Chromium in the San Fernando Valley Groundwater Basin (Panel Discussion)- Location and Extent of Chromium Contamination

Chromium Workshop

Glendale Civic Auditorium

March 10, 2008

California Regional Water Quality Control Board

Los Angeles Region

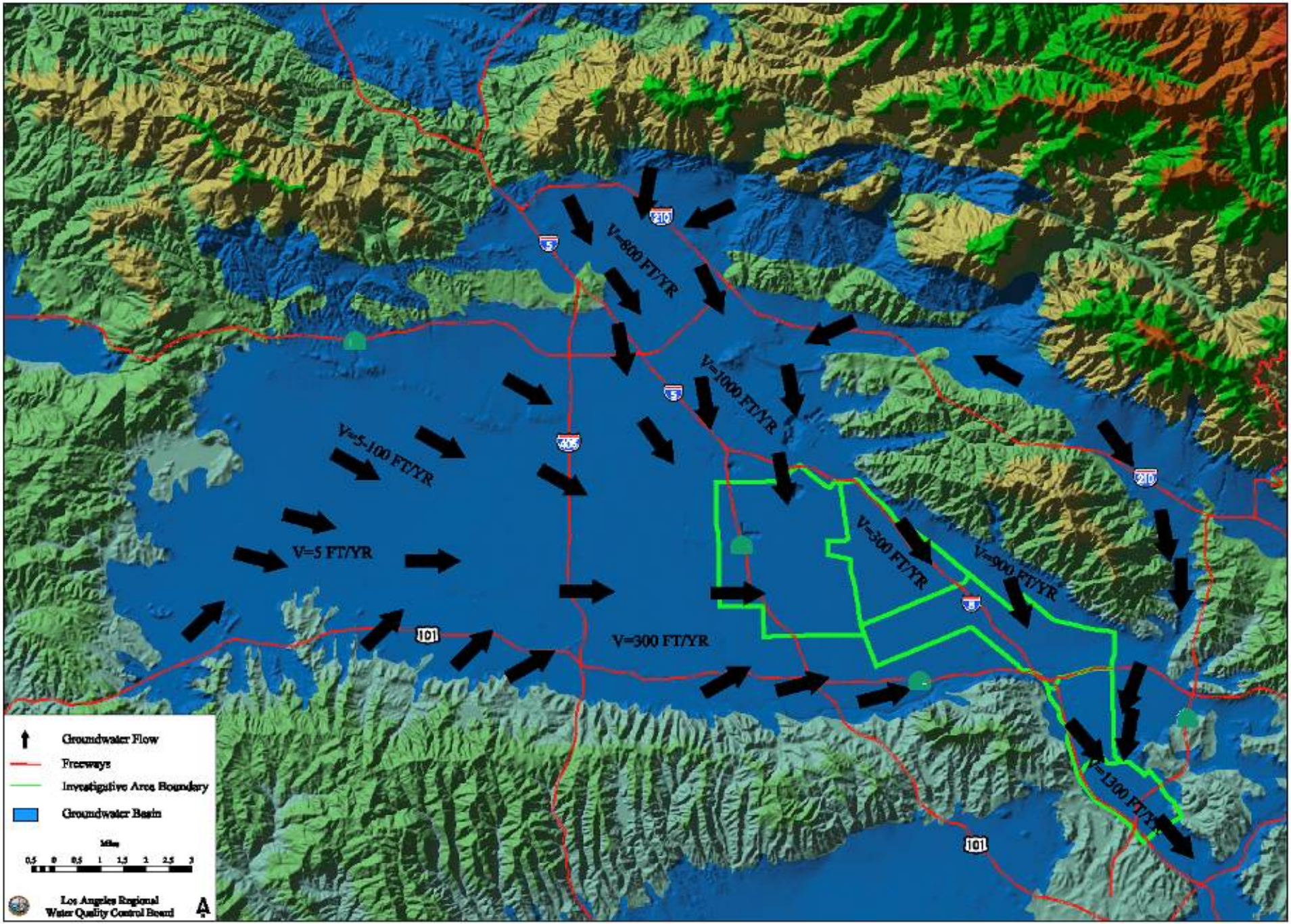
ACKNOWLEDGEMENTS

- USEPA Region IX San Francisco
- ULARA Watermaster
- California Department of Public Heath
- Office of Environmental Health Hazard Assessment (OEHHA)
- California Department of Toxic Substances Control Glendale (now Chatsworth) Office
- Federal Bureau of Investigation (FBI)
- Cities of Los Angeles, Burbank & Glendale

San Fernando Valley Groundwater Basin

- Large unconfined aquifer composed of alluvial deposits.
- Groundwater flows from west and north to the southeast.
- Major aquifer for Los Angeles, Burbank and Glendale.

SAN FERNANDO VALLEY: GROUNDWATER FLOW DIRECTIONS



Chromium

- Chromium in the environment
  - exists in three principal forms
  - Chromium metal (0)
    - Chromium Three (trivalent chrome)
      - common mineral
      - essential nutrient in very small quantities
    - Chromium Six (hexavalent chromium)
      - toxic chemical
      - forms soluble non-reactive compounds (readily moves in groundwater)
      - may occur naturally in very small concentrations

Sources of Chromium 6 Contamination

- Chrome plating
- Heavy Metal plating
- Steel making
- Bricks in furnaces
- Dyes and pigments
- Leather tanning
- Wood preservation

Chromium Contamination

- Chromium groundwater contamination:
- - is widespread along the eastern San Fernando Valley section
- - is <u>predominantly</u> the result of industrial practices that occurred from the 1940s through the early 1980s

Historical Context

(27-year period in San Fernando Valley {SFV})

- **1980** - Discovery of volatile organic compounds (VOCs) in municipal supply wells and facility monitoring wells.
- **1986** – SFV was placed on (Superfund) National Priority List (NPL) under CERCLA Federal authority.
- **1989** - Chromium 6 detected in some US EPA monitoring wells.

Chromium 6 Investigation

San Fernando Valley

- **1986** through **1996**
  - Chromium 6 discovered in soil and groundwater during site source investigations

- **1998**
  - LADWP detected Chromium 6 in their groundwater monitoring wells in San Fernando Valley.

- **2000**
  - USEPA continues to monitor its 87 multi-depth groundwater cluster wells in the eastern SFV.

Phase I Chromium 6 Investigation

- Between **1998** and **2000**: 4,040 Regional Board case files were scrutinized from which 255 suspected chromium sites were identified.

- **2001** – All 255 suspected sites were inspected by the Regional Board staff. 111 found to be worthy of additional assessment.

- **2002** – Phase I Chromium 6 Investigation Report published.

Notable Chromium Impacted Wells

- North Hollywood Aeration Well NH-2 offline due to almost 400 ppb of Chromium,
- Burbank Extraction Well V01 has detected up to 25 ppb of chromium historically,
- Glendale North Extraction Well GN-3 and nearby piezometers have been impacted up to 280 ppb of Chromium, and
- Glendale South Extraction Well GS-3 has shown consistent impact over 50 ppb

California Technical Plating
Burbank Plating Ser.
TEC Processing
Ultramet
Superior Plating
Alert Plating
LNL Anodizing
Pacific Plating
Industrial Metal Plating
Monitor Polishing & Plating Inc.
LADWP Valley Generating Station
Eagle Tech
Jesse's Plating
Dixon Hardchrome, Inc.
R.L. Anodizing and Plating
Cal-Air Processing
Magna Plating Co.
Elkay Cal Plumbing products
Weber Aircraft
Steve's Plating
Process Control Labs
Carter Plating
A.H. Plating
Lockheed-B1
VERDUGO MOUNTAINS
Crown Chrome Plating
Express Plating
Skipower Plating Works
Honeywell
Ward Engineering, Inc.
N. Hollywood Treatment Plant
Gold Star Plating Co.
F & H Plating Co.
Anobrite, Inc.
Burbank Airport
Burbank Treatment Plant
De La Torre, Co.
Technical Metal Finishing
Somers & Elmore Plating
M&R Plating Co.
J & M Anodizing Inc.
All Metals Co.
K & L Anodizing Co.
Uni-Plate Incorporated
D'Argenzio (Comet Plating)
Former Dynamic Plating, Inc.
Spence Electroplating Co.
Former Airtronics
Menasco Division (Goodrich Corp)
ITT Industries, Inc.
Automation Plating Co.
Lockheed Martin Librascope
Glendale Treatment Plant
PRC DeSoto
Zoe Fashion (Former Drilube)
American Metaseal, Co.
Hawkes Finishing
Drilube
Excello Plating
Los Angeles River
Pollock Treatment Plant

LOCATION MAP

Legend

Remedial Facilities
- Treatment Plant
- OU Extraction Wells

Site Type
- RWQCB Cleanup and Abatement Order (CAO)
- RWQCB Enforcement
- Sites Transfered to DTSC
  Note: 3 of the Sites are beyond view of map
- EPA RCRA Site

Total Dissolved Chromium Concentration in the Shallow Zone 2002 – 2004
- 5 - 25 ug/L
- 25.01 - 50 ug/L (MCL)
- Above 50 ug/L

San Fernando Valley Sites
- Area 1 (N. Hollywood OU & Burbank OU)
- Area 2 (Glendale N. & S. OU's)
- Area 4 (Pollock)

Site Status
- Suspected Contamination (No Field Data)
- Soil Characterization
- Soil and Groundwater Characterization
- Partial Remedial Action Completed

SAN FERNANDO VALLEY

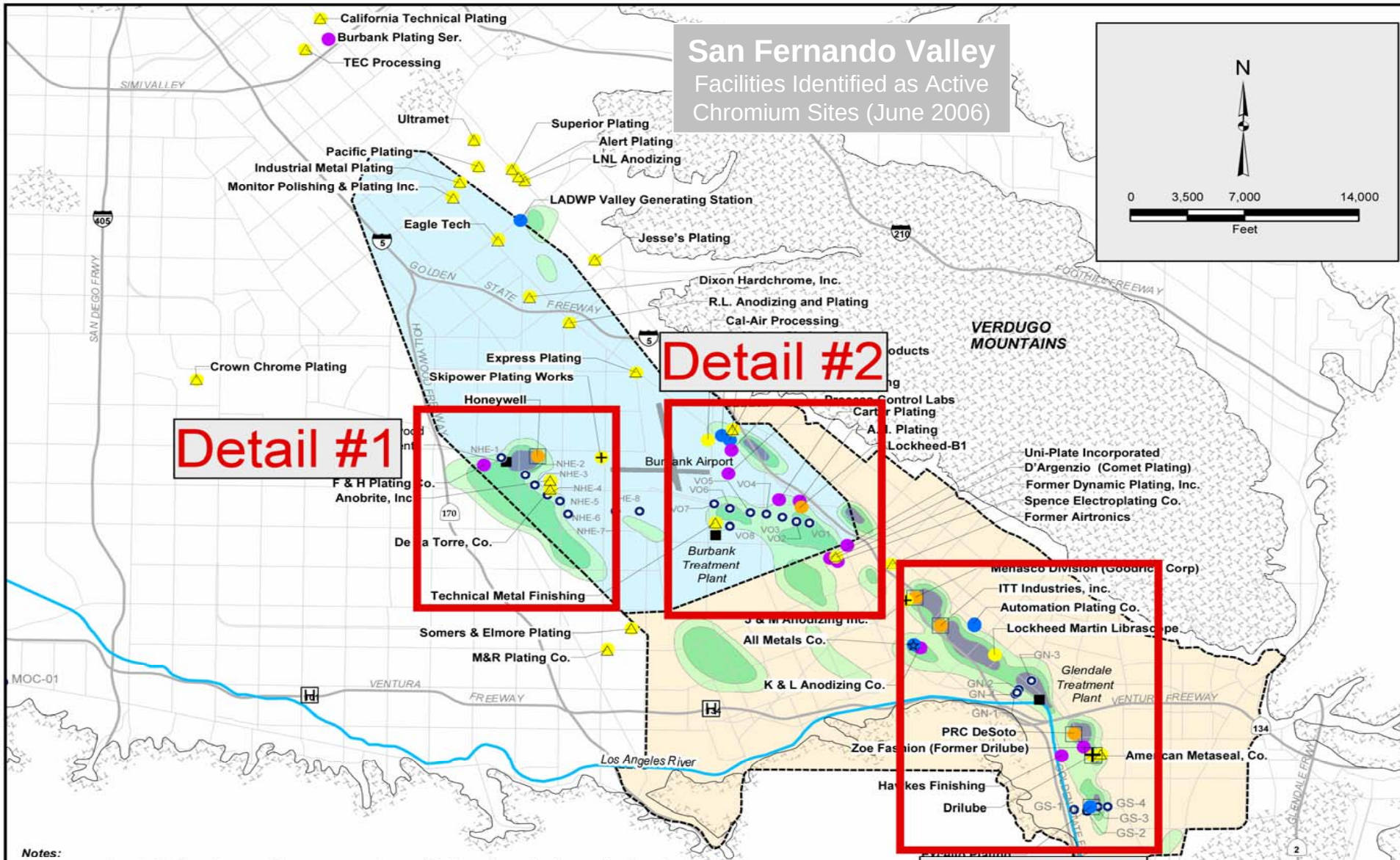
Facilities Identified as Active Chromium Sites (June 2006)

N

0 3,500 7,000 14,000
Feet

Notes:
1. The areas of contamination shown on this map represent generalized two-dimensional approximations based on water quality analysis from RI Monitoring Wells, Facility Wells, and Production Wells where the top of screened interval is within 50 feet of the water table.
2. Due to the possible vertical zonation of contamination, a well within an identified area of contamination may produce water with contamination different than that indicated on this map.
3. Data in the GIS database used in drawing the contours include the highest reported concentration of total dissolved chromium for RI monitoring wells, facility monitoring wells and LASC monitoring wells; and, the highest concentration reported as chromium for LADWP production wells and extraction wells associated with the North Hollywood, Burbank and Glendale treatment plants between March 2002 and January 2005
4. Areas outside the colored zone of contamination may also be contaminated. The indicated colored plume areas are based on limited data. The quantity of wells is limited, and the wells with chromium concentrations below the detection limit are not reported. Other data may exist that were not available at the time of map production that could significantly change the shape of the colored plume areas.
5. The original figure is produced in color. Significant information is lost if copied in black and white.

Modified from USEPA Map San Fernando Valley Facilities identified as Active Chromium Sites (June 2005), June 12, 2006



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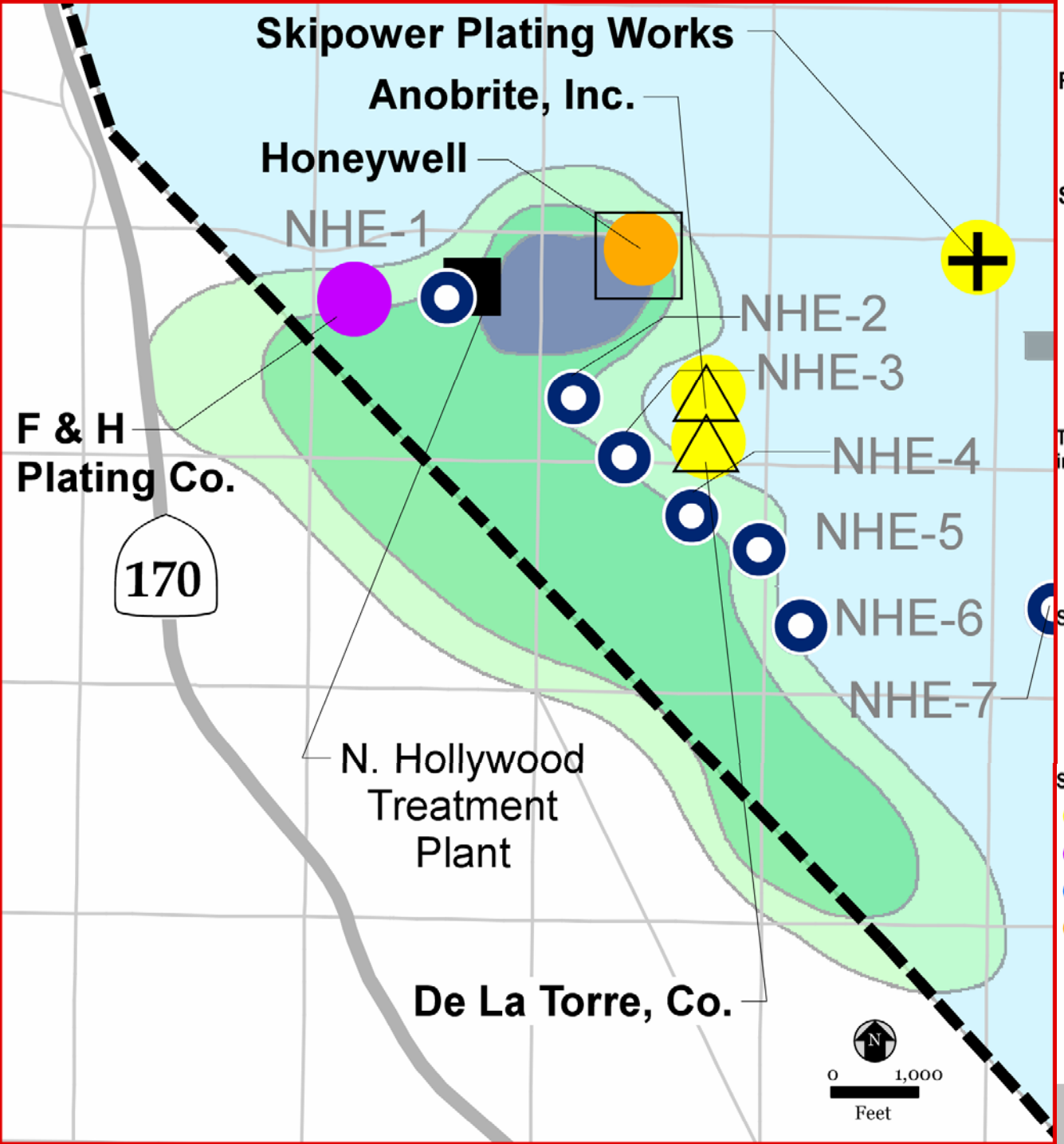

Legend

Remedial Facilities

- Treatment Plant
- OU Extraction Wells

Site Type

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- RWQCB Enforcement
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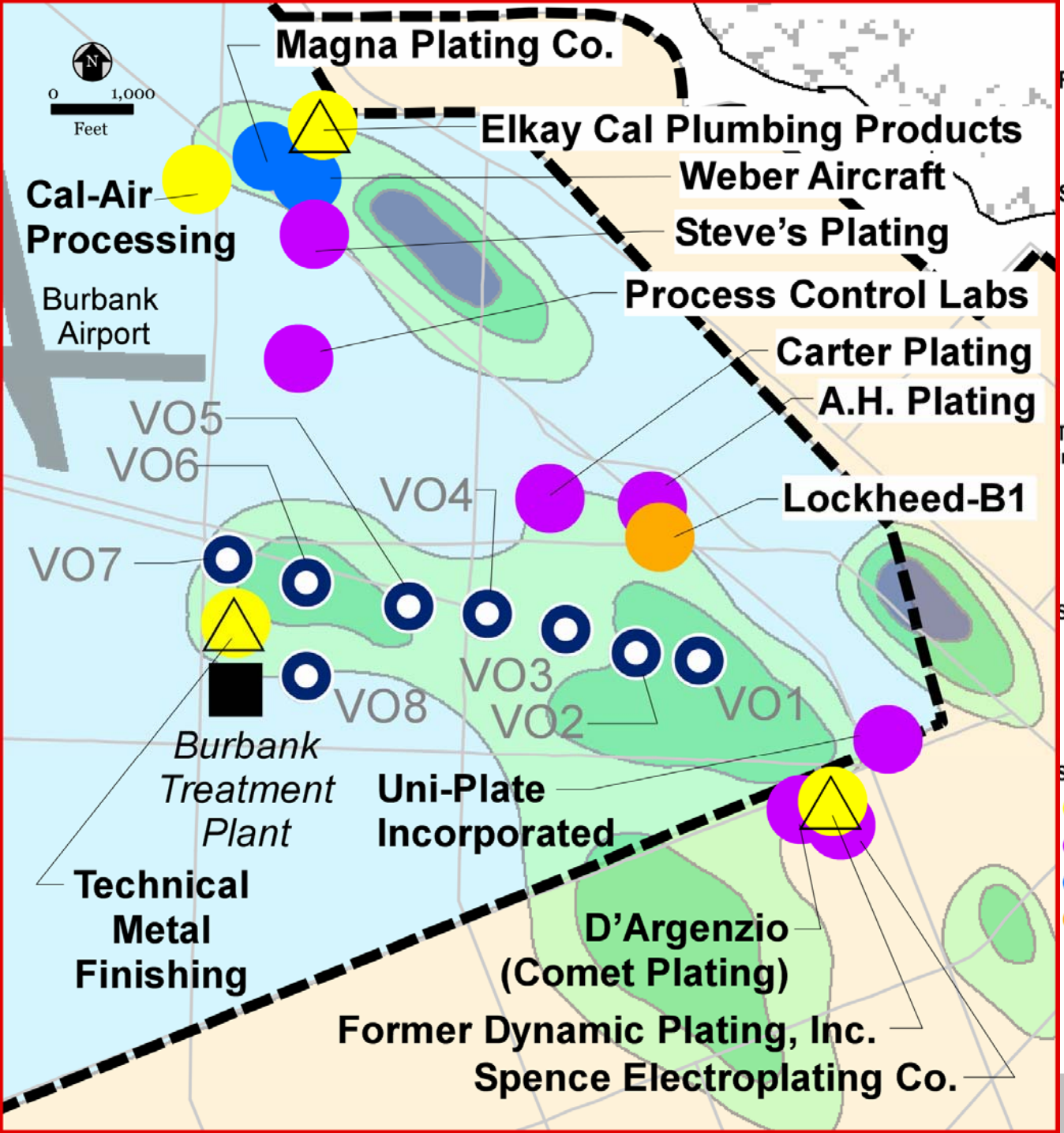
SAN FERNANDO VALLEY

Facilities Identified as Active Chromium Sites (June 2006)

Detail #1



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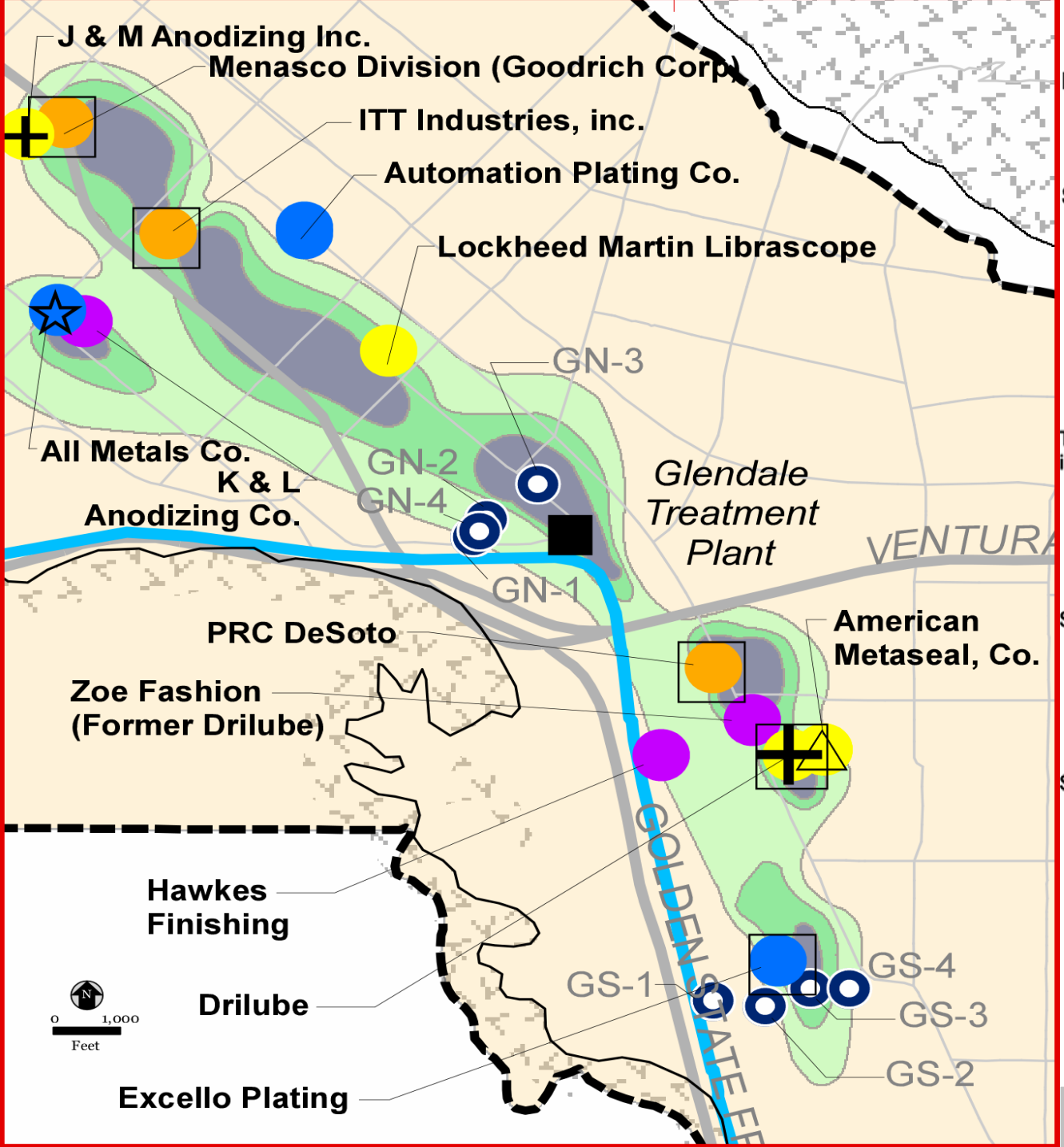
SAN FERNANDO VALLEY

Facilities Identified as Active Chromium Sites (June 2006)

Detail #2



Legend

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SAN FERNANDO VALLEY

Facilities Identified as Active Chromium Sites (June 2006)

Detail #3

Significance of Impacted Wells

- The continued operation of USEPA's Superfund Remedies (Drinking Water Treatment Plants) for Volatile Organic Compounds and Nitrates is threatened, since there are no in-place pre-treatment systems to remove Chromium 6.

- Regional water quality threat to drinking water supply- Remains.

SUMMARY

- Between 1998 and 2000, Regional Board staff have evaluated 4,040 sites and identified 255 suspect chromium sites, during a Phase I Investigation.
- All sites were inspected in 2001 and only 111 were found to be worthy of a Phase II soil investigation that started in 2004.
- In 2005, 28 new cases identified and transferred to DTSC.
- Between 2005 and 2007, 86 cases were closed.
- In May 2007, a joint agency decision to share the remaining active cases has the Regional Board with 16, USEPA 3 cases and 31 cases to DTSC.