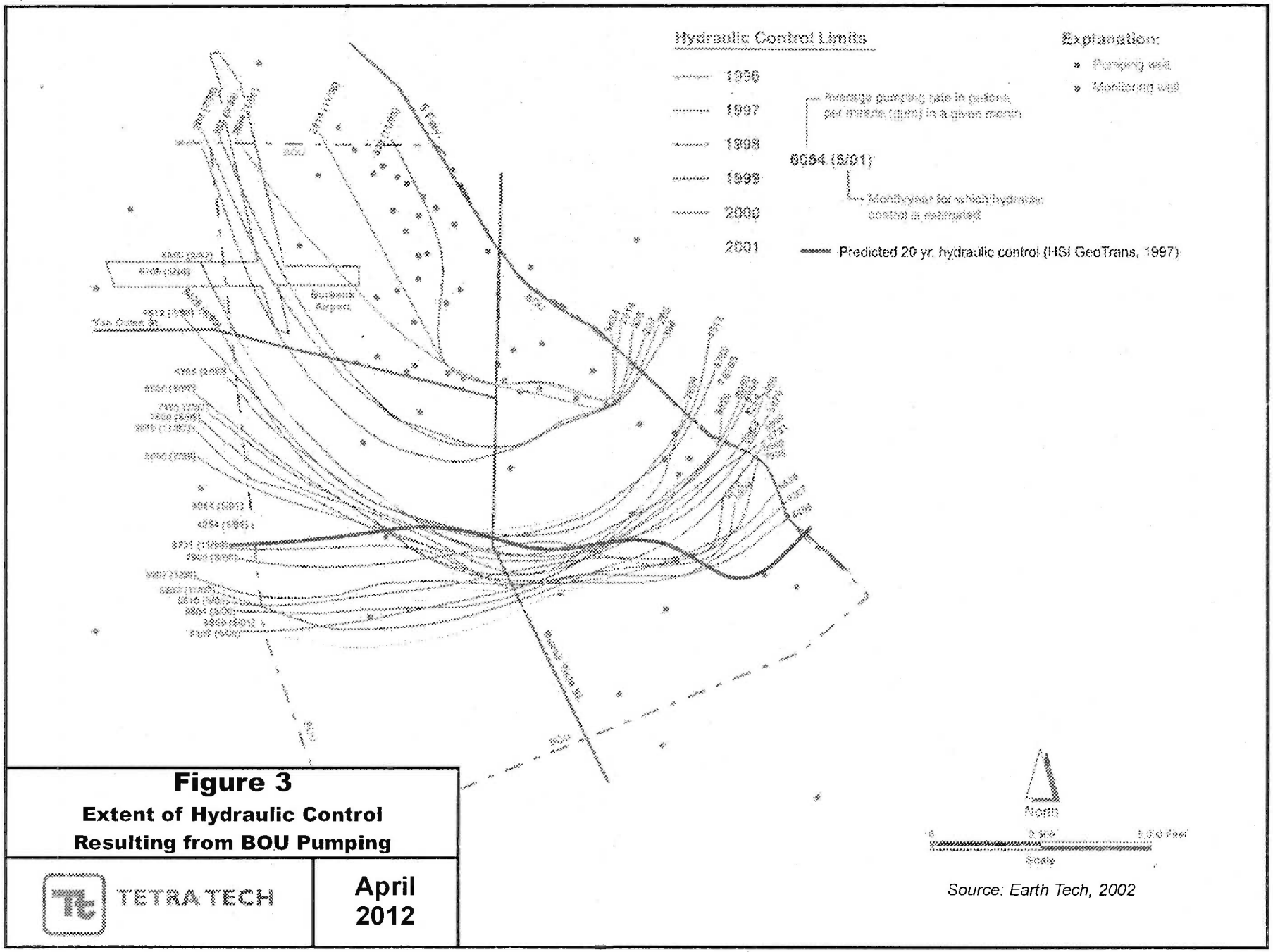

Source: Earth Tech, 2002

Figure 3
Extent of Hydraulic Control Resulting from BOU Pumping

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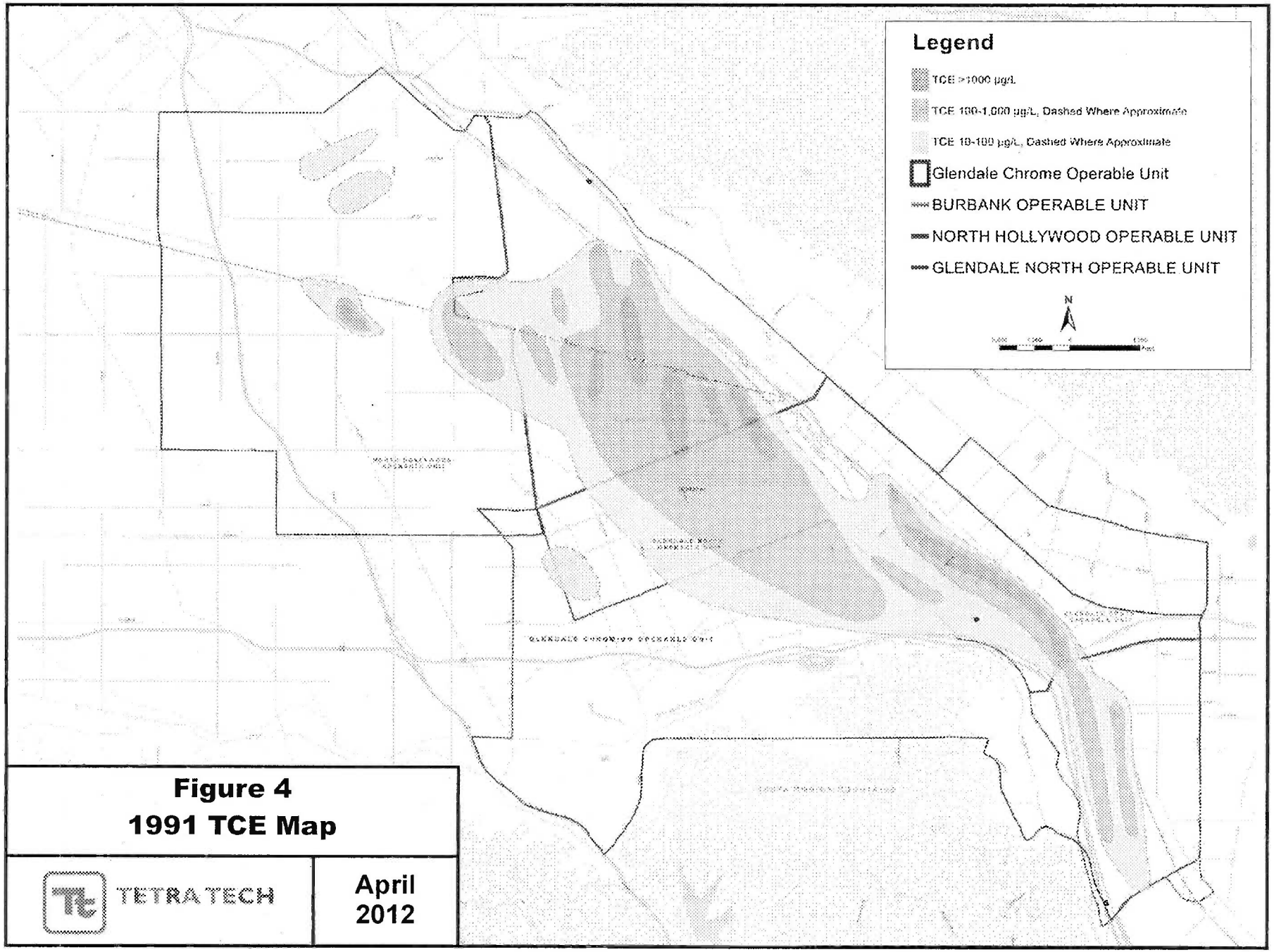

Figure 4
1991 TCE Map

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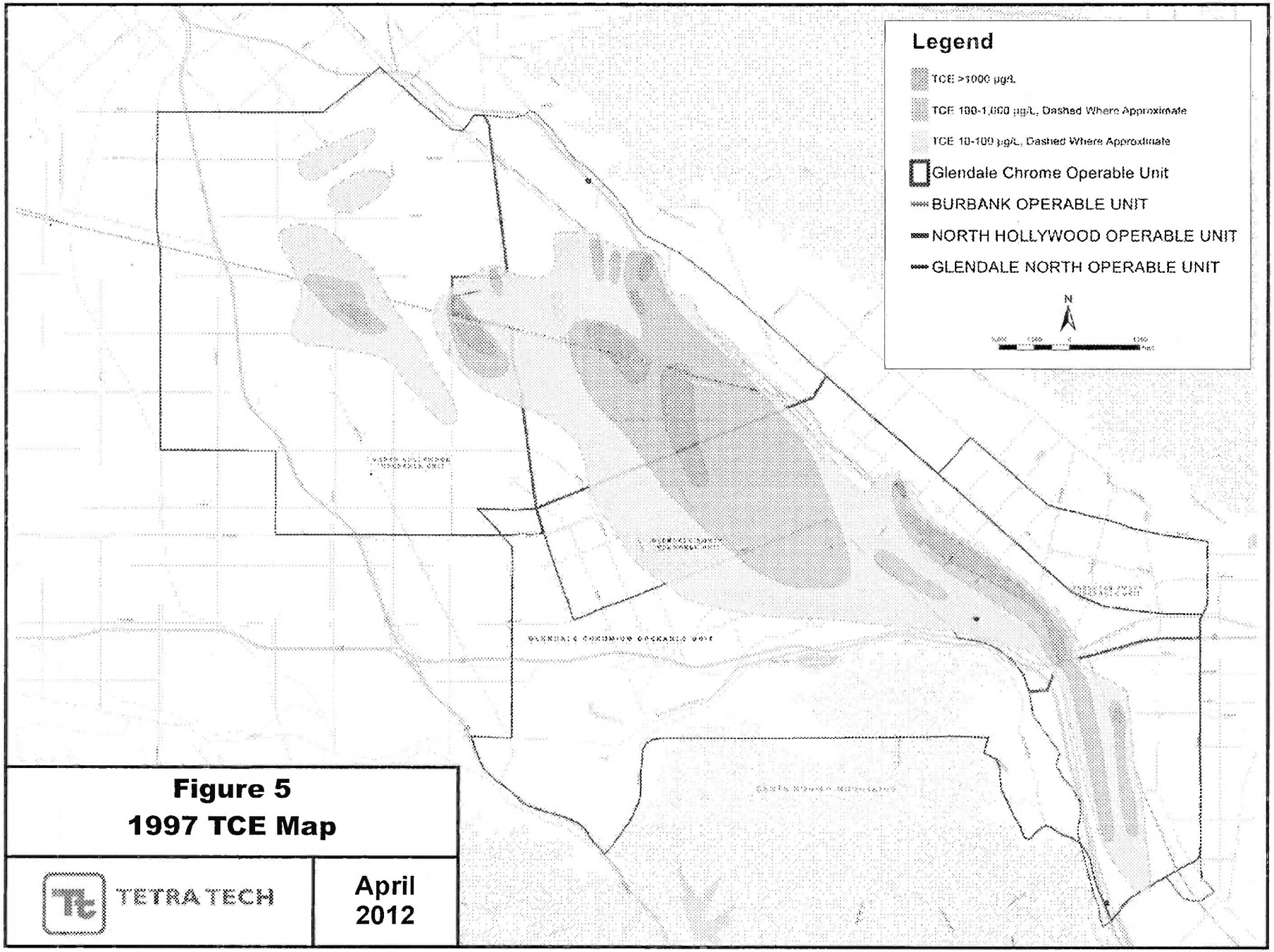

Figure 5
1997 TCE Map

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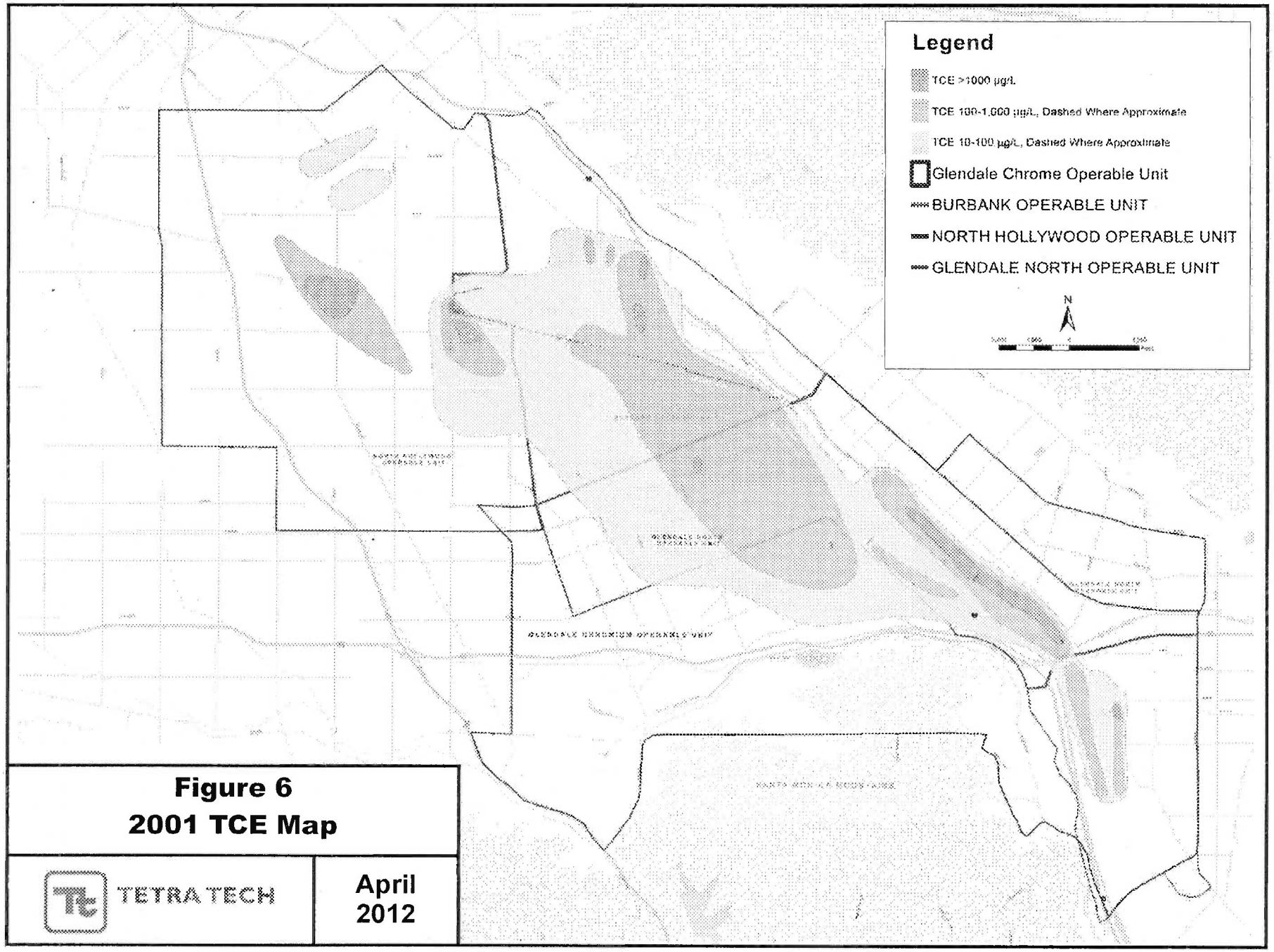

Figure 6
2001 TCE Map

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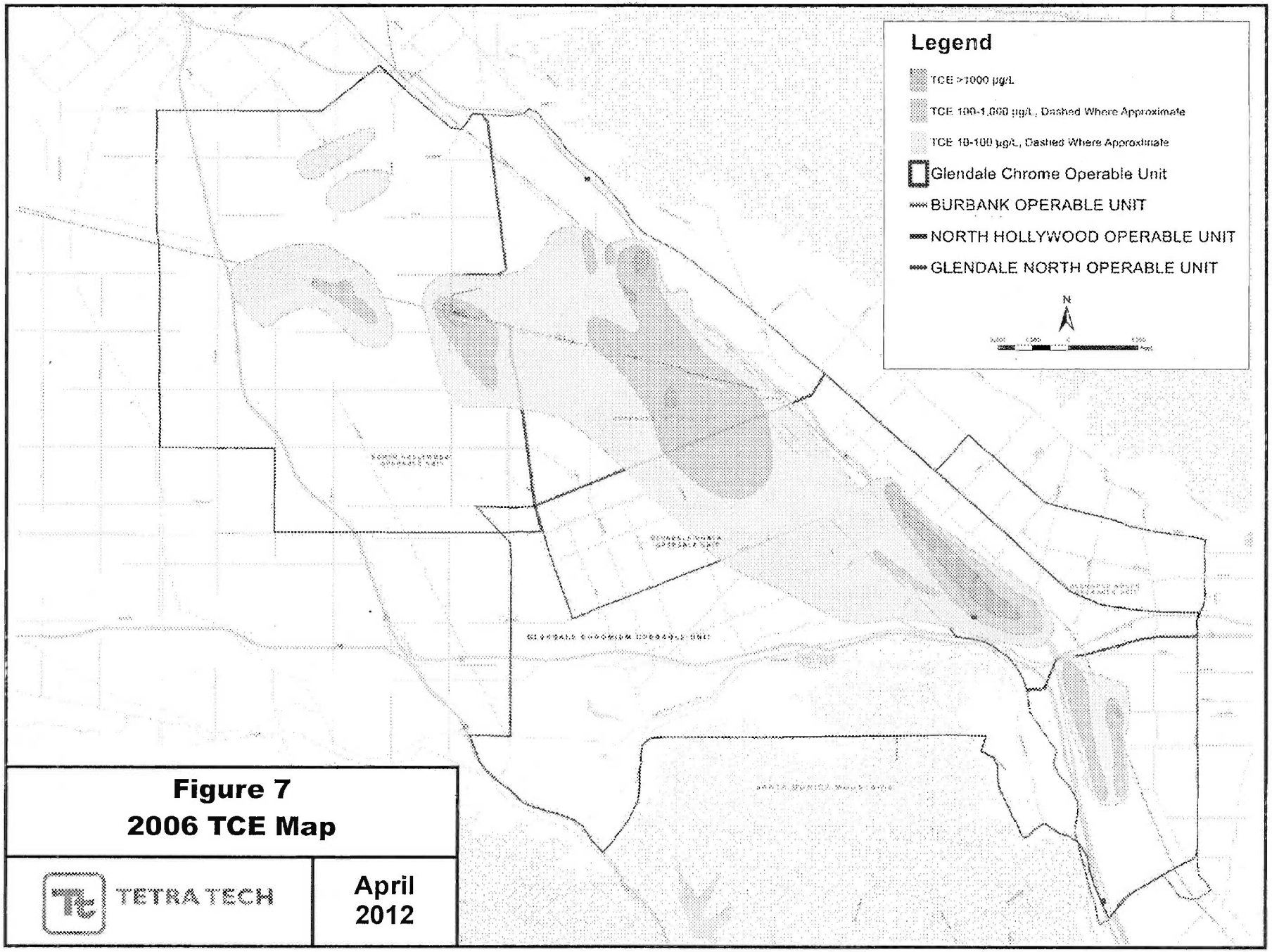

Figure 7
2006 TCE Map

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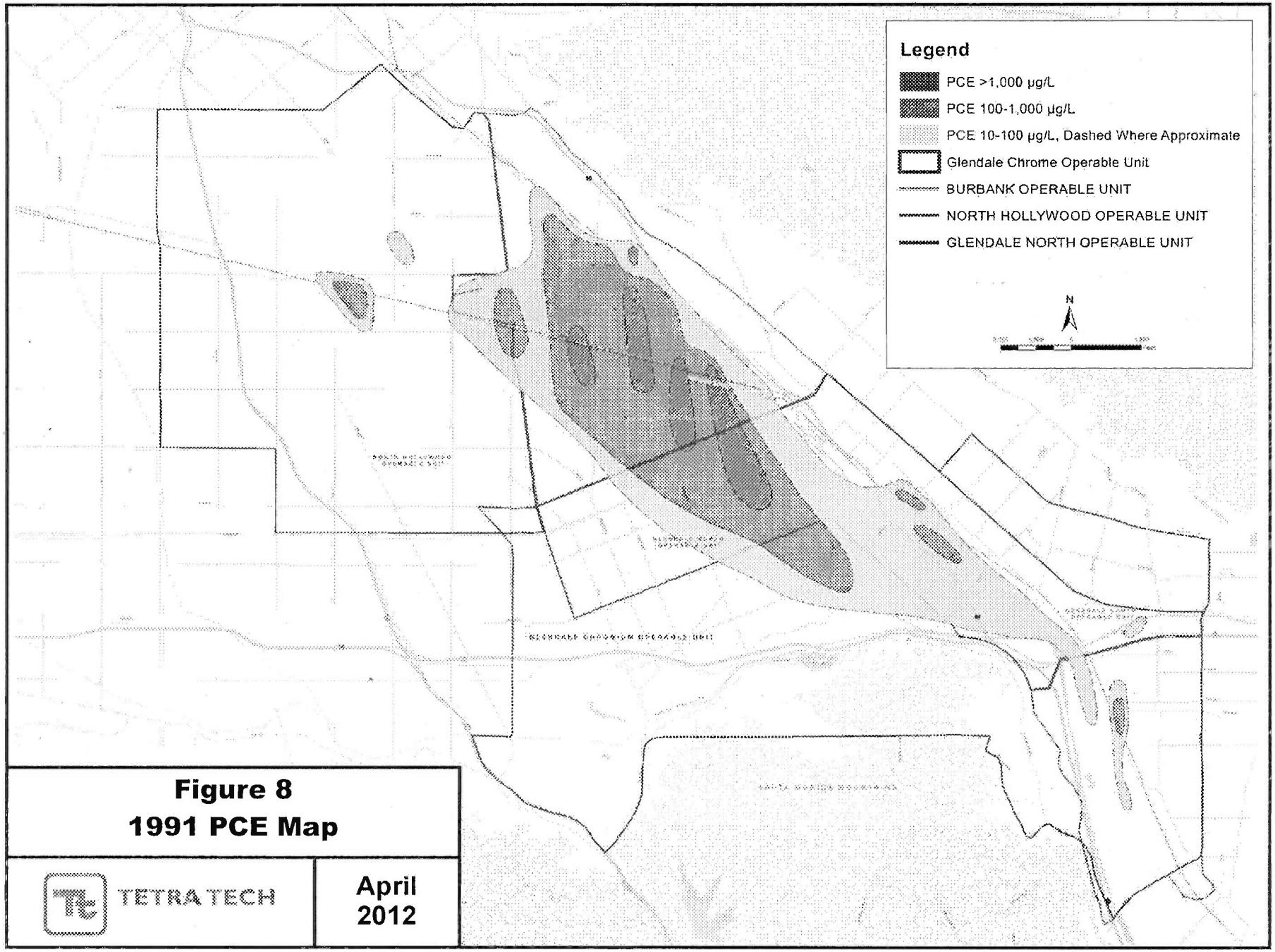

Figure 8
1991 PCE Map

TETRA TECH

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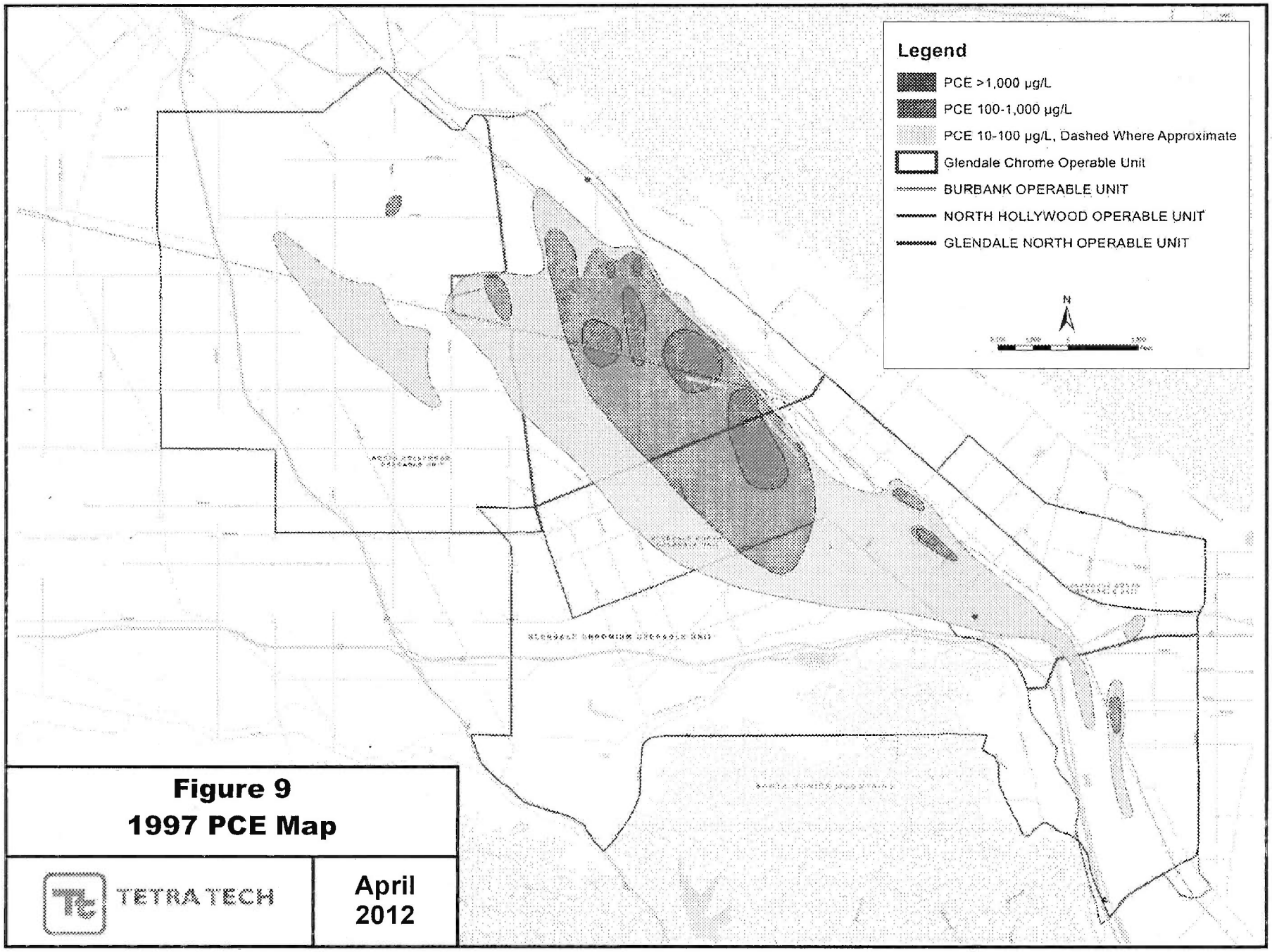

Figure 9
1997 PCE Map

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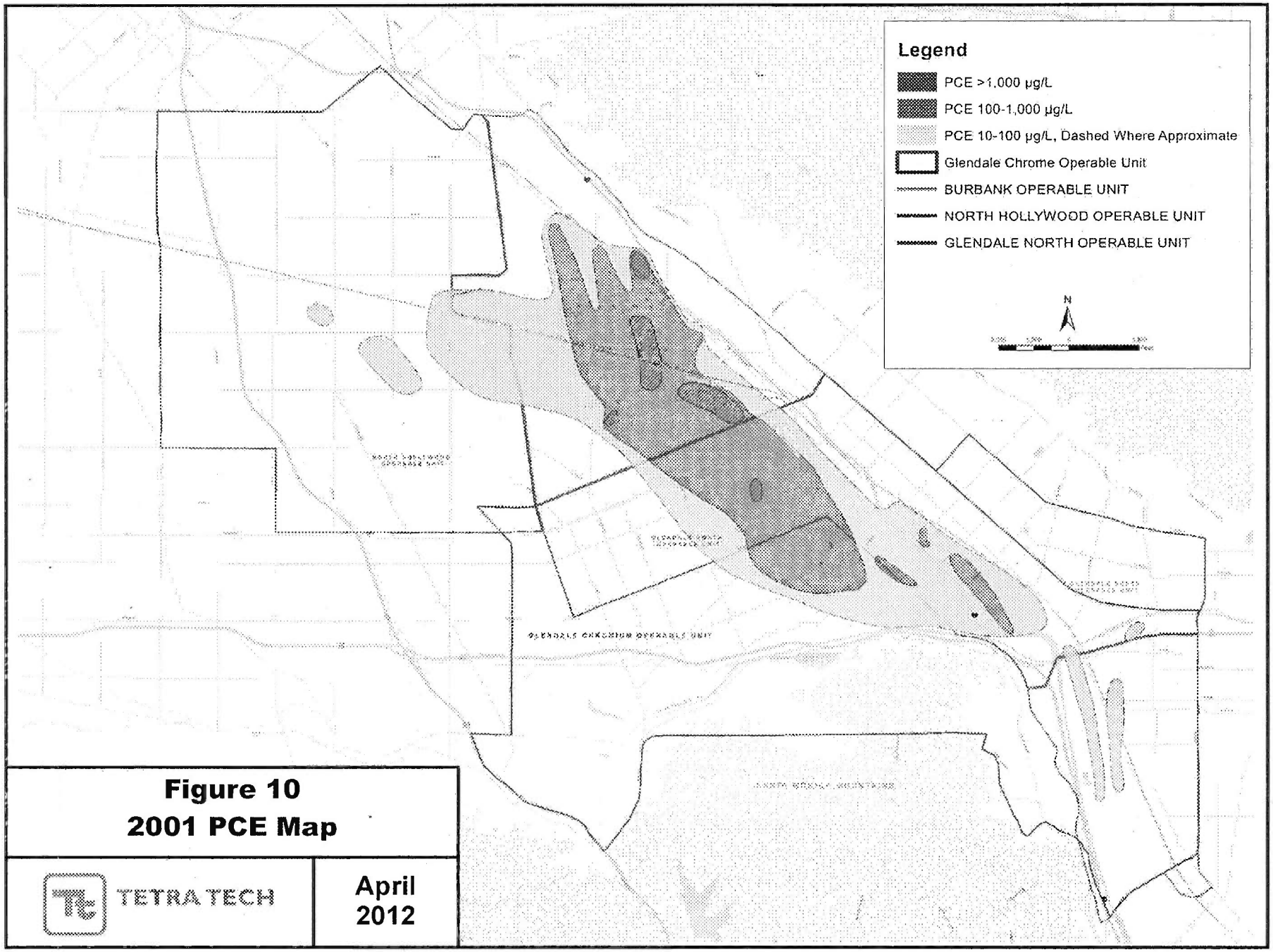

Figure 10
2001 PCE Map

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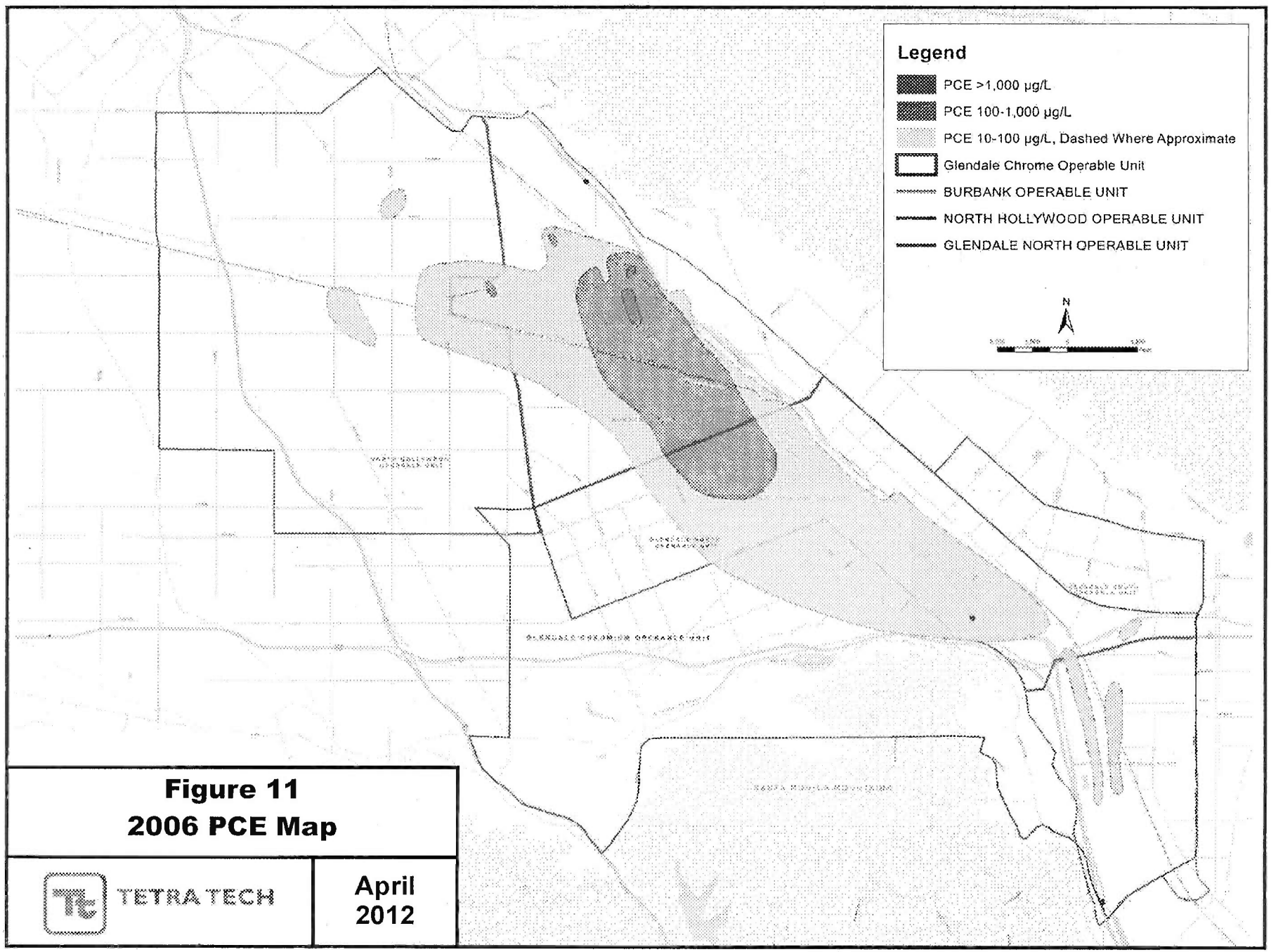

Figure 11
2006 PCE Map

TETRA TECH

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