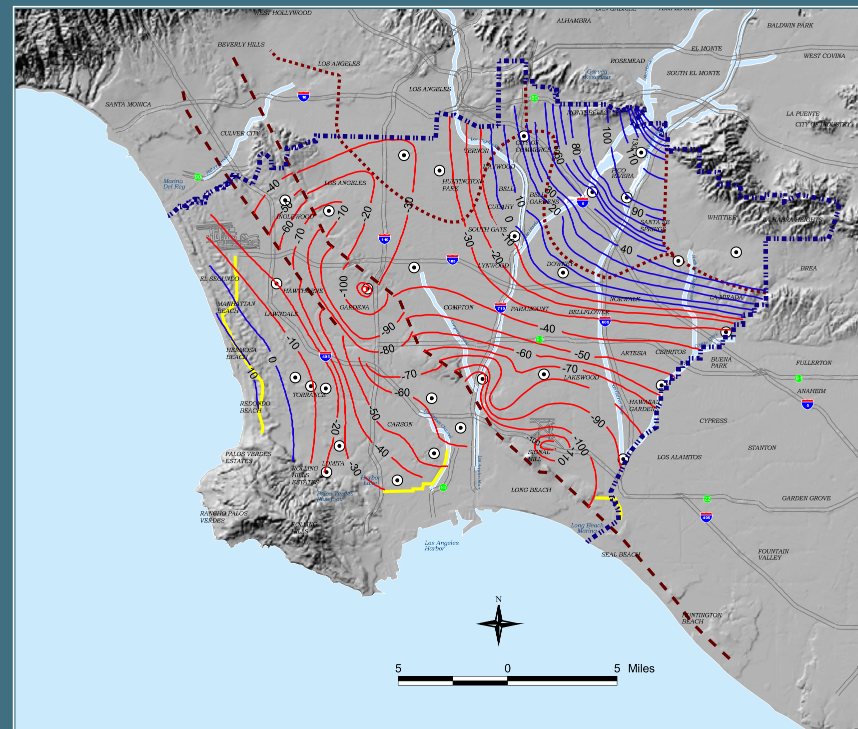
"To provide a sufficient supply of high quality groundwater through progressive, cost effective, and environmentally sensitive basin management."

Water Replenishment District
of Southern California
12621 East 166th Street
Cerritos, CA 90703
(562) 921-5521
(562) 921-6101 Fax
www.wrd.org

Regional Groundwater Monitoring Report • Water Year 2001 - 2002 '01 '02

Water Replenishment District
of Southern California



REGIONAL GROUNDWATER MONITORING REPORT
WATER YEAR 2001 - 2002

Central and West Coast Basins
Los Angeles County, California

June 2003

REGIONAL GROUNDWATER MONITORING REPORT
CENTRAL AND WEST COAST BASINS
LOS ANGELES COUNTY, CALIFORNIA
WATER YEAR 2001-2002

Water Replenishment District of
Southern California
12621 E. 166th Street
Cerritos, California 90703
(562) 921-5521

Bruce A. Mowry, Ph.D.	**General Manager**
Robb Whitaker	**Assistant General Manager/ District Engineer**

Prepared by:

Ted Johnson	**Senior Hydrogeologist**
Tony Kirk	**Hydrogeologist**
Nancy Matsumoto	**Hydrogeologist**
Benny Chong	**Assistant Hydrogeologist**
Wanjiru Njuguna	**Assistant GIS Specialist**
Hélène Mendoza	**Technical Support Specialist**

JUNE 2003

EXECUTIVE SUMMARY

"To provide a sufficient supply of high quality groundwater through progressive, cost effective, and environmentally sensitive basin management."

Since 1959, the Water Replenishment District of Southern California (WRD) has operated under the California Water Code to protect and preserve the quantity and quality of the groundwater supplies in the Central and West Coast groundwater basins (CWCB). Nearly 40 percent of the water used by the 4 million people overlying the WRD's 420-square mile service area comes from the underlying groundwater reservoir. As the regional agency responsible for managing and safeguarding this precious resource, WRD's focus is on maximizing the groundwater basins' capacity, preserving them for future use, and ensuring the basins' high water quality.

The extensive collection, analysis, and reporting of critical groundwater data is a major responsibility for the WRD to ensure proper basin management and to properly plan for the future. Our staff of highly skilled hydrogeologists, engineers, planners, and Geographic Information System (GIS) specialists work continually to sample, track, model, forecast, and plan for replenishment and water quality activities. These efforts result in the publication of the District's two main annual reports: the Engineering Survey and Report (issued since 1960) and a Groundwater Monitoring Report (since 1973).

This Regional Groundwater Monitoring Report for Water Year 2001-2002 is the most comprehensive report yet. The WRD's network of specialized monitoring wells continues to grow, DHS Title 22 drinking water analyses for potable wells in the CWCB are comprehensively incorporated, data sharing with the local groundwater pumpers and agencies improves, and greater amounts of data are collected, analyzed, and presented to better define the conditions in the CWCB. This report presents the latest information on groundwater replenishment activities, groundwater production, groundwater levels, and an extensive section on groundwater quality, including an analysis and presentation of data for the latest chemicals of concern, including arsenic, hexavalent chromium, colored water, and total dissolved solids.

In Water Year 2001-2002 water levels and groundwater in storage decreased primarily due to very low rainfall over the past year. Groundwater production increased slightly, less than 1% from the previous water year. The overall quantity and quality of groundwater and replenishment waters in the CWCB remain excellent and they are suitable for use now and in the near future. Localized areas of marginal to poor water quality do exist, however, and are being monitored closely by the WRD for potential action. When necessary, treatment plants are constructed by WRD or the pumpers to filter and treat the groundwater before it is served to the public. WRD has constructed ten treatment facilities to date and is in the planning stages for five additional facilities to remove volatile organic contamination and arsenic from the CWCB groundwater.

To help prevent future contamination, the WRD is facilitating Drinking Water Source Assessments on the majority of drinking water wells in the District to identify water quality threats to the wells. The WRD also completed its Robert W. Goldsworthy Desalter facility in Torrance which pumps out brackish groundwater caused by seawater intrusion and converts it into drinking water using reverse osmosis technology. The WRD is also pursuing conjunctive use projects to store excess water during wet years in the ground for future use by the region in times of drought. All of these projects are consistent with the WRD's efforts to effectively manage the current and future groundwater supply and water quality needs of the CWCB.

The WRD remains committed to its statutory charge to manage the public resource of the basins' storage capacity for the common good. To that end, innovative projects and programs will be implemented to ensure a continued reliable source of high quality groundwater, reduce the reliance on costly imported water, and optimize the region's water resources for the District's 43 constituent cities.

To achieve these objectives, the WRD will continue to reach out and work closely with the 43 WRD cities, private sector groundwater purveyors, and the southern Los Angeles County area officials. The WRD is optimistic that by working together we can implement these new initiatives to optimize the management of the basins for the benefit of all.

More information can be obtained on the District web site at http:\\www.wrd.org, or by telephoning the District at (562) 921-5521. WRD welcomes any comments or suggestions to this Regional Groundwater Monitoring Report.

TABLE OF CONTENTS

Section 1
Introduction

1.1 Background of the Regional Groundwater Monitoring Program 1-1
1.2 Conceptual Hydrogeologic Model 1-3
1.3 GIS Development and Implementation 1-4
1.4 Scope of Report 1-4

Section 2
Groundwater Replenishment

2.1 Sources of Replenishment Water 2-1
2.2 Quantities of Replenishment Water 2-2
2.3 Quality of Replenishment Water 2-4

Section 3
Groundwater Production and Water Levels

3.1 Groundwater Production in the Central and West Coast Basins 3-1
3.2 Groundwater Levels and Change in Storage 3-3

Section 4
Groundwater Quality

4.1 Major Mineral Characteristics of Groundwater in the Central and West Coast Basins 4-1
4.2 Total Dissolved Solids (TDS) 4-2
4.3 Iron 4-4
4.4 Manganese 4-5
4.5 Nitrate 4-6
4.6 Hardness 4-8
4.7 Sulfate 4-9
4.8 Chloride 4-9
4.9 Trichloroethylene (TCE) 4-10
4.10 Tetrachloroethylene (PCE) 4-11
4.11 Special Interest Constituents 4-12

4.11.1 Arsenic 4-12
4.11.2 Chromium 4-14
4.11.3 MTBE 4-17
4.11.4 Total Organic Carbon 4-18
4.11.5 Apparent Color 4-19
4.11.6 Perchlorate 4-20

Section 5
Summary of Findings

Summary of Findings 5-1

Section 6
Future Activities

Future Activities 6-1

Section 7
References

References 7-1

List of Tables

Table 1.1 Construction Information for WRD Nested Monitoring Wells
Table 2.1 Summary of Spreading Operations at Montebello Forebay
Table 2.2 Historical Quantities of Artificial Replenishment Water at Seawater Intrusion Barriers
Table 2.3 Water Quality of Replenishment Water, Water Year 2001-2002
Table 3.1 Historical Amounts of Groundwater Production
Table 3.2 Groundwater Elevations, Water Year 2001-2002
Table 4.1 Major Mineral Water Quality Groups
Table 4.2 Central Basin Water Quality Results, Regional Groundwater Monitoring, Water Year 2001-2002
Table 4.3 West Coast Basin Water Quality Results, Regional Groundwater Monitoring, Water Year 2001-2002

List of Figures

Figure 1.1 The Water Replenishment District of Southern California
Figure 1.2 Nested Wells versus Production Wells for Aquifer-Specific Data
Figure 1.3 Existing WRD Nested Monitoring Wells
Figure 1.4 Idealized Geologic Cross Section AA'
Figure 1.5 Idealized Geologic Cross Section BB'
Figure 3.1 Groundwater Production, Water Year Fall 2001-Fall 2002
Figure 3.2 Groundwater Elevation Contours, Spring 2002
Figure 3.3 Groundwater Elevation Contours, Fall 2002
Figure 3.4 Monthly Groundwater Production, Water Year 2001-2002
Figure 3.5 Changes in Groundwater Levels, Spring 2002-Fall 2002
Figure 3.6 Changes in Groundwater Levels, Fall 2001-Fall 2002
Figure 3.7 Fluctuations of Water Level at Wells, Montebello Forebay
Figure 3.8 Fluctuations of Water Level at Wells, Los Angeles Forebay
Figure 3.9 Fluctuations of Water Level at Wells, Central Basin Pressure Area
Figure 3.10 Fluctuations of Water Level at Wells, West Coast Basin
Figure 3.11 Groundwater Elevation Hydrograph: WRD Nested Monitoring Well - Rio Hondo #1
Figure 3.12 Groundwater Elevation Hydrograph: WRD Nested Monitoring Well - Huntington Park #1
Figure 3.13 Groundwater Elevation Hydrograph: WRD Nested Monitoring Well - Long Beach #1
Figure 3.14 Groundwater Elevation Hydrograph: WRD Nested Monitoring Well - Carson #1
Figure 4.1 TDS Concentrations in Groundwater: WRD Nested Monitoring Wells, Water Year 2001-2002
Figure 4.2 TDS Concentrations in Groundwater: Production Wells, October 1999 – September 2002
Figure 4.3 Iron Concentrations in Groundwater: WRD Nested Monitoring Wells, Water Year 2001-2002
Figure 4.4 Iron Concentrations in Groundwater: Production Wells, October 1999 – September 2002
Figure 4.5 Manganese Concentrations in Groundwater: WRD Nested Monitoring Wells, Water Year 2001-2002
Figure 4.6 Manganese Concentrations in Groundwater: Production Wells, October 1999 – September 2002
Figure 4.7 Total Nitrate (as Nitrogen) Concentrations in Groundwater: WRD Nested Monitoring Wells, Water Year 2001-2002
Figure 4.8 Total Nitrate (as Nitrogen) Concentrations in Groundwater: Production Wells, October 1999 – September 2002
Figure 4.9 Total Hardness as CaCO3 Concentrations in Groundwater: WRD Nested Monitoring Wells, Water Year 2001-2002
Figure 4.10 Total Hardness as CaCO3 Concentrations in Groundwater: Production Wells, October 1999 – September 2002

List of Figures (Cont'd)

Figure 4.11 Sulfate Concentrations in Groundwater: WRD Nested Monitoring Wells, Water Year 2001-2002
Figure 4.12 Sulfate Concentrations in Groundwater: Production Wells, October 1999–September 2002
Figure 4.13 Chloride Concentrations in Groundwater: WRD Nested Monitoring Wells, Water Year 2001-2002
Figure 4.14 Chloride Concentrations in Groundwater: Production Wells, October 1999–September 2002
Figure 4.15 TCE Concentrations in Groundwater: WRD Nested Monitoring Wells, Water Year 2001-2002
Figure 4.16 TCE Concentrations in Groundwater: Production Wells, October 1999–September 2002
Figure 4.17 PCE Concentrations in Groundwater: WRD Nested Monitoring Wells, Water Year 2001-2002
Figure 4.18 PCE Concentrations in Groundwater: Production Wells, October 1999–September 2002
Figure 4.19 Arsenic Concentrations in Groundwater: WRD Nested Monitoring Wells, October 1999–September 2002
Figure 4.20 Arsenic Concentrations in Groundwater: Production Wells, October 1999–September 2002
Figure 4.21 Total Chromium Concentrations in Groundwater; WRD Nested Monitoring Wells, 2001-2002
Figure 4.22 Total Chromium Concentrations in Groundwater: Production Wells, Water Year 1999-2002
Figure 4.23 Hexavalent Chromium Concentrations in Groundwater; WRD Nested Monitoring Wells, 1998-2002
Figure 4.24 Hexavalent Chromium Concentrations in Groundwater: Production Wells, October 1999–September 2002
Figure 4.25 MTBE Concentrations in Groundwater: WRD Nested Monitoring Wells, Water Year 2001-2002
Figure 4.26 MTBE Concentrations in Groundwater: Production Wells, October 1999–September 2002
Figure 4.27 Total Organic Carbon Concentrations in Groundwater: WRD Nested Monitoring Wells, Water Year 2001-2002
Figure 4.28 Total Organic Carbon Concentrations in Groundwater: Production Wells, October 1999–September 2002
Figure 4.29 Apparent Color in Groundwater: WRD Nested Monitoring Wells, Water Year 2001-2002
Figure 4.30 Apparent Color Concentrations in Groundwater: Production Wells, October 1999–September 2002
Figure 4.31 Perchlorate Concentrations in Groundwater: WRD Nested Monitoring Wells, 1998-2002
Figure 4.32 Perchlorate Concentrations in Groundwater: Production Wells, Water Years 1999-2002

SECTION 1
INTRODUCTION

The Water Replenishment District of Southern California (WRD or the District) manages groundwater replenishment and water quality activities of the Central and West Coast Basins (CWCB) in southwestern Los Angeles County (**Figure 1.1**). Our mission is to maintain a sufficient supply of high quality groundwater in the basins through progressive, cost effective, and environmentally sensitive management. This mission is being accomplished by meeting WRD goals relating to water quality, water supply, basin management, stakeholder communications, and efficient operations of the organization.

A major aspect to meeting these goals is to have a thorough and current understanding of groundwater conditions in the CWCB and to predict and prepare for future conditions. This is achieved through groundwater monitoring, modeling, and planning, which provide the necessary information to determine the "health" of the basins. This information in turn provides WRD, the pumpers in the District, other interested stakeholders, and the public with the knowledge necessary for responsible water resources planning and management.

1.1 BACKGROUND OF THE REGIONAL GROUNDWATER MONITORING PROGRAM

Since its formation in 1959, the WRD has been actively involved in groundwater replenishment, water quality monitoring, contaminant prevention, data management, and data publication. Historical overpumping of the CWCB caused overdraft, seawater intrusion and other groundwater management problems related to supply and quality. Adjudication of the basins in the early 1960s set a limit on allowable production to control the overpumping. Along with adjudication, WRD was formed to address issues of groundwater recharge and groundwater quality. The Regional Groundwater Monitoring Program is an important District program to track water levels and water quality in the CWCB to ensure the usability of this groundwater reservoir.

Prior to 1995, WRD relied heavily upon groundwater monitoring data collected, interpreted, and presented by other entities such as the Los Angeles County Department of Public Works (LACDPW), the California Department of Water Resources (DWR), and the private sector for understanding current basin conditions. This included WRD's former basinwide monitoring program, and the ongoing but separate Montebello Forebay recycled water monitoring for regulatory compliance. However, these data have been collected primarily from production wells, which are typically screened across multiple aquifers to maximize water inflow. This results in a mixing of the waters from the perforated aquifers inside of the well casing, causing an averaging of the water qualities and water levels.

In order to obtain more accurate data for specific aquifers from which to infer localized water quality and level conditions, depth-specific (nested) monitoring wells that tap discrete aquifer zones are necessary. **Figure 1.2** illustrates the capabilities of nested monitoring wells to assess individual aquifers compared to typical production wells. Data are generally provided for a water year (WY), which occurs from October 1 to the following September 30. During WY 1994-1995, WRD and the United States Geological Survey (USGS) began a cooperative study to improve the understanding of the geohydrology and geochemistry of the CWCB. This study was the nucleus of the Regional Groundwater Monitoring Program. In addition to compiling existing available data, this study recognized that sampling of production wells did not adequately characterize the layered multiple aquifer systems of the CWCB. The study focuses on new data collection through drilling and construction of nested groundwater monitoring wells and conducting depth-specific water quality sampling. **Figure 1.3** shows the locations of recently completed and existing WRD nested monitoring wells. Construction information for the completed wells is presented in **Table 1.1.**

An *Annual Report on the Results of Water Quality Monitoring* (*Annual Report*) was published by WRD from Water Years 1972-1973 through 1994-1995, and was based on a basinwide monitoring program outlined in the *Report on Program of Water Quality*

Monitoring (Bookman-Edmonston Engineering, Inc., January 1973). The latter report recommended a substantial expansion of the then-existing program, particularly the development of a detailed and intensive program of monitoring the quality of groundwater in the Montebello Forebay. The Regional Groundwater Monitoring Program is designed to serve as an expanded, more representative basinwide monitoring program for the CWCB. This Regional Groundwater Monitoring Report is published in lieu of the previous *Annual Reports*.

1.2 CONCEPTUAL HYDROGEOLOGIC MODEL

The Regional Groundwater Monitoring Program changes the focus of groundwater monitoring efforts in the CWCB from production zones with averaged groundwater level and groundwater quality information, to a layered multiple aquifer system with individual zones of groundwater quality and groundwater levels. WRD views each aquifer as a significant component of the groundwater system and understands the importance of the interrelationships between water-bearing zones. The most accepted hydrogeologic description of the basin and the names of water-bearing aquifers were provided in California Department of Water Resources, *Bulletin No. 104: Planned Utilization of the Ground Water Basins of the Coastal Plain of Los Angeles County, Appendix A – Ground Water Geology* (DWR, 1961). WRD generally follows the naming conventions of this report, redefining certain aspects when new data become available.

The locations of idealized geologic cross-sections AA' and BB' through the CWCB are shown on **Figure 1.3**. Cross-sections AA' and BB' are presented on **Figures 1.4 and 1.5**, respectively. These cross-sections illustrate a simplified aquifer system of the CWCB. The main potable production aquifers are shown, including the deeper Lynwood, Silverado, and Sunnyside aquifers of the lower Pleistocene San Pedro Formation. Other main shallower aquifers, which locally produce potable water, include the Gage and Gardena aquifers of the Upper Pleistocene Lakewood Formation. Also shown on the geologic sections are the aquitards separating the aquifers. Throughout this report the aquifers shown on the geologic sections are referred to as discrete groundwater zones. Many references are made to the Silverado aquifer producing zone, typically including the Lynwood aquifer.

1.3 GIS DEVELOPMENT AND IMPLEMENTATION

WRD is using a sophisticated geographic information system (GIS) as a tool for CWCB groundwater management. Much of the GIS was compiled during the WRD/USGS cooperative study. The GIS links spatially related information (e.g., well locations, geologic features, cultural features, contaminated sites) to data on well production, water quality, water levels, and replenishment amounts. WRD uses the industry standard ArcInfo® and ArcView® GIS software for data analysis and preparation of spatially related information (maps and graphics tied to data). WRD utilizes a global positioning system (GPS) to survey the locations of basinwide production wells and nested monitoring wells for use in the GIS database.

WRD is constantly updating the GIS with new data and newly acquired archives of data acquired by staff or provided by pumpers and other agencies. The GIS is a primary tool for WRD and other water-related agencies to more accurately track current and past use of groundwater, track groundwater quality, and project future water demands, thus allowing improved management of the basins.

In early 2003, WRD completed the development of its internet-based GIS, which is expected to be available to the public in mid-2003. The web site will provide the public with access to much of the water level and water quality data contained in this report. The well information can be accessed through either an interactive map or a text search and the resulting data can be displayed in both tabular and graphical formats.

1.4 SCOPE OF REPORT

The purpose of this report is to update information on groundwater conditions in the CWCB for WY 2001-2002, and to discuss the status of the Regional Groundwater Monitoring Program. Section 1 has provided an overview of WRD and the WRD Regional Groundwater Monitoring Program. Section 2 discusses the types, quantities, and quality of different source waters used by WRD for replenishment at the Montebello

Forebay spreading grounds and the seawater intrusion barriers. Section 3 summarizes groundwater production in the CWCB, and evaluates water level, storage change, and groundwater elevation data for WY 2001-2002. Section 4 presents water quality data for the WRD nested monitoring wells and basin-wide production wells. Section 5 summarizes the findings of this report. Section 6 describes future regional groundwater monitoring activities. Section 7 lists the references used in this report.

SECTION 2
GROUNDWATER REPLENISHMENT

Natural groundwater replenishment occurs through the percolation of precipitation and applied waters (such as irrigation), conservation of stormwater in spreading grounds, and underflow from adjacent basins. However, there is insufficient natural replenishment in the CWCB to sustain the groundwater pumping that takes place. Therefore, WRD provides for artificial groundwater replenishment through the purchase of imported, recycled, and In-Lieu water to make up the difference. Artificial replenishment occurs at the spreading grounds, the seawater intrusion barrier injection wells, and through the District's In-Lieu Replenishment Program. This section describes the sources, quantities, and quality of water used for artificial replenishment in the CWCB during WY 2001-2002.

2.1 SOURCES OF REPLENISHMENT WATER

Replenishment water comes from imported, recycled, and local sources. The types used by WRD are described below:

- <u>Imported water:</u> This source comes from the Colorado River or the State Water Project via Metropolitan Water District (MWD) pipelines and aqueducts. WRD purchases this water both for surface recharge at the Montebello Forebay spreading grounds and for injection at the seawater intrusion barriers. For the spreading grounds, the water is replenished without further treatment from the sources as the quality is very good and gets natural treatment as it percolates through the vadose zone soils. For the barrier wells, the water is treated to meet all drinking water standards before injection since it will not be moving through vadose zone soils. Spreading water is available seasonally from MWD if they have excess reserves, whereas a premium price is paid for injection water to maintain deliveries throughout the year and during droughts.
- <u>Recycled water:</u> This resource's relatively low unit cost and good quality coupled with its year-round availability makes it highly desirable as a replenishment source.

However, its use is limited by regulatory agencies. Tertiary-treated recycled water is used for replenishment at the spreading grounds. Tertiary-treated recycled water followed by additional microfiltration and reverse osmosis treatment is used for injection into the West Coast Basin Barrier Project seawater intrusion barriers, and will soon be used at the Dominguez Gap and Alamitos Barrier Projects.

- Make-Up Water: "Make-Up Water" is occasionally delivered to the Montebello Forebay spreading grounds from the San Gabriel Valley Basin. This water, termed the "Lower Area Annual Entitlement", was established in accordance with the judgment in Case No. 722647 of Los Angeles County, City of Long Beach, et al vs. San Gabriel Valley Water Co., et al (Long Beach Judgment). During WY 2001-2002, Make-Up Water was not delivered to the Lower Area.
- Local water: Local water consists of channel flow from local sources (e.g., storm-flow, rising water, incidental surface flows) conserved in the Montebello Forebay spreading grounds by the LACDPW. Precipitation falling on the basin floor and water applied to the ground (such as for irrigation) also percolate into the subsurface and contribute to recharge.
- Subsurface water: Groundwater flows into and out of the CWCB from adjacent groundwater basins (Santa Monica, Hollywood, San Gabriel, Orange County) and the Pacific Ocean. The amounts depend on the hydrogeologic properties of the aquifers and the groundwater gradients at the basin boundaries.

2.2 QUANTITIES OF REPLENISHMENT WATER

Current and historical quantities of water conserved (replenished) in the Montebello Forebay spreading grounds are presented in **Table 2.1**. Current and historical seawater barrier well injection amounts are shown on **Table 2.2**. The calculations required to determine the total quantity of artificial replenishment water necessary for the CWCB prior to each water year are outlined in the District's annual *Engineering Survey and Report* (ESR).

At the Montebello Forebay spreading grounds (**Table 2.1**), the following is noted for the quantities of replenishment water for WY 2001-2002:

- Total water conserved in the Rio Hondo (consisting of the Rio Hondo Spreading Grounds and percolation behind the Whittier Narrows Dam) and the San Gabriel System (consisting of the unlined San Gabriel River south of the Whittier Narrows Dam and the San Gabriel River Spreading Grounds) was 120,471 acre-feet (AF). This is less than the long-term running average of 127,023 AF (WY 1963/64 through 2000/01).

- The quantity of local water conserved during WY 2001-2002 was 18,607 AF, less than the long-term running average of 50,142 AF, and less than the previous 5-year average of 45,353 AF (WY 1996/97 through 2000/01). The relatively low amount of conserved local water was due to a very low amount of local precipitation totaling 2.5 inches in Downey. The long term average precipitation for Downey is 14.4 inches per year.

- The quantity of imported water conserved during WY 2001-2002 was 41,268 AF. This is less than the long-term running average of 45,781 AF, but greater than the previous 5-year average of 17,352 AF.

- The quantity of recycled water conserved during WY 2001-2002 was 60,596 AF. This is more than the long-term running average of 31,100 AF and the previous 5-year average of 41,737 AF.

- In addition to the water sources shown on **Table 2.1**, the Montebello Forebay received an estimated 1,195 AF of recharge due to infiltration of precipitation falling on the forebay floor, and an estimated 27,367 AF of groundwater underflow from San Gabriel Valley. The total replenishment was therefore 149,033 AF, of which 40% was recycled water. The three-year average recycled water used was 50,027 AF, and the three-year averaged percent recycled water component was 34.3%.

At the seawater intrusion barriers (**Table 2.2**), the following trends are noted for the quantities of artificial replenishment water for WY 2001-2002:

- At the West Coast Basin Barrier, 20,000 AF were injected, which included 12,724 AF of imported water and 7,276 AF of recycled water (36%). The current limit for recycled water injection is 50% of the total supply. The long-term injection average from WY 1963/64 through 2000/01 was 20,711 AF. The 5-year average (1996/97 through 2000/01) was 18,130 AF.

- At the Dominguez Gap Barrier, 5,459 AF were injected. The long-term average from WY 1971/72 through 2000/01 was 5,882 AF, and the 5-year average (1996/97 through 2000/01) was 4,815AF. To date, only imported water has been injected at the Dominguez Gap barrier; however, WRD and the City of Los Angeles plan to augment this source with recycled water in the near future.

- At the Alamitos Barrier, both WRD and Orange County Water District (OCWD) provide injection water; WRD for wells on the Los Angeles County side, and OWCD for wells on the Orange County side. During WY 2001-2002 a total of 6,193 AF were injected into the barrier system, 3,961 by WRD and 2,232 by OCWD. The long-term average from WY 1965/66 through 2000/01 was 5,079 AF, and the 5-year average (1996/97 through 2000/01) was 5,571 AF. To date, only imported water has been injected at the Alamitos Barrier; however, WRD plans to augment this source with recycled water in the near future.

Injection amounts at the barrier systems are expected to increase over the next several years to further combat seawater intrusion.

2.3 QUALITY OF REPLENISHMENT WATER

This section discusses water quality data for key parameters in WRD replenishment water and local surface water. Although numerous other constituents are monitored, the reported constituents are the ones found to be most prevalent and at elevated levels or of current regulatory interest in wells in the CWCB. The data are classified according to their sources. The key water quality parameters of this discussion are: total dissolved solids (TDS), hardness, sulfate, chloride, nitrogen, iron, manganese, trichloroethylene (TCE), tetrachloroethylene (PCE), total organic carbon (TOC), and perchlorate. Monitoring the concentrations of these constituents is necessary for an understanding of the general chemical nature of the recharge source, and its suitability for replenishing the groundwater basins. A brief description of each parameter follows. Various criteria are used in discussing water quality. An action level (AL) is an advisory level established by the California Department of Health Services (DHS) based on preliminary review of health effects studies. A public health goal (PHG) is an advisory level that is developed by the Office of Environmental Health Hazard Assessment (OEHHA) after a thorough review of health effects and risk assessment studies. A primary maximum contaminant level (MCL) is an enforceable drinking water standard that DHS establishes after health effects, risk assessments, detection capability, treatability and economic feasibility are considered. A secondary MCL is established for constituents that impact aesthetics of the water, such as taste, odor, and color, and do not impact health. It should also be noted that constituents with AL's often are considered unregulated contaminants for which additional monitoring may be required to determine the extent of exposure before PHG's and MCL's are established.

- TDS: TDS is a measure of the total mineralization of water and is indicative of general water quality. In general, the higher the TDS the less desirable a given water supply is for beneficial uses. The California DHS MCL in drinking water for TDS ranges from 500 milligrams per liter (mg/L), which is the recommended level, to 1,500 mg/L, which is the upper limit allowed for short term use.
- Hardness: For most municipal uses, hardness (a measure of calcium and magnesium ions that combine with carbonates to form a precipitate or solid substance in water) is an important mineral characteristic of water. Some degree of hardness is considered to be beneficial to human health; studies suggest that it helps to lower cholesterol levels. Excessive hardness is undesirable because it results in increased consumption of cleaning products, scale on pipes, and other undesirable effects. There is no MCL for hardness, but generally waters are considered soft when it is less than 75 mg/L

and very hard when greater than 300 mg/L.

- Sulfate: Sulfate is generally not a water quality concern in the CWCB. In excess amounts, it can act as a laxative. DHS has established a recommended State MCL (secondary) for sulfate at 250 mg/L and up to 600 mg/L for short term use. Sulfate is, however a very useful water quality constituent in the CWCB for use in tracking flow and observing travel times of artificial recharge. Colorado River water, local stormwater, and recycled water used for recharge in CWCB have characteristically high sulfate concentrations, while native groundwater and State Water Project water have relatively low sulfate concentrations.
- Chloride: Chloride is the characteristic constituent used to identify seawater intrusion. While recharge sources contain moderate concentrations of chloride, these concentrations are well below the State secondary MCL for chloride of 250 mg/L. When the ratio of chloride to other anions such as sulfate and bicarbonate becomes high, there is a strong indication of seawater intrusion or possible industrial brine impact to groundwater.
- Nitrogen species: DHS standards limit 2 forms of nitrogen, nitrite and nitrate, in drinking water. Nitrate cannot exceed concentrations of 45 mg/L (measured as nitrate), corresponding to 10 mg/L as nitrogen. Nitrite is limited to 1 mg/L as Nitrogen. The combined total of nitrite and nitrate reported as nitrogen cannot exceed 10 mg/L. These constituents are of concern because they can cause acute health effects in infants. When consumed in excess of these limits, they can reduce the uptake of oxygen, causing shortness of breath, lethargy, and a bluish color, and which can be fatal.
- Iron: Typically, iron occurs naturally in groundwater. It is also leached from iron or steel pipes as rust. Small concentrations of iron in water can affect the water's suitability for domestic or industrial purposes. The DHS limits the amount of iron in drinking water to 0.3 mg/L because iron in water stains plumbing fixtures and clothing, incrusts well screens, and clogs pipes. Some industrial processes cannot tolerate more than 0.1 mg/L iron.

- Manganese: Manganese, also naturally occurring, is objectionable in water in the same general way as iron. Stains caused by manganese are more unsightly and harder to remove than those caused by iron. The DHS MCL for manganese is 50 micrograms per liter (µg/L).

- TCE: Trichloroethylene is a solvent used in metal degreasing, textile processing, and dry cleaning. Because of its potential health effects, it has been classified as a probable human carcinogen. The MCL for TCE is 5 µg /L.
- PCE: Tetrachloroethylene (also known as perchloroethylene, perc, perclene, and perchlor) is a solvent used heavily in the dry cleaning industry, as well as in metal degreasing and textile processing. Like TCE, PCE is a probable possible carcinogen. The MCL for PCE in drinking water is also 5 µg/L.
- Total Organic Carbon: Total organic carbon (TOC) is the broadest measure of all organic molecules in water. TOC can be naturally occurring, wastewater-derived, or a combination of both (NRC, 1998). While there is no MCL established for TOC, regulators are generally concerned with wastewater derived TOC as a measurable component of recycled water.
- Perchlorate: This is used in a variety of defense and industrial applications, including being a primary ingredient in solid propellant for rockets, missiles, and fireworks, a component of air bag inflators, additives in lubricating oils, in tanning and finishing leather, and the production of paints and enamels. When ingested, it can inhibit the proper uptake of iodide by the thyroid gland, which causes a decrease in the production of hormones for normal growth and development and normal metabolism. The current DHS action level is 4 µg/L. DHS is required to establish an MCL by January 1, 2004.

Quality of Imported Water

As stated previously, treated imported water is used at the seawater intrusion barriers. This water meets all drinking water standards and is suitable for direct injection. Average water quality data for treated imported water are presented in **Table 2.3**.

Untreated imported water ("raw water") is used for recharge at the Montebello Forebay spreading grounds. The average TDS concentration of Colorado River water has decreased over the past five water years, from 682 mg/L to 564 mg/L. The average TDS concentration of State Project Water has also shown a modest decreasing trend, from 320 mg/L to 296 mg/L.

The average hardness of Colorado River water has decreased over the last five water years, from 322 mg/L to 283 mg/L. The average hardness of untreated State Project Water has also shown a decreasing trend, from 173 mg/L to 113 mg/L.

The average nitrogen concentration of Colorado River water has decreased compared to the previous water year, from 0.23 mg/L to below detection limits. The average nitrogen concentration of State Project Water has increased compared to the previous water year, from 0.20 mg/L to 0.54 mg/L. Recently and historically, both Colorado River and State Project Water nitrogen concentrations have been far below the MCL.

The average iron concentrations of untreated Colorado River Water have remained below detection limits. Iron in State Project Water was also below detection limits. Manganese in State Project water averaged 0.12 µg/L. Both Colorado River and State Project Water iron and manganese concentrations have historically been below the MCL.

The average chloride and sulfate concentrations of Colorado River Water and State Project Water have not changed significantly over the past several years. Both Colorado River and State Project Water chloride and sulfate concentrations have historically been below the MCL.

According to the MWD, TCE and PCE have not been detected in Colorado River Water or State Project Water over the last five water years.

Quality of Recycled Water

Recycled water is introduced into the CWCB through percolation and injection. Recycled water from the Whittier Narrows Water Reclamation Plants (WRP), San Jose Creek East WRP, San Jose Creek West WRP, and Pomona WRP is diverted into spreading basins where it percolates into the groundwater basins. The water quality from these WRPs is carefully controlled and monitored, as required by permits, and typically shows little variation over time. **Table 2.3** presents average water quality data from these WRPs. All constituents shown have either decreased slightly or remained stable over the past five water years. Furthermore, neither TCE nor PCE have been detected above MCLs in recycled water from these four WRPs over the last four water years.

Recycled water from the West Basin Municipal Water District (WBMWD) WRP undergoes advanced treatment using microfiltration and reverse osmosis, and is then injected at the West Coast Basin barrier. This water is treated to meet or exceed drinking water standards and is suitable for direct injection. The blend of recycled water and imported water is injected to prevent the intrusion of salt water and to also replenish the groundwater basins. The DHS limits injection to 50 percent of the total injected amount. However, the WBMWD, working with the DHS and WRD, are seeking to increase the recycled water percentage to 100 percent recycled water in the future. Average water quality data for this water is presented on **Table 2.3**.

Quality of Stormwater

As discussed in Section 2.1, stormwater infiltrates to some degree throughout the District, but especially in the Montebello Forebay, where it is intentionally percolated along with imported and recycled water at local spreading grounds. Occasional stormwater quality analyses have been performed by LACDPW throughout the history of the Montebello Forebay spreading grounds. Average stormwater quality data are presented on **Table 2.3**. The average TDS, hardness, sulfate, chloride, nitrate, TCE, and PCE concentrations of stormwater in the Montebello Forebay are relatively low. Average iron and manganese concentrations of stormwater have periodically exceeded MCLs.

SECTION 3
GROUNDWATER PRODUCTION AND WATER LEVELS

Groundwater production or pumping is the major source of groundwater outflow from the CWCB. Groundwater currently provides about 40% of the total water used in the basins. It is critical to maintain adequate supplies of groundwater in storage to meet this demand and to protect against times of drought when imported water may not be available. Measurements of water levels in the basins are made to check the current supply and are used to determine when artificial replenishment is needed. The remainder of this Section describes WRD's management of groundwater production and water levels in the CWCB.

3.1 GROUNDWATER PRODUCTION IN THE CENTRAL AND WEST COAST BASINS

Prior to the 1960s, groundwater production in the CWCB went relatively unchecked and continued to increase as the population increased. West Coast Basin pumping reached a maximum of 94,100 AF in 1952/53, and Central Basin pumping reached a maximum of 259,400 AF in 1955/56. Pumping exceeded natural recharge, resulting in overdraft, declining water levels, loss of groundwater from storage, and seawater intrusion.

In the early 1960s, the State courts limited the amount of pumping in the CWCB to reduce this overdraft. The West Coast Basin adjudication was finalized in 1961 and capped production at 64,468.25 acre-feet/year (AFY). The Central Basin adjudication rights were set at 271,650 AFY, although the Judgment set a lower Allowed Pumping Allocation (APA) of 217,367 AFY. The total amount that can be pumped from both basins is currently 281,835 AFY.

The adjudicated amounts were set higher than the natural replenishment of the CWCB. WRD was created in 1959 to manage this deficiency through artificial replenishment. A replenishment assessment is placed on pumping to collect the funds necessary to purchase the supplemental replenishment water.

During WY 2001-2002, groundwater production in the CWCB was 249,966 AF, of which 199,900 AF occurred in the Central Basin and 50,066 occurred in the West Coast Basin. This represents a 0.4% increase from the previous year. The five-year averaged production amount is 249,386 AF (WY 1997/98 through 2001/02). **Table 3.1** presents historical groundwater production quantities for the CWCB. **Figure 3.1** illustrates the levels of production throughout the CWCB during the 2001-2002 Water Year.

Under the terms of the Water Replenishment Districts Act, each groundwater producer in the CWCB must submit a report to the District summarizing their production activities (monthly reports for larger producers, quarterly reports for smaller producers). The information in these reports is the basis from which each producer pays the replenishment assessment. WRD then forwards these production data to the DWR, the court-appointed Watermaster, in connection with the adjudication of the CWCB.

With few exceptions, meters installed and maintained by the individual producers measure the groundwater production throughout the basins. Through periodic testing, both WRD and Watermaster verify the accuracy of individual meters and order corrective measures when necessary. The production of the few wells that are not metered is estimated on the basis of electrical energy consumed by individual pump motors, duty of water, or other reasonable means.

Participation in WRD's In-Lieu Replenishment Program, which replaces groundwater pumping with the use of surplus imported water, has become a major factor affecting annual groundwater production. As participation in the program increases, total production decreases accordingly. In Fiscal Year (FY) 2001-2002, In-Lieu participation was 20,720 AF, with 11,931 AF in the Central Basin and 8,789 AF in the West Coast Basin. In FY 02/03 in-lieu participation is anticipated to be 11,205 AF, 6,866 AF in the CB and 4,339 AF in the WCB. During the past five years, in-lieu replenishment has averaged 23,605 AFY. In-lieu replenishment peaked during 1993/94, with total groundwater extractions of less than 172,000 AF, and in-lieu replenishment of about 110,000 AF. Due to decreased interest in participation and changes to MWD's in-lieu certification process, the WRD Board of Directors is considering suspending the program for one year in FY 03/04. This will allow the District to gage the effectiveness of the program and make appropriate adjustments in the future.

During emergency or drought conditions, WRD can also allow an additional 27,000 AF (17,000 AF for Central Basin and 10,000 AF for West Coast Basin) of extractions for a four-month period. This provision has yet to be exercised but offers the potential use of an additional 7.8 % of groundwater for Central Basin and 15 % of groundwater for West Coast Basin pumpers.

3.2 GROUNDWATER LEVELS AND CHANGE IN STORAGE

Groundwater levels in the CWCB are tracked through the collection of water level measurements in production wells and monitoring wells. Automatic datalogging equipment has been installed in selected monitoring wells to collect water levels up to four times per day to capture the daily and seasonal changes in water levels due to local and regional pumping. WRD staff visit these and other monitoring wells at least four times per year to collect manual readings and to download the dataloggers. Staff also obtain records from other agencies such as the pumpers, the DWR, and the LACDPW, who regularly collect water level data from production wells. These data are input into WRD's Geographic Information System (GIS) for storage and analysis. Contour maps and hydrographs are prepared to illustrate the current and historical groundwater levels in the basins. The change in storage can be determined based on water level changes over the year.

3.2.1 Contour Maps

Groundwater elevation contour maps show the elevation of the water surface (potentiometric surface) in the aquifer system at a given period of time, such as spring or fall. These maps are used to determine groundwater flow directions and hydraulic gradients, identify areas of recharge and discharge, identify potential pathways for seawater intrusion, and can be used to calculate the changes in water levels and groundwater storage from one year to the next.

WRD has prepared contour maps representing the "Deep Aquifer System", which consists of the San Pedro Formation aquifers (Lynwood/400-Foot Gravel, Silverado, and Sunnyside/Lower San Pedro). **Figures 3.2 and 3.3** are groundwater elevation contour maps for Spring and Fall 2002, respectively. Based on these maps, groundwater levels are highest in the northeastern corner of the Montebello Forebay, where San Gabriel Valley groundwater flows into the Central Basin. Groundwater levels are lowest in several areas, including Long Beach near the city's airport and in the West Coast Basin along the Newport-Inglewood uplift in the City of Gardena. Groundwater flow in the basins move from recharge or high elevation areas to discharge or low elevation areas. In the Central Basin, groundwater generally moves in a southwesterly direction away from the Montebello Forebay recharge area, and then splits to either a southerly direction toward Long Beach or a westerly direction toward Huntington Park and Los Angeles. In the West Coast Basin, groundwater generally moves in an easterly direction away from the West Coast Basin Barrier Project. The Newport-Inglewood uplift and the Charnock Fault both act as partial barriers to groundwater flow.

In addition to the relatively high summer water demands, MWD's seasonal storage program provides some pumpers with an incentive to pump more groundwater from May through September, and less from October through April. **Figure 3.4** illustrates the monthly pumping amount for WY 2001-2002. As shown in the figure, pumping in the West Coast Basin is less and does not fluctuate as much as in the Central Basin. Between October 2001 and April 2002, production in the Central Basin averaged 13,431 AF/month and in the West Coast Basin 3,725 AF/month. However, between May 2002 and September 2002, Central Basin pumping averaged 21,176 AF/month and in the West Coast Basin 4,799 AF/month. The result of this unsteady seasonal pumping causes groundwater levels to vary dramatically from spring to fall, especially in the confined

Central Basin aquifers. **Figure 3.5** is a map showing the difference in water levels between Spring and Fall 2002 generally caused by this seasonal pumping. The biggest impact is in the Long Beach area along the Newport-Inglewood Uplift, where fall water levels are 80 feet to 100 feet lower than spring water levels.

The change in water levels over the course of the year are shown on **Figure 3.6**, which is a water level change map between Fall 2001 and Fall 2002 for the Silverado Aquifer (main production aquifer). As shown in the figure, water level changes in the Central Basin ranged from a 2 foot rise to a 3 foot drop, with water level declines covering most of the basin attributed to the overdraft in the basin caused by the lowest rainfall on record that year. Water level changes in the West Coast Basin ranged from a drop of 2 feet to a rise of up to 11 feet. The rise is attributed to the new injection into the Dominguez Gap Barrier that occurred as LACDPW turned on newly constructed wells. As more wells are installed and turned on in 2003 and 2004, water levels are expected to rise further.

3.2.2 Hydrographs

Hydrographs show the changes in water levels in a well over time. WRD uses hydrographs to evaluate basin storage, when to purchase replenishment water, drought preparedness, and how the basins and aquifers respond to both seasonal and long-term recharge and discharge events.

Both long-term and annual hydrographs are used. **Figures 3.7 through 3.10** are long-term hydrographs of key wells used in the District's annual Engineering Survey and Report that show water levels dating back to the 1930s and 1940s in the Montebello Forebay, Los Angeles Forebay, Central Basin Pressure Area, and West Coast Basin, respectively. **Figure 3.2** shows the locations of these key wells. The long-term key well hydrographs illustrate the general history of groundwater conditions in the CWCB: 1) Water levels were steadily declining in the 1940s and 1950s due to groundwater overdraft, causing seawater intrusion and significant removal of groundwater from storage; 2) This severe overdraft condition led to the adjudication of the CWCB in the early 1960s, and the formation of WRD to purchase and deliver artificial replenishment water at the spreading grounds, seawater barrier wells, and through in-lieu replenishment; 3) The reduction in pumping and the artificial replenishment caused groundwater levels to rise in the CWCB (although not to their historic highs) and returned groundwater to storage; and 4) Through the early to late 1990s, water levels remained relatively stable, but over the past 4 years levels have been declining. Seasonal variations due to MWD seasonal storage program produce near 100 foot water level swings in the confined aquifers between spring and fall, such as is illustrated in the Long Beach area **(Figure 3.9)**.

Annual hydrographs are also used to obtain a more detailed picture of aquifer-specific water level changes over the water year. The data for these annual hydrographs are collected from WRD's nested monitoring wells that were constructed by the USGS. **Figure 1.3** shows the locations of WRD's nested monitoring wells. **Table 3.2** presents the groundwater elevation measurements collected from nested monitoring wells during Water Year 2001-2002. **Figures 3.11 through 3.14** are annual hydrographs of selected WRD nested monitoring wells showing data for WY 2001-2002. These data demonstrate the elevation differences between individual aquifers at each nested well location. The differences in elevation are caused primarily by the thickness and hydraulic conductivity of aquitards (if any) which separate the aquifers, the amount and depth of pumping, and the proximity to recharge sources. The information from selected monitoring wells is presented below:

Figure 3.11 – Rio Hondo #1: This nested well is located in the Montebello Forebay in the City of Pico Rivera at the southeast corner of the Rio Hondo spreading grounds. It has six individual wells (zones) screened in the Gardena, Lynwood, Silverado, and Sunnyside (three different zones) aquifers from depths of 160 feet below ground surface (bgs) to 1,130 feet bgs. In WY 2001-2002, water levels in Zone 4, representing the Silverado Aquifer, varied about 23 feet throughout the year, from an elevation high of 77 feet (mean sea level, msl) in February 2002 to an elevation low of about 54 feet (msl) in September 2002. All six zones generally follow the same trend throughout the year, with lows in the fall and highs in the spring. With the exceptions of Zones 2 and 3 (both

in the Sunnyside aquifer) which have nearly identical elevation heads throughout the year, there are several feet of vertical head differences between aquifers. Elevation heads are lowest in Zone 4, the Silverado Aquifer, suggesting that this aquifer is the most heavily pumped in the area. Because it has the lowest head, it should be expected to receive recharge waters from aquifers above and below.

Figure 3.12 - Huntington Park #1: This nested well is located in the Los Angeles Forebay in the City of Huntington Park southeast of the intersection of Slauson Avenue and Alameda Street. It has 5 individual wells (zones) screened in the Gaspur, Exposition, Gage, Jefferson, and Silverado Aquifers, from depths of 134 feet bgs to 910 feet bgs. Only 4 zones are shown on the Figure because the shallowest well (screened from 114 feet to 134 feet in the Gaspur Aquifer) is dry, and therefore no water elevations can be shown on the graph. In WY 2001-2002, water levels in Zone 1, representing the Silverado Aquifer, varied about 10 feet throughout the year, from an elevation high of –26 feet (msl) in January 2002 to an elevation low of about –36 feet (msl) in September 2002. Zone 5, representing the Gaspur Aquifer, was dry throughout the year, indicating that the depth to groundwater exceeded 134 feet in that zone. Water levels of the deepest 3 zones generally followed the same trend throughout the year, with lows in the late summer and fall and highs in the winter and spring. Water levels in Zone 4, the Exposition Aquifer, had only relatively minor fluctuations throughout the year, and occur at elevations from 30 to 55 feet higher than the deeper zones, suggesting little interconnectivity with the lower aquifers.

Figure 3.13 - Long Beach #1: This nested well is located in the Central Basin Pressure Area in the City of Long Beach about a half mile south of the intersection of the 605 Freeway and Willow Street. It has 6 individual wells (zones) screened in the Artesia, Gage, Lynwood, Silverado and Sunnyside (2 zones) Aquifers, with depths ranging from 175 feet bgs to 1,450 feet bgs. In WY 2001-2002, water levels in Zone 3, representing the Silverado Aquifer, varied about 62 feet throughout the year, from an elevation high of –26 feet (msl) in April 2002 to an elevation low of about –88 feet (msl) from mid-July through September 2002. This large variation is due to the seasonal pumping patterns and

confined aquifer conditions previously discussed. Water levels of the six zones generally followed the same trend throughout the year, with lows in the late summer and fall and highs in the spring. An abrupt lowering of water levels began in late April to early May as the seasonal pumping season began. A similar rebounding effect is expected in October when pumping is reduced. Elevation head is lowest in Zone 3, the Silverado Aquifer, suggesting that this aquifer is the most heavily pumped in the area. Because Zone 3 has the lowest head, it should be expected to receive recharge waters from aquifers above and below the Silverado.

Figure 3.14 - Carson #1: This nested well is located in the West Coast Basin in the City of Carson about 1.5 miles northwest of the intersection of the 405 Freeway and Alameda Street. It has 4 individual wells (zones) screened in the Gage, Lynwood, Silverado, and Sunnyside Aquifers from depths of 270 feet bgs to 1,110 feet bgs. In WY 2001-2002, water levels in Zone 2, representing the Silverado Aquifer, varied about 14 feet throughout the year, from an elevation high of –55 feet (msl) in March 2002 to an elevation low of about -69 feet (msl) in June 2002. Water levels in Zones 1 and 2 track very similar throughout the year, as do Zones 3 and 4. A 35 to 50 foot difference in groundwater elevations between the upper two zones and lower two zones suggests that a strong aquitard exists between them.

3.2.3 Change In Storage

Groundwater enters and leaves the CWCB. It enters through natural and artificial replenishment, and leaves primarily through pumping. If the amount entering the basin equals the amount leaving, then water levels remain relatively unchanged and the basin is at steady state. When the amount of groundwater entering exceeds the amount leaving, water levels rise and there is an increase in the amount of groundwater in storage. Conversely, when groundwater leaving the basins exceeds the amount of entering, water levels drop and the amount in storage is reduced.

The change in groundwater storage over the course of a water year can be determined by calculating water level changes and multiplying those values by the aquifer's storage coefficients. The water level changes were obtained from WRD's nested monitoring wells, which have isolated screens in each of the four major aquifer systems in the CWCB (Gaspur, Gage/Gardena, Lynwood/Silverado, and Sunnyside/Lower San Pedro). These water level changes were brought into the GIS and converted into gridded surfaces so that they could be multiplied by the storage coefficient values determined by the USGS in their calibrated computer (Modflow) model of the basins. Storage changes are relatively small in the lower confined aquifers because they are fully saturated and storage coefficients are generally small (averaging about 0.0005). The most significant storage change occurs in the upper Gaspur aquifer, which has unconfined conditions with specific yield values from about 0.075 to 0.15. Based on the calculation, approximately 36,454 AF of water was lost from storage during the WY 2001/2002.

SECTION 4
GROUNDWATER QUALITY

This section discusses the vertical and horizontal distribution of several key water quality parameters based on data from WRD's monitoring wells for Water Year 2001-2002 and purveyor's production wells for Water Years 1999-2002. Groundwater samples from nested wells were submitted to a DHS certified laboratory for analytical testing for general water quality constituents, known or suspected contaminants, and special interest constituents. Water quality data for production wells were provided by the DHS based on results submitted over the past three years by purveyors for their Title 22 compliance. **Figures 4.1 through 4.32** are maps which present water quality data for key parameters and special interest constituents in the WRD nested monitoring wells and production wells in the CWCB. The figures present the maximum values for data where more than one result is available over the time frame. **Table 1.1** presents well construction information for WRD wells. **Table 4.1** categorizes groundwater at the WRD wells into major mineral water quality groups. **Table 4.2** lists the water quality analytical results for the wells in the Central Basin during WY 2001-2002. **Table 4.3** lists the water quality analytical results for the wells in the West Coast Basin during WY 2001-2002.

4.1 MAJOR MINERAL CHARACTERISTICS OF GROUNDWATER IN THE CENTRAL AND WEST COAST BASINS

Major minerals data from general mineral analyses were used to characterize groundwater from discrete vertical zones of each WRD well with respect to source of recharge water (**Table 4.1**). Research by the USGS has provided three distinct groupings of groundwater compositions. Group A groundwater is typically calcium bicarbonate or calcium bicarbonate/sulfate dominant. Group B groundwater has a typically calcium-sodium bicarbonate or sodium bicarbonate character. Group C has a sodium chloride character. A few of the WRD wells yield groundwater samples which do not fall into one of the three major groups and are grouped separately.

Groundwater from Group A likely represents recently recharged water with a significant percentage of imported water. Groundwater from Group B represents older native groundwater replenished by natural local recharge. Groundwater from Group C represents groundwater impacted by seawater intrusion or connate saline brines. **Table 4.1** lists the groundwater group for each WRD nested monitoring well sampled during WY 2001-2002. Comparison of groundwater groups with well locations indicates that, in general, Group A groundwater is found at and immediately down-gradient from the Montebello Forebay spreading grounds in all but the deepest zones. Group B groundwater is found farther down the flow path of the Central Basin and inland of the salt water wedge and injected water in the West Coast Basin. Group C water is generally found near the coastlines. Several wells, grouped as "Other" on **Table 4.1**, exhibit a chemical character range different from Group A, B, and C ranges and represent unique waters not characteristic of the dominant flow systems in the basins. The USGS is currently conducting trace element isotope analyses of water from these wells to identify their hydrogeologic source(s).

The major mineral compositions of water from the WRD nested monitoring wells sampled this water year have not changed substantially from previous years where older data are available. It is expected that continued analysis will show gradual changes in major mineral compositions over time, as older native water is extracted from the basins and replaced by younger artificially replenished water.

4.2 TOTAL DISSOLVED SOLIDS (TDS)

As described in Section 2.3, TDS is a measure of the total mineralization of water. It represents the overall mineral content of the water and usually is the first indicator used in assessing the quality of the water. The State DHS has established a recommended secondary standard of 500 mg/L and an upper limit of 1,500 mg/L for short term use. Exceeding the upper limit is not considered a health hazard, but high TDS levels can impart a salty taste.

WRD nested monitoring well data for WY 2001-2002 indicate relatively low TDS concentrations for groundwater in the deeper producing aquifers of the Central Basin (**Figure 4.1**). TDS concentrations in the Central Basin ranged from 190 mg/L in Lakewood #1 zones 1 and 2, to 2,720 mg/L in Whittier #1 zone 1. In the Central Basin, a Silverado Aquifer zone in 15 out of 19 WRD nested monitoring wells had very low TDS concentrations, below 500 mg/L. The Silverado aquifer zones of 18 out of 19 Central Basin wells tested were less than the DHS upper limit for TDS of 1,500 mg/L. Generally, TDS concentrations above 1000 mg/L were limited to localized very deep or very shallow zones of Whittier #1, Inglewood #2, Long Beach #1, and Long Beach #2.

In contrast, West Coast Basin nested monitoring well data show generally higher TDS concentrations. TDS in WRD nested monitoring wells in the West Coast Basin ranged from 200 mg/L in Carson #1 zone 1, to 11,000 mg/L in PM-4 Mariner zone 2. Only the most inland nested monitoring wells, Carson #1, Carson #2, and Gardena #1 indicate TDS values below 500 mg/L consistently for all zones below the shallowest. Wilmington #1 and Wilmington #2, located near the Dominguez Gap Seawater Intrusion Barriers have significantly high TDS values, each with elevated TDS in multiple zones, including Silverado aquifer zones, above 1000 mg/L. Many zones of the Inglewood #1 and Lomita # 1 nested monitoring wells exceed 750 mg/L with one or more zones greater than 1,000 mg/L.

Figure 4.2 presents DHS water quality data for TDS in production wells across the CWCB during WYs 1999-2002. In the Central basin, TDS generally ranged between 250 and 750 mg/L over most of the basin. In a localized area along the San Gabriel River around and partially down the flow paths from the Rio Hondo and San Gabriel River spreading grounds, many wells had TDS concentrations between 500 and 750 mg/L. A few wells in this area exceeded 1,000 mg/L TDS. Many production wells in the southernmost portion of the Central Basin indicated TDS less than 250 mg/L.

Data from West Coast Basin wells indicate that most wells in production had TDS concentrations below 750 mg/L. Several production wells in the Hawthorne/Torrance areas, close to the coast, had elevated TDS concentrations above 1,000 mg/L.

4.3 IRON

Iron and manganese in general are not harmful for ingestion. They are essential nutrients. However, secondary standards of 0.3 mg/L for iron and 0.05 mg/L for manganese were established for aesthetic purposes. If completely oxidized, they are relatively insoluble in groundwater as Fe^{+3} and Mn^{+4}. However, under anaerobic conditions, they exist in the reduced forms of Fe^{+2} and Mn^{+2} which are more soluble in water. Upon exposure to air they will then oxidize slowly and form undesirable precipitates that discolor the water. Iron and manganese can discolor water and stain plumbing fixtures and clothes. Iron will cause encrustation in pipes and boilers and also impart a metallic taste to the water.

Dissolved iron in groundwater has historically been a water quality problem in portions of the CWCB. An abundant source of iron is present in the minerals making up the aquifers of the basins. The presence of dissolved iron, that is, iron dissolving from the minerals into the groundwater is controlled by a variety of geochemical factors discussed at the end of this section. In the Central Basin iron in nested monitoring wells (**Figure 4.3**) ranged from less than the detection limit (numerous wells) to 0.61 mg/L (Inglewood #2 zone 1). Six wells in the Central Basin had detectable iron concentrations in the Silverado zones. These include Inglewood #2, Huntington Park #1, Commerce #1, Montebello #1, Pico #1, and Whittier #1. Only a Silverado zone in Pico #1 exceeded the MCL. Iron was detected in zones above and/or below the Silverado Aquifer in seven of the nineteen Central Basin nested wells sampled.

In the West Coast Basin elevated iron occurs locally. Iron concentrations ranged from less than the detection limit (numerous wells) to 0.39 mg/L (PM-3 Madrid zone 4). One well in the West Coast Basin had an iron concentration in the Silverado exceeding the MCL. This well, Inglewood #1, is at the northern margin of the basin which generally indicates slightly higher iron concentrations than wells in the central and southern portions of the basin where iron concentrations tend to be below MCL and even below detectable limits in the Silverado aquifer.

Figure 4.4 presents DHS water quality data for iron in production wells across the CWCB during WYs 1999-2002. The data show elevated iron concentrations in many production wells throughout the CWCB and many purveyors must treat groundwater to remove the iron. There does not appear to be a distinct pattern to the occurrence of elevated iron. Production wells exhibiting high iron concentrations appear in and around many with non-detectable iron.

Data from DHS for the West Coast Basin show several production wells in the northwestern portion of the basin have iron concentrations exceeding the secondary MCL. In the southern portion of the basin, iron concentrations were either non-detectable or below the MCL.

Although a definitive source cannot be identified for the various elevated iron concentrations described above, some general geochemical relationships for dissolved iron in groundwater may apply to the iron distribution patterns. First, dissolved iron tends to form under reducing groundwater conditions. Groundwater having a pH value between 6 and 8 (as is the case for all the WRD wells) can be sufficiently reducing to retain as much as 50 mg/L of dissolved ferrous iron at equilibrium, when bicarbonate activity does not exceed 61 mg/L (Hem, 1992). Second, iron is a common component of many igneous rocks and is found in trace amounts in virtually all sediments and sedimentary rocks—therefore, abundant natural sources of dissolved iron are present throughout the CWCB and in particular geochemical conditions, the natural iron will dissolve into the groundwater. Third, water may dissolve any subsurface iron casing, piping, etc. (the main materials of older production wells and pumps, and distribution systems), thus production wells themselves may contribute iron to water supplies.

4.4 MANGANESE

Manganese concentrations in the WRD nested monitoring wells exhibit widespread vertical and horizontal variations across the CWCB. Like iron, manganese is a naturally occurring element in groundwater and aquifer materials. In the Central Basin (**Figure 4.5**), manganese ranged from below the detection limit (numerous wells) to

760 µg/L (Pico #2 zone 6). In the southern portion of the basin, elevated manganese typically occurs in shallower aquifers above the Silverado producing zones. In the northern portion of the Central basin, manganese is present in shallow zones, the Silverado Aquifer, and the deeper zones.

In the West Coast Basin, manganese concentrations in nested monitoring wells ranged from below the detection limit (numerous wells) up to 1,200 µg/L (PM-4 Mariner zone 2). In the southern portion of the West Coast Basin, like iron, elevated manganese concentrations were limited to aquifer zones above the Silverado. In the western portion of the West Coast Basin, manganese concentrations typically exceed the MCL in most zones with only a few of the deepest aquifer zones below the MCL.

Figure 4.6 presents DHS water quality data for manganese in production wells across the CWCB during WYs 1999-2002. The data show a large number of wells having elevated manganese concentrations with approximately one-third exceeding the MCL. The production wells with elevated manganese tend to be widespread, but there does appear to be an area around and for about five miles down the flow path from the Montebello Forebay spreading grounds where manganese is below the MCL. In the West Coast Basin, production wells with high concentrations of manganese tended to occur somewhat more in the westernmost wells.

4.5 NITRATE

Nitrate concentrations in groundwater are a concern because its presence indicates that some contamination occurred from the degradation of organic matter. Native groundwater typically does not contain nitrate. It is usually introduced into groundwater from historic agricultural practices such as fertilizing crops and leaching of animal wastes, and is also formed when recycled water is percolated through the soil during recharge. Typically, organic nitrogen and ammonia are the initial byproducts from the decomposition of human or animal wastes. The organic nitrogen and ammonia, as they become oxidized, are converted to nitrite then nitrate ions in the ground. A portion of the nitrites and nitrates are converted to nitrogen gas and hence returned to the atmosphere.

Nitrate itself is not harmful. However, it can be converted back to nitrite in infants, which leads to methemoglobinemia, a condition in which hemoglobin in the blood cannot transport oxygen throughout the body. This results in a lack of oxygen, causing lethargy, shortness of breath, and a bluish skin color. Under extreme cases, this condition can be fatal. To safeguard public health, the DHS has a standard of 10 mg/L as nitrogen for nitrate, 1 mg/L as nitrogen for nitrite, and 10 mg/L as nitrogen for the total of nitrite and nitrate.

Figure 4.7 presents nitrate (as nitrogen) water quality data for nested monitoring wells in the CWCB during WY 2001-2002. In the Central Basin, nitrate (as nitrogen) concentrations ranged from below the detection limit (numerous wells) to 11.4 mg/L (Los Angeles #1 zone 5). Nested monitoring wells in the vicinity of the Montebello Forebay spreading grounds indicate concentrations of nitrate slightly above detection but below the MCL. Rio Hondo #1 and Pico #2 show detectable concentrations of nitrate from the shallowest down to Zones 3 and 1 respectively. South Gate #1, Downey #1, and Cerritos #2 show detectable concentrations in one or more of the middle zones, which are directly down the flow path from the spreading grounds, however Silverado and deeper zones of nested wells more distant from the spreading grounds have no detectable concentrations of nitrate. The detectable but relatively low concentrations of nitrate at and near the spreading grounds may be due to the local water and/or recycled water component of recharge at the spreading grounds. Nitrate is also observed in shallow zones at Huntington Park #1, Commerce #1, Pico #1, and Whittier #1. These shallow occurrences of nitrate, away from the spreading grounds, likely attributed to local surface recharge from former agricultural activities prior to the extensive land development beginning in the 1950s.

In the West Coast Basin nested monitoring wells, nitrate concentrations ranged from below the detection limit (numerous wells) to 14 mg/L (Gardena #1, zone 4). Concentrations exceeding the nitrate MCL were limited to the shallowest zone of Inglewood #1 and Gardena #1. Detections below the MCL in the shallowest zone at Hawthorne #1 were observed along with 4 of 5 zones monitored at Lomita #1. As in the

Central Basin, shallow zone occurrences of nitrate where deeper zones are below detection levels are likely attributable to local surface recharge from former agricultural activities prior to the extensive land development beginning in the 1950s.

Figure 4.8 presents DHS water quality data for nitrate in production wells across the CWCB during WYs 1999-2002. The data show only one production well, located in the Los Angeles Forebay exceeded the nitrate MCL in the CWCB during the past data period. Detectable concentrations below the MCL were generally located around and down the groundwater flow path of the San Gabriel River and Rio Hondo spreading grounds of the Montebello Forebay, and in several scattered detections in the northwestern portion of the Central Basin. Production wells in the southern portion of the Central Basin and most of the West Coast Basin show non-detectable nitrate concentrations.

4.6 HARDNESS

Figure 4.9 presents water quality data for total hardness in WRD nested monitoring wells in the CWCB during WY 2001-2002. As described in Section 2, there is no MCL established for total hardness; rather, hardness is undesirable due to scaling and other qualities. In the Central Basin total hardness ranged from 7.4 (Long Beach 1 zone 2) to 1,030 mg/L (Whittier #1 zone 1), while in the West Coast Basin, hardness ranged from 17.9 mg/L (Wilmington #2 zone 1) to 5,140 mg/L (PM-4 Mariner zone 2). In general, the deeper aquifers in the southern portion of the Central Basin and locally in the West Coast Basin show low total hardness, zones characterized as having older native groundwater. Most other zones in both basins have moderate to high hardness.

Figure 4.10 presents DHS water quality data for total hardness in production wells in the CWCB during WYs 1999-2002. Groundwater in the West Coast Basin has moderate hardness. Production wells in the southern and western portions of the Central Basin show groundwater with low to moderate hardness. In the northern portion of the Central Basin, production wells show groundwater with generally moderate to high hardness.

4.7 SULFATE

Figure 4.11 presents water quality data for sulfate in WRD nested monitoring wells in the CWCB during WY 2001-2002. In the Central Basin sulfate ranged from below the detection limit (numerous wells) to 1,400 mg/L (Whittier #1 zone 1), while in the West Coast Basin sulfate ranged from below the detection limit (numerous wells) to 650 mg/L (PM-4 Mariner zone 2). The data indicate, generally, the lowest sulfate concentrations are found in most of the deeper zones of the West Coast Basin and southern portion of the Central Basin. Again, these are areas characterized in previous sections as having older native groundwater. The uppermost one or two zones in many of these wells typically show elevated sulfate concentrations, likely due to local surface recharge. In the northeast portion of the Central Basin, higher sulfate concentrations are observed in most zones primarily due to the relatively high sulfate in imported Colorado River water. Only two nested monitoring wells indicated the Silverado Aquifer is impacted by sulfate greater than the MCL. These include the Whittier #1 well, in an area of generally poor water quality, and PM-4 Mariner, which is impacted by sea water intrusion in the West Coast Basin.

Figure 4.12 presents DHS water quality data for sulfate in production wells in the CWCB during WYs 1999-2002. The production well data indicate patterns of sulfate concentrations similar to the deeper zones of WRD nested monitoring wells. Sulfate is generally low in the central and eastern areas of the West Coast Basin and southern portion of the Central Basin, and somewhat higher along the western margin of the West Coast Basin and in the northern portion of the Central Basin.

4.8 CHLORIDE

Figure 4.13 presents water quality data for chloride in WRD nested monitoring wells in the CWCB during WY 2001-2002. In the Central Basin, chloride concentrations ranged from 5.1 mg/L (Downey #1 zone 1) to 730 mg/L (Long Beach #1 zone 5). The Silverado aquifer zones of the Central Basin nested monitoring wells have low to very low chloride concentrations, all below the MCL of 250 mg/L. In the West Coast Basin, chloride ranged from 16 (Gardena #1 zone 1) to 5600 mg/L (PM-4 Mariner zone 2). Chloride concentrations exceeded the MCL in the Silverado aquifer zones in four of the twelve West Coast Basin nested wells, primarily due to seawater intrusion (Wilmington #1 and #2, and PM-4 Mariner) or yet to be identified sources (Lomita #1).

Figure 4.14 presents DHS water quality data for chloride in production wells in the CWCB during WYs 1999-2002. No Central Basin production wells had chloride levels above the MCL. In the southern portion of the Central Basin, chloride concentrations in production wells were generally below 50 mg/L; while in the northeastern portion of the Central Basin, concentrations in most wells were slightly higher, between 50 and 100 mg/L. In the West Coast Basin, available DHS data indicate only the westernmost production wells had chloride concentrations above the MCL.

4.9 TRICHLOROETHYLENE (TCE)

TCE is a commonly used solvent for metal cleaning, dry cleaning of fabrics, and textile processing. It is classified as a probable human carcinogen. Its presence in groundwater most likely originated from improper disposal practices. The MCL for TCE is 5 μg/L. If it is found in water, it can be easily treated either by packed tower aeration or granular activated carbon.

TCE was detected in five WRD nested monitoring wells in the Central Basin and three in the West Coast Basin (**Figure 4.15**). In the Central Basin, TCE concentrations ranged from below the detection limit (numerous wells) to 22 μg/L (Los Angeles #1 zone 2) Only one well in the Silverado Aquifer, South Gate #1, had detectable TCE concentrations and it was below the MCL. Four other locations (Los Angeles #1 zones 4 and 5, Huntington Park #1 zones 3 and 4, Commerce #1 Zone 5, and Downey #1 zones 5 and 6) had detections of TCE in zones above the Silverado Aquifer. The detections in Los Angeles #1 zones 4 and 5, and Huntington Park #1 Zone 3 were above the MCL.

In the West Coast Basin, TCE concentrations ranged from below the detection limit (numerous wells) to 57 μg/L (Inglewood #1 zone 5). In the shallowest zone and deepest zone of Inglewood #1, and the shallowest zone of Hawthorne #1, TCE concentrations above the MCL were detected. In the shallowest zone at PM-3 Madrid, TCE was detected below the MCL. TCE was not detected in the Silverado zones at any nested monitoring wells in the West Coast Basin.

Figure 4.16 presents DHS water quality data for TCE in production wells across the CWCB during WYs 1999-2002. A total of 319 wells were tested for TCE. The data show that over the past three years TCE has been detected in 44 production wells in the Central Basin. Ten detections were above the MCL. All of those testing above the MCL were in or near the Montebello and Los Angeles Forebay areas. In the West Coast Basin TCE was detected in one production well, above the MCL, sampled during WYs 1999-2002.

4.10 TETRACHLOROETHYLENE (PCE)

Tetrachloroethylene, also known as perchloroethylene or perc, is a solvent used in dry cleaning, textile processing, and metal degreasing. It is also used in the manufacture of fluorocarbons and as a septic tank cleaner. Through improper disposal practices, it has contaminated many groundwater basins. It is a probable human carcinogen. The MCL for PCE is 5 µg/L. Like TCE, PCE is easily treated with packed tower aeration or granular activated carbon.

During WY 2001-2002, PCE (**Figure 4.17**) was detected in six nested wells in the Central Basin and one well in the West Coast Basin. In the Central Basin, PCE ranged from below the detection limit (numerous wells) to 10 µg/L (Pico #2 zone 3, and South Gate #1 zone 4), all from nested wells within or near the Montebello forebay. At well Pico #2 and South Gate #1, PCE was detected above the MCL in the Silverado Aquifer. At Downey #1, PCE was detected below the MCL within and below the Silverado Aquifer. Elsewhere, South Gate #1 shows PCE detected below the MCL beneath the Silverado Aquifer. At Huntington Park #1, PCE was detected below the MCL in zones 3 and 4, above the Silverado Aquifer. At Los Angeles #1, PCE was detected below the MCL in the shallowest zone, above the Silverado aquifer.

In the West Coast Basin, PCE concentrations were below the detection limit in all nested monitoring wells except Inglewood #1. The shallowest zone at Inglewood #1 had 9.7 µg/L of PCE. The deepest zone, below the Silverado aquifer, at Inglewood #1 also indicated PCE below the MCL.

Figure 4.18 presents DHS water quality data for PCE in production wells across the CWCB during WYs 1999-2002. In the Central Basin, PCE was detected in 74 production wells. Eleven of the 74 wells exceeded the MCL for PCE. Production wells with PCE are primarily located in or near the Los Angeles and Montebello Forebays and extend out into the western portion of the Central Basin. PCE was not detected in any production wells tested in the West Coast Basin during WYs 1999-2002.

4.11 SPECIAL INTEREST CONSTITUENTS

Several additional water quality constituents have been studied by WRD to address emerging water quality issues related to hazardous waste contamination, recycled water use in the CWCB, and proposed revisions to water quality regulations. Current special interest constituents include arsenic, hexavalent chromium, MTBE, total organic carbon (TOC), apparent color, and perchlorate. The studies in some cases have included focused sampling of WRD nested monitoring wells and evaluation of DHS Title 22 Program data for the special interest constituents. The following subsections present the data collected for these constituents.

4.11.1 Arsenic

EPA announced on October 31, 2001 that they will keep the arsenic standard at 10 µg/L, as they had originally announced on January 21, 2001. Three expert panel reviews were completed on the health effects of arsenic, costs for compliance, and benefits associated with varying degrees of treatment, and were considered before EPA's announcement. The current standard is 50 µg/L. Because costs for small systems will be significant, EPA has indicated that they will provide assistance in funding and training, as well as research to find new treatment technologies that will reduce the cost for compliance. The date for compliance for all water systems is January 2006.

Health and Safety code Section 116361 requires the State Department of Health Services to adopt a new arsenic MCL by June 30, 2004 and requires the Office of Environmental Health Hazard Assessment (OEHHA) to establish a new Public Health Goal (PHG) by December 31, 2002. Also, new language concerning the health effects of ingesting water with arsenic will be required in consumer confidence reports after July 1, 2003. OEHHA announced on March 7, 2003 that they are proposing a draft PHG of 0.004 µg/L and will receive public comments until May 2, 2003. DHS convened three stakeholder meetings in February and March 2003 to receive public comments on how to best approach the process of setting a standard for arsenic.

Arsenic is an element that occurs naturally in the earth's crust. Accordingly, there are natural sources of exposure. These include weathering and erosion of rocks, depositing arsenic in water bodies, and uptake of the metal by animals and plants. Consumption of food and water are the major sources of arsenic exposure for the majority of U.S. citizens. Over ninety percent of arsenic is used as wood preservative in the form of chromate copper arsenate to prevent dry rot, fungi, molds, termites, and other pests. People may also be exposed from other uses of arsenic in industrial applications, such as semiconductor manufacturing, petroleum refining, animal feed additives and herbicides. Arsenic is carcinogenic and also causes other health effects such as high blood pressure and diabetes.

The Safe Drinking Water Act, as amended in 1996, requires the United States Environmental Protection Agency (EPA) to revise the existing drinking water standard for arsenic, which they have done. The DHS is required to establish a standard equal to or more stringent than the EPA standard. In establishing the new statewide standard, the DHS will consider not only possible adverse health effects from exposure to this constituent but also, as required by statute, technical, and economic feasibility. Studies have shown that treatment to remove arsenic to acceptable levels is technically feasible.

However, the arsenic then becomes a potential hazardous waste. It is uncertain if arsenic residuals can be properly disposed of at acceptable costs.

Figure 4.19 presents arsenic water quality data for WRD nested monitoring wells during WY 2001-2002. In the Central Basin arsenic concentrations ranged from none detectable (numerous wells) to 36 μg/L in the shallowest zone at Cerritos #1. Arsenic concentrations greater than the pending MCL in the Central Basin were found at four wells, the Pico #2, Lakewood #1, Cerritos #1, and Cerritos #2 wells. Arsenic concentrations exceeding the pending MCL in the Silverado aquifer zones were found only at Cerritos #1, along the eastern District boundary. Overall the distribution of arsenic appears to be similar to the distribution of iron and manganese in the Central Basin with generally lower concentrations near the Forebays and higher concentrations down the flow paths away from the Montebello Forebay spreading basins.

In the West Coast Basin no zones in the Silverado Aquifer had arsenic concentrations above the pending MCL. Only the deepest zone in Gardena #1, below the Silverado Aquifer, had a concentration (20 μg/L) of arsenic above the pending MCL of 10 μg/L.

Figure 4.20 presents DHS water quality data for arsenic in production wells across the CWCB during WYs 1999-2002. Production wells in the central and southeastern portion of the Central Basin indicated eleven production wells with arsenic concentrations above the pending MCL. Many other production wells at various locations in the Central Basin had arsenic between 5 and 10 μg/L. Arsenic was not detected in any West Coast Basin production wells from WYs 1999 through 2002.

4.11.2 Chromium

Chromium is a metal used in the manufacture of stainless steel, metal plating operations, and other applications. It has the potential to contaminate groundwater from spills and leaking tanks. It comes in two basic forms: chromium 3 (trivalent) and chromium 6 (hexavalent). Chromium 3 is a basic nutrient that is quite commonly ingested by adults in doses of 50 to 200 μg/day. Chromium 6 is a known carcinogen when inhaled. This is based on occupational exposures in chromium plating and other related industries. It is unclear if ingestion of chromium 6 is harmful.

Currently the MCL for total (all forms of) chromium is 50 μg/L. In February 1999, OEHHA established a Public Health Goal for total chromium at 2.5 μg/L, based on a health protective level for chromium 6 at 0.2 μg/L and the assumption that 7 percent of total chromium in drinking water is chromium 6. In November 2001, OEHHA announced that it rescinded this PHG. At their request earlier this year, a scientific panel convened by the University of California, known as the Chromate Toxicity Review Committee, reviewed the study that OEHHA originally used as a basis for their PHG and concluded in September 2001 that the data were flawed and should not be used for health risk assessment. At the request of both DHS and OEHHA, the National Toxicity Program of the National Institute of Environmental Health Sciences will perform a long-term health effects study on rodents to evaluate the potential carcinogenicity of ingested chromium 6. It is expected to be completed in 2005. DHS has added chromium 6 to its list of Unregulated Chemicals Requiring Monitoring (UCRM) in production wells.

Health and Safety Code Section 116365.5 requires DHS to adopt a chromium 6 MCL by January 1, 2004. OEHHA will develop a new chromium 6 PHG in 2003.

Figure 4.21 presents total chromium water quality data for WRD nested monitoring wells. In the Central Basin, only the uppermost zone in the Los Angeles #1 nested well exceeded the MCL of 50 μg/L for total chromium. Trace levels of total chromium were detected in one or more zones of numerous other Central Basin nested wells. Total chromium was not detected above the MCL in the West Coast Basin. As in the Central Basin, trace levels of total chromium were detected in one or more zones of numerous other nested wells in the West Coast Basin.

Figure 4.22 presents DHS water quality data for total chromium in production wells across the CWCB during WYs 1999-2002. Only two production wells in the South Gate area of the Central Basin exceeded the MCL for total chromium. Four other production wells, all in the northwest corner of the Central Basin, had total chromium detected below the MCL. In the majority of other production wells sampled in the Central Basin, total chromium was not detected. Total chromium was detected below the MCL in one production well in the central portion of the West Coast Basin.

Figure 4.23 presents hexavalent chromium water quality data for WRD nested monitoring wells. In the CWCB, most WRD nested monitoring wells were sampled twice for hexavalent chromium since early 1998. Most zones of nested monitoring wells of the CWCB tested below the Preliminary Health Goal of 0.2 µg/L. However, in one area, the northern portion of the Central Basin, hexavalent chromium was detected from 0.2 to 30 µg/L. All of the detected concentrations were below the current MCL for total chromium. In the Los Angeles #1, Huntington Park #1, Commerce #1, Downey #1, Pico #1, and Whittier #1 wells hexavalent chromium was detected in zones above the Silverado Aquifer. In Los Angeles #1, South Gate #1, Downey #1, Rio Hondo #1, Pico #2, Cerritos #2, and Long Beach #1 hexavalent chromium was detected in zones within and/or below the Silverado Aquifer. In the West Coast Basin, hexavalent chromium was detected below the MCL in the shallowest zones of Inglewood #1, Gardena #1, and Chandler #3.

As new wells are added to the WRD nested monitoring well network, samples will be collected for hexavalent chromium analysis to update these special study results. WRD will report these updates in subsequent regional groundwater monitoring reports.

Figure 4.24 presents WYs DHS water quality data for hexavalent chromium in production wells across the CWCB during 1999-2002. Hexavalent chromium analyses have been reported in 134 production wells in the Central Basin and West Coast Basins. Detections of hexavalent chromium were observed in the northern portion of the Central Basin. Most of the detected concentrations were below the MCL for total chromium, only one production well in the Central Basin had a concentration above the MCL. In the southern and southeastern portion of the Central Basin, all production wells tested below the detection limit for hexavalent chromium. Hexavalent chromium was not detected in any West Coast Basin production well.

4.11.3 Methyl Tert-Butyl Ether (MTBE)

Methyl tert(iary) butyl ether (MTBE) is a synthetic chemical added to gasoline to improve air quality as part of the federal Clean Air Act. Limited quantities have been used in gasoline in California since the 1970s. In 1992, oil companies began using it extensively in California to meet reformulated gas requirements of the State Air Resources Board. Its use enables gasoline to burn more completely. However, MTBE has been detected in groundwater and surface water sources throughout California from leaking underground storage tanks and pipelines and spills and also from emissions of marine engines into lakes and reservoirs. Animal tests have shown it to be carcinogenic. Effective May 17, 2000, a primary MCL of 13 μg/L was established by DHS. A secondary standard of 5 μg/L was established in response to taste and odor concerns. An executive order by Governor Davis baned the use of MTBE by December 31, 2002, which should significantly reduce, if not virtually eliminate new discharges. In March 2002, the Governor delayed the ban one year to December 31, 2003 over concerns that a ban would result in gasoline shortages and increased prices. The most likely substitute for MTBE is ethanol. The production and distribution of ethanol, however, is problematic. There may not be an adequate supply source, and it cannot be delivered by pipelines. The state requested a waiver for oxygenates from the USEPA, and was denied this request. The state has filed suit requesting EPA to reconsider.

Figure 4.25 presents MTBE water quality data for WRD nested monitoring wells during WY 2001-2002. MTBE was detected in only the uppermost zone of one of the WRD nested monitoring wells, Gardena #1 in the West Coast Basin. This was the first detection of MTBE in the CWCB by WRD since the monitoring of the nested wells for this chemical began in 1999.

Figure 4.26 presents DHS water quality data for MTBE in production wells across the CWCB during WYs 1999-2002. In the Central Basin, MTBE was detected in two production wells in the Montebello Forebay area. These were the first DHS reported

MTBE detections in the CWCB since MTBE emerged as a chemical of concern in the 1990s. MTBE was not detected in any West Coast Basin production wells during the reporting period.

4.11.4 Total Organic Carbon

Total organic carbon (TOC) is the broadest measure of all organic molecules in water. TOC can be naturally occurring, wastewater-derived, or a combination of both (NRC, 1998). While there is no MCL established for TOC, regulators are generally concerned with wastewater derived TOC as a measurable component of recycled water. Typically, wastewater that has been subjected to effective secondary treatment contains 5 to 15 mg/L of TOC. Advanced treatment can effectively lower the TOC concentration to less than 1 mg/L. Likewise, soil has also been proven to be an effective method in reducing TOC in reclaimed water. It is likely that much of the TOC measured in groundwater samples in both nested monitoring wells and production wells in the CWCB is naturally occurring in the aquifer systems and was derived from organic material and decaying vegetation either deposited with the aquifer sediments as the basins were filling or originally contained in imported water.

Figure 4.27 presents TOC water quality data for WRD nested monitoring wells during. In the Central Basin, TOC was detected in multiple zones of 16 out of 19 nested monitoring wells. Only La Mirada #1 and Cerritos #1 had no detectable TOC in any zone. Where TOC is present, concentrations are typically below 1 mg/L and less frequently between 1 and 5 mg/L. These lower concentrations of TOC occur in the shallow and middle zones of the nested wells. Higher concentrations of TOC are generally found in deeper zones. Only four wells in the Central Basin have zones with TOC greater than 5 mg/L including the two deepest zones at Long Beach #6, the deepest zone at Long Beach #2, the deepest two zones at Inglewood #2, and the deepest zone sampled at Montebello #1. The deeper wells with TOC greater than 5 mg/L are likely to contain naturally occurring organic carbon, and not wastewater related organic carbon. In the West Coast Basin, TOC greater than 1 mg/L is present in one or more zones at all 12 nested monitoring wells tested, and greater than 5 mg/L in one or more zones at six out of the 12 West Coast Basin production wells tested.

Figure 4.28 presents limited DHS water quality data for TOC in production wells across the CWCB during WYs 1999-2002. During the three-year period only 46 wells were tested for TOC. Only five out of the 46 wells tested below the detection limit for TOC. Most had TOC ranging from 1 to 5 mg/L and most were located near the Montebello Forebay spreading basins or in the southern Central Basin (City of Long Beach).

4.11.5 Apparent Color

Apparent color in groundwater (colored groundwater) is not toxic or harmful; however an MCL of 15 apparent color units (ACUs) has been established as an aesthetic standard. Colored groundwater results from colloidal organic particles suspended in the water and impart colors ranging from pale yellow to a dark tea brown. There is an observed relationship between apparent color and TOC, especially in the higher ranges of concentrations. Colored groundwater can be effectively treated and served, however it is relatively expensive.

Figure 4.29 presents apparent color water quality data for WRD nested monitoring wells in the CWCB during WY 2001-2002. Apparent color is present above the MCL in the deepest zones of nine nested monitoring wells. Two other wells have apparent color above the MCL in intermediate zones. Apparent color does not exceed the MCL in the uppermost zone in any nested monitoring well tested. This relationship of higher color and depth, along with the relationship with TOC, is probably due to an increase in the content of natural organic matter in the deeper sediments of the basins.

Figure 4.30 presents DHS water quality data for apparent color in production wells across the CWCB during WYs 1999-2002. These data indicate that colored groundwater is not a widespread problem in the basins. Most production wells tested below the MCL. Locally, in the Cerritos, Long Beach, Inglewood, and South Gate/Commerce areas, several wells did test above the MCL for apparent color and the purveyors in those areas do have treatment systems operating to remove color from the groundwater.

4.11.6 Perchlorate

Perchlorate is the primary ingredient in rockets, missiles, and fireworks. It also has widespread use in air bag inflators, electronics, electroplating, lubricating oils, and the production of paints and enamels. Studies showed that perchlorate can impact the proper functioning of the thyroid gland by inhibiting the uptake of iodide, and cause a decrease in the production of hormones necessary for normal growth and development and normal metabolism.

DHS established an action level of 18 μg/L in 1997, but revised it to be 4 μg/L on January 18, 2002, based on more current studies. OEHHA proposed a draft PHG of 2 to 6 μg/L in December 2002, after receiving public comments, and OEHHA is now drafting their findings before issuing a final PHG. Health and Safety Code Section 116275 requires DHS to adopt a MCL for perchlorate by January 1, 2004.

Figure 4.31 presents perchlorate water quality data for WRD nested monitoring wells in the CWCB during 1998-2002. Perchlorate was not detected above the State Action Level (SAL) in any WRD nested monitoring wells. Perchlorate is present below the SAL in four of the 29 nested monitoring wells. In the Central Basin perchlorate was in or below the Silverado Aquifer at Downey #1, South Gate #1 and Los Angeles #1. Perchlorate was also detected in the shallowest zone of Los Angeles #1. In the West Coast Basin, perchlorate was detected below the SAL at one well, the shallowest zone of Lomita #1. Several of the WRD nested monitoring wells have not been tested for perchlorate and these wells will be sampled during the next monitoring period and the results of this special study constituent will be updated in next year's report.

Figure 4.32 presents DHS water quality data for perchlorate in production wells across the CWCB during WYs 1999-2002. These data indicate perchlorate is not a widespread problem in the basins. Most production wells tested below the detection limit. Locally, one production well in Norwalk and three production wells in the Los Angeles Forebay had perchlorate concentrations detected below the SAL.

SECTION 5
SUMMARY OF FINDINGS

This Annual Groundwater Monitoring Report was prepared by WRD to report on the groundwater conditions in the CWCB during the WY 2001-2002. A summary of findings is presented below.

- Artificial replenishment activities combined with natural replenishment and controlled pumping have ensured a sustainable, reliable supply of groundwater in the CWCB. Artificial replenishment water sources used by WRD include imported water from the Metropolitan Water District of Southern California, recycled water from the County Sanitation Districts of Los Angeles County, recycled water with advanced treatment from West Basin MWD, and In-Lieu replenishment water.
- At the Montebello Forebay, 41,268 AF of imported water was purchased for replenishment during WY 2001-2002. A total of 60,596 AF of recycled water was purchased for spreading in the Montebello Forebay. A total of 24,376 AF of imported water was purchased for injection to the seawater barriers. A total of 7,276 AF of recycled water was purchased for injection into the West Coast Basin Barrier Project. In-Lieu replenishment water totaled 20,720 AF for Fiscal Year 2001-2002. Total artificial replenishment was 154,236 AF for WY 2001-2002.
- Groundwater production in the CWCB was 249,996 AF for Water Year 2001-2002. This amount is less than the adjudicated amount of 281,835 AF, partly due to WRD's In-Lieu Replenishment Program, which provides incentives to pumpers for not pumping in areas that are difficult to recharge by other means.
- Groundwater levels were monitored continuously in the CWCB over the water year. The WRD nested monitoring wells show clear, significant differences in groundwater elevations between the various aquifers screened. The head differences in the WRD nested monitoring wells reflect both hydrogeologic and pumping conditions in the CWCB. Vertical head differences between 1 and 110 feet occur between zones above and within the producing zones. The greatest head differences tend to occur in the

pumping holes of the Central and West Coast Basin Pressure Areas, while the smallest differences occur in the Montebello Forebay recharge area, and the Torrance area which has thick, merged aquifers.

- Basinwide hydrographs and groundwater elevations measured in nested monitoring wells and key production wells indicate a slight decline in water levels in the CWCB during WY 2001-2002. On average, water levels dropped about 2 feet during WY 2001-2002. The change in groundwater storage for the CWCB was calculated at a loss in storage of approximately 36,454 AF from the CWCB.
- The water quality associated with key constituents in untreated imported water used at the Montebello Forebay spreading grounds remains good. Average TDS, hardness, iron and manganese concentrations in both Colorado River and State Project Water remain below their respective MCLs. Meanwhile, TCE and PCE have not been detected in either water source.
- The water quality associated with key constituents in recycled water used at the Montebello Forebay spreading grounds also remains excellent and is carefully monitored and controlled to show little variation over time.
- Stormwater samples are occasionally collected and analyzed for water quality parameters. Samples collected during WY 2001/2002 show that average stormwater TDS concentrations and hardness are lower than most other sources of replenishment water.
- Based on the data obtained from the WRD nested monitoring wells during WY 2001-2002, the water quality associated with key constituents in groundwater differs both vertically between aquifers and horizontally (areally) across the CWCB.
- TDS concentrations for WRD wells located in the Central Basin are relatively low, while TDS concentrations for WRD wells located in the West Coast Basin are elevated in portions of the basin, primarily the Torrance and Dominguez Gap areas. The elevated TDS concentrations may be caused by seawater intrusion or connate brines, or possibly oil field brines. During this reporting period, concentrations in the Central Basin ranged from 190 mg/L to 2,720 mg/L, and in the West Coast Basin 200 mg/L to 11,000 mg/L. The District is conducting further studies with the USGS to identify the sources of high TDS.

- Iron concentrations continue to be problematic in portions of the CWCB. During this reporting period, concentrations in the Central Basin ranged from non-detectable to 0.61 mg/L, and in the West Coast Basin non-detectable to 0.39 mg/L. The secondary MCL for iron is 0.3 mg/L. Sources of the localized high iron concentrations have yet to be identified.
- Similar to the iron concentrations, manganese concentrations exceed the MCL (50 μg/L) in a large number of nested monitoring wells and production wells across the CWCB. During this reporting period, concentrations in the Central Basin ranged from non-detectable to 760 μg/L, and in the West Coast Basin from non-detectable to 1,200 μg/L. Similar to iron, sources of the localized high manganese concentrations have yet to be identified.
- Nitrate (as nitrogen) concentrations in WRD nested monitoring wells in the Central Basin ranged from non-detectable to 11.4 mg/L, and in the West Coast Basin non-detectable to 14 mg/L. Concentrations approaching or exceeding the 10 mg/L MCL tend to be limited to the uppermost zone at a particular nested well and likely due to localized infiltration and leaching. No concentrations above the MCL were observed in the Silverado Aquifer. DHS data indicated no CWCB production wells tested for nitrate above the MCL from WYs 1999-2002.
- TCE was not detected in the Silverado Aquifer in the WRD wells sampled, with the exception of South Gate #1. During this reporting period, concentrations in nested monitoring wells in the Central Basin ranged from non-detectable to 22 μg/L, and in the West Coast Basin from non-detectable to 57 μg/L. DHS data indicate that TCE was detected in 44 production wells in the Central Basin from WYs 1999-2002. Ten out of the 44 detections exceed the MCL for TCE. In the West Coast Basin, TCE was detected below the MCL in one production well.
- PCE was detected in six WRD nested monitoring wells in the Central Basin and one well in the West Coast Basin. PCE was detected in the Silverado Aquifer in three of the WRD wells sampled. During this reporting period, concentrations in the Central Basin ranged from non-detectable to 10 μg/L, and in the West Coast Basin from non-detectable to 9.7 μg/L. DHS data indicate that PCE was detected in 74 production wells in the Central Basin from WYs 1999-2002. Eleven out of the 74 detections

exceeded the MCL for PCE. PCE was not detected in any West Coast Basin production wells.

- EPA has adopted a new arsenic standard for drinking water, decreasing the former MCL of 50 µg/L to 10 µg/L. Enforcement of the pending MCL is scheduled to begin in 2006. WRD nested monitoring wells indicated arsenic concentrations in the southeast portion of the Central Basin exceed the pending MCL. Eleven production wells, all in the southern portion of the Central Basin, had arsenic concentrations exceeding the pending MCL of 10 µg/L. Arsenic was not detected above the MCL in any West Coast Basin production wells.
- Chromium, including hexavalent chromium, has been detected above the MCL in groundwater samples from one WRD nested monitoring well and three production wells in or near the Montebello and Los Angeles Forebay areas. Additional monitoring wells and production wells had detectable chromium concentrations below the MCL. Some of the detections are in the deep aquifers including the Silverado and Sunnyside aquifers. DHS data for hexavalent chromium in groundwater from production wells were reasonably consistent with data for nested monitoring wells. WRD is currently conducting an investigation to identify potential sources of hexavalent chromium in the South Gate/Cudahy/Bell Gardens area of the Central Basin.
- MTBE has been detected, for the first time, in one WRD nested monitoring well and in two Central Basin production wells, both below the MCL.
- Total organic carbon and apparent color are being monitored and studied in relation to the potential groundwater production from deeper portions of the CWCB than have typically been utilized in the past.
- Perchlorate has been detected in four WRD nested monitoring wells and three production wells in the Central Basin, all below the SAL. Perchlorate was not detected in West Coast Basin wells.
- As represented by these data, groundwater in the CWCB is of generally good quality and is suitable for continued use by the pumpers in the District, the stakeholders, and the public. Localized areas of marginal to poor water quality are receiving or may require treatment prior to being used as a potable source.

SECTION 6
FUTURE ACTIVITIES

WRD will continue to update and augment its Regional Groundwater Monitoring Program to best serve the needs of the District, the pumpers and the public. Some of the activities planned under this program for the WY 2002/2003 are listed below.

- WRD will continue to maximize recycled water use at the Montebello Forebay spreading grounds without exceeding regulatory limits, because recycled water is a relatively low-cost replenishment water source. Over the past three years, WRD has fully utilized this resource within regulatory limits.
- WRD will continue to maximize recycled water use at the West Coast Basin barrier, and intends to use recycled water at the Dominguez Gap and Alamitos barriers in the near future.
- WRD will continue to monitor the quality of replenishment water sources to ensure the CWCB are being recharged with high-quality water.
- Total injection quantities at all three seawater intrusion barriers are expected to increase over the next several years as additional barrier wells are constructed to further combat seawater intrusion. WRD will work with the pumpers over the next year to find solutions to reduce the injection water demands and/or high costs. Basin management alternatives including Aquifer Storage and Recovery (ASR) projects, pipeline construction, and other conjunctive use projects and programs will be explored to help find these solutions.
- WRD continues refining the regional understanding of groundwater occurrence, movement, and quality. Water levels will be recorded using automatic dataloggers to monitor groundwater elevation differences throughout the year.
- WRD and the USGS have completed construction of four new nested groundwater monitoring wells this past year which will be added to the regional groundwater monitoring program. These wells are located in Gardena, Compton, Norwalk, and Long Beach.

- WRD will continue to sample groundwater from nested monitoring wells, and analyze the samples for general water quality constituents. In addition, WRD will continue to focus on constituents of interest to WRD and the pumpers such as TCE, PCE, arsenic, hexavalent chromium, MTBE, perchlorate, and apparent color.
- WRD will continue to use the data generated by this Regional Groundwater Monitoring Program along with WRD's advanced GIS capabilities to address current and upcoming issues related to water quality and groundwater replenishment in the Central and West Coast Basins.

SECTION 7
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TABLES

TABLE 1.1
CONSTRUCTION INFORMATION FOR WRD NESTED MONITORING WELLS

Well Name	Zone	WRD ID Number	Depth of Well (feet)	Top of Perforation (feet)	Bottom of Perforation (feet)	Aquifer Designation
Carson #1	1	100030	1010	990	1010	Sunnyside
	2	100031	760	740	760	Silverado
	3	100032	480	460	480	Lynwood
	4	100033	270	250	270	Gage
Carson #2	1	101787	1250	1230	1250	Lower San Pedro
	2	101788	870	850	870	Silverado
	3	101789	620	600	620	Silverado
	4	101790	470	450	470	Lynwood
	5	101791	250	230	250	Gage
Cerritos #1	1	100870	1215	1155	1175	Sunnyside
	2	100871	1020	1000	1020	Sunnyside
	3	100872	630	610	630	Silverado
	4	100873	290	270	290	Hollydale
	5	100874	200	180	200	Gage
	6	100875	135	125	135	Artesia
Cerritos #2	1	101781	1370	1350	1370	Sunnyside
	2	101782	935	915	935	Silverado
	3	101783	760	740	760	Silverado
	4	101784	510	490	510	Lynwood
	5	101785	370	350	370	Gage
	6	101786	170	150	170	Gaspur
Chandler #3b	1	100082	363	341	363	Gage/Lynwood/Silverado
Chandler #3a	2	100083	192	165	192	Gage/Lynwood/Silverado
Commerce #1	1	100881	1390	1330	1390	Pico Formation
	2	100882	960	940	960	Sunnyside
	3	100883	780	760	780	Sunnyside
	4	100884	590	570	590	Silverado
	5	100885	345	325	345	Hollydale
	6	100886	225	205	225	Exposition/Gage
Downey #1	1	100010	1190	1170	1190	Sunnyside
	2	100011	960	940	960	Silverado
	3	100012	600	580	600	Silverado
	4	100013	390	370	390	Hollydale/Jefferson
	5	100014	270	250	270	Exposition
	6	100015	110	90	110	Gaspur
Gardena #1	1	100020	990	970	990	Sunnyside
	2	100021	465	445	465	Silverado
	3	100022	365	345	365	Lynwood
	4	100023	140	120	140	Gage
Hawthorne #1	1	100887	990	910	950	Pico Formation
	2	100888	730	710	730	Lower San Pedro/Sunnyside
	3	100889	540	520	540	Lower San Pedro/Sunnyside
	4	100890	420	400	420	Silverado
	5	100891	260	240	260	Lynwood
	6	100892	130	110	130	Gage
Huntington Park #1	1	100005	910	890	910	Silverado
	2	100006	710	690	710	Jefferson
	3	100007	440	420	440	Gage
	4	100008	295	275	295	Exposition
	5	100009	134	114	134	Gaspur

TABLE 1.1
CONSTRUCTION INFORMATION FOR WRD NESTED MONITORING WELLS

Well Name	Zone	WRD ID Number	Depth of Well (feet)	Top of Perforation (feet)	Bottom of Perforation (feet)	Aquifer Designation
Inglewood #1	1	100091	1400	1380	1400	Pico Formation
	2	100092	Abandoned Well			
	3	100093	450	430	450	Silverado
	4	100094	300	280	300	Lynwood
	5	100095	170	150	170	Gage
Inglewood #2	1	100824	860	800	840	Pico Formation
	2	100825	470	450	470	Pico Formation
	3	100826	350	330	350	Silverado
	4	100827	245	225	245	Lynwood
Lakewood #1	1	100024	1009	989	1009	Sunnyside
	2	100025	660	640	660	Silverado
	3	100026	470	450	470	Lynwood
	4	100027	300	280	300	Hollydale
	5	100028	160	140	160	Artesia
	6	100029	90	70	90	semi-perched
La Mirada #1	1	100876	1150	1130	1150	Sunnyside
	2	100877	985	965	985	Silverado
	3	100878	710	690	710	Lynwood
	4	100879	490	470	490	Jefferson
	5	100880	245	225	245	Gage
Lomita #1	1	100818	1340	1240	1260	Lower San Pedro
	2	100819	720	700	720	Silverado
	3	100820	570	550	570	Silverado
	4	100821	420	400	420	Silverado
	5	100822	240	220	240	Gage
	6	100823	120	100	120	Gage
Long Beach #1	1	100920	1470	1430	1450	Sunnyside
	2	100921	1250	1230	1250	Sunnyside
	3	100922	990	970	990	Silverado
	4	100923	619	599	619	Lynwood
	5	100924	420	400	420	Gage
	6	100925	175	155	175	Artesia
Long Beach #2	1	101740	1090	970	990	Pico Formation
	2	101741	740	720	740	Sunnyside
	3	101742	470	450	470	Silverado
	4	101743	300	280	300	Lynwood
	5	101744	180	160	180	Gage
	6	101745	115	95	115	Gaspur
Long Beach #3	1	101751	1390	1350	1390	Lower San Pedro
	2	101752	1017	997	1017	Silverado
	3	101753	690	670	690	Silverado
	4	101754	550	530	550	Silverado
	5	101755	430	410	430	Lynwood
Long Beach #4	1	101759	1380	1200	1220	Pico Formation
	2	101760	820	800	820	Lower San Pedro
Long Beach #6	1	101792	1530	1490	1510	Lower San Pedro
	2	101793	950	930	950	Sunnyside
	3	101794	760	740	760	Sunnyside
	4	101795	500	480	500	Silverado
	5	101796	400	380	400	Lynwood
	6	101797	240	220	240	Gage

TABLE 1.1

CONSTRUCTION INFORMATION FOR WRD NESTED MONITORING WELLS

Well Name	Zone	WRD ID Number	Depth of Well (feet)	Top of Perforation (feet)	Bottom of Perforation (feet)	Aquifer Designation
Los Angeles #1	1	100926	1370	1350	1370	Pico Formation
	2	100927	1100	1080	1100	Sunnyside
	3	100928	940	920	940	Silverado
	4	100929	660	640	660	Lynwood
	5	100930	370	350	370	Gage
Montebello #1	1	101770	980	900	960	Pico Formation
	2	101771	710	690	710	Sunnyside
	3	101772	520	500	520	Silverado
	4	101773	390	370	390	Lynwood
	5	101774	230	210	230	Gage
	6	101775	110	90	110	Exposition
Norwalk #1	1	101814	1420	1400	1420	Lower San Pedro
	2	101815	1010	990	1010	Silverado
	3	101816	740	720	740	Lynwood
	4	101817	450	430	450	Jefferson
	5	101818	240	220	240	Gage
Pico #1	1	100001	900	860	900	Pico Formation
	2	100002	480	460	480	Silverado
	3	100003	400	380	400	Silverado
	4	100004	190	170	190	Jefferson
Pico #2	1	100085	1200	1180	1200	Sunnyside
	2	100086	850	830	850	Sunnyside
	3	100087	580	560	580	Sunnyside
	4	100088	340	320	340	Silverado
	5	100089	255	235	255	Lynwood
	6	100090	120	100	120	Gaspur
PM-1 Columbia	1	100042	600	555	595	Lower San Pedro
	2	100043	505	460	500	Silverado
	3	100044	285	240	280	Lynwood
	4	100045	205	160	200	Gage
PM-3 Madrid	1	100034	685	640	680	Lower San Pedro
	2	100035	525	480	520	Silverado
	3	100036	285	240	280	Lynwood
	4	100037	190	145	185	Gage
PM-4 Mariner	1	100038	715	670	710	Lower San Pedro
	2	100039	545	500	540	Silverado
	3	100040	385	340	380	Lynwood
	4	100041	245	200	240	Gage
Rio Hondo #1	1	100064	1150	1110	1130	Sunnyside
	2	100065	930	910	930	Sunnyside
	3	100066	730	710	730	Sunnyside
	4	100067	450	430	450	Silverado
	5	100068	300	280	300	Lynwood
	6	100069	160	140	160	Gardena
Santa Fe Springs #1	1	100096	1410	1290	1310	Pico Formation
	2	100097	845	825	845	Sunnyside
	3	100098	560	540	560	Sunnyside
	4	100099	285	265	285	Silverado
	5	100100	Abandoned Well			

TABLE 1.1

CONSTRUCTION INFORMATION FOR WRD NESTED MONITORING WELLS

Well Name	Zone	WRD ID Number	Depth of Well (feet)	Top of Perforation (feet)	Bottom of Perforation (feet)	Aquifer Designation
South Gate #1	1	100893	1460	1440	1460	Sunnyside
	2	100894	1340	1320	1340	Sunnyside
	3	100895	930	910	930	Sunnyside
	4	100896	585	565	585	Lynwood/Silverado
	5	100897	250	220	240	Exposition
Westchester #1	1	101776	860	740	760	Pico Formation
	2	101777	580	560	580	Lower San Pedro
	3	101778	475	455	475	Silverado
	4	10179	330	310	330	Lynwood
	5	101780	235	215	235	Gage
Whittier #1	1	101735	1298	1180	1200	Pico Formation
	2	101736	940	920	940	Sunnyside
	3	101737	620	600	620	Silverado
	4	101738	470	450	470	Jefferson
	5	101739	220	200	220	Gage
Willowbrook #1	1	100016	905	885	905	Pico Formation
	2	100017	520	500	520	Silverado
	3	100018	380	360	380	Lynwood
	4	100019	220	200	220	Gage
Wilmington #1	1	100070	1040	915	935	Lower San Pedro
	2	100071	800	780	800	Silverado
	3	100072	570	550	570	Silverado
	4	100073	245	225	245	Lynwood
	5	100074	140	120	140	Gage
Wilmington #2	1	100075	1030	950	970	Lower San Pedro
	2	100076	775	755	775	Silverado
	3	100077	560	540	560	Silverado
	4	100078	410	390	410	Lynwood
	5	100079	140	120	140	Gage

TABLE 2.1
SUMMARY OF SPREADING OPERATIONS AT MONTEBELLO FOREBAY

(Acre-feet)

Water Year	Rio Hondo (includes Spreading Grounds & Whittier Narrows Reservoir)				San Gabriel (includes unlined river and Spreading Grounds)				Total Recharge			
	Imported	Recycled	Local	Total	Imported	Recycled	Local	Total	Imported	Recycled	Local	Total
1963/64	44,366	4,758	6,013	55,137	40,150	4,145	3,979	48,274	84,516	8,903	9,992	103,411
1964/65	64,344	2,501	8,616	75,461	69,995	4,867	4,481	79,343	134,339	7,368	13,097	154,804
1965/66	62,067	9,984	31,317	103,368	32,125	3,129	14,433	49,687	94,192	13,113	45,750	153,055
1966/67	46,322	14,117	37,428	97,867	20,813	2,106	22,392	45,311	67,135	16,223	59,820	143,178
1967/68	65,925	16,299	27,885	110,109	12,402	1,975	11,875	26,252	78,327	18,274	39,760	136,361
1968/69	13,018	6,105	69,055	88,178	4,895	7,772	50,106	62,773	17,913	13,877	119,161	150,951
1969/70	25,474	13,475	24,669	63,618	35,164	3,683	28,247	67,094	60,638	17,158	52,916	130,712
1970/71	41,913	11,112	24,384	77,409	21,211	8,367	21,735	51,313	63,124	19,479	46,119	128,722
1971/72	15,413	12,584	10,962	38,959	14,077	4,959	6,218	25,254	29,490	17,543	17,180	64,213
1972/73	47,712	12,238	33,061	93,011	32,823	9,767	12,016	54,606	80,535	22,005	45,077	147,617
1973/74	40,593	9,574	18,421	68,588	34,271	10,516	8,544	53,331	74,864	20,090	26,965	121,919
1974/75	29,173	11,359	16,542	57,075	32,974	8,084	10,360	51,418	62,147	19,443	26,902	108,493
1975/76	14,783	8,371	10,503	33,657	19,611	10,297	7,763	37,671	34,394	18,668	18,266	71,328
1976/77	11,349	3,195	7,753	22,297	2,548	15,707	5,165	23,420	13,897	18,902	12,918	45,717
1977/78	19,112	7,424	53,086	79,622	11,249	9,938	74,967	96,154	30,361	17,362	128,053	175,776
1978/79	27,486	6,233	36,659	70,377	15,143	14,367	17,250	46,760	42,629	20,600	53,909	117,137
1979/80	11,229	8,082	54,416	73,726	6,602	14,549	39,753	60,904	17,831	22,631	94,169	134,630
1980/81	43,040	9,177	38,363	90,581	13,823	16,283	8,860	38,966	56,863	25,460	47,223	129,547
1981/82	19,299	9,667	37,730	66,696	11,239	19,143	8,283	38,665	30,538	28,810	46,013	105,361
1982/83	3,203	7,512	89,153	99,868	5,975	9,419	36,893	52,287	9,178	16,931	126,046	152,155
1983/84	18,815	9,647	38,395	66,857	912	17,371	18,667	36,950	19,727	27,018	57,062	103,807
1984/85	33,364	7,848	23,614	64,826	3,879	12,930	10,620	27,429	37,243	20,778	34,234	92,255
1985/86	8,128	9,234	51,913	69,275	10,927	16,806	13,045	40,778	19,055	26,040	64,958	110,053
1986/87	-	12,234			64,575	87,921			64,575	100,155	16,700	181,431
1987/88	16,105	12,560	22,508	51,173	6,529	24,678	22,125	53,332	22,634	37,238	44,633	104,505
1988/89	-	26,568			63,216	25,981			63,216	52,548	24,200	139,964
1989/90	7,079	25,629			72,196	24,560			79,275	50,188	26,400	155,864
1990/91	33,320	20,927			34,215	33,045			67,536	53,972	18,300	139,808
1991/92	28,695	19,156			58,381	28,679			87,077	47,835	71,000	205,911
1992/93	4,306	18,526			26,596	32,041			30,902	50,567	107,700	189,169
1993/94	7,599	26,654			25,893	27,361			33,492	54,015	36,800	124,307
1994/95	3,827	16,397			25,227	22,861			29,054	39,258	92,100	160,411
1995/96	12,304	24,154	41,514	77,972	3,899	26,502	13,709	44,110	16,203	50,656	55,223	122,082
1996/97	12,652	17,899	33,658	64,209	4,732	28,085	17,715	50,532	17,384	45,984	51,373	114,741
1997/98	889	14,984	52,958	68,831	-	19,594	32,580	52,174	889	34,578	85,538	121,005
1998/99	-	23,102	14,840	37,942	-	18,099	11,990	30,089	-	41,201	26,830	68,031
1999/00	43,441	16,093	5,700	65,234	1,596	27,049	15,036	43,681	45,037	43,142	20,736	108,915
2000/01									23,451	43,778	42,290	109,519
2001/02				72,874				47,597	41,268	60,596	18,607	120,471

Notes:

1) These amounts may differ from those shown in WRD's Annual Engineering Survey and Report. The ESR reflects only water that WRD purchased for replenishment. However, some of this water may percolate or evaporate in San Gabriel Valley before it reaches the spreading grounds. Other entities such as LACDPW or the Main San Gabriel Basin Watermaster may also purchase replenishment water that is spread and accounted for in the above table. Reclaimed water is also provided by the Pomona treatment plant and is nc paid for by WRD. This table reflects water which was actually conserved in the spreading grounds as reported by LACDPW. The Rio Hondo System includes the Rio Hondo spreading grounds and water conserved behind the Whittier Narrows Reservoir.

2) Data from shaded areas were not available from LACDPW detailing the relative amounts of water spread in the Rio Hondo and San Gabriel River Spreading Grounds, only total central basin recharge volumes could be reported (Source: Annual Reports on Results of Water Quality Monitoring). Corresponding local water rechage volumes were calculated by subtracting corresponding imported and reclaimed water from the total volume.

TABLE 2.2
HISTORICAL QUANTITIES OF ARTIFICIAL REPLENISHMENT WATER AT SEAWATER INTRUSION BARRIERS

(Acre-feet)

WATER YEAR	WEST COAST BASIN BARRIER			DOMINGUEZ GAP BARRIER	ALAMITOS BARRIER (a)			TOTAL
	Imported	Recycled	Total		WRD	OCWD	Total	
1952/53	1,140		1,140					1,140
1953/54	3,290		3,290					3,290
1954/55	2,740		2,740					2,740
1955/56	2,840		2,840					2,840
1956/57	3,590		3,590					3,590
1957/58	4,330		4,330					4,330
1958/59	3,700		3,700					3,700
1959/60	3,800		3,800					3,800
1960/61	4,480		4,480					4,480
1961/62	4,510		4,510					4,510
1962/63	4,200		4,200					4,200
1963/64	10,450		10,450					10,450
1964/65	33,020		33,020		2,760	200	2,960	35,980
1965/66	44,390		44,390		3,370	350	3,720	48,110
1966/67	43,060		43,060		3,390	490	3,880	46,940
1967/68	39,580		39,580		4,210	740	4,950	44,530
1968/69	36,420		36,420		4,310	950	5,260	41,680
1969/70	29,460		29,460		3,760	720	4,480	33,940
1970/71	29,870		29,870	2,200	3,310	820	4,130	36,200
1971/72	26,490		26,490	9,550	4,060	930	4,990	41,030
1972/73	28,150		28,150	8,470	4,300	880	5,180	41,800
1973/74	27,540		27,540	7,830	6,140	1,150	7,290	42,660
1974/75	26,430		26,430	5,160	4,440	720	5,160	36,750
1975/76	35,220		35,220	4,940	4,090	570	4,660	44,820
1976/77	34,260		34,260	9,280	4,890	880	5,770	49,310
1977/78	29,640		29,640	5,740	4,020	830	4,850	40,230
1978/79	23,720		23,720	5,660	4,220	900	5,120	34,500
1979/80	28,630		28,630	4,470	3,560	580	4,140	37,240
1980/81	26,350		26,350	3,550	3,940	530	4,470	34,370
1981/82	24,640		24,640	4,720	4,540	390	4,930	34,290
1982/83	33,950		33,950	6,020	3,270	1,940	5,210	45,180
1983/84	28,000		28,000	7,640	2,440	1,400	3,840	39,480
1984/85	25,210		25,210	7,470	3,400	1,450	4,850	37,530
1985/86	20,260		20,260	6,160	3,410	1,860	5,270	31,690
1986/87	26,030		26,030	6,230	4,170	2,750	6,920	39,180
1987/88	24,270		24,270	7,050	3,990	2,170	6,160	37,480
1988/89	22,740		22,740	5,220	3,900	1,680	5,580	33,540
1989/90	20,279		20,279	5,736	4,110	2,000	6,110	32,125
1990/91	16,039		16,039	7,756	4,096	1,818	5,914	29,709
1991/92	22,180		22,180	6,894	4,172	1,553	5,725	34,799
1992/93	21,516		21,516	4,910	3,350	1,567	4,917	31,343
1993/94	15,482		15,482	5,524	2,794	1,309	4,103	25,109
1994/95	14,237	1,480	15,717	4,989	2,883	889	3,772	24,478
1995/96	12,426	4,170	16,596	5,107	3,760	2,010	5,770	27,473
1996/97	11,372	6,241	17,613	5,886	3,854	1,751	5,605	29,103
1997/98	8,173	8,306	16,479	3,771	3,677	1,503	5,180	25,430
1998/99	10,125	6,973	17,098	4,483	4,012	1,689	5,701	27,282
1999/00	11,172	7,460	18,632	6,010	4,028	1,709	5,737	30,379
2000/01	13,988	6,838	20,826	3,923	3,710	1,923	5,633	30,382
2001/02	12,724	7,276	20,000	5,459	3,961	2,232	6,193	31,652

(a) Alamitos Barrier Water is purchased by WRD on the Los Angeles County side of the barriers, and by Orange County Water District on the Orange County side.

TABLE 2.3
WATER QUALITY OF REPLENISHMENT WATER, WATER YEAR 2001-2002

Constituent	Units	Treated Colorado River/State Project Water[a]	Untreated Colorado River Water[b]	Untreated State Project Water[b]	West Basin MWD WRP[c]	Whittier Narrows WRP[b]	San Jose Creek East WRP[b]	San Jose Creek West WRP[b]	Pomona WRP[b]	Stormwater[g]
		2001[d]	2001[d]	2001[d]	2001[e]	2001[f]	2001[f]	2001[f]	2001[f]	2001-2002
Total Dissolved Solids (TDS)	mg/L	500/293	564	296	116	548	600	550	543	369
Hardness	mg/L	234/123	283	113	46	197	215	207	216	175
Sulfate	mg/L	175/56	223	41	3.7	85	113	99	69	82
Chloride	mg/L	79/70	70	86	31	98	134	113	141	62
Nitrogen (Nitrate as N)	mg/L	ND/0.54	ND	ND	0.8	6.9	3.7	1.2	1	0.74
Iron	mg/L	ND/ND	ND	0.12	ND	<0.05	0.09	0.02	<0.03	0.1
Manganese	ug/L	ND/ND	ND	ND	ND	6	30	7	9	ND
Trichloroethylene (TCE)	ug/L	ND/ND	ND	ND	ND	<0.7	<1	<0.7	<0.7	NA
Tetrachloroethylene (PCE)	ug/L	ND/ND	ND	ND	ND	<0.7	<0.8	<0.7	<0.7	NA
Total Organic Carbon (TOC)	ppm	2.75/2.40	3.34	3.74	0.7	7	8.6	10	11	NA
Perchlorate	ug/L	4/ND	5	ND	NA	NA	NA	NA	NA	NA

Notes:

a = Used at the seawater intrusion barriers

b = Used at the Montebello Forebay spreading grounds

c = Used at the West Coast Basin Barrier

d = Average concentration data from Metropolitan Water District of Southern California (MWD), for 2001

e = Average concentration data from West Basin Municipal Water District (West Basin MWD), for calendar year 2001

f = Average concentration data from County Sanitation Districts of Los Angeles County (CSDLAC), for callendar year 2001.

g = Average concentration data from LACDPW, for samples collected from San Gabriel River WY 2001-2002

Sources of data:

2001 Wqter Quality Report to MWD Member Agencies

Montebello Forebay Groundwater Recharge annual report (CSDLAC, 2000)

West Basin Water Recycling Facility Annual Report (West Basin MWD, 2001)

Los Angeles County Stormwater Monitoring Reports (LACDPW Web Site)

TABLE 3.1
HISTORICAL AMOUNTS OF GROUNDWATER PRODUCTION
(Acre-feet)

WATER YEAR	CENTRAL BASIN	WEST COAST BASIN	TOTAL
1960/61	292,500	61,900	354,400
1961/62	275,800	59,100	334,900
1962/63	225,400	59,100	284,500
1963/64	219,100	61,300	280,400
1964/65	211,600	59,800	271,400
1965/66	222,800	60,800	283,600
1966/67	206,700	62,300	269,000
1967/68	220,100	61,600	281,700
1968/69	213,800	61,600	275,400
1969/70	222,200	62,600	284,800
1970/71	211,600	60,900	272,500
1971/72	216,100	64,800	280,900
1972/73	205,600	60,300	265,900
1973/74	211,300	55,000	266,300
1974/75	213,100	56,700	269,800
1975/76	215,300	59,400	274,700
1976/77	211,500	59,800	271,300
1977/78	196,600	58,300	254,900
1978/79	207,000	58,000	265,000
1979/80	209,500	57,100	266,600
1980/81	211,915	57,711	269,626
1981/82	202,587	61,874	264,461
1982/83	194,548	57,542	252,090
1983/84	196,660	51,930	248,590
1984/85	193,085	52,746	245,831
1985/86	195,889	52,762	248,650
1986/87	196,587	48,026	244,613
1987/88	194,561	43,833	238,394
1988/89	200,105	44,162	244,267
1989/90	197,811	47,904	245,715
1990/91	186,977	53,075	240,052
1991/92	196,382	55,964	252,346
1992/93	150,386	40,058	190,444
1993/94	156,930	41,768	198,697
1994/95	181,164	41,396	222,560
1995/96	182,067	52,759	234,826
1996/97	187,452	52,581	240,033
1997/98	188,988	51,841	240,829
1998/99	204,418	51,331	255,749
1999/00	197,946	53,579	251,525
2000/01	195,255	53,842	249,047
2001/02	199,900	50,066	249,966

TABLE 3.2
GROUNDWATER ELEVATIONS, WATER YEAR 2001-2002

	Zone 1	Zone 2	Zone 3	Zone 4	Zone 5	Zone 6
Carson #1					Reference Point Elevation: 24.16	
Depth of Well	990-1010	740-760	460-480	250-270		
Aquifer Name	Sunnyside	Silverado	Lynwood	Gage		
12/27/2001	-59.31	-58.28	-24.69	-22.66		
3/25/2002	-67.06	-65.22	-24.63	-22.54		
6/28/2002	-62.59	-61.62	-25.52	-23.37		
7/7/2002		-60.18	-25.2			
9/30/2002	-62.22	-61.25	-24.8	-22.66		
Carson #2			Estimated Reference Point Elevation (From USGS Topographic Quadrangle): 36			
Depth of Well	1230-1250	850-870	600-620	450-470	230-250	
Aquifer Name	Lower San Pedro	Silverado	Silverado	Lynwood	Gage	
8/16/2002	-51	-49	-48	-43	-40	
8/19/2002	-51	-49	-48	-43	-40	
8/22/2002	-51	-49	-48	-43	-40	
8/23/2002	-51	-49	-48	-43	-40	
8/30/2002	-51	-45	-45	-42	-39	
9/29/2002	-51	-50	-49	-44	-40	
Cerritos #1					Reference Point Elevation: 40.72	
Depth of Well	1155-1175	1000-1020	610-630	270-290	180-200	125-135
Aquifer Name	Sunnyside	Sunnyside	Silverado	Hollydale	Gage	Artesia
11/12/2001	-37.01	-36.85	-43.88	10.54	16.07	16.1
12/26/2001	-27.02	-27.02	-32.88	12.95	18.12	18.19
2/15/2002	-25.41	-25.99	-29.93	14.85	18.81	18.86
3/27/2002	-26.99	-24.77	-30.8	14.55	18.79	18.79
6/26/2002	-52.25	-61.24	-56.93	7.94	14.05	14.17
9/23/2002	-56.74	-65.45	-56.87	6.34	12.65	12.79

	Zone 1	Zone 2	Zone 3	Zone 4	Zone 5	Zone 6
Cerritos #2	Estimated Reference Point Elevation (From USGS Topographic Quadrangle): 67					
Depth of Well	1350-1370	915-935	740-760	490-510	350-370	150-170
Aquifer Name	Sunnyside	Silverado	Silverado	Lynwood	Gage	Gaspur
12/26/2001	-95	-70	-54	-10	12	24
2/19/2002	-81	-68	-53	-1	13	25
3/29/2002	-7	-12	-20	-5	19	25
6/28/2002	-21	-35	-35	-14	16	24
9/25/2002	-30	-42	-37	-16	14	23
Commerce #1	Reference Point Elevation: 170.09					
Depth of Well	1330-1390	940-960	760-780	570-590	325-345	205-225
Aquifer Name	Pico	Sunnyside	Sunnyside	Silverado	Hollydale	Exposition/Gage
12/26/2001	59.69	63.61	60.49	38.2	48.12	62.19
2/19/2002	58.5	66.06	63.12	36.43	35.07	61.17
3/7/2002		66.26	63.3	34.36	33.59	61.21
3/27/2002	59.62	66.18	63.16	35.15	38.53	61.46
6/26/2002	58.78	60.42	56.84	26.86	33.42	60.3
9/25/2002	58.94	56.64	52.2	19.41	29.06	59.2
Downey #1	Reference Point Elevation: 97.21					
Depth of Well	1170-1190	940-960	580-600	370-390	250-270	90-110
Aquifer Name	Sunnyside	Silverado	Silverado	Hollydale/Jefferson	Exposition	Gaspur
1/9/2002	17.82	20.04	23.09	21.6	44.22	47.31
3/27/2002	18.88	19.22	22.64	21.43	44.13	47.28
5/8/2002	18.26	18.25	19.3	18.59	43.56	47.1
6/5/2002	13.04	13.86	15.83	16.85	43.4	46.98
6/6/2002	12.88	13.74	15.65	16.64	43.39	47
6/26/2002	9.23	10.43	13.49	16.11	42.9	46.7
9/25/2002	-0.52	3.01	9.33	13.45	41.68	45.76
Gardena #1	Reference Point Elevation: 79.9					
Depth of Well	970-990	445-465	345-365	120-140		
Aquifer Name	Sunnyside	Silverado	Lynwood	Gage		
3/29/2002	-58.28	-121.63	-85.68	-16.76		
9/25/2002	-59.82	-127.03	-82.97	-17.66		

	Zone 1	Zone 2	Zone 3	Zone 4	Zone 5	Zone 6
Hawthorne #1						Reference Point Elevation: 86.35
Depth of Well	910-950	710-730	520-540	400-420	240-260	110-130
Aquifer Name	Pico	Lower San Pedro	Lower San Pedro	Silverado	Lynwood	Gage
12/27/2001	-109.07	-17.52	-16.35	-16.16	-11.81	-1.94
2/26/2002	-105.89	-17.36	-16.13	-15.93	-11.54	-1.75
3/26/2002	-104.11	-17.21	-16	-15.8	-11.43	-1.69
5/1/2002	-109.25	-18.16	-16.91	-16.68	-11.98	-1.68
6/27/2002	-110.82	-24.22	-23.01	-22.79	-16.36	-2.53
9/23/2002	-100.61	-18.08	-19.86	-19.66	-14.64	-2.8
Huntington Park #1						Reference Point Elevation: 177.08
Depth of Well	890-910	690-710	420-440	275-295		
Aquifer Name	Silverado	Jefferson	Gage	Exposition		
12/26/2001	-27.33	-31.04	-22.56	17.21		
1/22/2002			-21.08	16.89		
3/27/2002	-27.59	-35.26	-24.47	16.67		
6/6/2002	-31.94	-39.88	-29.92	16.16		
6/27/2002	-32.63	-40.29	-30.24	15.7		
9/25/2002	-36.29	-42.66	-32.9	15.22		
Inglewood #1						Reference Point Elevation: 110.56
Depth of Well	1380-1400		430-450	280-300	150-170	
Aquifer Name	Pico		Silverado	Lynwood	Gage	
12/28/2001	-35.14		-49.89	-5.41	0.55	
3/5/2002	-35.12		-49.9	-5.46	0.37	
3/26/2002	-35.12		-49.59	-5.31	0.63	
6/27/2002	-35.03		-51.82	-5.83	1.5	
9/30/2002	-35.45		-49.9	-5.42	0.49	

TABLE 3.2
GROUNDWATER ELEVATIONS, WATER YEAR 2001-2002

	Zone 1	Zone 2	Zone 3	Zone 4	Zone 5	Zone 6
Inglewood #2						Reference Point Elevation: 217.33
Depth of Well	800-840	450-470	330-350	225-245		
Aquifer Name	Pico	Pico	Silverado	Lynwood		
12/28/2001	-22.7	-20.05	-10.03	-4.43		
3/26/2002	-22.65	-19.65	-9.82	-4.29		
6/27/2002	-22.36	-19.24	-9.67	-4.11		
8/21/2002	-22.58	-19.38	-9.82	-4.32		
9/25/2002	-22.43	-19.16	-9.49	-4.4		
Lakewood #1						Reference Point Elevation: 37.91
Depth of Well	989-1009	640-660	450-470	280-300	140-160	70-90
Aquifer Name	Sunnyside	Silverado	Lynwood	Hollydale	Artesia	Semi-Perched
12/26/2001	-53.5	-46.76	-44.47	-21.43	-8.88	13.1
2/26/2002	-65.96	-53.32	-50.89	-19.11	-7.75	13.29
3/28/2002	-59.41	-49.79	-47.86	-19.99	-8.18	13.09
6/27/2002	-94.66	-72.03	-70.3	-26.83	-12.93	12.26
9/26/2002	-101.77	-77.33	-75.13	-30.18	-15.08	11.2
La Mirada #1						Reference Point Elevation: 75.85
Depth of Well	1130-1150	965-985	690-710	470-490	225-245	
Aquifer Name	Sunnyside	Silverado	Lynwood	Jefferson	Gage	
11/12/2001	-32.24	-33.14	-46.18	-43.08	-29.89	
12/26/2001	-16.51	-16.2	-25.58	-31.35	-21.94	
3/26/2002	-5.7	-6.55	-26.86	-37.67	-21.42	
5/2/2002	-14.7	-17.19	-29.57	-40.15	-22.41	
6/26/2002	-32.48	-32.7	-45.31	-53.8	-30.78	
9/23/2002	-34.03	-35.58	-51.02	-56.04	-34.99	

TABLE 3.2
GROUNDWATER ELEVATIONS, WATER YEAR 2001-2002

	Zone 1	Zone 2	Zone 3	Zone 4	Zone 5	Zone 6
Lomita #1						Reference Point Elevation: 76.91
Depth of Well	1240-1260	700-720	550-570	400-420	220-240	100-120
Aquifer Name	Lower San Pedro	Silverado	Silverado	Silverado	Gage	Gage
12/26/2001	-27.69	-26.81	-25.86	-26.78	-23.59	-26.15
3/25/2002	-26.15	-25.57	-24.73	-25.96	-22.65	-24.87
6/27/2002	-39.78	-29.11	-26.47	-27.58	-22.84	-26.94
8/22/2002	-35.85	-27.19	-25.35	-26.46	-22.72	-25.61
8/23/2002	-35.82	-27.29	-25.48	-26.71	-22.66	-25.66
8/30/2002	-35.66	-27.04	-25.32	-26.51	-22.64	-25.5
9/25/2002	-35.21	-26.86	-25.21	-26.53	-22.41	-25.2
Long Beach #1						Reference Point Elevation: 28.69
Depth of Well	1430-1450	1230-1250	970-990	599-619	400-420	155-175
Aquifer Name	Sunnyside	Sunnyside	Silverado	Lynwood	Gage	Artesia
11/12/2001	-33.66	-35.06	-55.76	-38.95	-34.46	-20.79
12/26/2001	-21.35	-22.52	-45.29	-29.2	-25.11	-12.84
4/2/2002	-7.47	-8.5	-26.08	-22.42	-21.01	-13.13
5/7/2002	-8.03	-10.26	-50.14	-29.77	-29.71	-16.93
6/27/2002	-29.47	-32.66	-84.81	-54.98	-53.18	-25.71
9/29/2002	-46.5	-49.7	-87.37	-57.84	-55.23	-26.7
Long Beach #2						Estimated Reference Point Elevation (From USGS Topographic Quadrangle): 42
Depth of Well	970-990	720-740	450-470	280-300	160-180	95-115
Aquifer Name	Pico	Sunnyside	Silverado	Lynwood	Gage	Gaspur
11/10/2001	-53	-43	-47	-13	-3	-1
12/26/2001	-44	-38	-45	-11	-2	-1
2/13/2002	-38	-36	-44	-11	-2	0
3/13/2002	-33	-36	-43	-11	-2	0
5/28/2002	-74	-42	-44	-12	-3	-1
6/26/2002	-87	-48	-45	-13	-3	-1
7/7/2002	-90	-50	-45	-14	-3	-1
9/29/2002	-100	-54	-44	-16	-5	-2

	Zone 1	Zone 2	Zone 3	Zone 4	Zone 5	Zone 6
Long Beach #3	Estimated Reference Point Elevation (From USGS Topographic Quadrangle): 25					
Depth of Well	1350-1390	997-1017	670-690	530-550	410-430	
Aquifer Name	Lower San Pedro	Silverado	Silverado	Silverado	Lynwood	
11/14/2001	-49	-63	-63	-58	-13	
12/26/2001	-48	-58	-58	-53	-12	
3/29/2002	-44	-67	-67	-67	-13	
6/26/2002	-47	-62	-62	-61	-13	
9/29/2002	-45	-60	-60	-61	-12	
Long Beach #6	Estimated Reference Point Elevation (From USGS Topographic Quadrangle): 35					
Depth of Well	1490-1510	930-950	740-760	480-500	380-400	220-240
Aquifer Name	Lower San Pedro	Sunnyside	Sunnyside	Silverado	Lynwood	Gage
9/23/2002		-81	-83	-125	-125	-41
9/26/2002	-50	-81	-83	-126	-125	-41
Los Angeles #1	Reference Point Elevation: 173.34					
Depth of Well	1350-1370	1080-1100	920-940	640-660	350-370	
Aquifer Name	Pico	Sunnyside	Silverado	Lynwood	Gage	
12/26/2001	-18.21	-21.14	-22.83	-27.41		
3/27/2002	-12.21	-19.24	-21.13	-27.11	-20.5	
6/13/2002	-12.39	-21.64	-21.66	-28.76	-20.47	
6/27/2002	-13.96	-22.12	-24.23	-28.78	-20.42	
9/25/2002	-20.14	-25.39	-26.96	-31.19	-21.85	
Montebello #1	Estimated Reference Point Elevation (From USGS Topographic Quadrangle): 190					
Depth of Well	960-980	690-710	500-520	370-390	210-230	90-110
Aquifer Name	Pico	Sunnyside	Silverado	Lynwood	Gage	Exposition
11/6/2001	93	88	87	84	87	Dry
11/16/2001	94	89	88	85	87	Dry
12/26/2001	98	97	95	92	90	Dry
3/27/2002	101	100	98	95	93	Dry
5/7/2002	101	98	98	94	94	Dry
5/15/2002	101	98	98	94	94	Dry
6/26/2002	99	96	95	92	94	Dry
9/30/2002	92	86	85	82	88	Dry

TABLE 3.2
GROUNDWATER ELEVATIONS, WATER YEAR 2001-2002

	Zone 1	Zone 2	Zone 3	Zone 4	Zone 5	Zone 6
Pico #1						Reference Point Elevation: 181.06
Depth of Well	860-900	460-480	380-400	170-190		
Aquifer Name	Pico	Silverado	Silverado	Jefferson		
12/26/2001	139.63	130.31	128.6	134.86		
1/9/2002	141.44	135.93	136.48	139.35		
1/11/2002		138.02	137.91			
3/27/2002	145.12	133.42	131.73	137.63		
4/29/2002		138.1	137.85	136.87		
6/26/2002	142.07	121.87	121.29	129.76		
9/30/2002	135.53	114.44	113.13	119.8		
Pico #2						Reference Point Elevation: 149.6
Depth of Well	1180-1200	830-850	560-580	320-340	235-255	100-120
Aquifer Name	Sunnyside	Sunnyside	Sunnyside	Silverado	Lynwood	Gaspur
1/2/2002	86.94	91.9	97.52	112.85	113.58	118.82
3/27/2002	87.12	91.74	95.93	110.45	111.3	116.55
6/18/2002	79.02	80.62	89.43	101.38	98.7	108.97
6/27/2002	79.25	79.82	88.63	102.87	103.77	108.37
9/30/2002	68.26	69.47	78.13	98.31	99.62	107.54
PM-1 Columbia						Reference Point Elevation: 78.42
Depth of Well	555-595	460-500				
Aquifer Name	Lower San Pedro	Silverado				
3/25/2002	-11.32	-10.55				
8/22/2002	-12.93	-12.3				
8/26/2002		-12.23				
8/30/2002		-12.09				
9/23/2002	-12.64	-11.73				

	Zone 1	Zone 2	Zone 3	Zone 4	Zone 5	Zone 6
PM-3 Madrid						Reference Point Elevation: 70.68
Depth of Well	640-680	480-520	240-280	145-185		
Aquifer Name	Lower San Pedro	Silverado	Lynwood	Gage		
12/27/2001	-16.49	-13.12	-13.04	-13		
2/28/2002	-15.96	-12.89	-12.78	-11.87		
3/25/2002	-16.3	-12.95	-12.89	-12.82		
6/28/2002	-17.69	-13.98	-13.77	-13.71		
8/16/2002	-17.51	-14.02	-13.96	-13.92		
8/19/2002	-17.51	-13.92	-13.85	-13.82		
8/22/2002	-17.6	-14.08	-14.01	-13.98		
8/26/2002	-17.68	-14.05	-13.97	-13.92		
8/30/2002	-17.52	-14.06	-13.94	-13.9		
9/23/2002	-17.56	-13.87	-13.77	-13.68		
PM-4 Mariner						Reference Point Elevation: 97.7
Depth of Well	670-710	500-540	340-380	200-240		
Aquifer Name	Lower San Pedro	Silverado	Lynwood	Gage		
12/27/2001	-9.67	-5.22	-2.77	-2.67		
3/25/2002	-9.65	-5.41	-2.98	-2.91		
5/5/2002	-10.09	-3.12	-5.61	-3.12		
6/26/2002	-11.36	-7.35	-4.83	-4.34		
9/23/2002	-11.46	-6.64	-4.2	-4.1		
Rio Hondo #1						Reference Point Elevation: 144.36
Depth of Well	1110-1130	910-930	710-730	430-450	280-300	140-160
Aquifer Name	Sunnyside	Sunnyside	Sunnyside	Silverado	Lynwood	Gardena
12/20/2001	75.43	76.53	75.85	69.81	78.14	81.39
1/2/2002	78.19	80.03	79.31	74.48	81.9	84.7
2/4/2002	80.69	81.35	80.67	76.05	83.29	86.17
3/26/2002	79.39	80.27	79.71	73.55	81.13	84.22
6/26/2002	74.42	73.3	72.49	65.61	76.07	79.39
8/5/2002	71.73	69.74	68.82	62.53	75.01	78.71
9/26/2002	65.14	61.13	60.29	55.43	68.71	73.01

	Zone 1	Zone 2	Zone 3	Zone 4	Zone 5	Zone 6
Santa Fe Springs #1				Reference Point Elevation: 168.83		
Depth of Well	1290-1310	825-845	540-560	265-285		
Aquifer Name	Pico	Sunnyside	Sunnyside	Silverado		
12/27/2001	89.85	81.73	58.22	45.23		
4/2/2002	98.49	86.62	64.24	52.42		
6/27/2002		86.51	62.87	50.68		
9/29/2002		83.21	57.88	43.91		
South Gate #1				Reference Point Elevation: 90.96		
Depth of Well	1440-1460	1320-1340	910-930	565-585	220-240	
Aquifer Name	Sunnyside	Sunnyside	Sunnyside	Lynwood/Silverado	Exposition	
10/10/2001	-9.05	-5.64	0.86	-4.72	36.25	
1/2/2002	2.14	4.44	9.45	4.29	37.37	
3/27/2002	0.58	1.94	6.09	-0.2	37.1	
6/7/2002	-4.29	-3.27	1.54	-5.46	36.41	
9/25/2002	-14.27	-12	-4.72	-9.55	35.1	
Westchester #1		Estimated Reference Point Elevation (From USGS Topographic Quadrangle): 95				
Depth of Well	740-760	560-580	455-475	310-330	215-235	
Aquifer Name	Pico	Lower San Pedro	Silverado	Lynwood	Gage	
12/27/2001	6	17	18	18	18	
3/26/2002	7	17	18	18	18	
6/27/2002	6	17	18	18	18	
7/11/2002	5	17	17	18	18	
7/15/2002	5	17	17	18	18	
9/25/2002	7	17	17	18	18	
Whittier #1		Estimated Reference Point Elevation (From USGS Topographic Quadrangle): 210				
Depth of Well	1180-1200	920-940	600-620	450-470	200-220	
Aquifer Name	Pico	Sunnyside	Silverado	Jefferson	Gage	
11/12/2001	108	108	102	100	191	
12/26/2001	108	108	102	100	191	
3/29/2002	109	109	103	102	191	
7/2/2002	109	109	103	102	190	
9/30/2002	109	109	103	101	190	

TABLE 3.2
GROUNDWATER ELEVATIONS, WATER YEAR 2001-2002

	Zone 1	Zone 2	Zone 3	Zone 4	Zone 5	Zone 6
Willowbrook #1						Reference Point Elevation: 96.21
Depth of Well	885-905	500-520	360-380	200-220		
Aquifer Name	Pico	Silverado	Lynwood	Gage		
12/26/2001	-31.2	-29	-22.83	-22.7		
3/18/2002	-28.52	-29.06	-23.39	-23.04		
3/28/2002	-27.52	-29.01	-23.43	-23.1		
6/27/2002	-33.67	-30.47	-25.23	-24.8		
9/25/2002	-41.53	-33.1	-26.89	-26.45		
Wilmington #1						Reference Point Elevation: 37.96
Depth of Well	915-935	780-800	550-570	225-245	120-140	
Aquifer Name	Lower San Pedro	Silverado	Silverado	Lynwood	Gage	
12/26/2001	-57.86	-58.09	-58.28	-28.14	-24.96	
3/29/2002	-63.89	-64.09	-64.21	-28.81		
5/13/2002	-65.97	-66.17	-66.24	-29.46	-25.64	
6/26/2002	-60.52	-60.72	-60.77	-28.56	-25.12	
9/25/2002	-59.12	-59.35	-59.38	-26.9	-23.54	
Wilmington #2						Reference Point Elevation: 29.78
Depth of Well	950-970	755-775	540-560	390-410	120-140	
Aquifer Name	Lower San Pedro	Silverado	Silverado	Lynwood	Gage	
12/26/2001	-43.34	-38.58	-34.18	-33.4	-11.07	
2/19/2002	-41.65	-38.18	-32.45	-31.6	-11.2	
4/2/2002	-45.89	-40.12	-34.79	-33.86	-11.04	
6/26/2002	-45.66	-40.51	-35.49	-34.53	-15.77	
9/25/2002	-43.72	-38.43	-32.95	-31.85	-10.45	

TABLE 4.1
MAJOR MINERAL WATER QUALITY GROUPS

GROUP A Generally Calcium Bicarbonate or Calcium Bicarbonate/Sulfate Dominant	GROUP B Generally Calcium-Sodium-Bicarbonate or Sodium-Bicarbonate Dominant	GROUP C Generally Sodium-Chloride Dominant	OTHER Generally Different Than Groups A, B, and C
CENTRAL BASIN			
Cerritos #1 Zones 1, 2, 3, 4, 5, 6 Commerce #1 Zones 2,3,4,5,6 Downey #1 Zones 2, 3, 4, 5, 6 Huntington Park #1 Zones 1, 2, 3, 4 Lakewood #1 Zone 6 Long Beach #1 Zones 5,6 Long Beach #2 Zones 4,5,6 Rio Hondo #1 Zones 1, 2, 3, 4, 5, 6, Pico #1 Zones 2, 3, 4 Pico #2 Zones 1, 2, 3, 4, 5, 6 South Gate #1 Zones 1, 2, 3, 4, 5 Whittier #1 Zones 1,2,3,4,5 Willowbrook #1 Zones 2, 3, 4 Los Angeles #1 Zones 1, 2, 3, 4, 5 Montebello #1 Zones 3, 4, 5 Cerritos #2 Zones 1, 2, 3, 4, 5, 6	Downey #1 Zone 1 Inglewood #2 Zones 1,3 Lakewood #1 Zones 1,2, 3, 4, 5 La Mirada #1 Zones 1, 2, 3, 4 Willowbrook #1 Zone 1 Long Beach #1 Zones 1,2,3,4 Long Beach #2 Zones 1,2,3 Santa Fe Springs #1 Zone 3 Long Beach #6 Zones 1,2 ,3 ,4 ,5 ,6 Montebello #1 Zone 2 Carson #2 Zones 1, 2, 3, 4, 5 Westchester #1 Zones 1, 2, 3, 4, 5	Inglewood #2 Zone 2	La Mirada #1 Zone 5 Pico #1 Zone 1 Santa Fe Springs #1 Zones 1,2,4
WEST COAST BASIN			
Carson #1 Zones 3, 4 Gardena #1 Zones 2, 3, 4 Hawthorne #1 Zones 5,6 Inglewood #1 Zones 3, 4, 5 PM-3 Madrid Zones 3,4	Carson #1 Zones 1, 2 Hawthorne #1 Zones 1,2,3,4 PM-Madrid Zone 2 Wilmington #2 Zone 3 Long Beach #3 Zones 1, 2, 3	PM-4 Mariner Zones 2,3,4 Wilmington #1 Zones 1, 2, 3, 4, 5 Wilmington #2 Zones 4, 5 Long Beach #3 Zones 4, 5	Gardena #1 Zone 1 Inglewood #1 Zone 1 Lomita #1 Zones 1, 2, 3, 4, 5, 6 PM-3 Madrid Zone 1 PM-4 Mariner Zone 1 Wilmington #2 Zone 1,2

TABLE 4.2
CENTRAL BASIN WATER QUALITY RESULTS
REGIONAL GROUNDWATER MONITORING, WATER YEAR 2001/2002

Water Quality Constituent	Units	MCL	MCL Type	Cerritos #1	Cerritos #1	Cerritos #1	Cerritos #1	Cerritos #1	Cerritos #1
				Zone 1	Zone 2	Zone 3	Zone 4	Zone 5	Zone 6
				2/21/02	2/21/02	2/21/02	2/21/02	2/22/02	2/22/02
General Mineral									
Total Dissolved Solid (TDS)	mg/l	1000	s	280	260	310	280	240	250
Cation Sum	meq/l			4.78	4.46	5.24	4.81	4.61	4.65
Anion Sum	meq/l			4.67	4.37	5.14	4.69	4.49	4.52
Iron, Total, ICAP	mg/l	0.3	s	ND	ND	ND	ND	ND	ND
Manganese, Total, ICAP/MS	ug/l	50	s	25	29	45	**70**	**100**	**120**
Alkalinity	mg/l			161	153	167	180	179	187
Boron	mg/l			0.085	0.069	0.082	0.066	0.083	0.083
Bicarbonate as HCO3,calculated	mg/l			195	186	203	219	217	227
Calcium, Total, ICAP	mg/l			36	34	43	44	40	46
Carbonate as CO3, Calculated	mg/l			2.53	2.41	2.09	1.42	2.24	1.86
Hardness (Total, as CaCO3)	mg/l			110	107	129	151	139	153
Chloride	mg/l	500	s	14	14	19	11	10	9.5
Fluoride	mg/l	2	p	0.26	0.37	0.36	0.57	0.47	0.32
Hydroxide as OH, Calculated	mg/l			0.03	0.03	0.03	0.02	0.03	0.02
Langelier Index - 25 degree	None			0.7	0.66	0.7	0.54	0.69	0.67
Magnesium, Total, ICAP	mg/l			4.8	5.3	5.2	10	9.5	9.4
Mercury	ug/l	2	p	ND	ND	ND	ND	ND	ND
Nitrate-N by IC	mg/l	10	p	ND	ND	ND	ND	ND	ND
Nitrite, Nitrogen by IC	mg/l	1	p	ND	ND	ND	ND	ND	ND
Potassium, Total, ICAP	mg/l			2.3	2.3	2	2	1.9	2.1
Sodium, Total, ICAP	mg/l			58	52	60	40	41	35
Sulfate	mg/l	500	s	50	43	60	36	29	24
Surfactants	mg/l	0.5	s	ND	ND	ND	ND	ND	ND
Total Nitrate, Nitrite-N, CALC	mg/l			ND	ND	ND	ND	ND	ND
Total Organic Carbon	mg/l			ND	ND	ND	ND	ND	ND
Carbon Dioxide	mg/l			1.95	1.86	2.56	4.38	2.74	3.61
General Physical									
Apparent Color	ACU	15	s	5	3	3	5	5	3
Lab pH	Units			8.3	8.3	8.2	8	8.2	8.1
Odor	TON	3	s	1	3	1	1	**4**	2
Specific Conductance	umho/cm	1600	s	449	422	489	451	421	419
Turbidity	NTU	5	s	ND	ND	ND	0.15	0.5	0.2
Radon	pCi/l								
Metals									
Aluminum, Total, ICAP/MS	ug/l	200	s	ND	ND	ND	ND	ND	ND
Antimony, Total, ICAP/MS	ug/l	6	p	ND	ND	ND	ND	ND	ND
Arsenic, Total, ICAP/MS	ug/l	50	p	13	13	25	6.1	13	36
Barium, Total, ICAP/MS	ug/l	1000	p	46	98	100	58	70	92
Beryllium, Total, ICAP/MS	ug/l	4	p	ND	ND	ND	ND	ND	ND
Chromium, Total, ICAP/MS	ug/l	50	p	ND	ND	ND	ND	ND	ND
Hexavalent Chromium (Cr VI)	mg/l								
Cadmium, Total, ICAP/MS	ug/l	5	p	ND	ND	ND	ND	ND	ND
Copper, Total, ICAP/MS	ug/l	1000	s	ND	ND	ND	ND	ND	ND
Lead, Total, ICAP/MS	ug/l			ND	ND	ND	ND	ND	ND
Nickel, Total, ICAP/MS	ug/l	100	p	ND	ND	ND	ND	ND	ND
Selenium, Total, ICAP/MS	ug/l	50	p	ND	ND	ND	ND	ND	ND
Silver, Total, ICAP/MS	ug/l	100	s	ND	ND	ND	ND	ND	ND
Thallium, Total, ICAP/MS	ug/l	2	p	ND	ND	ND	ND	ND	ND
Zinc, Total, ICAP/MS	ug/l	5000	s	ND	ND	ND	ND	ND	ND
Volatile Organic Compounds									
Trichloroethylene (TCE)	ug/l	5	p	ND	ND	ND	ND	ND	ND
Tetrachloroethylene (PCE)	ug/l	5	p	ND	ND	ND	ND	ND	ND
1,1-Dichloroethylene	ug/l	6	p	ND	ND	ND	ND	ND	ND
cis-1,2-Dichloroethylene	ug/l	6	p	ND	ND	ND	ND	ND	ND
Chloroform (Trichloromethane)	ug/l	100	p	ND	ND	ND	ND	ND	ND
1,1-Dichloroethane	ug/l	5	p	ND	ND	ND	ND	ND	ND
1,2-Dichloroethane	ug/l	0.5	p	ND	ND	ND	ND	ND	ND
Carbon Tetrachloride	ug/l	0.5	p	ND	ND	ND	ND	ND	ND
Di-Isopropyl Ether	ug/l			ND	ND	ND	ND	ND	ND
Fluorotrichloromethane-Freon11	ug/l	150	p	ND	ND	ND	ND	ND	ND
Isopropylbenzene	ug/l			ND	ND	ND	ND	ND	ND
n-Propylbenzene	ug/l			ND	ND	ND	ND	ND	ND
sec-Butylbenzene	ug/l			ND	ND	ND	ND	ND	ND
1,1,1-Trichloroethane	ug/l	200	p	ND	ND	ND	ND	ND	ND
Benzene	ug/l	1	p	ND	ND	ND	ND	ND	ND
Toluene	ug/l	150	p	ND	ND	ND	ND	ND	ND
m,p-Xylenes	ug/l	1750	p	ND	ND	ND	ND	ND	ND
o-Xylene	ug/l	1750	p	ND	ND	ND	ND	ND	ND
Ethyl benzene	ug/l	700	p	ND	ND	ND	ND	ND	ND
MTBE	ug/l	13	p	ND	ND	ND	ND	ND	ND
Perchlorate	ug/l								

MCL: Maximum Contaminant Level, bold value indicates concentration exceeds MCL. (p): Primary MCL (s): Secondary MCL (ND): Not Detected

TABLE 4.2
CENTRAL BASIN WATER QUALITY RESULTS
REGIONAL GROUNDWATER MONITORING, WATER YEAR 2001/2002

Water Quality Constituent	Units	MCL	MCL Type	Cerritos #2	Cerritos #2	Cerritos #2	Cerritos #2	Cerritos #2	Cerritos #2
				Zone 1	Zone 2	Zone 3	Zone 4	Zone 5	Zone 6
				5/29/02	5/30/02	5/31/02	5/31/02	5/30/02	5/29/02
General Mineral									
Total Dissolved Solid (TDS)	mg/l	1000	s	240	500	240	260	270	690
Cation Sum	meq/l			3.83	8.2	4	4.48	4.41	12.1
Anion Sum	meq/l			3.59	8.06	3.8	4.32	4.24	11.3
Iron, Total, ICAP	mg/l	0.3	s	ND	ND	ND	ND	ND	0.29
Manganese, Total, ICAP/MS	ug/l	50	s	26	4.7	42	**89**	**100**	**310**
Alkalinity	mg/l			151	173	162	186	184	310
Boron	mg/l			0.052	0.094	0.056	0.076	0.073	0.087
Bicarbonate as HCO3,calculated	mg/l			184	211	197	226	224	378
Calcium, Total, ICAP	mg/l			44	100	43	50	50	150
Carbonate as CO3, Calculated	mg/l			1.2	0.687	1.61	1.47	1.46	0.978
Hardness (Total, as CaCO3)	mg/l			133	324	131	160	156	498
Chloride	mg/l	500	s	5.8	66	6.1	7.2	6.6	61
Fluoride	mg/l	2	p	0.28	0.37	0.31	0.43	0.34	0.37
Hydroxide as OH, Calculated	mg/l			0.02	0.009	0.02	0.02	0.02	0.007
Langelier Index - 25 degree	None			0.46	0.58	0.58	0.61	0.6	0.91
Magnesium, Total, ICAP	mg/l			5.7	18	5.8	8.5	7.5	30
Mercury	ug/l	2	p	ND	ND	ND	ND	ND	ND
Nitrate-N by IC	mg/l	10	p	ND	3	ND	ND	ND	ND
Nitrite, Nitrogen by IC	mg/l	1	p	ND	ND	ND	ND	ND	ND
Potassium, Total, ICAP	mg/l			3	4.1	2.6	2.6	3.1	4
Sodium, Total, ICAP	mg/l			25	37	30	28	28	46
Sulfate	mg/l	500	s	19	120	18	18	17	160
Surfactants	mg/l	0.5	s	ND	ND	ND	ND	ND	ND
Total Nitrate, Nitrite-N, CALC	mg/l			ND	3	ND	ND	ND	ND
Total Organic Carbon	mg/l			ND	ND	1.1	0.6	0.7	1.2
Carbon Dioxide	mg/l			3.68	8.42	3.13	4.52	4.48	19
General Physical									
Apparent Color	ACU	15	s	3	ND	3	3	3	5
Lab pH	Units			8	7.7	8.1	8	8	7.6
Odor	TON	3	s	**4**	**4**	**4**	**4**	**8**	**4**
Specific Conductance	umho/cm	1600	s	348	752	351	400	386	1010
Turbidity	NTU	5	s	0.3	0.25	**6.5**	1.4	0.2	0.15
Radon	pCi/l			160	150	170	64	70	84
Metals									
Aluminum, Total, ICAP/MS	ug/l	200	s	ND	ND	ND	120	ND	ND
Antimony, Total, ICAP/MS	ug/l	6	p	ND	ND	ND	ND	ND	ND
Arsenic, Total, ICAP/MS	ug/l	50	p	3.2	2.4	4.4	ND	21	8.2
Barium, Total, ICAP/MS	ug/l	1000	p	94	160	100	100	89	140
Beryllium, Total, ICAP/MS	ug/l	4	p	ND	ND	ND	ND	ND	ND
Chromium, Total, ICAP/MS	ug/l	50	p	3.1	6.2	3.5	2.7	ND	3.4
Hexavalent Chromium (Cr VI)	mg/l			0.2	1.1	ND	ND	ND	ND
Cadmium, Total, ICAP/MS	ug/l	5	p	ND	ND	ND	ND	ND	ND
Copper, Total, ICAP/MS	ug/l	1000	s	ND	ND	ND	ND	ND	ND
Lead, Total, ICAP/MS	ug/l			ND	ND	ND	ND	ND	ND
Nickel, Total, ICAP/MS	ug/l	100	p	ND	ND	ND	ND	ND	ND
Selenium, Total, ICAP/MS	ug/l	50	p	ND	ND	ND	ND	ND	ND
Silver, Total, ICAP/MS	ug/l	100	s	ND	ND	ND	ND	ND	ND
Thallium, Total, ICAP/MS	ug/l	2	p	ND	ND	ND	ND	ND	ND
Zinc, Total, ICAP/MS	ug/l	5000	s	ND	ND	ND	8.6	ND	ND
Volatile Organic Compounds									
Trichloroethylene (TCE)	ug/l	5	p	ND	ND	ND	ND	ND	ND
Tetrachloroethylene (PCE)	ug/l	5	p	ND	ND	ND	ND	ND	ND
1,1-Dichloroethylene	ug/l	6	p	ND	ND	ND	ND	ND	ND
cis-1,2-Dichloroethylene	ug/l	6	p	ND	ND	ND	ND	ND	ND
Chloroform (Trichloromethane)	ug/l	100	p	ND	ND	ND	ND	ND	ND
1,1-Dichloroethane	ug/l	5	p	ND	ND	ND	ND	ND	ND
1,2-Dichloroethane	ug/l	0.5	p	ND	ND	ND	ND	ND	ND
Carbon Tetrachloride	ug/l	0.5	p	ND	ND	ND	ND	ND	ND
Di-Isopropyl Ether	ug/l			ND	ND	ND	ND	ND	ND
Fluorotrichloromethane-Freon11	ug/l	150	p	ND	ND	ND	ND	ND	ND
Isopropylbenzene	ug/l			ND	ND	ND	ND	ND	ND
n-Propylbenzene	ug/l			ND	ND	ND	ND	ND	ND
sec-Butylbenzene	ug/l			ND	ND	ND	ND	ND	ND
1,1,1-Trichloroethane	ug/l	200	p	ND	ND	ND	ND	ND	ND
Benzene	ug/l	1	p	ND	ND	ND	ND	ND	ND
Toluene	ug/l	150	p	ND	ND	ND	ND	ND	ND
m,p-Xylenes	ug/l	1750	p	ND	ND	ND	ND	ND	ND
o-Xylene	ug/l	1750	p	ND	ND	ND	ND	ND	ND
Ethyl benzene	ug/l	700	p	ND	ND	ND	ND	ND	ND
MTBE	ug/l	13	p	ND	ND	ND	ND	ND	ND
Perchlorate	ug/l			ND	ND	ND	ND	ND	ND

MCL: Maximum Contaminant Level, bold value indicates concentration exceeds MCL. (p): Primary MCL (s): Secondary MCL (ND): Not Detected

TABLE 4.2
CENTRAL BASIN WATER QUALITY RESULTS
REGIONAL GROUNDWATER MONITORING, WATER YEAR 2001/2002

Water Quality Constituent	Units	MCL	MCL Type	Commerce #1 Zone 2 3/7/02	Commerce #1 Zone 3 3/7/02	Commerce #1 Zone 4 3/7/02	Commerce #1 Zone 5 3/7/02	Commerce #1 Zone 6 3/7/02
General Mineral								
Total Dissolved Solid (TDS)	mg/l	1000	s	680	500	530	970	370
Cation Sum	meq/l			12.1	8.45	9.48	16	6.66
Anion Sum	meq/l			12.2	8.51	9.24	16.9	6.22
Iron, Total, ICAP	mg/l	0.3	s	ND	ND	0.12	ND	ND
Manganese, Total, ICAP/MS	ug/l	50	s	30	**84**	**74**	**59**	ND
Alkalinity	mg/l			298	206	214	202	171
Boron	mg/l			0.47	0.24	0.25	0.39	0.13
Bicarbonate as HCO3,calculated	mg/l			363	251	261	246	208
Calcium, Total, ICAP	mg/l			62	49	59	76	61
Carbonate as CO3, Calculated	mg/l			1.87	1.3	1.35	0.64	0.54
Hardness (Total, as CaCO3)	mg/l			270	200	230	297	230
Chloride	mg/l	500	s	220	120	130	380	55
Fluoride	mg/l	2	p	0.35	0.43	0.37	0.4	0.46
Hydroxide as OH, Calculated	mg/l			0.01	0.01	0.01	0.007	0.007
Langelier Index - 25 degree	None			0.81	0.54	0.64	0.43	0.26
Magnesium, Total, ICAP	mg/l			28	19	20	26	19
Mercury	ug/l	2	p	ND	ND	ND	ND	ND
Nitrate-N by IC	mg/l	10	p	ND	ND	ND	2.3	6
Nitrite, Nitrogen by IC	mg/l	1	p	ND	ND	ND	ND	ND
Potassium, Total, ICAP	mg/l			5.9	3.5	4	4.2	1.9
Sodium, Total, ICAP	mg/l			150	100	110	230	46
Sulfate	mg/l	500	s	ND	47	61	95	38
Surfactants	mg/l	0.5	s	ND	ND	ND	ND	ND
Total Nitrate, Nitrite-N, CALC	mg/l			ND	ND	ND	2.3	6
Total Organic Carbon	mg/l			3.2	0.7	1	1.7	ND
Carbon Dioxide	mg/l			9.1	6.3	6.6	12	10
General Physical								
Apparent Color	ACU	15	s	15	10	10	10	5
Lab pH	Units			7.9	7.9	7.9	7.6	7.6
Odor	TON	3	s	**4**	2	3	**4**	1
Specific Conductance	umho/cm	1600	s	1180	831	895	**1640**	612
Turbidity	NTU	5	s	**7.4**	0.5	0.35	3	3.2
Radon	pCi/l							
Metals								
Aluminum, Total, ICAP/MS	ug/l	200	s	ND	ND	ND	ND	ND
Antimony, Total, ICAP/MS	ug/l	6	p	ND	ND	ND	ND	ND
Arsenic, Total, ICAP/MS	ug/l	50	p	1.5	1.3	1.3	ND	1.1
Barium, Total, ICAP/MS	ug/l	1000	p	82	220	70	94	56
Beryllium, Total, ICAP/MS	ug/l	4	p	ND	ND	ND	ND	ND
Chromium, Total, ICAP/MS	ug/l	50	p	ND	ND	ND	ND	9.2
Hexavalent Chromium (Cr VI)	mg/l							
Cadmium, Total, ICAP/MS	ug/l	5	p	ND	ND	ND	ND	ND
Copper, Total, ICAP/MS	ug/l	1000	s	ND	ND	ND	ND	ND
Lead, Total, ICAP/MS	ug/l			ND	ND	ND	ND	ND
Nickel, Total, ICAP/MS	ug/l	100	p	ND	ND	ND	ND	ND
Selenium, Total, ICAP/MS	ug/l	50	p	32	ND	ND	ND	ND
Silver, Total, ICAP/MS	ug/l	100	s	ND	ND	ND	ND	ND
Thallium, Total, ICAP/MS	ug/l	2	p	ND	ND	ND	ND	ND
Zinc, Total, ICAP/MS	ug/l	5000	s	ND	ND	ND	ND	ND
Volatile Organic Compounds								
Trichloroethylene (TCE)	ug/l	5	p	ND	ND	ND	0.5	ND
Tetrachloroethylene (PCE)	ug/l	5	p	ND	ND	ND	1.3	ND
1,1-Dichloroethylene	ug/l	6	p	ND	ND	ND	ND	ND
cis-1,2-Dichloroethylene	ug/l	6	p	ND	ND	ND	ND	ND
Chloroform (Trichloromethane)	ug/l	100	p	ND	ND	ND	ND	ND
1,1-Dichloroethane	ug/l	5	p	ND	ND	ND	ND	ND
1,2-Dichloroethane	ug/l	0.5	p	ND	ND	ND	ND	ND
Carbon Tetrachloride	ug/l	0.5	p	ND	ND	ND	ND	ND
Di-Isopropyl Ether	ug/l			ND	ND	ND	ND	ND
Fluorotrichloromethane-Freon11	ug/l	150	p	ND	ND	ND	ND	ND
Isopropylbenzene	ug/l			ND	ND	ND	ND	ND
n-Propylbenzene	ug/l			ND	ND	ND	ND	ND
sec-Butylbenzene	ug/l			ND	ND	ND	ND	ND
1,1,1-Trichloroethane	ug/l	200	p	ND	ND	ND	ND	ND
Benzene	ug/l	1	p	ND	ND	ND	ND	ND
Toluene	ug/l	150	p	ND	ND	ND	ND	ND
m,p-Xylenes	ug/l	1750	p	ND	ND	ND	ND	ND
o-Xylene	ug/l	1750	p	ND	ND	ND	ND	ND
Ethyl benzene	ug/l	700	p	ND	ND	ND	ND	ND
MTBE	ug/l	13	p	ND	ND	ND	ND	ND
Perchlorate	ug/l							

MCL: Maximum Contaminant Level, bold value indicates concentration exceeds MCL. (p): Primary MCL (s): Secondary MCL (ND): Not Detected

TABLE 4.2
CENTRAL BASIN WATER QUALITY RESULTS
REGIONAL GROUNDWATER MONITORING, WATER YEAR 2001/2002

Water Quality Constituent	Units	MCL	MCL Type	Downey #1 Zone 1 5/8/02	Downey #1 Zone 2 5/8/02	Downey #1 Zone 3 5/8/02	Downey #1 Zone 4 5/8/02	Downey #1 Zone 5 5/8/02	Downey #1 Zone 6 5/8/02
General Mineral									
Total Dissolved Solid (TDS)	mg/l	1000	s	480	220	500	540	410	830
Cation Sum	meq/l			8.15	3.79	8.66	9.33	7.02	14.3
Anion Sum	meq/l			8.11	3.59	8.11	9.23	6.83	14.1
Iron, Total, ICAP	mg/l	0.3	s	ND	ND	ND	ND	ND	ND
Manganese, Total, ICAP/MS	ug/l	50	s	ND	ND	ND	ND	**140**	**74**
Alkalinity	mg/l			167	155	167	197	216	293
Boron	mg/l			0.056	0.051	0.067	0.19	0.074	0.23
Bicarbonate as HCO3,calculated	mg/l			203	189	203	240	263	357
Calcium, Total, ICAP	mg/l			100	42	110	100	88	160
Carbonate as CO3, Calculated	mg/l			0.832	1.23	0.832	0.621	0.857	0.463
Hardness (Total, as CaCO3)	mg/l			340	129	365	332	290	531
Chloride	mg/l	500	s	65	5.1	65	77	33	100
Fluoride	mg/l	2	p	0.33	0.32	0.34	0.4	0.36	0.3
Hydroxide as OH, Calculated	mg/l			0.01	0.02	0.01	0.007	0.009	0.003
Langelier Index - 25 degree	None			0.66	0.46	0.7	0.53	0.62	0.61
Magnesium, Total, ICAP	mg/l			22	5.9	22	20	17	32
Mercury	ug/l	2	p	ND	ND	ND	ND	ND	ND
Nitrate-N by IC	mg/l	10	p	3	ND	3	2.5	ND	ND
Nitrite, Nitrogen by IC	mg/l	1	p	ND	ND	ND	ND	ND	ND
Potassium, Total, ICAP	mg/l			3	2.9	3.3	4.5	3.6	5.5
Sodium, Total, ICAP	mg/l			29	26	29	59	26	80
Sulfate	mg/l	500	s	130	16	130	140	75	260
Surfactants	mg/l	0.5	s	ND	ND	ND	ND	ND	ND
Total Nitrate, Nitrite-N, CALC	mg/l			3	ND	3	2.5	ND	ND
Total Organic Carbon	mg/l			ND	0.7	0.5	0.6	ND	0.9
Carbon Dioxide	mg/l			6.43	3.78	6.43	12.1	10.5	35.8
General Physical									
Apparent Color	ACU	15	s	3	ND	ND	3	ND	3
Lab pH	Units			7.8	8	7.8	7.6	7.7	7.3
Odor	TON	3	s	**4**	1	1	3	2	3
Specific Conductance	umho/cm	1600	s	800	370	810	980	755	1340
Turbidity	NTU	5	s	**14**	0.1	0.1	0.1	0.55	0.5
Radon	pCi/l								
Metals									
Aluminum, Total, ICAP/MS	ug/l	200	s	ND	ND	ND	ND	ND	ND
Antimony, Total, ICAP/MS	ug/l	6	p	ND	ND	ND	ND	ND	ND
Arsenic, Total, ICAP/MS	ug/l	50	p	5.2	3.7	3.9	2.5	5.8	3.1
Barium, Total, ICAP/MS	ug/l	1000	p	140	100	160	100	260	63
Beryllium, Total, ICAP/MS	ug/l	4	p	ND	ND	ND	ND	ND	ND
Chromium, Total, ICAP/MS	ug/l	50	p	2.7	4.3	2.7	1.9	2.1	1.1
Hexavalent Chromium (Cr VI)	mg/l								
Cadmium, Total, ICAP/MS	ug/l	5	p	ND	ND	ND	ND	ND	ND
Copper, Total, ICAP/MS	ug/l	1000	s	ND	ND	ND	ND	ND	ND
Lead, Total, ICAP/MS	ug/l			ND	ND	ND	ND	ND	ND
Nickel, Total, ICAP/MS	ug/l	100	p	ND	ND	ND	ND	ND	6.3
Selenium, Total, ICAP/MS	ug/l	50	p	ND	ND	ND	ND	ND	ND
Silver, Total, ICAP/MS	ug/l	100	s	ND	ND	ND	ND	ND	ND
Thallium, Total, ICAP/MS	ug/l	2	p	ND	ND	ND	ND	ND	ND
Zinc, Total, ICAP/MS	ug/l	5000	s	ND	ND	ND	ND	ND	ND
Volatile Organic Compounds									
Trichloroethylene (TCE)	ug/l	5	p	ND	ND	ND	ND	0.6	**5.2**
Tetrachloroethylene (PCE)	ug/l	5	p	0.7	ND	0.8	ND	ND	ND
1,1-Dichloroethylene	ug/l	6	p	ND	ND	ND	ND	ND	ND
cis-1,2-Dichloroethylene	ug/l	6	p	ND	ND	ND	ND	ND	**19**
Chloroform (Trichloromethane)	ug/l	100	p	0.7	ND	ND	ND	ND	ND
1,1-Dichloroethane	ug/l	5	p	ND	ND	ND	ND	ND	ND
1,2-Dichloroethane	ug/l	0.5	p	ND	ND	ND	ND	ND	ND
Carbon Tetrachloride	ug/l	0.5	p	ND	ND	ND	ND	ND	ND
Di-Isopropyl Ether	ug/l			ND	ND	ND	ND	ND	ND
Fluorotrichloromethane-Freon11	ug/l	150	p	ND	ND	ND	ND	ND	ND
Isopropylbenzene	ug/l			ND	ND	ND	ND	ND	ND
n-Propylbenzene	ug/l			ND	ND	ND	ND	ND	ND
sec-Butylbenzene	ug/l			ND	ND	ND	ND	ND	ND
1,1,1-Trichloroethane	ug/l	200	p	ND	ND	ND	ND	ND	ND
Benzene	ug/l	1	p	ND	ND	ND	ND	ND	ND
Toluene	ug/l	150	p	ND	ND	ND	ND	ND	ND
m,p-Xylenes	ug/l	1750	p	ND	ND	ND	ND	ND	ND
o-Xylene	ug/l	1750	p	ND	ND	ND	ND	ND	ND
Ethyl benzene	ug/l	700	p	ND	ND	ND	ND	ND	ND
MTBE	ug/l	13	p	ND	ND	ND	ND	ND	ND
Perchlorate	ug/l								

MCL: Maximum Contaminant Level, bold value indicates concentration exceeds MCL. (p): Primary MCL (s): Secondary MCL (ND): Not Detected

TABLE 4.2
CENTRAL BASIN WATER QUALITY RESULTS
REGIONAL GROUNDWATER MONITORING, WATER YEAR 2001/2002

Water Quality Constituent	Units	MCL	MCL Type	Huntington Park #1	Huntington Park #1	Huntington Park #1	Huntington Park #1
				Zone 1	Zone 2	Zone 3	Zone 4
				6/6/02	6/6/02	6/6/02	6/6/02
General Mineral							
Total Dissolved Solid (TDS)	mg/l	1000	s	360	360	670	710
Cation Sum	meq/l			6.21	6.17	11	11.7
Anion Sum	meq/l			5.89	5.95	10.7	11.4
Iron, Total, ICAP	mg/l	0.3	s	0.23	ND	ND	ND
Manganese, Total, ICAP/MS	ug/l	50	s	50	4.5	ND	ND
Alkalinity	mg/l			178	180	250	267
Boron	mg/l			0.12	0.13	0.18	0.16
Bicarbonate as HCO3,calculated	mg/l			217	219	305	325
Calcium, Total, ICAP	mg/l			63	64	120	130
Carbonate as CO3, Calculated	mg/l			0.707	0.898	1.25	0.841
Hardness (Total, as CaCO3)	mg/l			219	221	423	448
Chloride	mg/l	500	s	21	22	61	63
Fluoride	mg/l	2	p	0.48	0.43	0.34	0.36
Hydroxide as OH, Calculated	mg/l			0.009	0.01	0.01	0.007
Langelier Index - 25 degree	None			0.39	0.5	0.92	0.78
Magnesium, Total, ICAP	mg/l			15	15	30	30
Mercury	ug/l	2	p	ND	ND	ND	ND
Nitrate-N by IC	mg/l	10	p	ND	ND	6	4.8
Nitrite, Nitrogen by IC	mg/l	1	p	ND	ND	ND	ND
Potassium, Total, ICAP	mg/l			3.4	3.2	4.5	5
Sodium, Total, ICAP	mg/l			40	38	55	61
Sulfate	mg/l	500	s	82	82	170	190
Surfactants	mg/l	0.5	s	ND	ND	ND	ND
Total Nitrate, Nitrite-N, CALC	mg/l			ND	ND	6	4.8
Total Organic Carbon	mg/l			0.8	ND	0.5	ND
Carbon Dioxide	mg/l			8.66	6.94	9.67	16.3
General Physical							
Apparent Color	ACU	15	s	5	3	3	3
Lab pH	Units			7.7	7.8	7.8	7.6
Odor	TON	3	s	1	1	1	1
Specific Conductance	umho/cm	1600	s	557	560	971	1000
Turbidity	NTU	5	s	1.2	0.3	0.2	0.2
Radon	pCi/l						
Metals							
Aluminum, Total, ICAP/MS	ug/l	200	s	ND	ND	ND	ND
Antimony, Total, ICAP/MS	ug/l	6	p	ND	ND	ND	ND
Arsenic, Total, ICAP/MS	ug/l	50	p	1.3	1.2	1.7	1
Barium, Total, ICAP/MS	ug/l	1000	p	59	70	110	100
Beryllium, Total, ICAP/MS	ug/l	4	p	ND	ND	ND	ND
Chromium, Total, ICAP/MS	ug/l	50	p	ND	ND	9.7	2.6
Hexavalent Chromium (Cr VI)	mg/l						
Cadmium, Total, ICAP/MS	ug/l	5	p	ND	ND	ND	ND
Copper, Total, ICAP/MS	ug/l	1000	s	ND	ND	ND	ND
Lead, Total, ICAP/MS	ug/l			ND	ND	ND	ND
Nickel, Total, ICAP/MS	ug/l	100	p	ND	ND	ND	ND
Selenium, Total, ICAP/MS	ug/l	50	p	ND	ND	ND	ND
Silver, Total, ICAP/MS	ug/l	100	s	ND	ND	ND	ND
Thallium, Total, ICAP/MS	ug/l	2	p	ND	ND	ND	ND
Zinc, Total, ICAP/MS	ug/l	5000	s	ND	ND	ND	ND
Volatile Organic Compounds							
Trichloroethylene (TCE)	ug/l	5	p	ND	ND	**20**	1.5
Tetrachloroethylene (PCE)	ug/l	5	p	ND	ND	4.6	0.8
1,1-Dichloroethylene	ug/l	6	p	ND	ND	ND	ND
cis-1,2-Dichloroethylene	ug/l	6	p	ND	ND	ND	ND
Chloroform (Trichloromethane)	ug/l	100	p	ND	ND	3.4	ND
1,1-Dichloroethane	ug/l	5	p	ND	ND	ND	ND
1,2-Dichloroethane	ug/l	0.5	p	ND	ND	**0.6**	ND
Carbon Tetrachloride	ug/l	0.5	p	ND	ND	**7.8**	ND
Di-Isopropyl Ether	ug/l			ND	ND	ND	ND
Fluorotrichloromethane-Freon11	ug/l	150	p	ND	ND	ND	ND
Isopropylbenzene	ug/l			ND	ND	ND	ND
n-Propylbenzene	ug/l			ND	ND	ND	ND
sec-Butylbenzene	ug/l			ND	ND	ND	ND
1,1,1-Trichloroethane	ug/l	200	p	ND	ND	ND	ND
Benzene	ug/l	1	p	ND	ND	ND	ND
Toluene	ug/l	150	p	ND	ND	ND	ND
m,p-Xylenes	ug/l	1750	p	ND	ND	ND	ND
o-Xylene	ug/l	1750	p	ND	ND	ND	ND
Ethyl benzene	ug/l	700	p	ND	ND	ND	ND
MTBE	ug/l	13	p	ND	ND	ND	ND
Perchlorate	ug/l						

MCL: Maximum Contaminant Level, bold value indicates concentration exceeds MCL. (p): Primary MCL (s): Secondary MCL (ND): Not Detected

TABLE 4.2
CENTRAL BASIN WATER QUALITY RESULTS
REGIONAL GROUNDWATER MONITORING, WATER YEAR 2001/2002

Water Quality Constituent	Units	MCL	MCL Type	Inglewood #2 Zone 1 9/26/02	Inglewood #2 Zone 2 9/26/02	Inglewood #2 Zone 3 9/26/02
General Mineral						
Total Dissolved Solid (TDS)	mg/l	1000	s	**1660**	**1470**	290
Cation Sum	meq/l			29.1	25.9	5.2
Anion Sum	meq/l			29.4	26.3	5.07
Iron, Total, ICAP	mg/l	0.3	s	**0.61**	**0.56**	0.11
Manganese, Total, ICAP/MS	ug/l	50	s	38	**67**	46
Alkalinity	mg/l			1420	1280	226
Boron	mg/l			3.8	3.2	0.2
Bicarbonate as HCO3,calculated	mg/l			1720	1560	275
Calcium, Total, ICAP	mg/l			18	14	31
Carbonate as CO3, Calculated	mg/l			22.3	16.1	2.83
Hardness (Total, as CaCO3)	mg/l			115	75.2	123
Chloride	mg/l	500	s	33	26	19
Fluoride	mg/l	2	p	0.53	0.3	0.23
Hydroxide as OH, Calculated	mg/l			0.03	0.03	0.03
Langelier Index - 25 degree	None			1.3	1.1	0.69
Magnesium, Total, ICAP	mg/l			17	9.8	11
Mercury	ug/l	2	p	ND	ND	ND
Nitrate-N by IC	mg/l	10	p	ND	ND	ND
Nitrite, Nitrogen by IC	mg/l	1	p	ND	ND	ND
Potassium, Total, ICAP	mg/l			26	20	6.9
Sodium, Total, ICAP	mg/l			600	550	59
Sulfate	mg/l	500	s	ND	ND	ND
Surfactants	mg/l	0.5	s	ND	ND	ND
Total Nitrate, Nitrite-N, CALC	mg/l			ND	ND	ND
Total Organic Carbon	mg/l			44	28	1.2
Carbon Dioxide	mg/l			17.2	19.7	3.47
General Physical						
Apparent Color	ACU	15	s	**450**	**200**	10
Lab pH	Units			8.3	8.2	8.2
Odor	TON	3	s	**40**	**40**	**8**
Specific Conductance	umho/cm	1600	s	**2550**	**2290**	481
Turbidity	NTU	5	s	4.2	**63**	1.6
Radon	pCi/l					
Metals						
Aluminum, Total, ICAP/MS	ug/l	200	s	ND	ND	ND
Antimony, Total, ICAP/MS	ug/l	6	p	ND	ND	ND
Arsenic, Total, ICAP/MS	ug/l	50	p	ND	ND	ND
Barium, Total, ICAP/MS	ug/l	1000	p	44	25	14
Beryllium, Total, ICAP/MS	ug/l	4	p	ND	ND	ND
Chromium, Total, ICAP/MS	ug/l	50	p	5.8	5	ND
Hexavalent Chromium (Cr VI)	mg/l					
Cadmium, Total, ICAP/MS	ug/l	5	p	ND	ND	ND
Copper, Total, ICAP/MS	ug/l	1000	s	ND	ND	ND
Lead, Total, ICAP/MS	ug/l			ND	ND	ND
Nickel, Total, ICAP/MS	ug/l	100	p	ND	ND	ND
Selenium, Total, ICAP/MS	ug/l	50	p	ND	ND	ND
Silver, Total, ICAP/MS	ug/l	100	s	ND	ND	ND
Thallium, Total, ICAP/MS	ug/l	2	p	ND	ND	ND
Zinc, Total, ICAP/MS	ug/l	5000	s	ND	ND	ND
Volatile Organic Compounds						
Trichloroethylene (TCE)	ug/l	5	p	ND	ND	ND
Tetrachloroethylene (PCE)	ug/l	5	p	ND	ND	ND
1,1-Dichloroethylene	ug/l	6	p	ND	ND	ND
cis-1,2-Dichloroethylene	ug/l	6	p	ND	ND	ND
Chloroform (Trichloromethane)	ug/l	100	p	ND	ND	ND
1,1-Dichloroethane	ug/l	5	p	ND	ND	ND
1,2-Dichloroethane	ug/l	0.5	p	ND	ND	ND
Carbon Tetrachloride	ug/l	0.5	p	ND	ND	ND
Di-Isopropyl Ether	ug/l			ND	ND	ND
Fluorotrichloromethane-Freon11	ug/l	150	p	ND	ND	ND
Isopropylbenzene	ug/l			ND	ND	ND
n-Propylbenzene	ug/l			ND	ND	ND
sec-Butylbenzene	ug/l			ND	ND	ND
1,1,1-Trichloroethane	ug/l	200	p	ND	ND	ND
Benzene	ug/l	1	p	ND	ND	ND
Toluene	ug/l	150	p	ND	ND	ND
m,p-Xylenes	ug/l	1750	p	ND	ND	ND
o-Xylene	ug/l	1750	p	ND	ND	ND
Ethyl benzene	ug/l	700	p	ND	ND	ND
MTBE	ug/l	13	p	ND	ND	ND
Perchlorate	ug/l					

MCL: Maximum Contaminant Level, bold value indicates concentration exceeds MCL. (p): Primary MCL (s): Secondary MCL (ND): Not Detected

TABLE 4.2
CENTRAL BASIN WATER QUALITY RESULTS
REGIONAL GROUNDWATER MONITORING, WATER YEAR 2001/2002

Water Quality Constituent	Units	MCL	MCL Type	La Mirada #1	La Mirada #1	La Mirada #1	La Mirada #1	La Mirada #1
				Zone 1	Zone 2	Zone 3	Zone 4	Zone 5
				5/2/02	5/2/02	5/2/02	5/2/02	5/2/02
General Mineral								
Total Dissolved Solid (TDS)	mg/l	1000	s	360	250	310	420	490
Cation Sum	meq/l			6.28	4.3	5.63	7.3	8.22
Anion Sum	meq/l			5.91	4.31	5.53	7.26	8.16
Iron, Total, ICAP	mg/l	0.3	s	ND	ND	ND	ND	ND
Manganese, Total, ICAP/MS	ug/l	50	s	11	7.9	18	**65**	35
Alkalinity	mg/l			159	141	185	199	193
Boron	mg/l			0.12	0.081	0.13	0.13	0.13
Bicarbonate as HCO3,calculated	mg/l			193	171	225	242	235
Calcium, Total, ICAP	mg/l			15	10	22	45	57
Carbonate as CO3, Calculated	mg/l			3.15	3.51	2.32	1.25	0.964
Hardness (Total, as CaCO3)	mg/l			50.2	32.4	84.5	178	225
Chloride	mg/l	500	s	26	15	17	34	72
Fluoride	mg/l	2	p	0.76	0.56	0.74	0.57	0.47
Hydroxide as OH, Calculated	mg/l			0.04	0.05	0.03	0.01	0.01
Langelier Index - 25 degree	None			0.42	0.29	0.45	0.49	0.48
Magnesium, Total, ICAP	mg/l			3.1	1.8	7.2	16	20
Mercury	ug/l	2	p	ND	ND	ND	ND	ND
Nitrate-N by IC	mg/l	10	p	ND	ND	ND	ND	2.3
Nitrite, Nitrogen by IC	mg/l	1	p	ND	ND	ND	ND	ND
Potassium, Total, ICAP	mg/l			2.3	1.6	2.6	3	2.9
Sodium, Total, ICAP	mg/l			120	83	89	84	84
Sulfate	mg/l	500	s	94	50	63	110	100
Surfactants	mg/l	0.5	s	ND	ND	ND	ND	ND
Total Nitrate, Nitrite-N, CALC	mg/l			ND	ND	ND	ND	2.3
Total Organic Carbon	mg/l			ND	ND	ND	ND	ND
Carbon Dioxide	mg/l			1.54	1.08	2.84	6.09	7.45
General Physical								
Apparent Color	ACU	15	s	3	3	5	3	3
Lab pH	Units			8.4	8.5	8.2	7.9	7.8
Odor	TON	3	s	1	1	1	1	1
Specific Conductance	umho/cm	1600	s	585	430	435	685	790
Turbidity	NTU	5	s	0.1	0.1	0.1	0.35	0.2
Radon	pCi/l							
Metals								
Aluminum, Total, ICAP/MS	ug/l	200	s	ND	ND	ND	ND	ND
Antimony, Total, ICAP/MS	ug/l	6	p	ND	ND	ND	ND	ND
Arsenic, Total, ICAP/MS	ug/l	50	p	7.2	7.6	8	5	2.3
Barium, Total, ICAP/MS	ug/l	1000	p	52	22	37	45	51
Beryllium, Total, ICAP/MS	ug/l	4	p	ND	ND	ND	ND	ND
Chromium, Total, ICAP/MS	ug/l	50	p	ND	ND	ND	ND	1
Hexavalent Chromium (Cr VI)	mg/l							
Cadmium, Total, ICAP/MS	ug/l	5	p	ND	ND	ND	ND	ND
Copper, Total, ICAP/MS	ug/l	1000	s	ND	ND	ND	ND	ND
Lead, Total, ICAP/MS	ug/l			ND	ND	ND	ND	ND
Nickel, Total, ICAP/MS	ug/l	100	p	ND	ND	ND	ND	ND
Selenium, Total, ICAP/MS	ug/l	50	p	ND	ND	ND	ND	7.2
Silver, Total, ICAP/MS	ug/l	100	s	ND	ND	ND	ND	ND
Thallium, Total, ICAP/MS	ug/l	2	p	ND	ND	ND	ND	ND
Zinc, Total, ICAP/MS	ug/l	5000	s	ND	ND	ND	ND	ND
Volatile Organic Compounds								
Trichloroethylene (TCE)	ug/l	5	p	ND	ND	ND	ND	ND
Tetrachloroethylene (PCE)	ug/l	5	p	ND	ND	ND	ND	ND
1,1-Dichloroethylene	ug/l	6	p	ND	ND	ND	ND	ND
cis-1,2-Dichloroethylene	ug/l	6	p	ND	ND	ND	ND	ND
Chloroform (Trichloromethane)	ug/l	100	p	ND	ND	ND	ND	ND
1,1-Dichloroethane	ug/l	5	p	ND	ND	ND	ND	ND
1,2-Dichloroethane	ug/l	0.5	p	ND	ND	ND	ND	ND
Carbon Tetrachloride	ug/l	0.5	p	ND	ND	ND	ND	ND
Di-Isopropyl Ether	ug/l			ND	ND	ND	ND	ND
Fluorotrichloromethane-Freon11	ug/l	150	p	ND	ND	ND	ND	ND
Isopropylbenzene	ug/l			ND	ND	ND	ND	ND
n-Propylbenzene	ug/l			ND	ND	ND	ND	ND
sec-Butylbenzene	ug/l			ND	ND	ND	ND	ND
1,1,1-Trichloroethane	ug/l	200	p	ND	ND	ND	ND	ND
Benzene	ug/l	1	p	ND	ND	ND	ND	ND
Toluene	ug/l	150	p	ND	ND	ND	ND	ND
m,p-Xylenes	ug/l	1750	p	ND	ND	ND	ND	ND
o-Xylene	ug/l	1750	p	ND	ND	ND	ND	ND
Ethyl benzene	ug/l	700	p	ND	ND	ND	ND	ND
MTBE	ug/l	13	p	ND	ND	ND	ND	ND
Perchlorate	ug/l							

MCL: Maximum Contaminant Level, bold value indicates concentration exceeds MCL. (p): Primary MCL (s): Secondary MCL (ND): Not Detected

TABLE 4.2
CENTRAL BASIN WATER QUALITY RESULTS
REGIONAL GROUNDWATER MONITORING, WATER YEAR 2001/2002

Water Quality Constituent	Units	MCL	MCL Type	Lakewood #1 Zone 1 2/26/02	Lakewood #1 Zone 2 2/26/02	Lakewood #1 Zone 3 2/26/02	Lakewood #1 Zone 4 2/26/02	Lakewood #1 Zone 5 2/26/02	Lakewood #1 Zone 6 2/26/02
General Mineral									
Total Dissolved Solid (TDS)	mg/l	1000	s	190	190	220	290	230	470
Cation Sum	meq/l			2.86	3.37	3.8	4.97	4.25	7.71
Anion Sum	meq/l			2.83	3.21	3.96	4.83	4.05	7.72
Iron, Total, ICAP	mg/l	0.3	s	ND	ND	ND	0.1	ND	ND
Manganese, Total, ICAP/MS	ug/l	50	s	3.2	16	25	**140**	**52**	**280**
Alkalinity	mg/l			95	136	155	168	173	197
Boron	mg/l			0.056	ND	0.058	0.07	0.079	0.08
Bicarbonate as HCO3,calculated	mg/l			114	165	188	204	210	240
Calcium, Total, ICAP	mg/l			10	33	40	57	48	100
Carbonate as CO3, Calculated	mg/l			4.67	2.14	3.07	1.67	1.72	0.984
Hardness (Total, as CaCO3)	mg/l			26.4	98	119	171	154	291
Chloride	mg/l	500	s	20	6	19	39	9.7	98
Fluoride	mg/l	2	p	0.46	0.25	0.31	0.25	0.49	0.22
Hydroxide as OH, Calculated	mg/l			0.1	0.03	0.04	0.02	0.02	0.01
Langelier Index - 25 degree	None			0.41	0.59	0.83	0.72	0.66	0.73
Magnesium, Total, ICAP	mg/l			0.36	3.8	4.7	6.9	8.4	10
Mercury	ug/l	2	p	ND	ND	ND	ND	ND	ND
Nitrate-N by IC	mg/l	10	p	ND	ND	ND	ND	ND	ND
Nitrite, Nitrogen by IC	mg/l	1	p	ND	ND	ND	ND	ND	ND
Potassium, Total, ICAP	mg/l			1.1	2.2	2.5	3	2.7	4.1
Sodium, Total, ICAP	mg/l			53	31	31	34	25	41
Sulfate	mg/l	500	s	17	15	15	17	14	48
Surfactants	mg/l	0.5	s	ND	ND	ND	0.098	ND	0.109
Total Nitrate, Nitrite-N, CALC	mg/l			ND	ND	ND	ND	ND	ND
Total Organic Carbon	mg/l			0.9	ND	0.9	0.7	ND	0.9
Carbon Dioxide	mg/l			0.361	1.65	1.5	3.24	3.34	7.61
General Physical									
Apparent Color	ACU	15	s	15	3	5	5	3	5
Lab pH	Units			8.8	8.3	8.4	8.1	8.1	7.8
Odor	TON	3	s	2	1	1	2	2	2
Specific Conductance	umho/cm	1600	s	317	273	367	485	430	785
Turbidity	NTU	5	s	0.05	0.6	3.8	0.45	0.2	0.6
Radon	pCi/l								
Metals									
Aluminum, Total, ICAP/MS	ug/l	200	s	ND	ND	ND	ND	ND	ND
Antimony, Total, ICAP/MS	ug/l	6	p	ND	ND	ND	ND	ND	ND
Arsenic, Total, ICAP/MS	ug/l	50	p	9.5	1.9	1.3	12	4.8	21
Barium, Total, ICAP/MS	ug/l	1000	p	16	20	29	130	100	290
Beryllium, Total, ICAP/MS	ug/l	4	p	ND	ND	ND	ND	ND	ND
Chromium, Total, ICAP/MS	ug/l	50	p	ND	ND	ND	ND	ND	ND
Hexavalent Chromium (Cr VI)	mg/l								
Cadmium, Total, ICAP/MS	ug/l	5	p	ND	ND	ND	ND	ND	ND
Copper, Total, ICAP/MS	ug/l	1000	s	ND	ND	ND	ND	ND	ND
Lead, Total, ICAP/MS	ug/l			ND	ND	ND	ND	ND	ND
Nickel, Total, ICAP/MS	ug/l	100	p	ND	ND	ND	ND	ND	6.2
Selenium, Total, ICAP/MS	ug/l	50	p	ND	ND	ND	ND	ND	ND
Silver, Total, ICAP/MS	ug/l	100	s	ND	ND	ND	ND	ND	ND
Thallium, Total, ICAP/MS	ug/l	2	p	ND	ND	ND	ND	ND	ND
Zinc, Total, ICAP/MS	ug/l	5000	s	ND	ND	ND	ND	ND	ND
Volatile Organic Compounds									
Trichloroethylene (TCE)	ug/l	5	p	ND	ND	ND	ND	ND	ND
Tetrachloroethylene (PCE)	ug/l	5	p	ND	ND	ND	ND	ND	ND
1,1-Dichloroethylene	ug/l	6	p	ND	ND	ND	ND	ND	ND
cis-1,2-Dichloroethylene	ug/l	6	p	ND	ND	ND	ND	ND	ND
Chloroform (Trichloromethane)	ug/l	100	p	ND	ND	ND	ND	ND	ND
1,1-Dichloroethane	ug/l	5	p	ND	ND	ND	ND	ND	ND
1,2-Dichloroethane	ug/l	0.5	p	ND	ND	ND	ND	ND	ND
Carbon Tetrachloride	ug/l	0.5	p	ND	ND	ND	ND	ND	ND
Di-Isopropyl Ether	ug/l			ND	ND	ND	ND	ND	ND
Fluorotrichloromethane-Freon11	ug/l	150	p	ND	ND	ND	ND	ND	ND
Isopropylbenzene	ug/l			ND	ND	ND	ND	ND	ND
n-Propylbenzene	ug/l			ND	ND	ND	ND	ND	ND
sec-Butylbenzene	ug/l			ND	ND	ND	ND	ND	ND
1,1,1-Trichloroethane	ug/l	200	p	ND	ND	ND	ND	ND	ND
Benzene	ug/l	1	p	ND	ND	ND	ND	ND	ND
Toluene	ug/l	150	p	ND	ND	ND	ND	ND	ND
m,p-Xylenes	ug/l	1750	p	ND	ND	ND	ND	ND	ND
o-Xylene	ug/l	1750	p	ND	ND	ND	ND	ND	ND
Ethyl benzene	ug/l	700	p	ND	ND	ND	ND	ND	ND
MTBE	ug/l	13	p	ND	ND	ND	ND	ND	ND
Perchlorate	ug/l				ND				

MCL: Maximum Contaminant Level, bold value indicates concentration exceeds MCL. (p): Primary MCL (s): Secondary MCL (ND): Not Detected

TABLE 4.2
CENTRAL BASIN WATER QUALITY RESULTS
REGIONAL GROUNDWATER MONITORING, WATER YEAR 2001/2002

Water Quality Constituent	Units	MCL	MCL Type	Long Beach #1 Zone 1 5/7/02	Long Beach #1 Zone 2 5/7/02	Long Beach #1 Zone 3 5/7/02	Long Beach #1 Zone 4 5/7/02	Long Beach #1 Zone 5 5/7/02	Long Beach #1 Zone 6 5/7/02
General Mineral									
Total Dissolved Solid (TDS)	mg/l	1000	s	230	220	190	230	**1920**	750
Cation Sum	meq/l			3.71	3.67	3.14	3.91	30.4	12.2
Anion Sum	meq/l			3.62	3.47	3.01	3.62	30.5	11.9
Iron, Total, ICAP	mg/l	0.3	s	ND	ND	ND	ND	ND	ND
Manganese, Total, ICAP/MS	ug/l	50	s	2.6	ND	5.5	15	**280**	**250**
Alkalinity	mg/l			158	152	120	142	128	192
Boron	mg/l			0.18	0.18	0.075	0.13	0.072	0.081
Bicarbonate as HCO3,calculated	mg/l			186	181	144	172	156	234
Calcium, Total, ICAP	mg/l			2.4	2.7	4.8	6.1	250	140
Carbonate as CO3, Calculated	mg/l			15.2	11.8	5.9	2.81	0.64	1.21
Hardness (Total, as CaCO3)	mg/l			7.06	7.4	13.3	18.2	772	440
Chloride	mg/l	500	s	15	14	11	12	**730**	130
Fluoride	mg/l	2	p	0.64	0.63	0.6	0.43	0.15	0.3
Hydroxide as OH, Calculated	mg/l			0.2	0.2	0.1	0.04	0.01	0.01
Langelier Index - 25 degree	None			0.3	0.24	0.2	-0.02	0.95	0.97
Magnesium, Total, ICAP	mg/l			0.26	0.16	0.31	0.73	36	22
Mercury	ug/l	2	p	ND	ND	ND	ND	ND	ND
Nitrate-N by IC	mg/l	10	p	ND	ND	ND	ND	ND	ND
Nitrite, Nitrogen by IC	mg/l	1	p	ND	ND	ND	ND	ND	ND
Potassium, Total, ICAP	mg/l			ND	ND	ND	1.1	5.8	3.4
Sodium, Total, ICAP	mg/l			82	81	66	81	340	75
Sulfate	mg/l	500	s	ND	ND	13	20	350	210
Surfactants	mg/l	0.5	s	ND	ND	ND	ND	ND	0.061
Total Nitrate, Nitrite-N, CALC	mg/l			ND	ND	ND	ND	ND	ND
Total Organic Carbon	mg/l			5	5	1.7	1.7	1.2	1.1
Carbon Dioxide	mg/l			0.295	0.362	0.456	1.37	4.94	5.89
General Physical									
Apparent Color	ACU	15	s	**80**	**100**	**35**	**25**	3	3
Lab pH	Units			9.1	9	8.8	8.4	7.8	7.9
Odor	TON	3	s	2	2	1	2	1	1
Specific Conductance	umho/cm	1600	s	350	345	300	360	**3100**	1150
Turbidity	NTU	5	s	0.3	0.4	2.8	**6.6**	**11**	1.4
Radon	pCi/l								
Metals									
Aluminum, Total, ICAP/MS	ug/l	200	s	41	31	ND	ND	ND	ND
Antimony, Total, ICAP/MS	ug/l	6	p	ND	ND	ND	ND	ND	ND
Arsenic, Total, ICAP/MS	ug/l	50	p	ND	1.1	ND	4.4	ND	7.7
Barium, Total, ICAP/MS	ug/l	1000	p	ND	2.2	ND	3.8	170	260
Beryllium, Total, ICAP/MS	ug/l	4	p	ND	ND	ND	ND	ND	ND
Chromium, Total, ICAP/MS	ug/l	50	p	1.8	2.4	ND	2.7	2.1	1.8
Hexavalent Chromium (Cr VI)	mg/l								
Cadmium, Total, ICAP/MS	ug/l	5	p	ND	ND	ND	ND	ND	ND
Copper, Total, ICAP/MS	ug/l	1000	s	ND	ND	ND	ND	ND	ND
Lead, Total, ICAP/MS	ug/l			ND	ND	ND	ND	ND	ND
Nickel, Total, ICAP/MS	ug/l	100	p	ND	ND	ND	ND	11	5.7
Selenium, Total, ICAP/MS	ug/l	50	p	ND	ND	ND	ND	ND	ND
Silver, Total, ICAP/MS	ug/l	100	s	ND	ND	ND	ND	ND	ND
Thallium, Total, ICAP/MS	ug/l	2	p	ND	ND	ND	ND	ND	ND
Zinc, Total, ICAP/MS	ug/l	5000	s	ND	ND	ND	ND	ND	ND
Volatile Organic Compounds									
Trichloroethylene (TCE)	ug/l	5	p	ND	ND	ND	ND	ND	ND
Tetrachloroethylene (PCE)	ug/l	5	p	ND	ND	ND	ND	ND	ND
1,1-Dichloroethylene	ug/l	6	p	ND	ND	ND	ND	ND	ND
cis-1,2-Dichloroethylene	ug/l	6	p	ND	ND	ND	ND	ND	ND
Chloroform (Trichloromethane)	ug/l	100	p	ND	ND	ND	ND	ND	ND
1,1-Dichloroethane	ug/l	5	p	ND	ND	ND	ND	ND	ND
1,2-Dichloroethane	ug/l	0.5	p	ND	ND	ND	ND	ND	ND
Carbon Tetrachloride	ug/l	0.5	p	ND	ND	ND	ND	ND	ND
Di-Isopropyl Ether	ug/l			ND	ND	ND	ND	ND	ND
Fluorotrichloromethane-Freon11	ug/l	150	p	ND	ND	ND	ND	ND	ND
Isopropylbenzene	ug/l			ND	ND	ND	ND	ND	ND
n-Propylbenzene	ug/l			ND	ND	ND	ND	ND	ND
sec-Butylbenzene	ug/l			ND	ND	ND	ND	ND	ND
1,1,1-Trichloroethane	ug/l	200	p	ND	ND	ND	ND	ND	ND
Benzene	ug/l	1	p	ND	ND	ND	ND	ND	ND
Toluene	ug/l	150	p	ND	ND	ND	ND	ND	ND
m,p-Xylenes	ug/l	1750	p	ND	ND	ND	ND	ND	ND
o-Xylene	ug/l	1750	p	ND	ND	ND	ND	ND	ND
Ethyl benzene	ug/l	700	p	ND	ND	ND	ND	ND	ND
MTBE	ug/l	13	p	ND	ND	ND	ND	ND	ND
Perchlorate	ug/l								

MCL: Maximum Contaminant Level, bold value indicates concentration exceeds MCL. (p): Primary MCL (s): Secondary MCL (ND): Not Detected

TABLE 4.2
CENTRAL BASIN WATER QUALITY RESULTS
REGIONAL GROUNDWATER MONITORING, WATER YEAR 2001/2002

Water Quality Constituent	Units	MCL	MCL Type	Long Beach #2	Long Beach #2	Long Beach #2	Long Beach #2	Long Beach #2	Long Beach #2
				Zone 1	Zone 2	Zone 3	Zone 4	Zone 5	Zone 6
				5/28/02	7/8/02	5/28/02	5/28/02	5/28/02	5/28/02
General Mineral									
Total Dissolved Solid (TDS)	mg/l	1000	s	430	300	250	300	980	**1260**
Cation Sum	meq/l			7.08	4.98	4.07	4.89	16.6	20.8
Anion Sum	meq/l			6.83	4.76	3.98	4.63	15.7	20.9
Iron, Total, ICAP	mg/l	0.3	s	0.15	ND	ND	ND	0.14	0.18
Manganese, Total, ICAP/MS	ug/l	50	s	18	22	10	33	**150**	**310**
Alkalinity	mg/l			309	206	139	143	284	303
Boron	mg/l			0.55	0.2	0.13	0.091	0.25	0.33
Bicarbonate as HCO3,calculated	mg/l			375	250	168	174	346	369
Calcium, Total, ICAP	mg/l			7.3	13	14	39	190	230
Carbonate as CO3, Calculated	mg/l			4.86	3.24	3.45	1.79	0.895	0.955
Hardness (Total, as CaCO3)	mg/l			24.8	39.4	40.7	117	581	726
Chloride	mg/l	500	s	22	20	23	29	120	180
Fluoride	mg/l	2	p	0.61	0.36	0.51	0.32	0.17	0.3
Hydroxide as OH, Calculated	mg/l			0.03	0.03	0.05	0.03	0.007	0.007
Langelier Index - 25 degree	None			0.29	0.37	0.43	0.59	0.97	1.1
Magnesium, Total, ICAP	mg/l			1.6	1.7	1.4	4.7	26	37
Mercury	ug/l	2	p	ND	ND	ND	ND	ND	ND
Nitrate-N by IC	mg/l	10	p	ND	ND	ND	ND	ND	ND
Nitrite, Nitrogen by IC	mg/l	1	p	ND	ND	ND	ND	ND	ND
Potassium, Total, ICAP	mg/l			2.6	2.3	1.6	3	5.1	6.4
Sodium, Total, ICAP	mg/l			150	95	74	57	110	140
Sulfate	mg/l	500	s	ND	2.5	25	45	320	470
Surfactants	mg/l	0.5	s	ND	ND	ND	ND	ND	0.084
Total Nitrate, Nitrite-N, CALC	mg/l			ND	ND	ND	ND	ND	ND
Total Organic Carbon	mg/l			14.2	4.4	1.5	1	1.2	1.4
Carbon Dioxide	mg/l			3.76	2.51	1.06	2.2	17.4	18.5
General Physical									
Apparent Color	ACU	15	s	**300**	**40**	**20**	5	3	3
Lab pH	Units			8.3	8.3	8.5	8.2	7.6	7.6
Odor	TON	3	s	**4**	**8**	**4**	**4**	1	**8**
Specific Conductance	umho/cm	1600	s	636	433	336	453	1430	**1760**
Turbidity	NTU	5	s	1.3	0.8	0.15	1.6	0.7	2.2
Radon	pCi/l								
Metals									
Aluminum, Total, ICAP/MS	ug/l	200	s	ND	ND	ND	ND	ND	ND
Antimony, Total, ICAP/MS	ug/l	6	p	ND	ND	ND	ND	ND	ND
Arsenic, Total, ICAP/MS	ug/l	50	p	1.2	1.3	ND	2.6	6.8	8.4
Barium, Total, ICAP/MS	ug/l	1000	p	7.2	8.3	5.6	18	88	93
Beryllium, Total, ICAP/MS	ug/l	4	p	ND	ND	ND	ND	ND	ND
Chromium, Total, ICAP/MS	ug/l	50	p	2.4	ND	ND	ND	3	3.9
Hexavalent Chromium (Cr VI)	mg/l								
Cadmium, Total, ICAP/MS	ug/l	5	p	ND	ND	ND	ND	ND	ND
Copper, Total, ICAP/MS	ug/l	1000	s	2.9	ND	ND	ND	ND	ND
Lead, Total, ICAP/MS	ug/l			ND	ND	ND	ND	ND	ND
Nickel, Total, ICAP/MS	ug/l	100	p	ND	ND	ND	ND	ND	6.3
Selenium, Total, ICAP/MS	ug/l	50	p	ND	ND	ND	ND	ND	ND
Silver, Total, ICAP/MS	ug/l	100	s	ND	ND	ND	ND	ND	ND
Thallium, Total, ICAP/MS	ug/l	2	p	ND	ND	ND	ND	ND	ND
Zinc, Total, ICAP/MS	ug/l	5000	s	ND	ND	ND	ND	ND	ND
Volatile Organic Compounds									
Trichloroethylene (TCE)	ug/l	5	p	ND	ND	ND	ND	ND	ND
Tetrachloroethylene (PCE)	ug/l	5	p	ND	ND	ND	ND	ND	ND
1,1-Dichloroethylene	ug/l	6	p	ND	ND	ND	ND	ND	ND
cis-1,2-Dichloroethylene	ug/l	6	p	ND	ND	ND	ND	ND	ND
Chloroform (Trichloromethane)	ug/l	100	p	ND	ND	ND	ND	ND	ND
1,1-Dichloroethane	ug/l	5	p	ND	ND	ND	ND	ND	ND
1,2-Dichloroethane	ug/l	0.5	p	ND	ND	ND	ND	ND	ND
Carbon Tetrachloride	ug/l	0.5	p	ND	ND	ND	ND	ND	ND
Di-Isopropyl Ether	ug/l			ND	ND	ND	ND	ND	ND
Fluorotrichloromethane-Freon11	ug/l	150	p	ND	ND	ND	ND	ND	ND
Isopropylbenzene	ug/l			ND	ND	ND	ND	ND	ND
n-Propylbenzene	ug/l			ND	ND	ND	ND	ND	ND
sec-Butylbenzene	ug/l			ND	ND	ND	ND	ND	ND
1,1,1-Trichloroethane	ug/l	200	p	ND	ND	ND	ND	ND	ND
Benzene	ug/l	1	p	ND	ND	ND	ND	ND	ND
Toluene	ug/l	150	p	ND	ND	ND	ND	ND	ND
m,p-Xylenes	ug/l	1750	p	ND	ND	ND	ND	ND	ND
o-Xylene	ug/l	1750	p	ND	ND	ND	ND	ND	ND
Ethyl benzene	ug/l	700	p	ND	ND	ND	ND	ND	ND
MTBE	ug/l	13	p	ND	ND	ND	ND	ND	ND
Perchlorate	ug/l								

MCL: Maximum Contaminant Level, bold value indicates concentration exceeds MCL. (p): Primary MCL (s): Secondary MCL (ND): Not Detected

TABLE 4.2
CENTRAL BASIN WATER QUALITY RESULTS
REGIONAL GROUNDWATER MONITORING, WATER YEAR 2001/2002

Water Quality Constituent	Units	MCL	MCL Type	Long Beach #6	Long Beach #6	Long Beach #6	Long Beach #6	Long Beach #6	Long Beach #6
				Zone 1	Zone 2	Zone 3	Zone 4	Zone 5	Zone 6
				7/16/02	7/16/02	7/17/02	8/21/02	8/22/02	7/17/02
General Mineral									
Total Dissolved Solid (TDS)	mg/l	1000	s	690	360	260	270	210	260
Cation Sum	meq/l			11.5	5.54	3.99	3.7	3.24	4.57
Anion Sum	meq/l			11.6	5.55	3.79	3.6	3.14	3.98
Iron, Total, ICAP	mg/l	0.3	s	ND	ND	ND	ND	ND	0.12
Manganese, Total, ICAP/MS	ug/l	50	s	15	21	8.2	29	12	32
Alkalinity	mg/l			552	249	165	149	123	138
Boron	mg/l			1.1	0.41	0.25	0.14	0.08	0.051
Bicarbonate as HCO3,calculated	mg/l			669	301	200	181	149	168
Calcium, Total, ICAP	mg/l			8.2	4.7	3.6	3.8	12	40
Carbonate as CO3, Calculated	mg/l			10.9	6.19	4.11	2.35	3.06	1.37
Hardness (Total, as CaCO3)	mg/l			27.1	14.5	11	11.5	34.1	157
Chloride	mg/l	500	s	18	19	16	14	15	30
Fluoride	mg/l	2	p	0.72	0.71	0.67	0.6	0.47	0.28
Hydroxide as OH, Calculated	mg/l			0.04	0.05	0.05	0.03	0.05	0.02
Langelier Index - 25 degree	None			0.69	0.21	-0.079	-0.3	0.31	0.61
Magnesium, Total, ICAP	mg/l			1.6	0.67	0.5	0.5	1	4.1
Mercury	ug/l	2	p	ND	ND	ND	ND	ND	ND
Nitrate-N by IC	mg/l	10	p	ND	ND	ND	ND	ND	ND
Nitrite, Nitrogen by IC	mg/l	1	p	ND	ND	ND	ND	ND	ND
Potassium, Total, ICAP	mg/l			2	1.3	1.3	1.5	1.3	2.4
Sodium, Total, ICAP	mg/l			250	120	86	79	58	50
Sulfate	mg/l	500	s	ND	ND	ND	9.3	11	17
Surfactants	mg/l	0.5	s	ND	ND	ND	ND	ND	ND
Total Nitrate, Nitrite-N, CALC	mg/l			ND	ND	ND	ND	ND	ND
Total Organic Carbon	mg/l			26	12.6	7.3	5.4	1.5	0.7
Carbon Dioxide	mg/l			5.33	1.9	1.26	1.81	0.942	2.67
General Physical									
Apparent Color	ACU	15	s	**300**	**150**	**120**	**50**	**25**	5
Lab pH	Units			8.4	8.5	8.5	8.3	8.5	8.1
Odor	TON	3	s	**17**	**8**	**4**	**40**	**4**	**4**
Specific Conductance	umho/cm	1600	s	1060	535	357	351	303	392
Turbidity	NTU	5	s	2.6	**6.1**	2	**13**	1.4	**7.1**
Radon	pCi/l			79	110	110	110	ND	76
Metals									
Aluminum, Total, ICAP/MS	ug/l	200	s	27	34	63	ND	ND	31
Antimony, Total, ICAP/MS	ug/l	6	p	ND	ND	ND	ND	ND	ND
Arsenic, Total, ICAP/MS	ug/l	50	p	ND	ND	2.7	ND	ND	3.6
Barium, Total, ICAP/MS	ug/l	1000	p	10	3	3.4	ND	5	10
Beryllium, Total, ICAP/MS	ug/l	4	p	ND	ND	ND	ND	ND	ND
Chromium, Total, ICAP/MS	ug/l	50	p	4	11	3.8	2.5	ND	ND
Hexavalent Chromium (Cr VI)	mg/l			0.1	ND	ND	ND	ND	ND
Cadmium, Total, ICAP/MS	ug/l	5	p	ND	ND	ND	ND	ND	ND
Copper, Total, ICAP/MS	ug/l	1000	s	ND	ND	ND	ND	ND	ND
Lead, Total, ICAP/MS	ug/l			ND	ND	ND	ND	ND	ND
Nickel, Total, ICAP/MS	ug/l	100	p	ND	ND	ND	ND	ND	ND
Selenium, Total, ICAP/MS	ug/l	50	p	ND	ND	ND	ND	ND	ND
Silver, Total, ICAP/MS	ug/l	100	s	ND	ND	ND	ND	ND	ND
Thallium, Total, ICAP/MS	ug/l	2	p	ND	ND	ND	ND	ND	ND
Zinc, Total, ICAP/MS	ug/l	5000	s	ND	ND	ND	5.1	ND	ND
Volatile Organic Compounds									
Trichloroethylene (TCE)	ug/l	5	p	ND	ND	ND	ND	ND	ND
Tetrachloroethylene (PCE)	ug/l	5	p	ND	ND	ND	ND	ND	ND
1,1-Dichloroethylene	ug/l	6	p	ND	ND	ND	ND	ND	ND
cis-1,2-Dichloroethylene	ug/l	6	p	ND	ND	ND	ND	ND	ND
Chloroform (Trichloromethane)	ug/l	100	p	ND	ND	ND	ND	ND	ND
1,1-Dichloroethane	ug/l	5	p	ND	ND	ND	ND	ND	ND
1,2-Dichloroethane	ug/l	0.5	p	ND	ND	ND	ND	ND	ND
Carbon Tetrachloride	ug/l	0.5	p	ND	ND	ND	ND	ND	ND
Di-Isopropyl Ether	ug/l			ND	ND	ND	ND	ND	ND
Fluorotrichloromethane-Freon11	ug/l	150	p	ND	ND	ND	ND	ND	ND
Isopropylbenzene	ug/l			ND	ND	ND	ND	ND	ND
n-Propylbenzene	ug/l			ND	ND	ND	ND	ND	ND
sec-Butylbenzene	ug/l			ND	ND	ND	ND	ND	ND
1,1,1-Trichloroethane	ug/l	200	p	ND	ND	ND	ND	ND	ND
Benzene	ug/l	1	p	ND	ND	ND	ND	ND	ND
Toluene	ug/l	150	p	ND	ND	ND	ND	ND	ND
m,p-Xylenes	ug/l	1750	p	ND	ND	ND	ND	ND	ND
o-Xylene	ug/l	1750	p	ND	ND	ND	ND	ND	ND
Ethyl benzene	ug/l	700	p	ND	ND	ND	ND	ND	ND
MTBE	ug/l	13	p	ND	ND	ND	ND	ND	ND
Perchlorate	ug/l			ND	ND	ND	ND	ND	ND

MCL: Maximum Contaminant Level, bold value indicates concentration exceeds MCL. (p): Primary MCL (s): Secondary MCL (ND): Not Detected

TABLE 4.2
CENTRAL BASIN WATER QUALITY RESULTS
REGIONAL GROUNDWATER MONITORING, WATER YEAR 2001/2002

Water Quality Constituent	Units	MCL	MCL Type	Los Angeles #1	Los Angeles #1	Los Angeles #1	Los Angeles #1	Los Angeles #1
				Zone 1	Zone 2	Zone 3	Zone 4	Zone 5
				6/13/02	6/13/02	6/13/02	6/13/02	6/13/02
General Mineral								
Total Dissolved Solid (TDS)	mg/l	1000	s	350	370	380	570	620
Cation Sum	meq/l			5.81	6.4	6.29	9.78	11.1
Anion Sum	meq/l			5.56	5.92	6.07	9.59	10.6
Iron, Total, ICAP	mg/l	0.3	s	ND	0.22	ND	ND	ND
Manganese, Total, ICAP/MS	ug/l	50	s	47	**52**	26	4.2	ND
Alkalinity	mg/l			176	182	183	214	225
Boron	mg/l			0.14	0.13	0.15	0.18	0.19
Bicarbonate as HCO3,calculated	mg/l			214	222	223	261	274
Calcium, Total, ICAP	mg/l			56	54	61	100	120
Carbonate as CO3, Calculated	mg/l			1.75	0.456	0.577	0.536	0.563
Hardness (Total, as CaCO3)	mg/l			189	188	214	357	423
Chloride	mg/l	500	s	21	21	22	67	82
Fluoride	mg/l	2	p	0.28	0.39	0.37	0.42	0.41
Hydroxide as OH, Calculated	mg/l			0.02	0.005	0.007	0.005	0.005
Langelier Index - 25 degree	None			0.73	0.13	0.29	0.47	0.57
Magnesium, Total, ICAP	mg/l			12	13	15	26	30
Mercury	ug/l	2	p	ND	ND	ND	ND	ND
Nitrate-N by IC	mg/l	10	p	ND	ND	ND	6.7	**12**
Nitrite, Nitrogen by IC	mg/l	1	p	ND	ND	ND	0.59	ND
Potassium, Total, ICAP	mg/l			4.3	4.2	3.6	4.5	4.5
Sodium, Total, ICAP	mg/l			44	58	44	58	58
Sulfate	mg/l	500	s	69	80	85	140	140
Surfactants	mg/l	0.5	s	ND	ND	ND	ND	ND
Total Nitrate, Nitrite-N, CALC	mg/l			ND	ND	ND	7.29	12
Total Organic Carbon	mg/l			ND	ND	0.8	0.6	0.6
Carbon Dioxide	mg/l			3.4	14	11.2	16.5	17.3
General Physical								
Apparent Color	ACU	15	s	3	3	ND	3	10
Lab pH	Units			8.1	7.5	7.6	7.5	7.5
Odor	TON	3	s	2	1	1	2	1
Specific Conductance	umho/cm	1600	s	532	574	571	885	981
Turbidity	NTU	5	s	ND	0.85	3.3	1.7	1.5
Radon	pCi/l							
Metals								
Aluminum, Total, ICAP/MS	ug/l	200	s	ND	ND	ND	ND	ND
Antimony, Total, ICAP/MS	ug/l	6	p	ND	ND	ND	ND	ND
Arsenic, Total, ICAP/MS	ug/l	50	p	ND	ND	2.1	1.2	1.3
Barium, Total, ICAP/MS	ug/l	1000	p	29	50	52	120	150
Beryllium, Total, ICAP/MS	ug/l	4	p	ND	ND	ND	ND	ND
Chromium, Total, ICAP/MS	ug/l	50	p	ND	ND	ND	17	**350**
Hexavalent Chromium (Cr VI)	mg/l							
Cadmium, Total, ICAP/MS	ug/l	5	p	ND	ND	ND	ND	ND
Copper, Total, ICAP/MS	ug/l	1000	s	ND	ND	ND	ND	ND
Lead, Total, ICAP/MS	ug/l			ND	ND	ND	ND	ND
Nickel, Total, ICAP/MS	ug/l	100	p	ND	ND	ND	ND	ND
Selenium, Total, ICAP/MS	ug/l	50	p	ND	ND	ND	ND	ND
Silver, Total, ICAP/MS	ug/l	100	s	ND	ND	ND	ND	0.55
Thallium, Total, ICAP/MS	ug/l	2	p	ND	ND	ND	ND	ND
Zinc, Total, ICAP/MS	ug/l	5000	s	ND	ND	ND	ND	ND
Volatile Organic Compounds								
Trichloroethylene (TCE)	ug/l	5	p	ND	ND	ND	**14**	**22**
Tetrachloroethylene (PCE)	ug/l	5	p	ND	ND	ND	ND	0.7
1,1-Dichloroethylene	ug/l	6	p	ND	ND	ND	ND	ND
cis-1,2-Dichloroethylene	ug/l	6	p	ND	ND	ND	ND	ND
Chloroform (Trichloromethane)	ug/l	100	p	ND	ND	ND	ND	ND
1,1-Dichloroethane	ug/l	5	p	ND	ND	ND	ND	ND
1,2-Dichloroethane	ug/l	0.5	p	ND	ND	ND	ND	**0.6**
Carbon Tetrachloride	ug/l	0.5	p	ND	ND	ND	ND	ND
Di-Isopropyl Ether	ug/l			ND	ND	ND	ND	ND
Fluorotrichloromethane-Freon11	ug/l	150	p	ND	ND	ND	ND	ND
Isopropylbenzene	ug/l			ND	ND	ND	ND	ND
n-Propylbenzene	ug/l			ND	ND	ND	ND	ND
sec-Butylbenzene	ug/l			ND	ND	ND	ND	ND
1,1,1-Trichloroethane	ug/l	200	p	ND	ND	ND	ND	ND
Benzene	ug/l	1	p	ND	ND	ND	ND	ND
Toluene	ug/l	150	p	ND	ND	ND	ND	ND
m,p-Xylenes	ug/l	1750	p	ND	ND	ND	ND	ND
o-Xylene	ug/l	1750	p	ND	ND	ND	ND	ND
Ethyl benzene	ug/l	700	p	ND	ND	ND	ND	ND
MTBE	ug/l	13	p	ND	ND	ND	ND	ND
Perchlorate	ug/l							

MCL: Maximum Contaminant Level, bold value indicates concentration exceeds MCL. (p): Primary MCL (s): Secondary MCL (ND): Not Detected

TABLE 4.2
CENTRAL BASIN WATER QUALITY RESULTS
REGIONAL GROUNDWATER MONITORING, WATER YEAR 2001/2002

Water Quality Constituent	Units	MCL	MCL Type	Montebello #1	Montebello #1	Montebello #1	Montebello #1
				Zone 2	Zone 3	Zone 4	Zone 5
				8/29/02	8/29/02	8/29/02	8/29/02
General Mineral							
Total Dissolved Solid (TDS)	mg/l	1000	s	920	610	570	500
Cation Sum	meq/l			15.2	9.62	9.11	8.29
Anion Sum	meq/l			15.3	9.59	9.35	8.21
Iron, Total, ICAP	mg/l	0.3	s	ND	0.14	ND	ND
Manganese, Total, ICAP/MS	ug/l	50	s	45	**160**	**150**	ND
Alkalinity	mg/l			583	203	211	169
Boron	mg/l			2.2	0.29	0.25	0.24
Bicarbonate as HCO3,calculated	mg/l			709	246	257	206
Calcium, Total, ICAP	mg/l			19	97	100	83
Carbonate as CO3, Calculated	mg/l			5.8	1.01	1.33	0.533
Hardness (Total, as CaCO3)	mg/l			78.7	308	320	273
Chloride	mg/l	500	s	130	85	78	78
Fluoride	mg/l	2	p	0.34	0.2	0.2	0.41
Hydroxide as OH, Calculated	mg/l			0.02	0.01	0.01	0.007
Langelier Index - 25 degree	None			0.78	0.73	0.87	0.39
Magnesium, Total, ICAP	mg/l			7.6	16	17	16
Mercury	ug/l	2	p	ND	ND	ND	ND
Nitrate-N by IC	mg/l	10	p	ND	ND	ND	4.5
Nitrite, Nitrogen by IC	mg/l	1	p	ND	ND	ND	ND
Potassium, Total, ICAP	mg/l			6.3	4.2	3.9	3.4
Sodium, Total, ICAP	mg/l			310	77	60	63
Sulfate	mg/l	500	s	ND	150	140	110
Surfactants	mg/l	0.5	s	ND	ND	ND	ND
Total Nitrate, Nitrite-N, CALC	mg/l			ND	ND	ND	4.5
Total Organic Carbon	mg/l			29	2	2.7	0.5
Carbon Dioxide	mg/l			11.3	7.8	6.47	10.3
General Physical							
Apparent Color	ACU	15	s	**250**	15	**25**	3
Lab pH	Units			8.1	7.8	7.9	7.6
Odor	TON	3	s	**17**	**17**	**17**	3
Specific Conductance	umho/cm	1600	s	1350	882	854	766
Turbidity	NTU	5	s	2.7	**12**	1.2	0.9
Radon	pCi/l			170	260	490	260
Metals							
Aluminum, Total, ICAP/MS	ug/l	200	s	ND	ND	ND	ND
Antimony, Total, ICAP/MS	ug/l	6	p	ND	ND	ND	ND
Arsenic, Total, ICAP/MS	ug/l	50	p	1.2	ND	ND	ND
Barium, Total, ICAP/MS	ug/l	1000	p	25	49	64	58
Beryllium, Total, ICAP/MS	ug/l	4	p	ND	ND	ND	ND
Chromium, Total, ICAP/MS	ug/l	50	p	1.4	ND	ND	ND
Hexavalent Chromium (Cr VI)	mg/l			ND	ND	ND	ND
Cadmium, Total, ICAP/MS	ug/l	5	p	ND	ND	ND	ND
Copper, Total, ICAP/MS	ug/l	1000	s	2.3	ND	ND	ND
Lead, Total, ICAP/MS	ug/l			ND	ND	ND	ND
Nickel, Total, ICAP/MS	ug/l	100	p	ND	ND	ND	ND
Selenium, Total, ICAP/MS	ug/l	50	p	ND	ND	ND	ND
Silver, Total, ICAP/MS	ug/l	100	s	ND	ND	ND	ND
Thallium, Total, ICAP/MS	ug/l	2	p	ND	ND	ND	ND
Zinc, Total, ICAP/MS	ug/l	5000	s	6.5	ND	ND	ND
Volatile Organic Compounds							
Trichloroethylene (TCE)	ug/l	5	p	ND	ND	ND	ND
Tetrachloroethylene (PCE)	ug/l	5	p	ND	ND	ND	ND
1,1-Dichloroethylene	ug/l	6	p	ND	ND	ND	ND
cis-1,2-Dichloroethylene	ug/l	6	p	ND	ND	ND	ND
Chloroform (Trichloromethane)	ug/l	100	p	ND	ND	ND	ND
1,1-Dichloroethane	ug/l	5	p	ND	ND	ND	ND
1,2-Dichloroethane	ug/l	0.5	p	ND	ND	ND	ND
Carbon Tetrachloride	ug/l	0.5	p	ND	ND	ND	ND
Di-Isopropyl Ether	ug/l			ND	ND	ND	ND
Fluorotrichloromethane-Freon11	ug/l	150	p	ND	ND	ND	ND
Isopropylbenzene	ug/l			ND	ND	ND	ND
n-Propylbenzene	ug/l			ND	ND	ND	ND
sec-Butylbenzene	ug/l			ND	ND	ND	ND
1,1,1-Trichloroethane	ug/l	200	p	ND	ND	ND	ND
Benzene	ug/l	1	p	ND	ND	ND	ND
Toluene	ug/l	150	p	ND	ND	ND	ND
m,p-Xylenes	ug/l	1750	p	ND	ND	ND	ND
o-Xylene	ug/l	1750	p	ND	ND	ND	ND
Ethyl benzene	ug/l	700	p	ND	ND	ND	ND
MTBE	ug/l	13	p	ND	ND	ND	ND
Perchlorate	ug/l			ND	ND	ND	ND

MCL: Maximum Contaminant Level, bold value indicates concentration exceeds MCL. (p): Primary MCL (s): Secondary MCL (ND): Not Detected

TABLE 4.2
CENTRAL BASIN WATER QUALITY RESULTS
REGIONAL GROUNDWATER MONITORING, WATER YEAR 2001/2002

Water Quality Constituent	Units	MCL	MCL Type	Pico #1	Pico #1	Pico #1
				Zone 2	Zone 3	Zone 4
				4/29/02	4/29/02	4/29/02
General Mineral						
Total Dissolved Solid (TDS)	mg/l	1000	s	300	560	630
Cation Sum	meq/l			5.36	9.6	10.8
Anion Sum	meq/l			5.11	9.61	10.7
Iron, Total, ICAP	mg/l	0.3	s	0.25	**0.39**	ND
Manganese, Total, ICAP/MS	ug/l	50	s	37	22	2.3
Alkalinity	mg/l			164	175	203
Boron	mg/l			0.062	0.2	0.18
Bicarbonate as HCO3,calculated	mg/l			200	213	247
Calcium, Total, ICAP	mg/l			66	91	120
Carbonate as CO3, Calculated	mg/l			1.03	0.348	0.639
Hardness (Total, as CaCO3)	mg/l			214	305	386
Chloride	mg/l	500	s	17	98	88
Fluoride	mg/l	2	p	0.33	0.25	0.29
Hydroxide as OH, Calculated	mg/l			0.01	0.004	0.007
Langelier Index - 25 degree	None			0.58	0.24	0.63
Magnesium, Total, ICAP	mg/l			12	19	21
Mercury	ug/l	2	p	ND	ND	ND
Nitrate-N by IC	mg/l	10	p	ND	ND	1.9
Nitrite, Nitrogen by IC	mg/l	1	p	ND	ND	ND
Potassium, Total, ICAP	mg/l			3	5.4	5.4
Sodium, Total, ICAP	mg/l			23	77	68
Sulfate	mg/l	500	s	64	160	190
Surfactants	mg/l	0.5	s	ND	ND	ND
Total Nitrate, Nitrite-N, CALC	mg/l			ND	ND	1.9
Total Organic Carbon	mg/l			ND	0.6	0.6
Carbon Dioxide	mg/l			5.04	17	12.4
General Physical						
Apparent Color	ACU	15	s	5	5	3
Lab pH	Units			7.9	7.4	7.6
Odor	TON	3	s	1	1	1
Specific Conductance	umho/cm	1600	s	476	875	945
Turbidity	NTU	5	s	1.9	2.7	0.1
Radon	pCi/l					
Metals						
Aluminum, Total, ICAP/MS	ug/l	200	s	ND	ND	ND
Antimony, Total, ICAP/MS	ug/l	6	p	ND	ND	ND
Arsenic, Total, ICAP/MS	ug/l	50	p	ND	ND	3.2
Barium, Total, ICAP/MS	ug/l	1000	p	70	53	67
Beryllium, Total, ICAP/MS	ug/l	4	p	ND	ND	ND
Chromium, Total, ICAP/MS	ug/l	50	p	ND	ND	ND
Hexavalent Chromium (Cr VI)	mg/l					
Cadmium, Total, ICAP/MS	ug/l	5	p	ND	ND	ND
Copper, Total, ICAP/MS	ug/l	1000	s	ND	ND	ND
Lead, Total, ICAP/MS	ug/l			ND	ND	ND
Nickel, Total, ICAP/MS	ug/l	100	p	ND	ND	ND
Selenium, Total, ICAP/MS	ug/l	50	p	ND	ND	ND
Silver, Total, ICAP/MS	ug/l	100	s	ND	ND	ND
Thallium, Total, ICAP/MS	ug/l	2	p	ND	ND	ND
Zinc, Total, ICAP/MS	ug/l	5000	s	ND	ND	ND
Volatile Organic Compounds						
Trichloroethylene (TCE)	ug/l	5	p	ND	ND	ND
Tetrachloroethylene (PCE)	ug/l	5	p	ND	ND	ND
1,1-Dichloroethylene	ug/l	6	p	ND	ND	ND
cis-1,2-Dichloroethylene	ug/l	6	p	ND	ND	ND
Chloroform (Trichloromethane)	ug/l	100	p	ND	ND	ND
1,1-Dichloroethane	ug/l	5	p	ND	ND	ND
1,2-Dichloroethane	ug/l	0.5	p	ND	ND	ND
Carbon Tetrachloride	ug/l	0.5	p	ND	ND	ND
Di-Isopropyl Ether	ug/l			ND	ND	ND
Fluorotrichloromethane-Freon11	ug/l	150	p	ND	ND	ND
Isopropylbenzene	ug/l			ND	ND	ND
n-Propylbenzene	ug/l			ND	ND	ND
sec-Butylbenzene	ug/l			ND	ND	ND
1,1,1-Trichloroethane	ug/l	200	p	ND	ND	ND
Benzene	ug/l	1	p	ND	ND	ND
Toluene	ug/l	150	p	ND	ND	ND
m,p-Xylenes	ug/l	1750	p	ND	ND	ND
o-Xylene	ug/l	1750	p	ND	ND	ND
Ethyl benzene	ug/l	700	p	ND	ND	ND
MTBE	ug/l	13	p	ND	ND	ND
Perchlorate	ug/l					

MCL: Maximum Contaminant Level, bold value indicates concentration exceeds MCL. (p): Primary MCL (s): Secondary MCL (ND): Not Detected

TABLE 4.2
CENTRAL BASIN WATER QUALITY RESULTS
REGIONAL GROUNDWATER MONITORING, WATER YEAR 2001/2002

Water Quality Constituent	Units	MCL	MCL Type	Pico #2 Zone 1 6/18/02	Pico #2 Zone 2 6/18/02	Pico #2 Zone 3 6/18/02	Pico #2 Zone 4 6/18/02	Pico #2 Zone 5 6/18/02	Pico #2 Zone 6 6/18/02
General Mineral									
Total Dissolved Solid (TDS)	mg/l	1000	s	510	550	510	530	500	490
Cation Sum	meq/l			8.55	9.37	8.36	8.94	8.06	8.16
Anion Sum	meq/l			8.42	9.25	8.16	8.48	8.28	8.1
Iron, Total, ICAP	mg/l	0.3	s	ND	ND	ND	ND	ND	ND
Manganese, Total, ICAP/MS	ug/l	50	s	ND	ND	8.2	ND	23	**760**
Alkalinity	mg/l			197	228	153	195	137	129
Boron	mg/l			0.11	0.097	0.22	0.11	0.21	0.16
Bicarbonate as HCO3,calculated	mg/l			240	278	187	238	167	157
Calcium, Total, ICAP	mg/l			95	120	69	110	64	58
Carbonate as CO3, Calculated	mg/l			0.493	0.571	0.384	0.775	0.273	0.204
Hardness (Total, as CaCO3)	mg/l			328	398	238	361	230	215
Chloride	mg/l	500	s	52	62	86	58	95	94
Fluoride	mg/l	2	p	0.31	0.28	0.33	0.33	0.34	0.37
Hydroxide as OH, Calculated	mg/l			0.005	0.005	0.005	0.009	0.004	0.003
Langelier Index - 25 degree	None			0.41	0.58	0.17	0.67	-0.009	-0.09
Magnesium, Total, ICAP	mg/l			22	24	16	21	17	17
Mercury	ug/l	2	p	ND	ND	ND	ND	ND	ND
Nitrate-N by IC	mg/l	10	p	4	3.1	2.2	3.1	1.9	2
Nitrite, Nitrogen by IC	mg/l	1	p	ND	ND	ND	ND	ND	ND
Potassium, Total, ICAP	mg/l			6.3	3.7	4.3	4.1	4.5	6.6
Sodium, Total, ICAP	mg/l			42	30	80	37	77	85
Sulfate	mg/l	500	s	130	130	120	130	130	130
Surfactants	mg/l	0.5	s	ND	ND	ND	ND	ND	ND
Total Nitrate, Nitrite-N, CALC	mg/l			4	3.1	2.2	3.1	1.9	2
Total Organic Carbon	mg/l			0.5	ND	1	ND	1.1	1.4
Carbon Dioxide	mg/l			15.2	17.6	11.8	9.5	13.3	15.7
General Physical									
Apparent Color	ACU	15	s	3	ND	3	3	3	5
Lab pH	Units			7.5	7.5	7.5	7.7	7.4	7.3
Odor	TON	3	s	1	1	2	1	1	1
Specific Conductance	umho/cm	1600	s	771	852	800	795	788	792
Turbidity	NTU	5	s	0.5	0.25	1	1.7	0.3	0.85
Radon	pCi/l								
Metals									
Aluminum, Total, ICAP/MS	ug/l	200	s	ND	ND	ND	ND	ND	ND
Antimony, Total, ICAP/MS	ug/l	6	p	ND	ND	ND	ND	ND	ND
Arsenic, Total, ICAP/MS	ug/l	50	p	4.1	2.8	2.7	ND	1.2	21
Barium, Total, ICAP/MS	ug/l	1000	p	120	130	61	170	90	140
Beryllium, Total, ICAP/MS	ug/l	4	p	ND	ND	ND	ND	ND	ND
Chromium, Total, ICAP/MS	ug/l	50	p	ND	ND	ND	1.2	ND	ND
Hexavalent Chromium (Cr VI)	mg/l								
Cadmium, Total, ICAP/MS	ug/l	5	p	ND	ND	ND	ND	ND	ND
Copper, Total, ICAP/MS	ug/l	1000	s	ND	ND	ND	ND	ND	2.6
Lead, Total, ICAP/MS	ug/l			ND	ND	ND	ND	ND	ND
Nickel, Total, ICAP/MS	ug/l	100	p	ND	ND	ND	ND	ND	ND
Selenium, Total, ICAP/MS	ug/l	50	p	ND	ND	ND	ND	ND	ND
Silver, Total, ICAP/MS	ug/l	100	s	ND	ND	ND	ND	ND	ND
Thallium, Total, ICAP/MS	ug/l	2	p	ND	ND	ND	ND	ND	ND
Zinc, Total, ICAP/MS	ug/l	5000	s	ND	ND	ND	ND	ND	ND
Volatile Organic Compounds									
Trichloroethylene (TCE)	ug/l	5	p	ND	ND	ND	ND	ND	ND
Tetrachloroethylene (PCE)	ug/l	5	p	ND	2.8	ND	**10**	ND	ND
1,1-Dichloroethylene	ug/l	6	p	ND	ND	ND	ND	ND	ND
cis-1,2-Dichloroethylene	ug/l	6	p	ND	ND	ND	ND	ND	ND
Chloroform (Trichloromethane)	ug/l	100	p	ND	ND	ND	ND	ND	ND
1,1-Dichloroethane	ug/l	5	p	ND	ND	ND	ND	ND	ND
1,2-Dichloroethane	ug/l	0.5	p	ND	ND	ND	ND	ND	ND
Carbon Tetrachloride	ug/l	0.5	p	ND	ND	ND	ND	ND	ND
Di-Isopropyl Ether	ug/l			ND	ND	ND	ND	ND	ND
Fluorotrichloromethane-Freon11	ug/l	150	p	ND	ND	ND	ND	ND	ND
Isopropylbenzene	ug/l			ND	ND	ND	ND	ND	ND
n-Propylbenzene	ug/l			ND	ND	ND	ND	ND	ND
sec-Butylbenzene	ug/l			ND	ND	ND	ND	ND	ND
1,1,1-Trichloroethane	ug/l	200	p	ND	ND	ND	ND	ND	ND
Benzene	ug/l	1	p	ND	ND	ND	ND	ND	ND
Toluene	ug/l	150	p	ND	ND	ND	ND	ND	ND
m,p-Xylenes	ug/l	1750	p	ND	ND	ND	ND	ND	ND
o-Xylene	ug/l	1750	p	ND	ND	ND	ND	ND	ND
Ethyl benzene	ug/l	700	p	ND	ND	ND	ND	ND	ND
MTBE	ug/l	13	p	ND	ND	ND	ND	ND	ND
Perchlorate	ug/l								

MCL: Maximum Contaminant Level, bold value indicates concentration exceeds MCL. (p): Primary MCL (s): Secondary MCL (ND): Not Detected

TABLE 4.2
CENTRAL BASIN WATER QUALITY RESULTS
REGIONAL GROUNDWATER MONITORING, WATER YEAR 2001/2002

Water Quality Constituent	Units	MCL	MCL Type	Rio Hondo #1	Rio Hondo #1	Rio Hondo #1	Rio Hondo #1	Rio Hondo #1	Rio Hondo #1
				Zone 1	Zone 2	Zone 3	Zone 4	Zone 5	Zone 6
				3/26/02	3/26/02	3/26/02	3/26/02	3/26/02	3/26/02
General Mineral									
Total Dissolved Solid (TDS)	mg/l	1000	s	280	470	430	450	400	400
Cation Sum	meq/l			4.65	7.76	7.3	7.45	6.76	6.45
Anion Sum	meq/l			4.37	7.72	6.83	7.27	6.42	6.23
Iron, Total, ICAP	mg/l	0.3	s	ND	ND	ND	ND	ND	ND
Manganese, Total, ICAP/MS	ug/l	50	s	34	**54**	3.1	ND	7.8	8.9
Alkalinity	mg/l			146	166	153	145	132	119
Boron	mg/l			0.054	ND	0.14	0.18	0.14	0.17
Bicarbonate as HCO3,calculated	mg/l			178	202	186	177	161	145
Calcium, Total, ICAP	mg/l			42	100	80	68	64	56
Carbonate as CO3, Calculated	mg/l			1.46	0.828	0.763	0.576	0.417	0.237
Hardness (Total, as CaCO3)	mg/l			139	324	257	223	213	201
Chloride	mg/l	500	s	17	52	53	66	59	60
Fluoride	mg/l	2	p	0.27	0.22	0.32	0.42	0.34	0.3
Hydroxide as OH, Calculated	mg/l			0.02	0.01	0.01	0.009	0.007	0.004
Langelier Index - 25 degree	None			0.53	0.66	0.53	0.34	0.17	-0.1
Magnesium, Total, ICAP	mg/l			8.3	18	14	13	13	15
Mercury	ug/l	2	p	ND	ND	ND	ND	ND	ND
Nitrate-N by IC	mg/l	10	p	ND	ND	2.4	2.7	2.5	2.9
Nitrite, Nitrogen by IC	mg/l	1	p	ND	ND	ND	ND	ND	ND
Potassium, Total, ICAP	mg/l			3.2	3.9	4	4.2	4	4.4
Sodium, Total, ICAP	mg/l			41	27	47	66	55	53
Sulfate	mg/l	500	s	46	140	100	110	92	93
Surfactants	mg/l	0.5	s	ND	ND	ND	ND	ND	ND
Total Nitrate, Nitrite-N, CALC	mg/l			ND	ND	2.4	2.7	2.5	2.9
Total Organic Carbon	mg/l			ND	ND	ND	0.6	0.6	0.6
Carbon Dioxide	mg/l			2.83	6.4	5.9	7.06	8.09	11.5
General Physical									
Apparent Color	ACU	15	s	3	3	3	3	3	3
Lab pH	Units			8.1	7.8	7.8	7.7	7.6	7.4
Odor	TON	3	s	1	1	2	2	3	2
Specific Conductance	umho/cm	1600	s	418	689	645	664	633	621
Turbidity	NTU	5	s	1	0.45	0.1	0.2	1.4	0.2
Radon	pCi/l								
Metals									
Aluminum, Total, ICAP/MS	ug/l	200	s	ND	ND	ND	ND	ND	ND
Antimony, Total, ICAP/MS	ug/l	6	p	ND	ND	ND	ND	ND	ND
Arsenic, Total, ICAP/MS	ug/l	50	p	ND	1.2	ND	3.1	2	1.5
Barium, Total, ICAP/MS	ug/l	1000	p	17	54	110	57	55	76
Beryllium, Total, ICAP/MS	ug/l	4	p	ND	ND	ND	ND	ND	ND
Chromium, Total, ICAP/MS	ug/l	50	p	ND	ND	ND	ND	ND	ND
Hexavalent Chromium (Cr VI)	mg/l								
Cadmium, Total, ICAP/MS	ug/l	5	p	ND	ND	ND	ND	ND	ND
Copper, Total, ICAP/MS	ug/l	1000	s	ND	ND	ND	ND	ND	ND
Lead, Total, ICAP/MS	ug/l			ND	ND	ND	ND	ND	ND
Nickel, Total, ICAP/MS	ug/l	100	p	ND	ND	ND	ND	ND	ND
Selenium, Total, ICAP/MS	ug/l	50	p	ND	ND	ND	ND	ND	ND
Silver, Total, ICAP/MS	ug/l	100	s	ND	ND	ND	ND	ND	ND
Thallium, Total, ICAP/MS	ug/l	2	p	ND	ND	ND	ND	ND	ND
Zinc, Total, ICAP/MS	ug/l	5000	s	ND	ND	ND	ND	ND	ND
Volatile Organic Compounds									
Trichloroethylene (TCE)	ug/l	5	p	ND	ND	ND	ND	ND	ND
Tetrachloroethylene (PCE)	ug/l	5	p	ND	ND	ND	ND	ND	ND
1,1-Dichloroethylene	ug/l	6	p	ND	ND	ND	ND	ND	ND
cis-1,2-Dichloroethylene	ug/l	6	p	ND	ND	ND	ND	ND	ND
Chloroform (Trichloromethane)	ug/l	100	p	ND	ND	ND	ND	ND	ND
1,1-Dichloroethane	ug/l	5	p	ND	ND	ND	ND	ND	ND
1,2-Dichloroethane	ug/l	0.5	p	ND	ND	ND	ND	ND	ND
Carbon Tetrachloride	ug/l	0.5	p	ND	ND	ND	ND	ND	ND
Di-Isopropyl Ether	ug/l			ND	ND	ND	ND	ND	ND
Fluorotrichloromethane-Freon11	ug/l	150	p	ND	ND	ND	ND	ND	ND
Isopropylbenzene	ug/l			ND	ND	ND	ND	ND	ND
n-Propylbenzene	ug/l			ND	ND	ND	ND	ND	ND
sec-Butylbenzene	ug/l			ND	ND	ND	ND	ND	ND
1,1,1-Trichloroethane	ug/l	200	p	ND	ND	ND	ND	ND	ND
Benzene	ug/l	1	p	ND	ND	ND	ND	ND	ND
Toluene	ug/l	150	p	ND	ND	ND	ND	ND	ND
m,p-Xylenes	ug/l	1750	p	ND	ND	ND	ND	ND	ND
o-Xylene	ug/l	1750	p	ND	ND	ND	ND	ND	ND
Ethyl benzene	ug/l	700	p	ND	ND	ND	ND	ND	ND
MTBE	ug/l	13	p	ND	ND	ND	ND	ND	ND
Perchlorate	ug/l								

MCL: Maximum Contaminant Level, bold value indicates concentration exceeds MCL. (p): Primary MCL (s): Secondary MCL (ND): Not Detected

TABLE 4.2
CENTRAL BASIN WATER QUALITY RESULTS
REGIONAL GROUNDWATER MONITORING, WATER YEAR 2001/2002

Water Quality Constituent	Units	MCL	MCL Type	South Gate #1	South Gate #1	South Gate #1	South Gate #1	South Gate #1
				Zone 1	Zone 2	Zone 3	Zone 4	Zone 5
				6/10/02	6/10/02	6/10/02	6/10/02	6/10/02
General Mineral								
Total Dissolved Solid (TDS)	mg/l	1000	s	320	430	450	480	510
Cation Sum	meq/l			5.46	7	7.09	7.83	8.17
Anion Sum	meq/l			5.12	6.59	6.98	7.86	8.05
Iron, Total, ICAP	mg/l	0.3	s	ND	ND	ND	ND	ND
Manganese, Total, ICAP/MS	ug/l	50	s	**76**	ND	ND	2	**130**
Alkalinity	mg/l			166	146	161	176	191
Boron	mg/l			0.1	0.13	0.11	0.16	0.12
Bicarbonate as HCO3,calculated	mg/l			202	178	196	214	233
Calcium, Total, ICAP	mg/l			52	77	79	86	83
Carbonate as CO3, Calculated	mg/l			1.65	0.73	0.804	0.697	0.759
Hardness (Total, as CaCO3)	mg/l			163	250	263	281	294
Chloride	mg/l	500	s	21	49	45	53	82
Fluoride	mg/l	2	p	0.3	0.31	0.37	0.36	0.43
Hydroxide as OH, Calculated	mg/l			0.02	0.01	0.01	0.009	0.009
Langelier Index - 25 degree	None			0.68	0.49	0.54	0.52	0.54
Magnesium, Total, ICAP	mg/l			8.1	14	16	16	21
Mercury	ug/l	2	p	ND	ND	ND	ND	ND
Nitrate-N by IC	mg/l	10	p	ND	2.6	2.5	1.6	ND
Nitrite, Nitrogen by IC	mg/l	1	p	ND	ND	ND	ND	ND
Potassium, Total, ICAP	mg/l			2.5	3.5	3.1	3.3	2.9
Sodium, Total, ICAP	mg/l			49	44	40	49	51
Sulfate	mg/l	500	s	57	100	110	130	91
Surfactants	mg/l	0.5	s	ND	ND	ND	ND	ND
Total Nitrate, Nitrite-N, CALC	mg/l			ND	2.6	2.5	1.6	ND
Total Organic Carbon	mg/l			ND	0.5	ND	0.7	0.5
Carbon Dioxide	mg/l			3.21	5.64	6.21	8.54	9.3
General Physical								
Apparent Color	ACU	15	s	3	3	3	3	3
Lab pH	Units			8.1	7.8	7.8	7.7	7.7
Odor	TON	3	s	1	1	1	2	1
Specific Conductance	umho/cm	1600	s	489	631	668	727	783
Turbidity	NTU	5	s	0.1	0.25	1.1	0.3	0.3
Radon	pCi/l							
Metals								
Aluminum, Total, ICAP/MS	ug/l	200	s	ND	ND	ND	ND	ND
Antimony, Total, ICAP/MS	ug/l	6	p	ND	ND	ND	ND	ND
Arsenic, Total, ICAP/MS	ug/l	50	p	ND	2.8	ND	ND	ND
Barium, Total, ICAP/MS	ug/l	1000	p	110	92	150	76	200
Beryllium, Total, ICAP/MS	ug/l	4	p	ND	ND	ND	ND	ND
Chromium, Total, ICAP/MS	ug/l	50	p	ND	ND	ND	ND	ND
Hexavalent Chromium (Cr VI)	mg/l							
Cadmium, Total, ICAP/MS	ug/l	5	p	ND	ND	ND	ND	ND
Copper, Total, ICAP/MS	ug/l	1000	s	ND	ND	ND	ND	ND
Lead, Total, ICAP/MS	ug/l			ND	ND	ND	ND	ND
Nickel, Total, ICAP/MS	ug/l	100	p	ND	ND	ND	ND	ND
Selenium, Total, ICAP/MS	ug/l	50	p	ND	ND	ND	ND	ND
Silver, Total, ICAP/MS	ug/l	100	s	ND	ND	ND	ND	ND
Thallium, Total, ICAP/MS	ug/l	2	p	ND	ND	ND	ND	ND
Zinc, Total, ICAP/MS	ug/l	5000	s	ND	ND	ND	ND	ND
Volatile Organic Compounds								
Trichloroethylene (TCE)	ug/l	5	p	ND	ND	ND	1.3	ND
Tetrachloroethylene (PCE)	ug/l	5	p	ND	ND	0.9	**10**	ND
1,1-Dichloroethylene	ug/l	6	p	ND	ND	ND	ND	ND
cis-1,2-Dichloroethylene	ug/l	6	p	ND	ND	ND	ND	ND
Chloroform (Trichloromethane)	ug/l	100	p	ND	ND	ND	ND	ND
1,1-Dichloroethane	ug/l	5	p	ND	ND	ND	ND	ND
1,2-Dichloroethane	ug/l	0.5	p	ND	ND	ND	ND	ND
Carbon Tetrachloride	ug/l	0.5	p	ND	ND	ND	ND	ND
Di-Isopropyl Ether	ug/l			ND	ND	ND	ND	ND
Fluorotrichloromethane-Freon11	ug/l	150	p	ND	ND	ND	ND	ND
Isopropylbenzene	ug/l			ND	ND	ND	ND	ND
n-Propylbenzene	ug/l			ND	ND	ND	ND	ND
sec-Butylbenzene	ug/l			ND	ND	ND	ND	ND
1,1,1-Trichloroethane	ug/l	200	p	ND	ND	ND	ND	ND
Benzene	ug/l	1	p	ND	ND	ND	ND	ND
Toluene	ug/l	150	p	ND	ND	ND	ND	ND
m,p-Xylenes	ug/l	1750	p	ND	ND	ND	ND	ND
o-Xylene	ug/l	1750	p	ND	ND	ND	ND	ND
Ethyl benzene	ug/l	700	p	ND	ND	ND	ND	ND
MTBE	ug/l	13	p	ND	ND	ND	ND	ND
Perchlorate	ug/l							

MCL: Maximum Contaminant Level, bold value indicates concentration exceeds MCL. (p): Primary MCL (s): Secondary MCL (ND): Not Detected

TABLE 4.2
CENTRAL BASIN WATER QUALITY RESULTS
REGIONAL GROUNDWATER MONITORING, WATER YEAR 2001/2002

Water Quality Constituent	Units	MCL	MCL Type	Whittier #1	Whittier #1	Whittier #1	Whittier #1	Whittier #1
				Zone 1	Zone 2	Zone 3	Zone 4	Zone 5
				7/2/02	7/2/02	7/2/02	7/2/02	7/2/02
General Mineral								
Total Dissolved Solid (TDS)	mg/l	1000	s	**2720**	**2540**	**1630**	660	690
Cation Sum	meq/l			40.5	38.3	24.8	11	11.2
Anion Sum	meq/l			42.8	39.7	26	11.2	10.9
Iron, Total, ICAP	mg/l	0.3	s	**0.56**	**0.41**	0.25	ND	ND
Manganese, Total, ICAP/MS	ug/l	50	s	**110**	**150**	**150**	19	19
Alkalinity	mg/l			270	292	294	260	235
Boron	mg/l			0.83	0.92	0.6	0.18	0.15
Bicarbonate as HCO3,calculated	mg/l			329	356	358	317	286
Calcium, Total, ICAP	mg/l			200	190	140	76	81
Carbonate as CO3, Calculated	mg/l			0.676	1.46	1.47	1.03	0.74
Hardness (Total, as CaCO3)	mg/l			1030	1010	687	325	363
Chloride	mg/l	500	s	290	240	180	76	80
Fluoride	mg/l	2	p	0.29	0.3	0.51	0.2	0.32
Hydroxide as OH, Calculated	mg/l			0.005	0.01	0.01	0.009	0.007
Langelier Index - 25 degree	None			0.87	1.2	1.1	0.64	0.52
Magnesium, Total, ICAP	mg/l			130	130	82	33	39
Mercury	ug/l	2	p	ND	ND	ND	ND	ND
Nitrate-N by IC	mg/l	10	p	ND	ND	ND	4	5
Nitrite, Nitrogen by IC	mg/l	1	p	ND	ND	ND	ND	ND
Potassium, Total, ICAP	mg/l			11	10	6.8	4.2	3.7
Sodium, Total, ICAP	mg/l			450	410	250	100	89
Sulfate	mg/l	500	s	**1400**	**1300**	**720**	170	170
Surfactants	mg/l	0.5	s	ND	ND	ND	ND	ND
Total Nitrate, Nitrite-N, CALC	mg/l			ND	ND	ND	4	5
Total Organic Carbon	mg/l			2.1	2.4	1.2	ND	ND
Carbon Dioxide	mg/l			20.8	11.3	11.3	12.6	14.4
General Physical								
Apparent Color	ACU	15	s	10	10	5	ND	ND
Lab pH	Units			7.5	7.8	7.8	7.7	7.6
Odor	TON	3	s	2	1	2	1	1
Specific Conductance	umho/cm	1600	s	**3340**	**3170**	**2150**	1030	1000
Turbidity	NTU	5	s	4.1	2.8	1.6	0.15	1.2
Radon	pCi/l							
Metals								
Aluminum, Total, ICAP/MS	ug/l	200	s	ND	ND	ND	ND	ND
Antimony, Total, ICAP/MS	ug/l	6	p	ND	ND	ND	ND	ND
Arsenic, Total, ICAP/MS	ug/l	50	p	ND	1.9	1.1	1.7	1.2
Barium, Total, ICAP/MS	ug/l	1000	p	19	20	23	29	26
Beryllium, Total, ICAP/MS	ug/l	4	p	ND	ND	ND	ND	ND
Chromium, Total, ICAP/MS	ug/l	50	p	ND	ND	ND	ND	2
Hexavalent Chromium (Cr VI)	mg/l							
Cadmium, Total, ICAP/MS	ug/l	5	p	ND	ND	ND	ND	ND
Copper, Total, ICAP/MS	ug/l	1000	s	ND	ND	ND	ND	ND
Lead, Total, ICAP/MS	ug/l			ND	ND	ND	ND	ND
Nickel, Total, ICAP/MS	ug/l	100	p	ND	ND	ND	ND	ND
Selenium, Total, ICAP/MS	ug/l	50	p	ND	ND	ND	ND	13
Silver, Total, ICAP/MS	ug/l	100	s	ND	ND	ND	ND	ND
Thallium, Total, ICAP/MS	ug/l	2	p	ND	ND	ND	ND	ND
Zinc, Total, ICAP/MS	ug/l	5000	s	ND	ND	ND	ND	ND
Volatile Organic Compounds								
Trichloroethylene (TCE)	ug/l	5	p	ND	ND	ND	ND	ND
Tetrachloroethylene (PCE)	ug/l	5	p	ND	ND	ND	ND	ND
1,1-Dichloroethylene	ug/l	6	p	ND	ND	ND	ND	ND
cis-1,2-Dichloroethylene	ug/l	6	p	ND	ND	ND	ND	ND
Chloroform (Trichloromethane)	ug/l	100	p	ND	ND	ND	ND	ND
1,1-Dichloroethane	ug/l	5	p	ND	ND	ND	ND	ND
1,2-Dichloroethane	ug/l	0.5	p	ND	ND	ND	ND	ND
Carbon Tetrachloride	ug/l	0.5	p	ND	ND	ND	ND	ND
Di-Isopropyl Ether	ug/l			ND	ND	ND	ND	ND
Fluorotrichloromethane-Freon11	ug/l	150	p	ND	ND	ND	ND	ND
Isopropylbenzene	ug/l			ND	ND	ND	ND	ND
n-Propylbenzene	ug/l			ND	ND	ND	ND	ND
sec-Butylbenzene	ug/l			ND	ND	ND	ND	ND
1,1,1-Trichloroethane	ug/l	200	p	ND	ND	ND	ND	ND
Benzene	ug/l	1	p	ND	ND	ND	ND	ND
Toluene	ug/l	150	p	ND	ND	ND	ND	ND
m,p-Xylenes	ug/l	1750	p	ND	ND	ND	ND	ND
o-Xylene	ug/l	1750	p	ND	ND	ND	ND	ND
Ethyl benzene	ug/l	700	p	ND	ND	ND	ND	ND
MTBE	ug/l	13	p	ND	ND	ND	ND	ND
Perchlorate	ug/l							

MCL: Maximum Contaminant Level, bold value indicates concentration exceeds MCL. (p): Primary MCL (s): Secondary MCL (ND): Not Detected

TABLE 4.2
CENTRAL BASIN WATER QUALITY RESULTS
REGIONAL GROUNDWATER MONITORING, WATER YEAR 2001/2002

Water Quality Constituent	Units	MCL	MCL Type	Willowbrook #1 Zone 1 3/28/02	Willowbrook #1 Zone 2 3/28/02	Willowbrook #1 Zone 3 3/28/02	Willowbrook #1 Zone 4 3/28/02
General Mineral							
Total Dissolved Solid (TDS)	mg/l	1000	s	360	330	330	340
Cation Sum	meq/l			6.35	5.72	5.91	5.92
Anion Sum	meq/l			6.12	5.4	5.67	5.72
Iron, Total, ICAP	mg/l	0.3	s	ND	ND	ND	ND
Manganese, Total, ICAP/MS	ug/l	50	s	43	48	30	**82**
Alkalinity	mg/l			244	165	178	180
Boron	mg/l			0.19	0.12	0.12	0.12
Bicarbonate as HCO3,calculated	mg/l			297	201	217	219
Calcium, Total, ICAP	mg/l			47	60	61	62
Carbonate as CO3, Calculated	mg/l			1.93	1.64	1.12	1.79
Hardness (Total, as CaCO3)	mg/l			156	191	206	196
Chloride	mg/l	500	s	16	20	20	22
Fluoride	mg/l	2	p	0.31	0.32	0.43	0.39
Hydroxide as OH, Calculated	mg/l			0.02	0.02	0.01	0.02
Langelier Index - 25 degree	None			0.7	0.74	0.58	0.79
Magnesium, Total, ICAP	mg/l			9.5	10	13	10
Mercury	ug/l	2	p	ND	ND	ND	ND
Nitrate-N by IC	mg/l	10	p	ND	ND	ND	ND
Nitrite, Nitrogen by IC	mg/l	1	p	ND	ND	ND	ND
Potassium, Total, ICAP	mg/l			5.1	2.9	3.6	3.1
Sodium, Total, ICAP	mg/l			71	42	39	44
Sulfate	mg/l	500	s	37	73	73	71
Surfactants	mg/l	0.5	s	ND	ND	ND	ND
Total Nitrate, Nitrite-N, CALC	mg/l			ND	ND	ND	ND
Total Organic Carbon	mg/l			1.8	ND	ND	ND
Carbon Dioxide	mg/l			5.94	3.19	5.46	3.48
General Physical							
Apparent Color	ACU	15	s	15	5	5	3
Lab pH	Units			8	8.1	7.9	8.1
Odor	TON	3	s	3	2	1	1
Specific Conductance	umho/cm	1600	s	552	496	512	526
Turbidity	NTU	5	s	0.25	0.2	0.3	**17**
Radon	pCi/l						
Metals							
Aluminum, Total, ICAP/MS	ug/l	200	s	ND	ND	ND	ND
Antimony, Total, ICAP/MS	ug/l	6	p	ND	ND	ND	ND
Arsenic, Total, ICAP/MS	ug/l	50	p	7.3	ND	ND	5.6
Barium, Total, ICAP/MS	ug/l	1000	p	58	45	66	120
Beryllium, Total, ICAP/MS	ug/l	4	p	ND	ND	ND	ND
Chromium, Total, ICAP/MS	ug/l	50	p	ND	ND	ND	ND
Hexavalent Chromium (Cr VI)	mg/l						
Cadmium, Total, ICAP/MS	ug/l	5	p	ND	ND	ND	ND
Copper, Total, ICAP/MS	ug/l	1000	s	ND	ND	ND	ND
Lead, Total, ICAP/MS	ug/l			ND	ND	ND	ND
Nickel, Total, ICAP/MS	ug/l	100	p	ND	ND	ND	ND
Selenium, Total, ICAP/MS	ug/l	50	p	ND	ND	ND	ND
Silver, Total, ICAP/MS	ug/l	100	s	ND	ND	ND	ND
Thallium, Total, ICAP/MS	ug/l	2	p	ND	ND	ND	ND
Zinc, Total, ICAP/MS	ug/l	5000	s	ND	ND	ND	ND
Volatile Organic Compounds							
Trichloroethylene (TCE)	ug/l	5	p	ND	ND	ND	ND
Tetrachloroethylene (PCE)	ug/l	5	p	ND	ND	ND	ND
1,1-Dichloroethylene	ug/l	6	p	ND	ND	ND	ND
cis-1,2-Dichloroethylene	ug/l	6	p	ND	ND	ND	ND
Chloroform (Trichloromethane)	ug/l	100	p	ND	ND	ND	ND
1,1-Dichloroethane	ug/l	5	p	ND	ND	ND	ND
1,2-Dichloroethane	ug/l	0.5	p	ND	ND	ND	ND
Carbon Tetrachloride	ug/l	0.5	p	ND	ND	ND	ND
Di-Isopropyl Ether	ug/l			ND	ND	ND	ND
Fluorotrichloromethane-Freon11	ug/l	150	p	ND	ND	ND	ND
Isopropylbenzene	ug/l			ND	ND	ND	ND
n-Propylbenzene	ug/l			ND	ND	ND	ND
sec-Butylbenzene	ug/l			ND	ND	ND	ND
1,1,1-Trichloroethane	ug/l	200	p	ND	ND	ND	ND
Benzene	ug/l	1	p	ND	ND	ND	ND
Toluene	ug/l	150	p	ND	ND	ND	ND
m,p-Xylenes	ug/l	1750	p	ND	ND	ND	ND
o-Xylene	ug/l	1750	p	ND	ND	ND	ND
Ethyl benzene	ug/l	700	p	ND	ND	ND	ND
MTBE	ug/l	13	p	ND	ND	ND	ND
Perchlorate	ug/l						

MCL: Maximum Contaminant Level, bold value indicates concentration exceeds MCL. (p): Primary MCL (s): Secondary MCL (ND): Not Detected

TABLE 4.3
WEST COAST BASIN WATER QUALITY RESULTS
REGIONAL GROUNDWATER MONITORING, WATER YEAR 2001/2002

Water Quality Constituent	Units	MCL	MCL Type	Carson #1	Carson #1	Carson #1	Carson #1
				Zone 1	Zone 2	Zone 3	Zone 4
				2/13/02	2/13/02	2/13/02	2/13/02
General Mineral							
Total Dissolved Solid (TDS)	mg/l	1000	s	200	230	320	470
Cation Sum	meq/l			3.58	4.18	5.54	8.17
Anion Sum	meq/l			3.45	3.96	5.11	7.63
Iron, Total, ICAP	mg/l	0.3	s	ND	ND	ND	ND
Manganese, Total, ICAP/MS	ug/l	50	s	31	22	34	**100**
Alkalinity	mg/l			145	169	166	211
Boron	mg/l			0.096	0.1	0.1	0.12
Bicarbonate as HCO3,calculated	mg/l			176	205	202	257
Calcium, Total, ICAP	mg/l			21	34	48	75
Carbonate as CO3, Calculated	mg/l			2.28	2.66	2.08	1.67
Hardness (Total, as CaCO3)	mg/l			70.9	114	173	261
Chloride	mg/l	500	s	19	20	20	55
Fluoride	mg/l	2	p	0.26	0.21	0.3	0.41
Hydroxide as OH, Calculated	mg/l			0.03	0.03	0.03	0.02
Langelier Index - 25 degree	None			0.42	0.7	0.74	0.84
Magnesium, Total, ICAP	mg/l			4.5	7.2	13	18
Mercury	ug/l	2	p	ND	ND	ND	ND
Nitrate-N by IC	mg/l	10	p	ND	ND	ND	ND
Nitrite, Nitrogen by IC	mg/l	1	p	ND	ND	ND	ND
Potassium, Total, ICAP	mg/l			2.8	2.4	2.9	4.5
Sodium, Total, ICAP	mg/l			48	42	46	65
Sulfate	mg/l	500	s	ND	ND	58	88
Surfactants	mg/l	0.5	s	ND	ND	ND	ND
Total Nitrate, Nitrite-N, CALC	mg/l			ND	ND	ND	ND
Total Organic Carbon	mg/l			0.8	1	ND	ND
Carbon Dioxide	mg/l			1.76	2.05	2.55	5.14
General Physical							
Apparent Color	ACU	15	s	10	5	5	5
Lab pH	Units			8.3	8.3	8.2	8
Odor	TON	3	s	3	2	1	2
Specific Conductance	umho/cm	1600	s	329	373	488	732
Turbidity	NTU	5	s	0.4	0.1	ND	1.6
Radon	pCi/l						
Metals							
Aluminum, Total, ICAP/MS	ug/l	200	s	ND	ND	ND	ND
Antimony, Total, ICAP/MS	ug/l	6	p	ND	ND	ND	ND
Arsenic, Total, ICAP/MS	ug/l	50	p	1.3	ND	ND	ND
Barium, Total, ICAP/MS	ug/l	1000	p	19	37	67	230
Beryllium, Total, ICAP/MS	ug/l	4	p	ND	ND	ND	ND
Chromium, Total, ICAP/MS	ug/l	50	p	ND	ND	ND	ND
Hexavalent Chromium (Cr VI)	mg/l						
Cadmium, Total, ICAP/MS	ug/l	5	p	ND	ND	ND	ND
Copper, Total, ICAP/MS	ug/l	1000	s	ND	ND	ND	ND
Lead, Total, ICAP/MS	ug/l			ND	ND	ND	ND
Nickel, Total, ICAP/MS	ug/l	100	p	ND	ND	ND	ND
Selenium, Total, ICAP/MS	ug/l	50	p	ND	ND	ND	ND
Silver, Total, ICAP/MS	ug/l	100	s	ND	ND	ND	ND
Thallium, Total, ICAP/MS	ug/l	2	p	ND	ND	ND	ND
Zinc, Total, ICAP/MS	ug/l	5000	s	ND	ND	ND	ND
Volatile Organic Compounds							
Trichloroethylene (TCE)	ug/l	5	p	ND	ND	ND	ND
Tetrachloroethylene (PCE)	ug/l	5	p	ND	ND	ND	ND
1,1-Dichloroethylene	ug/l	6	p	ND	ND	ND	ND
cis-1,2-Dichloroethylene	ug/l	6	p	ND	ND	ND	ND
Chloroform (Trichloromethane)	ug/l	100	p	ND	ND	ND	ND
1,1-Dichloroethane	ug/l	5	p	ND	ND	ND	ND
1,2-Dichloroethane	ug/l	0.5	p	ND	ND	ND	ND
Carbon Tetrachloride	ug/l	0.5	p	ND	ND	ND	ND
Di-Isopropyl Ether	ug/l			ND	ND	ND	ND
Fluorotrichloromethane-Freon11	ug/l	150	p	ND	ND	ND	ND
Isopropylbenzene	ug/l			ND	ND	ND	ND
n-Propylbenzene	ug/l			ND	ND	ND	ND
sec-Butylbenzene	ug/l			ND	ND	ND	ND
1,1,1-Trichloroethane	ug/l	200	p	ND	ND	ND	ND
Benzene	ug/l	1	p	ND	ND	ND	ND
Toluene	ug/l	150	p	ND	ND	ND	ND
m,p-Xylenes	ug/l	1750	p	ND	ND	ND	ND
o-Xylene	ug/l	1750	p	ND	ND	ND	ND
Ethyl benzene	ug/l	700	p	ND	ND	ND	ND
MTBE	ug/l	13	p	ND	ND	ND	ND
Perchlorate	ug/l						

MCL: Maximum Contaminant Level, bold value indicates concentration exceeds MCL. (p): Primary MCL (s): Secondary MCL (ND): Not Detected

TABLE 4.3
WEST COAST BASIN WATER QUALITY RESULTS
REGIONAL GROUNDWATER MONITORING, WATER YEAR 2001/2002

Water Quality Constituent	Units	MCL	MCL Type	Carson #2	Carson #2	Carson #2	Carson #2	Carson #2
				Zone 1	Zone 2	Zone 3	Zone 4	Zone 5
				8/7/02	8/8/02	8/9/02	8/8/02	8/7/02
General Mineral								
Total Dissolved Solid (TDS)	mg/l	1000	s	240	270	260	290	270
Cation Sum	meq/l			3.8	4.87	4.65	5.26	4.9
Anion Sum	meq/l			3.87	4.59	4.5	4.85	4.55
Iron, Total, ICAP	mg/l	0.3	s	ND	ND	ND	ND	ND
Manganese, Total, ICAP/MS	ug/l	50	s	7.8	16	22	17	34
Alkalinity	mg/l			166	191	188	212	183
Boron	mg/l			0.13	0.13	0.12	0.11	0.1
Bicarbonate as HCO3,calculated	mg/l			201	231	228	258	223
Calcium, Total, ICAP	mg/l			4.9	13	23	36	40
Carbonate as CO3, Calculated	mg/l			2.61	3.8	3	2.1	1.82
Hardness (Total, as CaCO3)	mg/l			16.8	50.5	89.1	139	136
Chloride	mg/l	500	s	19	21	21	21	20
Fluoride	mg/l	2	p	0.34	0.23	0.32	0.26	0.31
Hydroxide as OH, Calculated	mg/l			0.03	0.04	0.03	0.02	0.02
Langelier Index - 25 degree	None			-0.09	0.4	0.6	0.6	0.6
Magnesium, Total, ICAP	mg/l			1.1	4.4	7.7	12	8.7
Mercury	ug/l	2	p	ND	ND	ND	ND	ND
Nitrate-N by IC	mg/l	10	p	ND	ND	ND	ND	ND
Nitrite, Nitrogen by IC	mg/l	1	p	ND	ND	ND	ND	ND
Potassium, Total, ICAP	mg/l			2.8	4.8	4.8	4.8	3.7
Sodium, Total, ICAP	mg/l			78	86	63	54	48
Sulfate	mg/l	500	s	ND	8	6.3	ND	15
Surfactants	mg/l	0.5	s	ND	ND	ND	ND	ND
Total Nitrate, Nitrite-N, CALC	mg/l			ND	ND	ND	ND	ND
Total Organic Carbon	mg/l			2.9	1.1	1.1	1.2	0.5
Carbon Dioxide	mg/l			2.01	1.8	2.3	4.1	3.54
General Physical								
Apparent Color	ACU	15	s	**30**	15	10	3	3
Lab pH	Units			8.3	8.4	8.3	8.1	8.1
Odor	TON	3	s	3	2	**8**	2	3
Specific Conductance	umho/cm	1600	s	367	427	412	445	432
Turbidity	NTU	5	s	2.5	2.8	0.75	2.5	**6**
Radon	pCi/l			ND	54	54	100	73
Metals								
Aluminum, Total, ICAP/MS	ug/l	200	s	32	ND	ND	ND	ND
Antimony, Total, ICAP/MS	ug/l	6	p	ND	ND	ND	ND	ND
Arsenic, Total, ICAP/MS	ug/l	50	p	2.1	ND	1.3	ND	1.1
Barium, Total, ICAP/MS	ug/l	1000	p	2.5	5.6	11	17	18
Beryllium, Total, ICAP/MS	ug/l	4	p	ND	ND	ND	ND	ND
Chromium, Total, ICAP/MS	ug/l	50	p	ND	ND	ND	ND	ND
Hexavalent Chromium (Cr VI)	mg/l			ND	ND	ND	ND	ND
Cadmium, Total, ICAP/MS	ug/l	5	p	ND	ND	ND	ND	ND
Copper, Total, ICAP/MS	ug/l	1000	s	ND	ND	ND	ND	ND
Lead, Total, ICAP/MS	ug/l			ND	ND	ND	ND	ND
Nickel, Total, ICAP/MS	ug/l	100	p	ND	ND	ND	ND	ND
Selenium, Total, ICAP/MS	ug/l	50	p	ND	ND	ND	ND	ND
Silver, Total, ICAP/MS	ug/l	100	s	ND	ND	ND	ND	ND
Thallium, Total, ICAP/MS	ug/l	2	p	ND	ND	ND	ND	ND
Zinc, Total, ICAP/MS	ug/l	5000	s	ND	ND	ND	ND	ND
Volatile Organic Compounds								
Trichloroethylene (TCE)	ug/l	5	p	ND	ND	ND	ND	ND
Tetrachloroethylene (PCE)	ug/l	5	p	ND	ND	ND	ND	ND
1,1-Dichloroethylene	ug/l	6	p	ND	ND	ND	ND	ND
cis-1,2-Dichloroethylene	ug/l	6	p	ND	ND	ND	ND	ND
Chloroform (Trichloromethane)	ug/l	100	p	ND	ND	ND	ND	ND
1,1-Dichloroethane	ug/l	5	p	ND	ND	ND	ND	ND
1,2-Dichloroethane	ug/l	0.5	p	ND	ND	ND	ND	ND
Carbon Tetrachloride	ug/l	0.5	p	ND	ND	ND	ND	ND
Di-Isopropyl Ether	ug/l			ND	ND	ND	ND	ND
Fluorotrichloromethane-Freon11	ug/l	150	p	ND	ND	ND	ND	ND
Isopropylbenzene	ug/l			ND	ND	ND	ND	ND
n-Propylbenzene	ug/l			ND	ND	ND	ND	ND
sec-Butylbenzene	ug/l			ND	ND	ND	ND	ND
1,1,1-Trichloroethane	ug/l	200	p	ND	ND	ND	ND	ND
Benzene	ug/l	1	p	ND	ND	ND	ND	ND
Toluene	ug/l	150	p	ND	ND	ND	ND	ND
m,p-Xylenes	ug/l	1750	p	ND	ND	ND	ND	ND
o-Xylene	ug/l	1750	p	ND	ND	ND	ND	ND
Ethyl benzene	ug/l	700	p	ND	ND	ND	ND	ND
MTBE	ug/l	13	p	ND	ND	ND	ND	ND
Perchlorate	ug/l			ND	ND	ND	ND	ND

MCL: Maximum Contaminant Level, bold value indicates concentration exceeds MCL. (p): Primary MCL (s): Secondary MCL (ND): Not Detected

TABLE 4.3
WEST COAST BASIN WATER QUALITY RESULTS
REGIONAL GROUNDWATER MONITORING, WATER YEAR 2001/2002

Water Quality Constituent	Units	MCL	MCL Type	Gardena #1	Gardena #1	Gardena #1	Gardena #1
				Zone 1	Zone 2	Zone 3	Zone 4
				3/13/02	3/13/02	3/13/02	3/13/02
General Mineral							
Total Dissolved Solid (TDS)	mg/l	1000	s	340	350	340	**1450**
Cation Sum	meq/l			5.97	5.84	5.61	22.8
Anion Sum	meq/l			6.18	5.5	5.38	22.7
Iron, Total, ICAP	mg/l	0.3	s	ND	ND	ND	ND
Manganese, Total, ICAP/MS	ug/l	50	s	40	**68**	25	ND
Alkalinity	mg/l			286	180	172	186
Boron	mg/l			0.34	0.12	0.11	0.13
Bicarbonate as HCO3,calculated	mg/l			347	219	209	227
Calcium, Total, ICAP	mg/l			14	57	55	250
Carbonate as CO3, Calculated	mg/l			4.5	1.42	2.15	0.371
Hardness (Total, as CaCO3)	mg/l			65.8	196	183	916
Chloride	mg/l	500	s	16	20	21	**600**
Fluoride	mg/l	2	p	0.21	0.39	0.35	0.18
Hydroxide as OH, Calculated	mg/l			0.03	0.02	0.03	0.004
Langelier Index - 25 degree	None			0.54	0.65	0.82	0.71
Magnesium, Total, ICAP	mg/l			7.5	13	11	71
Mercury	ug/l	2	p	ND	ND	ND	ND
Nitrate-N by IC	mg/l	10	p	ND	ND	ND	**14**
Nitrite, Nitrogen by IC	mg/l	1	p	ND	ND	ND	ND
Potassium, Total, ICAP	mg/l			12	3.7	3.4	5.8
Sodium, Total, ICAP	mg/l			100	42	43	100
Sulfate	mg/l	500	s	ND	63	64	49
Surfactants	mg/l	0.5	s	ND	ND	ND	ND
Total Nitrate, Nitrite-N, CALC	mg/l			ND	ND	ND	14
Total Organic Carbon	mg/l			ND	3.5	ND	0.5
Carbon Dioxide	mg/l			3.48	4.38	2.64	18.1
General Physical							
Apparent Color	ACU	15	s	3	**25**	5	3
Lab pH	Units			8.3	8	8.2	7.4
Odor	TON	3	s	3	**4**	3	2
Specific Conductance	umho/cm	1600	s	563	521	510	**2300**
Turbidity	NTU	5	s	1.4	3.6	4.1	1.5
Radon	pCi/l						
Metals							
Aluminum, Total, ICAP/MS	ug/l	200	s	ND	ND	ND	ND
Antimony, Total, ICAP/MS	ug/l	6	p	ND	ND	ND	ND
Arsenic, Total, ICAP/MS	ug/l	50	p	20	ND	ND	ND
Barium, Total, ICAP/MS	ug/l	1000	p	15	49	24	300
Beryllium, Total, ICAP/MS	ug/l	4	p	ND	ND	ND	ND
Chromium, Total, ICAP/MS	ug/l	50	p	ND	ND	ND	6.8
Hexavalent Chromium (Cr VI)	mg/l						
Cadmium, Total, ICAP/MS	ug/l	5	p	ND	ND	ND	ND
Copper, Total, ICAP/MS	ug/l	1000	s	ND	ND	ND	ND
Lead, Total, ICAP/MS	ug/l			ND	ND	ND	ND
Nickel, Total, ICAP/MS	ug/l	100	p	ND	ND	ND	17
Selenium, Total, ICAP/MS	ug/l	50	p	ND	ND	ND	ND
Silver, Total, ICAP/MS	ug/l	100	s	ND	ND	ND	ND
Thallium, Total, ICAP/MS	ug/l	2	p	ND	ND	ND	ND
Zinc, Total, ICAP/MS	ug/l	5000	s	ND	ND	ND	ND
Volatile Organic Compounds							
Trichloroethylene (TCE)	ug/l	5	p	ND	ND	ND	ND
Tetrachloroethylene (PCE)	ug/l	5	p	ND	ND	ND	ND
1,1-Dichloroethylene	ug/l	6	p	ND	ND	ND	ND
cis-1,2-Dichloroethylene	ug/l	6	p	ND	ND	ND	ND
Chloroform (Trichloromethane)	ug/l	100	p	ND	ND	ND	ND
1,1-Dichloroethane	ug/l	5	p	ND	ND	ND	ND
1,2-Dichloroethane	ug/l	0.5	p	ND	ND	ND	ND
Carbon Tetrachloride	ug/l	0.5	p	ND	ND	ND	ND
Di-Isopropyl Ether	ug/l			ND	ND	ND	ND
Fluorotrichloromethane-Freon11	ug/l	150	p	ND	ND	ND	ND
Isopropylbenzene	ug/l			ND	ND	ND	ND
n-Propylbenzene	ug/l			ND	ND	ND	ND
sec-Butylbenzene	ug/l			ND	ND	ND	ND
1,1,1-Trichloroethane	ug/l	200	p	ND	ND	ND	ND
Benzene	ug/l	1	p	ND	ND	ND	ND
Toluene	ug/l	150	p	ND	ND	ND	ND
m,p-Xylenes	ug/l	1750	p	ND	ND	ND	ND
o-Xylene	ug/l	1750	p	ND	ND	ND	ND
Ethyl benzene	ug/l	700	p	ND	ND	ND	ND
MTBE	ug/l	13	p	ND	ND	ND	ND
Perchlorate	ug/l						

MCL: Maximum Contaminant Level, bold value indicates concentration exceeds MCL. (p): Primary MCL (s): Secondary MCL (ND): Not Detected

TABLE 4.3
WEST COAST BASIN WATER QUALITY RESULTS
REGIONAL GROUNDWATER MONITORING, WATER YEAR 2001/2002

Water Quality Constituent	Units	MCL	MCL Type	Hawthorne #1	Hawthorne #1	Hawthorne #1	Hawthorne #1	Hawthorne #1	Hawthorne #1
				Zone 1	Zone 2	Zone 3	Zone 4	Zone 5	Zone 6
				5/1/02	5/1/02	5/1/02	5/1/02	5/1/02	5/1/02
General Mineral									
Total Dissolved Solid (TDS)	mg/l	1000	s	900	780	570	450	730	**2070**
Cation Sum	meq/l			16	14.1	10.4	8.29	12.5	34.2
Anion Sum	meq/l			15.7	13.9	10.6	7.94	12.8	37.1
Iron, Total, ICAP	mg/l	0.3	s	0.18	0.13	0.23	0.11	ND	0.22
Manganese, Total, ICAP/MS	ug/l	50	s	12	**58**	**91**	**61**	**140**	**820**
Alkalinity	mg/l			726	630	462	334	209	292
Boron	mg/l			1.5	1	0.48	0.35	0.14	0.27
Bicarbonate as HCO3,calculated	mg/l			883	766	562	406	254	356
Calcium, Total, ICAP	mg/l			17	16	35	37	110	310
Carbonate as CO3, Calculated	mg/l			7.22	7.89	4.6	3.32	1.31	0.732
Hardness (Total, as CaCO3)	mg/l			100	81.1	178	162	423	1140
Chloride	mg/l	500	s	43	45	47	44	280	**630**
Fluoride	mg/l	2	p	0.12	0.26	0.24	0.38	0.3	0.25
Hydroxide as OH, Calculated	mg/l			0.02	0.03	0.02	0.02	0.01	0.005
Langelier Index - 25 degree	None			0.83	0.84	0.95	0.83	0.9	1.1
Magnesium, Total, ICAP	mg/l			14	10	22	17	36	88
Mercury	ug/l	2	p	ND	ND	ND	ND	ND	ND
Nitrate-N by IC	mg/l	10	p	ND	ND	ND	ND	ND	2.1
Nitrite, Nitrogen by IC	mg/l	1	p	ND	ND	ND	ND	ND	ND
Potassium, Total, ICAP	mg/l			21	13	14	10	6.9	7.7
Sodium, Total, ICAP	mg/l			310	280	150	110	88	260
Sulfate	mg/l	500	s	ND	ND	ND	ND	32	**640**
Surfactants	mg/l	0.5	s	ND	ND	ND	ND	ND	ND
Total Nitrate, Nitrite-N, CALC	mg/l			ND	ND	ND	ND	ND	2.1
Total Organic Carbon	mg/l			16	14	4.4	2.6	0.8	4.7
Carbon Dioxide	mg/l			14	9.67	8.93	6.45	6.4	22.5
General Physical									
Apparent Color	ACU	15	s	**200**	**250**	**35**	**20**	3	5
Lab pH	Units			8.1	8.2	8.1	8.1	7.9	7.5
Odor	TON	3	s	**4**	**4**	2	2	**8**	**8**
Specific Conductance	umho/cm	1600	s	1410	1240	910	730	1220	**3140**
Turbidity	NTU	5	s	0.5	0.45	0.8	0.85	1.6	3.5
Radon	pCi/l								
Metals									
Aluminum, Total, ICAP/MS	ug/l	200	s	ND	ND	ND	ND	ND	ND
Antimony, Total, ICAP/MS	ug/l	6	p	ND	ND	ND	ND	ND	ND
Arsenic, Total, ICAP/MS	ug/l	50	p	1.2	1.6	1.1	ND	ND	2.7
Barium, Total, ICAP/MS	ug/l	1000	p	30	27	33	29	110	51
Beryllium, Total, ICAP/MS	ug/l	4	p	ND	ND	ND	ND	ND	ND
Chromium, Total, ICAP/MS	ug/l	50	p	2.6	4.3	3.1	2.1	ND	ND
Hexavalent Chromium (Cr VI)	mg/l								
Cadmium, Total, ICAP/MS	ug/l	5	p	ND	ND	ND	ND	ND	ND
Copper, Total, ICAP/MS	ug/l	1000	s	ND	ND	ND	ND	ND	ND
Lead, Total, ICAP/MS	ug/l			ND	ND	ND	ND	ND	ND
Nickel, Total, ICAP/MS	ug/l	100	p	ND	ND	ND	ND	ND	15
Selenium, Total, ICAP/MS	ug/l	50	p	ND	ND	ND	ND	ND	ND
Silver, Total, ICAP/MS	ug/l	100	s	ND	ND	ND	ND	ND	ND
Thallium, Total, ICAP/MS	ug/l	2	p	ND	ND	ND	ND	ND	ND
Zinc, Total, ICAP/MS	ug/l	5000	s	ND	5.8	ND	ND	ND	6.8
Volatile Organic Compounds									
Trichloroethylene (TCE)	ug/l	5	p	ND	ND	ND	ND	ND	**22**
Tetrachloroethylene (PCE)	ug/l	5	p	ND	ND	ND	ND	ND	ND
1,1-Dichloroethylene	ug/l	6	p	ND	ND	ND	ND	ND	1.1
cis-1,2-Dichloroethylene	ug/l	6	p	ND	ND	ND	ND	ND	ND
Chloroform (Trichloromethane)	ug/l	100	p	ND	ND	ND	ND	ND	8.2
1,1-Dichloroethane	ug/l	5	p	ND	ND	ND	ND	ND	ND
1,2-Dichloroethane	ug/l	0.5	p	ND	ND	ND	ND	ND	ND
Carbon Tetrachloride	ug/l	0.5	p	ND	ND	ND	ND	ND	0.5
Di-Isopropyl Ether	ug/l			ND	ND	ND	ND	ND	ND
Fluorotrichloromethane-Freon11	ug/l	150	p	ND	ND	ND	ND	ND	9.1
Isopropylbenzene	ug/l			ND	ND	ND	ND	ND	ND
n-Propylbenzene	ug/l			ND	ND	ND	ND	ND	ND
sec-Butylbenzene	ug/l			ND	ND	ND	ND	ND	ND
1,1,1-Trichloroethane	ug/l	200	p	ND	ND	ND	ND	ND	ND
Benzene	ug/l	1	p	ND	ND	ND	ND	ND	ND
Toluene	ug/l	150	p	ND	ND	ND	ND	ND	ND
m,p-Xylenes	ug/l	1750	p	ND	ND	ND	ND	ND	ND
o-Xylene	ug/l	1750	p	ND	ND	ND	ND	ND	ND
Ethyl benzene	ug/l	700	p	ND	ND	ND	ND	ND	ND
MTBE	ug/l	13	p	ND	ND	ND	ND	ND	ND
Perchlorate	ug/l								

MCL: Maximum Contaminant Level, bold value indicates concentration exceeds MCL. (p): Primary MCL (s): Secondary MCL (ND): Not Detected

TABLE 4.3
WEST COAST BASIN WATER QUALITY RESULTS
REGIONAL GROUNDWATER MONITORING, WATER YEAR 2001/2002

Water Quality Constituent	Units	MCL	MCL Type	Inglewood #1	Inglewood #1	Inglewood #1	Inglewood #1
				Zone 1	Zone 3	Zone 4	Zone 5
				9/30/02	3/5/02	3/5/02	3/5/02
General Mineral							
Total Dissolved Solid (TDS)	mg/l	1000	s	**2460**	930	690	**1150**
Cation Sum	meq/l			40.6	15.4	11.6	19.7
Anion Sum	meq/l			46.4	14.1	11.1	18.5
Iron, Total, ICAP	mg/l	0.3	s	ND	**0.32**	**0.31**	ND
Manganese, Total, ICAP/MS	ug/l	50	s	**56**	**250**	**180**	ND
Alkalinity	mg/l			842	311	227	306
Boron	mg/l			4.5	0.39	0.19	0.27
Bicarbonate as HCO3,calculated	mg/l			1.02E+03	379	277	373
Calcium, Total, ICAP	mg/l			170	100	88	190
Carbonate as CO3, Calculated	mg/l			6.63	0.779	0.902	0.384
Hardness (Total, as CaCO3)	mg/l			655	414	376	717
Chloride	mg/l	500	s	**980**	210	180	340
Fluoride	mg/l	2	p	0.28	0.51	0.42	0.2
Hydroxide as OH, Calculated	mg/l			0.02	0.005	0.009	0.003
Langelier Index - 25 degree	None			1.8	0.63	0.64	0.61
Magnesium, Total, ICAP	mg/l			56	40	38	59
Mercury	ug/l	2	p	ND	ND	ND	ND
Nitrate-N by IC	mg/l	10	p	1.5	ND	ND	9.6
Nitrite, Nitrogen by IC	mg/l	1	p	ND	ND	ND	ND
Potassium, Total, ICAP	mg/l			19	6.8	8.8	6.4
Sodium, Total, ICAP	mg/l			620	160	89	120
Sulfate	mg/l	500	s	87	95	71	100
Surfactants	mg/l	0.5	s	0.097	ND	ND	ND
Total Nitrate, Nitrite-N, CALC	mg/l			1.5	ND	ND	9.6
Total Organic Carbon	mg/l			43	1.1	0.6	1.8
Carbon Dioxide	mg/l			20.4	24	11.1	47.1
General Physical							
Apparent Color	ACU	15	s	**120**	10	10	5
Lab pH	Units			8	7.5	7.7	7.2
Odor	TON	3	s	**8**	1	1	1
Specific Conductance	umho/cm	1600	s	**4160**	1520	1130	**1880**
Turbidity	NTU	5	s	0.7	1.7	1.5	0.7
Radon	pCi/l						
Metals							
Aluminum, Total, ICAP/MS	ug/l	200	s	ND	ND	ND	ND
Antimony, Total, ICAP/MS	ug/l	6	p	ND	ND	ND	ND
Arsenic, Total, ICAP/MS	ug/l	50	p	ND	ND	1.7	ND
Barium, Total, ICAP/MS	ug/l	1000	p	240	37	94	230
Beryllium, Total, ICAP/MS	ug/l	4	p	ND	ND	ND	ND
Chromium, Total, ICAP/MS	ug/l	50	p	5.1	ND	ND	ND
Hexavalent Chromium (Cr VI)	mg/l						
Cadmium, Total, ICAP/MS	ug/l	5	p	ND	ND	ND	ND
Copper, Total, ICAP/MS	ug/l	1000	s	ND	ND	ND	ND
Lead, Total, ICAP/MS	ug/l			ND	ND	ND	ND
Nickel, Total, ICAP/MS	ug/l	100	p	ND	ND	ND	7.8
Selenium, Total, ICAP/MS	ug/l	50	p	ND	ND	ND	ND
Silver, Total, ICAP/MS	ug/l	100	s	ND	ND	ND	ND
Thallium, Total, ICAP/MS	ug/l	2	p	ND	ND	ND	ND
Zinc, Total, ICAP/MS	ug/l	5000	s	29	ND	ND	ND
Volatile Organic Compounds							
Trichloroethylene (TCE)	ug/l	5	p	**31**	ND	ND	**57**
Tetrachloroethylene (PCE)	ug/l	5	p	3.4	ND	ND	**9.7**
1,1-Dichloroethylene	ug/l	6	p	2.8	ND	ND	ND
cis-1,2-Dichloroethylene	ug/l	6	p	1.5	ND	ND	ND
Chloroform (Trichloromethane)	ug/l	100	p	ND	ND	ND	0.5
1,1-Dichloroethane	ug/l	5	p	ND	ND	ND	ND
1,2-Dichloroethane	ug/l	0.5	p	ND	ND	ND	ND
Carbon Tetrachloride	ug/l	0.5	p	ND	ND	ND	ND
Di-Isopropyl Ether	ug/l			ND	ND	ND	ND
Fluorotrichloromethane-Freon11	ug/l	150	p	ND	ND	ND	ND
Isopropylbenzene	ug/l			ND	ND	ND	ND
n-Propylbenzene	ug/l			ND	ND	ND	ND
sec-Butylbenzene	ug/l			ND	ND	ND	ND
1,1,1-Trichloroethane	ug/l	200	p	ND	ND	ND	ND
Benzene	ug/l	1	p	ND	ND	ND	ND
Toluene	ug/l	150	p	ND	ND	ND	ND
m,p-Xylenes	ug/l	1750	p	ND	ND	ND	ND
o-Xylene	ug/l	1750	p	ND	ND	ND	ND
Ethyl benzene	ug/l	700	p	ND	ND	ND	ND
MTBE	ug/l	13	p	ND	ND	ND	ND
Perchlorate	ug/l						

MCL: Maximum Contaminant Level, bold value indicates concentration exceeds MCL. (p): Primary MCL (s): Secondary MCL (ND): Not Detected

TABLE 4.3
WEST COAST BASIN WATER QUALITY RESULTS
REGIONAL GROUNDWATER MONITORING, WATER YEAR 2001/2002

Water Quality Constituent	Units	MCL	MCL Type	Lomita #1	Lomita #1	Lomita #1	Lomita #1	Lomita #1
				Zone 1	Zone 2	Zone 3	Zone 4	Zone 5
				6/19/02	6/19/02	6/19/02	6/19/02	6/19/02
General Mineral								
Total Dissolved Solid (TDS)	mg/l	1000	s	**1250**	950	810	630	**1200**
Cation Sum	meq/l			21.4	16.1	15	11.1	19.5
Anion Sum	meq/l			21.3	15.5	15	11.2	19.1
Iron, Total, ICAP	mg/l	0.3	s	ND	ND	ND	ND	ND
Manganese, Total, ICAP/MS	ug/l	50	s	**190**	**140**	**110**	**100**	**190**
Alkalinity	mg/l			257	237	275	235	230
Boron	mg/l			0.77	0.49	0.45	0.41	0.61
Bicarbonate as HCO3,calculated	mg/l			313	289	335	286	280
Calcium, Total, ICAP	mg/l			130	110	100	67	140
Carbonate as CO3, Calculated	mg/l			0.81	0.941	1.73	1.86	0.912
Hardness (Total, as CaCO3)	mg/l			464	398	365	241	502
Chloride	mg/l	500	s	**540**	360	320	220	490
Fluoride	mg/l	2	p	0.1	0.14	0.14	0.21	0.1
Hydroxide as OH, Calculated	mg/l			0.007	0.009	0.01	0.02	0.009
Langelier Index - 25 degree	None			0.76	0.76	0.98	0.84	0.85
Magnesium, Total, ICAP	mg/l			34	30	28	18	37
Mercury	ug/l	2	p	ND	ND	ND	ND	ND
Nitrate-N by IC	mg/l	10	p	0.93	0.67	0.58	ND	0.9
Nitrite, Nitrogen by IC	mg/l	1	p	ND	ND	ND	ND	ND
Potassium, Total, ICAP	mg/l			14	12	11	8.6	13
Sodium, Total, ICAP	mg/l			270	180	170	140	210
Sulfate	mg/l	500	s	41	26	21	13	28
Surfactants	mg/l	0.5	s	ND	ND	ND	ND	ND
Total Nitrate, Nitrite-N, CALC	mg/l			0.93	0.67	0.58	ND	0.9
Total Organic Carbon	mg/l			1.5	1.8	3.3	2.4	1.4
Carbon Dioxide	mg/l			15.7	11.5	8.43	5.72	11.2
General Physical								
Apparent Color	ACU	15	s	5	5	15	**20**	5
Lab pH	Units			7.6	7.7	7.9	8	7.7
Odor	TON	3	s	**4**	3	2	2	**4**
Specific Conductance	umho/cm	1600	s	**2140**	**1610**	1430	1090	**1900**
Turbidity	NTU	5	s	1.5	**6.1**	2.4	1.7	0.5
Radon	pCi/l							
Metals								
Aluminum, Total, ICAP/MS	ug/l	200	s	ND	ND	ND	ND	ND
Antimony, Total, ICAP/MS	ug/l	6	p		ND	ND	ND	ND
Arsenic, Total, ICAP/MS	ug/l	50	p	ND	ND	ND	ND	ND
Barium, Total, ICAP/MS	ug/l	1000	p	75	69	60	38	78
Beryllium, Total, ICAP/MS	ug/l	4	p	ND	ND	ND	ND	ND
Chromium, Total, ICAP/MS	ug/l	50	p	3.8	3	ND	1.7	2
Hexavalent Chromium (Cr VI)	mg/l							
Cadmium, Total, ICAP/MS	ug/l	5	p	ND	ND	ND	ND	ND
Copper, Total, ICAP/MS	ug/l	1000	s	ND	ND	ND	ND	ND
Lead, Total, ICAP/MS	ug/l			ND	ND	ND	ND	ND
Nickel, Total, ICAP/MS	ug/l	100	p	ND	ND	ND	ND	ND
Selenium, Total, ICAP/MS	ug/l	50	p	ND	ND	ND	ND	ND
Silver, Total, ICAP/MS	ug/l	100	s	ND	ND	ND	ND	ND
Thallium, Total, ICAP/MS	ug/l	2	p	ND	ND	ND	ND	ND
Zinc, Total, ICAP/MS	ug/l	5000	s	ND	ND	ND	ND	ND
Volatile Organic Compounds								
Trichloroethylene (TCE)	ug/l	5	p	ND	ND	ND	ND	ND
Tetrachloroethylene (PCE)	ug/l	5	p	ND	ND	ND	ND	ND
1,1-Dichloroethylene	ug/l	6	p	ND	ND	ND	ND	ND
cis-1,2-Dichloroethylene	ug/l	6	p	ND	ND	ND	ND	ND
Chloroform (Trichloromethane)	ug/l	100	p	ND	ND	ND	ND	ND
1,1-Dichloroethane	ug/l	5	p	ND	ND	ND	ND	ND
1,2-Dichloroethane	ug/l	0.5	p	ND	ND	ND	ND	ND
Carbon Tetrachloride	ug/l	0.5	p	ND	ND	ND	ND	ND
Di-Isopropyl Ether	ug/l			ND	ND	ND	ND	ND
Fluorotrichloromethane-Freon11	ug/l	150	p	ND	ND	ND	ND	ND
Isopropylbenzene	ug/l			ND	ND	ND	ND	ND
n-Propylbenzene	ug/l			ND	ND	ND	ND	ND
sec-Butylbenzene	ug/l			ND	ND	ND	ND	ND
1,1,1-Trichloroethane	ug/l	200	p	ND	ND	ND	ND	ND
Benzene	ug/l	1	p	ND	ND	ND	ND	ND
Toluene	ug/l	150	p	ND	ND	ND	ND	ND
m,p-Xylenes	ug/l	1750	p	ND	ND	ND	ND	ND
o-Xylene	ug/l	1750	p	ND	ND	ND	ND	ND
Ethyl benzene	ug/l	700	p	ND	ND	ND	ND	ND
MTBE	ug/l	13	p	ND	ND	ND	ND	ND
Perchlorate	ug/l							

MCL: Maximum Contaminant Level, bold value indicates concentration exceeds MCL. (p): Primary MCL (s): Secondary MCL (ND): Not Detected

TABLE 4.3
WEST COAST BASIN WATER QUALITY RESULTS
REGIONAL GROUNDWATER MONITORING, WATER YEAR 2001/2002

Water Quality Constituent	Units	MCL	MCL Type	Long Beach #3	Long Beach #3	Long Beach #3	Long Beach #3	Long Beach #3
				Zone 1	Zone 2	Zone 3	Zone 4	Zone 5
				2/24/02	2/24/02	2/24/02	2/24/02	2/24/02
General Mineral								
Total Dissolved Solid (TDS)	mg/l	1000	s	450	230	210	**1110**	**1380**
Cation Sum	meq/l			8.39	4.11	3.82	18.8	24
Anion Sum	meq/l			7.97	3.96	3.78	18	24.8
Iron, Total, ICAP	mg/l	0.3	s	ND	ND	ND	ND	ND
Manganese, Total, ICAP/MS	ug/l	50	s	16	15	11	**210**	**290**
Alkalinity	mg/l			373	137	153	144	139
Boron	mg/l			0.38	0.14	0.14	0.11	0.11
Bicarbonate as HCO3,calculated	mg/l			452	166	185	175	169
Calcium, Total, ICAP	mg/l			12	17	19	200	270
Carbonate as CO3, Calculated	mg/l			7.38	3.41	3.02	0.903	0.872
Hardness (Total, as CaCO3)	mg/l			44.8	56.4	61.4	713	941
Chloride	mg/l	500	s	17	24	25	490	**730**
Fluoride	mg/l	2	p	0.53	0.37	0.37	0.19	0.18
Hydroxide as OH, Calculated	mg/l			0.04	0.05	0.04	0.01	0.01
Langelier Index - 25 degree	None			0.69	0.51	0.5	1	1.1
Magnesium, Total, ICAP	mg/l			3.6	3.4	3.4	52	66
Mercury	ug/l	2	p	ND	ND	ND	ND	ND
Nitrate-N by IC	mg/l	10	p	ND	ND	ND	ND	ND
Nitrite, Nitrogen by IC	mg/l	1	p	ND	ND	ND	ND	ND
Potassium, Total, ICAP	mg/l			4	2.8	2.5	10	9.3
Sodium, Total, ICAP	mg/l			170	67	58	99	110
Sulfate	mg/l	500	s	ND	25	ND	63	70
Surfactants	mg/l	0.5	s	ND	ND	ND	0.067	0.075
Total Nitrate, Nitrite-N, CALC	mg/l			ND	ND	ND	ND	ND
Total Organic Carbon	mg/l			8.2	2.2	2.9	0.8	1.4
Carbon Dioxide	mg/l			3.6	1.05	1.47	4.41	4.26
General Physical								
Apparent Color	ACU	15	s	**100**	**20**	**20**	3	5
Lab pH	Units			8.4	8.5	8.4	7.9	7.9
Odor	TON	3	s	1	2	1	1	3
Specific Conductance	umho/cm	1600	s	713	384	357	**1900**	**2380**
Turbidity	NTU	5	s	0.4	0.3	0.15	4.8	1.2
Radon	pCi/l							
Metals								
Aluminum, Total, ICAP/MS	ug/l	200	s	ND	ND	ND	ND	ND
Antimony, Total, ICAP/MS	ug/l	6	p	ND	ND	ND	ND	ND
Arsenic, Total, ICAP/MS	ug/l	50	p	1.2	ND	ND	ND	ND
Barium, Total, ICAP/MS	ug/l	1000	p	9	14	11	76	120
Beryllium, Total, ICAP/MS	ug/l	4	p	ND	ND	ND	ND	ND
Chromium, Total, ICAP/MS	ug/l	50	p	2	ND	ND	ND	ND
Hexavalent Chromium (Cr VI)	mg/l							
Cadmium, Total, ICAP/MS	ug/l	5	p	ND	ND	ND	ND	ND
Copper, Total, ICAP/MS	ug/l	1000	s	ND	ND	ND	ND	ND
Lead, Total, ICAP/MS	ug/l			0.7	ND	ND	ND	ND
Nickel, Total, ICAP/MS	ug/l	100	p	ND	ND	ND	12	16
Selenium, Total, ICAP/MS	ug/l	50	p	ND	ND	ND	ND	ND
Silver, Total, ICAP/MS	ug/l	100	s	ND	ND	ND	ND	ND
Thallium, Total, ICAP/MS	ug/l	2	p	ND	ND	ND	ND	ND
Zinc, Total, ICAP/MS	ug/l	5000	s	9.9	ND	ND	ND	ND
Volatile Organic Compounds								
Trichloroethylene (TCE)	ug/l	5	p	ND	ND	ND	ND	ND
Tetrachloroethylene (PCE)	ug/l	5	p	ND	ND	ND	ND	ND
1,1-Dichloroethylene	ug/l	6	p	ND	ND	ND	ND	ND
cis-1,2-Dichloroethylene	ug/l	6	p	ND	ND	ND	ND	ND
Chloroform (Trichloromethane)	ug/l	100	p	ND	ND	ND	ND	ND
1,1-Dichloroethane	ug/l	5	p	ND	ND	ND	ND	ND
1,2-Dichloroethane	ug/l	0.5	p	ND	ND	ND	ND	ND
Carbon Tetrachloride	ug/l	0.5	p	ND	ND	ND	ND	ND
Di-Isopropyl Ether	ug/l			ND	ND	ND	ND	ND
Fluorotrichloromethane-Freon11	ug/l	150	p	ND	ND	ND	ND	ND
Isopropylbenzene	ug/l			ND	ND	ND	ND	ND
n-Propylbenzene	ug/l			ND	ND	ND	ND	ND
sec-Butylbenzene	ug/l			ND	ND	ND	ND	ND
1,1,1-Trichloroethane	ug/l	200	p	ND	ND	ND	ND	ND
Benzene	ug/l	1	p	ND	ND	ND	ND	ND
Toluene	ug/l	150	p	ND	ND	ND	ND	ND
m,p-Xylenes	ug/l	1750	p	ND	ND	ND	ND	ND
o-Xylene	ug/l	1750	p	ND	ND	ND	ND	ND
Ethyl benzene	ug/l	700	p	ND	ND	ND	ND	ND
MTBE	ug/l	13	p	ND	ND	ND	ND	ND
Perchlorate	ug/l							

MCL: Maximum Contaminant Level, bold value indicates concentration exceeds MCL. (p): Primary MCL (s): Secondary MCL (ND): Not Detected

TABLE 4.3
WEST COAST BASIN WATER QUALITY RESULTS
REGIONAL GROUNDWATER MONITORING, WATER YEAR 2001/2002

Water Quality Constituent	Units	MCL	MCL Type	PM-3 Madrid	PM-3 Madrid	PM-3 Madrid	PM-3 Madrid
				Zone 1	Zone 2	Zone 3	Zone 4
				2/28/02	2/28/02	2/28/02	2/28/02
General Mineral							
Total Dissolved Solid (TDS)	mg/l	1000	s	390	280	720	790
Cation Sum	meq/l			6.98	5.12	12.1	13.2
Anion Sum	meq/l			7	5.06	12.6	13.8
Iron, Total, ICAP	mg/l	0.3	s	ND	0.15	0.13	**0.39**
Manganese, Total, ICAP/MS	ug/l	50	s	45	50	**76**	**270**
Alkalinity	mg/l			318	201	216	195
Boron	mg/l			0.33	0.1	0.1	0.28
Bicarbonate as HCO3,calculated	mg/l			386	244	263	238
Calcium, Total, ICAP	mg/l			13	40	110	100
Carbonate as CO3, Calculated	mg/l			6.3	2.51	1.08	0.976
Hardness (Total, as CaCO3)	mg/l			71.5	145	406	369
Chloride	mg/l	500	s	22	36	250	330
Fluoride	mg/l	2	p	0.31	0.39	0.33	0.28
Hydroxide as OH, Calculated	mg/l			0.04	0.03	0.01	0.01
Langelier Index - 25 degree	None			0.66	0.74	0.82	0.73
Magnesium, Total, ICAP	mg/l			9.5	11	32	29
Mercury	ug/l	2	p	ND	ND	ND	ND
Nitrate-N by IC	mg/l	10	p	ND	ND	ND	ND
Nitrite, Nitrogen by IC	mg/l	1	p	ND	ND	ND	ND
Potassium, Total, ICAP	mg/l			13	3.2	5.7	6.5
Sodium, Total, ICAP	mg/l			120	49	87	130
Sulfate	mg/l	500	s	ND	ND	59	29
Surfactants	mg/l	0.5	s	ND	ND	ND	ND
Total Nitrate, Nitrite-N, CALC	mg/l			ND	ND	ND	ND
Total Organic Carbon	mg/l			3.4	ND	0.9	0.8
Carbon Dioxide	mg/l			3.07	3.08	8.34	7.54
General Physical							
Apparent Color	ACU	15	s	**35**	10	5	10
Lab pH	Units			8.4	8.2	7.8	7.8
Odor	TON	3	s	3	1	2	**4**
Specific Conductance	umho/cm	1600	s	624	471	1200	1290
Turbidity	NTU	5	s	3.7	0.25	2.7	**5.6**
Radon	pCi/l						
Metals							
Aluminum, Total, ICAP/MS	ug/l	200	s	ND	ND	ND	ND
Antimony, Total, ICAP/MS	ug/l	6	p	ND	ND	ND	ND
Arsenic, Total, ICAP/MS	ug/l	50	p	ND	ND	1.6	ND
Barium, Total, ICAP/MS	ug/l	1000	p	28	21	83	81
Beryllium, Total, ICAP/MS	ug/l	4	p	ND	ND	ND	ND
Chromium, Total, ICAP/MS	ug/l	50	p	1.4	ND	1.1	1.1
Hexavalent Chromium (Cr VI)	mg/l						
Cadmium, Total, ICAP/MS	ug/l	5	p	ND	ND	ND	ND
Copper, Total, ICAP/MS	ug/l	1000	s	ND	ND	ND	ND
Lead, Total, ICAP/MS	ug/l			ND	ND	ND	ND
Nickel, Total, ICAP/MS	ug/l	100	p	ND	ND	13	ND
Selenium, Total, ICAP/MS	ug/l	50	p	ND	ND	ND	ND
Silver, Total, ICAP/MS	ug/l	100	s	ND	ND	ND	ND
Thallium, Total, ICAP/MS	ug/l	2	p	ND	ND	ND	ND
Zinc, Total, ICAP/MS	ug/l	5000	s	ND	ND	ND	ND
Volatile Organic Compounds							
Trichloroethylene (TCE)	ug/l	5	p	ND	ND	ND	1.3
Tetrachloroethylene (PCE)	ug/l	5	p	ND	ND	ND	ND
1,1-Dichloroethylene	ug/l	6	p	ND	ND	**32**	**11**
cis-1,2-Dichloroethylene	ug/l	6	p	ND	ND	1.9	1.1
Chloroform (Trichloromethane)	ug/l	100	p	ND	ND	ND	ND
1,1-Dichloroethane	ug/l	5	p	ND	ND	ND	0.9
1,2-Dichloroethane	ug/l	0.5	p	ND	ND	ND	ND
Carbon Tetrachloride	ug/l	0.5	p	ND	ND	ND	ND
Di-Isopropyl Ether	ug/l			ND	ND	ND	ND
Fluorotrichloromethane-Freon11	ug/l	150	p	ND	ND	ND	ND
Isopropylbenzene	ug/l			ND	ND	ND	ND
n-Propylbenzene	ug/l			ND	ND	ND	ND
sec-Butylbenzene	ug/l			ND	ND	ND	ND
1,1,1-Trichloroethane	ug/l	200	p	ND	ND	15	ND
Benzene	ug/l	1	p	ND	ND	ND	ND
Toluene	ug/l	150	p	ND	ND	ND	ND
m,p-Xylenes	ug/l	1750	p	ND	ND	ND	ND
o-Xylene	ug/l	1750	p	ND	ND	ND	ND
Ethyl benzene	ug/l	700	p	ND	ND	ND	ND
MTBE	ug/l	13	p	ND	ND	ND	ND
Perchlorate	ug/l						

MCL: Maximum Contaminant Level, bold value indicates concentration exceeds MCL. (p): Primary MCL (s): Secondary MCL (ND): Not Detected

TABLE 4.3
WEST COAST BASIN WATER QUALITY RESULTS
REGIONAL GROUNDWATER MONITORING, WATER YEAR 2001/2002

Water Quality Constituent	Units	MCL	MCL Type	PM-4 Mariner	PM-4 Mariner	PM-4 Mariner	PM-4 Mariner
				Zone 1	Zone 2	Zone 3	Zone 4
				5/5/02	5/5/02	5/5/02	5/5/02
General Mineral							
Total Dissolved Solid (TDS)	mg/l	1000	s	320	**11000**	860	720
Cation Sum	meq/l			6.04	174	13.7	11.8
Anion Sum	meq/l			5.97	175	13.6	12.1
Iron, Total, ICAP	mg/l	0.3	s	ND	ND	ND	0.17
Manganese, Total, ICAP/MS	ug/l	50	s	40	**1200**	**87**	**86**
Alkalinity	mg/l			258	159	154	197
Boron	mg/l			0.15	ND	0.33	0.24
Bicarbonate as HCO3,calculated	mg/l			314	194	187	240
Calcium, Total, ICAP	mg/l			27	1400	110	84
Carbonate as CO3, Calculated	mg/l			2.57	0.317	1.22	1.96
Hardness (Total, as CaCO3)	mg/l			117	5140	394	300
Chloride	mg/l	500	s	28	**5600**	150	140
Fluoride	mg/l	2	p	0.35	0.11	0.26	0.28
Hydroxide as OH, Calculated	mg/l			0.02	0.004	0.02	0.02
Langelier Index - 25 degree	None			0.58	1.4	0.87	0.96
Magnesium, Total, ICAP	mg/l			12	400	29	22
Mercury	ug/l	2	p	ND	ND	ND	ND
Nitrate-N by IC	mg/l	10	p	ND	ND	ND	ND
Nitrite, Nitrogen by IC	mg/l	1	p	ND	ND	ND	ND
Potassium, Total, ICAP	mg/l			7.1	43	7	6.5
Sodium, Total, ICAP	mg/l			81	1600	130	130
Sulfate	mg/l	500	s	ND	**650**	300	200
Surfactants	mg/l	0.5	s	ND	0.058	ND	ND
Total Nitrate, Nitrite-N, CALC	mg/l			ND	ND	ND	ND
Total Organic Carbon	mg/l			1.6	1	1.7	0.8
Carbon Dioxide	mg/l			4.99	15.4	3.74	3.81
General Physical							
Apparent Color	ACU	15	s	10	3	5	5
Lab pH	Units			8.1	7.4	8	8.1
Odor	TON	3	s	3	3	3	**4**
Specific Conductance	umho/cm	1600	s	560	**17500**	1310	1140
Turbidity	NTU	5	s	0.05	0.4	0.6	0.8
Radon	pCi/l						
Metals							
Aluminum, Total, ICAP/MS	ug/l	200	s	ND	ND	ND	ND
Antimony, Total, ICAP/MS	ug/l	6	p	ND	ND	ND	ND
Arsenic, Total, ICAP/MS	ug/l	50	p	ND	ND	ND	ND
Barium, Total, ICAP/MS	ug/l	1000	p	23	260	110	56
Beryllium, Total, ICAP/MS	ug/l	4	p	ND	ND	ND	ND
Chromium, Total, ICAP/MS	ug/l	50	p	ND	ND	ND	1.2
Hexavalent Chromium (Cr VI)	mg/l						
Cadmium, Total, ICAP/MS	ug/l	5	p	ND	ND	ND	ND
Copper, Total, ICAP/MS	ug/l	1000	s	ND	ND	ND	ND
Lead, Total, ICAP/MS	ug/l			ND	ND	ND	ND
Nickel, Total, ICAP/MS	ug/l	100	p	ND	55	ND	ND
Selenium, Total, ICAP/MS	ug/l	50	p	ND	ND	ND	ND
Silver, Total, ICAP/MS	ug/l	100	s	ND	4.2	ND	ND
Thallium, Total, ICAP/MS	ug/l	2	p	ND	ND	ND	ND
Zinc, Total, ICAP/MS	ug/l	5000	s	ND	ND	ND	ND
Volatile Organic Compounds							
Trichloroethylene (TCE)	ug/l	5	p	ND	ND	ND	ND
Tetrachloroethylene (PCE)	ug/l	5	p	ND	ND	ND	ND
1,1-Dichloroethylene	ug/l	6	p	ND	ND	ND	ND
cis-1,2-Dichloroethylene	ug/l	6	p	ND	ND	ND	ND
Chloroform (Trichloromethane)	ug/l	100	p	ND	ND	ND	ND
1,1-Dichloroethane	ug/l	5	p	ND	ND	ND	ND
1,2-Dichloroethane	ug/l	0.5	p	ND	ND	ND	ND
Carbon Tetrachloride	ug/l	0.5	p	ND	ND	ND	ND
Di-Isopropyl Ether	ug/l			ND	ND	ND	ND
Fluorotrichloromethane-Freon11	ug/l	150	p	ND	ND	ND	ND
Isopropylbenzene	ug/l			ND	ND	ND	ND
n-Propylbenzene	ug/l			ND	ND	ND	ND
sec-Butylbenzene	ug/l			ND	ND	ND	ND
1,1,1-Trichloroethane	ug/l	200	p	ND	ND	ND	ND
Benzene	ug/l	1	p	ND	ND	ND	ND
Toluene	ug/l	150	p	ND	ND	ND	ND
m,p-Xylenes	ug/l	1750	p	ND	ND	ND	ND
o-Xylene	ug/l	1750	p	ND	ND	ND	ND
Ethyl benzene	ug/l	700	p	ND	ND	ND	ND
MTBE	ug/l	13	p	ND	ND	ND	ND
Perchlorate	ug/l						

MCL: Maximum Contaminant Level, bold value indicates concentration exceeds MCL. (p): Primary MCL (s): Secondary MCL (ND): Not Detected

TABLE 4.3
WEST COAST BASIN WATER QUALITY RESULTS
REGIONAL GROUNDWATER MONITORING, WATER YEAR 2001/2002

Water Quality Constituent	Units	MCL	MCL Type	Westchester #1	Westchester #1	Westchester #1	Westchester #1	Westchester #1
				Zone 1	Zone 2	Zone 3	Zone 4	Zone 5
				5/22/02	5/22/02	5/20/02	5/21/02	5/21/02
General Mineral								
Total Dissolved Solid (TDS)	mg/l	1000	s	**1360**	780	590	550	530
Cation Sum	meq/l			14.2	13	11.5	10.6	10.6
Anion Sum	meq/l			23.1	13.6	11.2	10.3	10
Iron, Total, ICAP	mg/l	0.3	s	0.11	0.29	0.25	0.15	0.19
Manganese, Total, ICAP/MS	ug/l	50	s	**61**	36	**150**	**130**	**210**
Alkalinity	mg/l			971	580	447	352	328
Boron	mg/l			0.93	2.3	0.46	0.24	0.23
Bicarbonate as HCO3,calculated	mg/l			1.18E+03	706	544	429	400
Calcium, Total, ICAP	mg/l			25	17	41	70	67
Carbonate as CO3, Calculated	mg/l			7.67	3.64	2.23	1.4	1.03
Hardness (Total, as CaCO3)	mg/l			124	104	189	298	282
Chloride	mg/l	500	s	130	71	66	61	64
Fluoride	mg/l	2	p	0.27	0.29	0.32	0.27	0.33
Hydroxide as OH, Calculated	mg/l			0.02	0.01	0.01	0.009	0.007
Langelier Index - 25 degree	None			1	0.53	0.7	0.73	0.58
Magnesium, Total, ICAP	mg/l			15	15	21	30	28
Mercury	ug/l	2	p	ND	ND	ND	ND	ND
Nitrate-N by IC	mg/l	10	p	ND	ND	ND	ND	ND
Nitrite, Nitrogen by IC	mg/l	1	p	ND	ND	ND	ND	ND
Potassium, Total, ICAP	mg/l			15	19	13	9.6	8.1
Sodium, Total, ICAP	mg/l			260	240	170	100	110
Sulfate	mg/l	500	s	ND	ND	19	74	79
Surfactants	mg/l	0.5	s	ND	ND	ND	ND	ND
Total Nitrate, Nitrite-N, CALC	mg/l			ND	ND	ND	ND	ND
Total Organic Carbon	mg/l			11	46	2	1.6	1.4
Carbon Dioxide	mg/l			23.6	17.8	17.2	17.1	20.1
General Physical								
Apparent Color	ACU	15	s	**500**	**100**	**25**	10	5
Lab pH	Units			8	7.9	7.8	7.7	7.6
Odor	TON	3	s	**4**	**4**	**4**	2	3
Specific Conductance	umho/cm	1600	s	**2110**	1270	990	930	920
Turbidity	NTU	5	s	1.8	2.3	0.65	0.3	0.85
Radon	pCi/l			72	110	120	120	94
Metals								
Aluminum, Total, ICAP/MS	ug/l	200	s	ND	ND	ND	ND	ND
Antimony, Total, ICAP/MS	ug/l	6	p	ND	5.5	ND	ND	ND
Arsenic, Total, ICAP/MS	ug/l	50	p	1.2	ND	1.9	ND	2.6
Barium, Total, ICAP/MS	ug/l	1000	p	76	37	58	65	54
Beryllium, Total, ICAP/MS	ug/l	4	p	ND	ND	ND	ND	ND
Chromium, Total, ICAP/MS	ug/l	50	p	5.1	ND	ND	2.9	2.3
Hexavalent Chromium (Cr VI)	mg/l			ND	ND	ND	ND	ND
Cadmium, Total, ICAP/MS	ug/l	5	p	ND	ND	ND	ND	ND
Copper, Total, ICAP/MS	ug/l	1000	s	ND	ND	ND	ND	ND
Lead, Total, ICAP/MS	ug/l			ND	ND	ND	ND	ND
Nickel, Total, ICAP/MS	ug/l	100	p	ND	ND	ND	ND	ND
Selenium, Total, ICAP/MS	ug/l	50	p	ND	ND	ND	ND	ND
Silver, Total, ICAP/MS	ug/l	100	s	ND	10	ND	ND	ND
Thallium, Total, ICAP/MS	ug/l	2	p	ND	ND	ND	ND	ND
Zinc, Total, ICAP/MS	ug/l	5000	s	ND	ND	ND	ND	ND
Volatile Organic Compounds								
Trichloroethylene (TCE)	ug/l	5	p	ND	ND	ND	ND	ND
Tetrachloroethylene (PCE)	ug/l	5	p	ND	ND	ND	ND	ND
1,1-Dichloroethylene	ug/l	6	p	ND	ND	ND	ND	ND
cis-1,2-Dichloroethylene	ug/l	6	p	ND	ND	ND	ND	ND
Chloroform (Trichloromethane)	ug/l	100	p	ND	ND	ND	ND	ND
1,1-Dichloroethane	ug/l	5	p	ND	ND	ND	ND	ND
1,2-Dichloroethane	ug/l	0.5	p	ND	ND	ND	ND	ND
Carbon Tetrachloride	ug/l	0.5	p	ND	ND	ND	ND	ND
Di-Isopropyl Ether	ug/l			ND	ND	ND	ND	ND
Fluorotrichloromethane-Freon11	ug/l	150	p	ND	ND	ND	ND	ND
Isopropylbenzene	ug/l			ND	ND	ND	ND	ND
n-Propylbenzene	ug/l			ND	ND	ND	ND	ND
sec-Butylbenzene	ug/l			ND	ND	ND	ND	ND
1,1,1-Trichloroethane	ug/l	200	p	ND	ND	ND	ND	ND
Benzene	ug/l	1	p	ND	ND	ND	ND	ND
Toluene	ug/l	150	p	ND	ND	ND	ND	ND
m,p-Xylenes	ug/l	1750	p	ND	ND	ND	ND	ND
o-Xylene	ug/l	1750	p	ND	ND	ND	ND	ND
Ethyl benzene	ug/l	700	p	ND	ND	ND	ND	ND
MTBE	ug/l	13	p	ND	ND	ND	ND	ND
Perchlorate	ug/l			ND	ND	ND	ND	ND

MCL: Maximum Contaminant Level, bold value indicates concentration exceeds MCL. (p): Primary MCL (s): Secondary MCL (ND): Not Detected

TABLE 4.3
WEST COAST BASIN WATER QUALITY RESULTS
REGIONAL GROUNDWATER MONITORING, WATER YEAR 2001/2002

Water Quality Constituent	Units	MCL	MCL Type	Wilmington #1	Wilmington #1	Wilmington #1	Wilmington #1	Wilmington #1
				Zone 1	Zone 2	Zone 3	Zone 4	Zone 5
				5/13/02	5/13/02	5/13/02	5/13/02	5/13/02
General Mineral								
Total Dissolved Solid (TDS)	mg/l	1000	s	580	**1210**	**1750**	**2340**	920
Cation Sum	meq/l			9.79	19	26.8	36.9	15.5
Anion Sum	meq/l			9.64	20.1	25.5	39.7	15.6
Iron, Total, ICAP	mg/l	0.3	s	ND	ND	ND	ND	**0.36**
Manganese, Total, ICAP/MS	ug/l	50	s	22	18	7.5	36	**100**
Alkalinity	mg/l			129	136	142	154	221
Boron	mg/l			0.11	0.19	0.22	0.19	0.2
Bicarbonate as HCO3,calculated	mg/l			157	166	173	188	269
Calcium, Total, ICAP	mg/l			58	150	170	220	100
Carbonate as CO3, Calculated	mg/l			1.28	0.857	0.356	0.612	0.876
Hardness (Total, as CaCO3)	mg/l			219	506	589	853	394
Chloride	mg/l	500	s	250	**560**	**780**	**1100**	300
Fluoride	mg/l	2	p	0.17	0.1	0.08	0.08	0.12
Hydroxide as OH, Calculated	mg/l			0.02	0.01	0.005	0.009	0.009
Langelier Index - 25 degree	None			0.61	0.85	0.52	0.87	0.69
Magnesium, Total, ICAP	mg/l			18	32	40	74	35
Mercury	ug/l	2	p	ND	ND	ND	ND	ND
Nitrate-N by IC	mg/l	10	p	ND	ND	ND	ND	ND
Nitrite, Nitrogen by IC	mg/l	1	p	ND	ND	ND	ND	ND
Potassium, Total, ICAP	mg/l			7.6	7	9.1	11	7.5
Sodium, Total, ICAP	mg/l			120	200	340	450	170
Sulfate	mg/l	500	s	ND	74	32	270	130
Surfactants	mg/l	0.5	s	0.186	0.303	0.267	0.255	**0.764**
Total Nitrate, Nitrite-N, CALC	mg/l			ND	ND	ND	ND	ND
Total Organic Carbon	mg/l			2.8	4.1	5.6	3.9	12.4
Carbon Dioxide	mg/l			2.49	4.18	10.9	7.5	10.7
General Physical								
Apparent Color	ACU	15	s	5	5	10	5	10
Lab pH	Units			8.1	7.9	7.5	7.7	7.7
Odor	TON	3	s	**67**	**40**	**200**	**67**	**200**
Specific Conductance	umho/cm	1600	s	985	**2040**	**2820**	**3860**	1510
Turbidity	NTU	5	s	0.35	0.1	0.4	0.2	**21**
Radon	pCi/l							
Metals								
Aluminum, Total, ICAP/MS	ug/l	200	s	ND	ND	ND	ND	ND
Antimony, Total, ICAP/MS	ug/l	6	p	ND	ND	ND	ND	ND
Arsenic, Total, ICAP/MS	ug/l	50	p	1.3	1.5	1.8	ND	1.3
Barium, Total, ICAP/MS	ug/l	1000	p	11	11	24	92	110
Beryllium, Total, ICAP/MS	ug/l	4	p	ND	ND	ND	ND	ND
Chromium, Total, ICAP/MS	ug/l	50	p	ND	ND	ND	ND	ND
Hexavalent Chromium (Cr VI)	mg/l							
Cadmium, Total, ICAP/MS	ug/l	5	p	ND	ND	ND	ND	ND
Copper, Total, ICAP/MS	ug/l	1000	s	ND	ND	ND	ND	ND
Lead, Total, ICAP/MS	ug/l			ND	ND	ND	ND	ND
Nickel, Total, ICAP/MS	ug/l	100	p	ND	ND	ND	ND	ND
Selenium, Total, ICAP/MS	ug/l	50	p	ND	ND	ND	ND	ND
Silver, Total, ICAP/MS	ug/l	100	s	ND	ND	ND	ND	ND
Thallium, Total, ICAP/MS	ug/l	2	p	ND	ND	ND	ND	ND
Zinc, Total, ICAP/MS	ug/l	5000	s	ND	ND	ND	ND	ND
Volatile Organic Compounds								
Trichloroethylene (TCE)	ug/l	5	p	ND	ND	ND	ND	ND
Tetrachloroethylene (PCE)	ug/l	5	p	ND	ND	ND	ND	ND
1,1-Dichloroethylene	ug/l	6	p	ND	ND	ND	ND	ND
cis-1,2-Dichloroethylene	ug/l	6	p	ND	ND	ND	ND	ND
Chloroform (Trichloromethane)	ug/l	100	p	ND	ND	ND	ND	ND
1,1-Dichloroethane	ug/l	5	p	ND	ND	ND	ND	ND
1,2-Dichloroethane	ug/l	0.5	p	ND	ND	ND	ND	ND
Carbon Tetrachloride	ug/l	0.5	p	ND	ND	ND	ND	ND
Di-Isopropyl Ether	ug/l			ND	13	8.2	6.4	ND
Fluorotrichloromethane-Freon11	ug/l	150	p	ND	ND	ND	ND	ND
Isopropylbenzene	ug/l			ND	ND	ND	ND	6.4
n-Propylbenzene	ug/l			ND	ND	ND	ND	6.6
sec-Butylbenzene	ug/l			ND	ND	ND	ND	0.8
1,1,1-Trichloroethane	ug/l	200	p	ND	ND	ND	ND	ND
Benzene	ug/l	1	p	ND	ND	ND	ND	ND
Toluene	ug/l	150	p	ND	ND	ND	ND	ND
m,p-Xylenes	ug/l	1750	p	ND	ND	ND	ND	1.2
o-Xylene	ug/l	1750	p	ND	ND	ND	ND	ND
Ethyl benzene	ug/l	700	p	ND	ND	ND	ND	ND
MTBE	ug/l	13	p	ND	ND	ND	ND	ND
Perchlorate	ug/l							

MCL: Maximum Contaminant Level, bold value indicates concentration exceeds MCL. (p): Primary MCL (s): Secondary MCL (ND): Not Detected

TABLE 4.3
WEST COAST BASIN WATER QUALITY RESULTS
REGIONAL GROUNDWATER MONITORING, WATER YEAR 2001/2002

Water Quality Constituent	Units	MCL	MCL Type	Wilmington #2	Wilmington #2	Wilmington #2	Wilmington #2	Wilmington #2
				Zone 1	Zone 2	Zone 3	Zone 4	Zone 5
				2/19/02	7/8/02	2/19/02	2/19/02	2/19/02
General Mineral								
Total Dissolved Solid (TDS)	mg/l	1000	s	530	**1450**	510	**1870**	**8710**
Cation Sum	meq/l			9.19	24.5	8.78	31.5	133
Anion Sum	meq/l			8.77	26.3	10.2	30.9	140
Iron, Total, ICAP	mg/l	0.3	s	0.15	ND	ND	ND	ND
Manganese, Total, ICAP/MS	ug/l	50	s	6.8	20	17	38	**130**
Alkalinity	mg/l			378	470	298	235	376
Boron	mg/l			0.66	1.6	0.34	ND	0.58
Bicarbonate as HCO3,calculated	mg/l			455	572	362	286	458
Calcium, Total, ICAP	mg/l			3.4	36	31	130	550
Carbonate as CO3, Calculated	mg/l			14.8	4.68	4.69	2.34	1.88
Hardness (Total, as CaCO3)	mg/l			17.9	189	127	575	2480
Chloride	mg/l	500	s	41	**600**	150	**930**	**4300**
Fluoride	mg/l	2	p	0.98	0.32	0.25	0.26	0.18
Hydroxide as OH, Calculated	mg/l			0.09	0.02	0.03	0.02	0.01
Langelier Index - 25 degree	None			0.44	0.97	0.91	1.2	1.8
Magnesium, Total, ICAP	mg/l			2.3	24	12	61	270
Mercury	ug/l	2	p	ND	ND	ND	ND	ND
Nitrate-N by IC	mg/l	10	p	ND	ND	ND	ND	ND
Nitrite, Nitrogen by IC	mg/l	1	p	ND	ND	ND	ND	ND
Potassium, Total, ICAP	mg/l			5.2	12	6.1	15	27
Sodium, Total, ICAP	mg/l			200	470	140	450	1900
Sulfate	mg/l	500	s	ND	ND	ND	ND	**550**
Surfactants	mg/l	0.5	s	ND	ND	ND	0.077	0.073
Total Nitrate, Nitrite-N, CALC	mg/l			ND	ND	ND	ND	ND
Total Organic Carbon	mg/l			14.8	20	5.3	6	2.6
Carbon Dioxide	mg/l			1.82	9.09	3.63	4.54	14.5
General Physical								
Apparent Color	ACU	15	s	**400**	**125**	**35**	**45**	10
Lab pH	Units			8.7	8.1	8.3	8.1	7.8
Odor	TON	3	s	**8**	**4**	2	**200**	**8**
Specific Conductance	umho/cm	1600	s	786	**2450**	835	**3230**	**12700**
Turbidity	NTU	5	s	1.1	1.1	0.85	2	4.3
Radon	pCi/l							
Metals								
Aluminum, Total, ICAP/MS	ug/l	200	s	ND	ND	ND	ND	ND
Antimony, Total, ICAP/MS	ug/l	6	p	ND	ND	ND	ND	ND
Arsenic, Total, ICAP/MS	ug/l	50	p	1.4	ND	1.3	ND	ND
Barium, Total, ICAP/MS	ug/l	1000	p	7.7	52	19	100	120
Beryllium, Total, ICAP/MS	ug/l	4	p	ND	ND	ND	ND	ND
Chromium, Total, ICAP/MS	ug/l	50	p	3.7	2.9	2.2	1.9	ND
Hexavalent Chromium (Cr VI)	mg/l							
Cadmium, Total, ICAP/MS	ug/l	5	p	ND	ND	ND	ND	ND
Copper, Total, ICAP/MS	ug/l	1000	s	2.4	ND	ND	ND	ND
Lead, Total, ICAP/MS	ug/l			0.5	ND	0.52	ND	ND
Nickel, Total, ICAP/MS	ug/l	100	p	ND	ND	ND	6.2	ND
Selenium, Total, ICAP/MS	ug/l	50	p	ND	ND	ND	ND	ND
Silver, Total, ICAP/MS	ug/l	100	s	ND	ND	ND	ND	52
Thallium, Total, ICAP/MS	ug/l	2	p	ND	ND	ND	ND	ND
Zinc, Total, ICAP/MS	ug/l	5000	s	18	7.4	9.3	11	ND
Volatile Organic Compounds								
Trichloroethylene (TCE)	ug/l	5	p	ND	ND	ND	ND	ND
Tetrachloroethylene (PCE)	ug/l	5	p	ND	ND	ND	ND	ND
1,1-Dichloroethylene	ug/l	6	p	ND	ND	ND	ND	ND
cis-1,2-Dichloroethylene	ug/l	6	p	ND	ND	ND	ND	ND
Chloroform (Trichloromethane)	ug/l	100	p	ND	ND	ND	ND	ND
1,1-Dichloroethane	ug/l	5	p	ND	ND	ND	ND	ND
1,2-Dichloroethane	ug/l	0.5	p	ND	ND	ND	ND	ND
Carbon Tetrachloride	ug/l	0.5	p	ND	ND	ND	ND	ND
Di-Isopropyl Ether	ug/l			ND	ND	ND	ND	ND
Fluorotrichloromethane-Freon11	ug/l	150	p	ND	ND	ND	ND	ND
Isopropylbenzene	ug/l			ND	ND	ND	ND	ND
n-Propylbenzene	ug/l			ND	ND	ND	ND	ND
sec-Butylbenzene	ug/l			ND	ND	ND	ND	ND
1,1,1-Trichloroethane	ug/l	200	p	ND	ND	ND	ND	ND
Benzene	ug/l	1	p	ND	ND	ND	ND	ND
Toluene	ug/l	150	p	ND	ND	ND	ND	ND
m,p-Xylenes	ug/l	1750	p	ND	ND	ND	ND	ND
o-Xylene	ug/l	1750	p	ND	ND	ND	ND	ND
Ethyl benzene	ug/l	700	p	ND	ND	ND	ND	ND
MTBE	ug/l	13	p	ND	ND	ND	ND	ND
Perchlorate	ug/l							

MCL: Maximum Contaminant Level, bold value indicates concentration exceeds MCL. (p): Primary MCL (s): Secondary MCL (ND): Not Detected

FIGURES

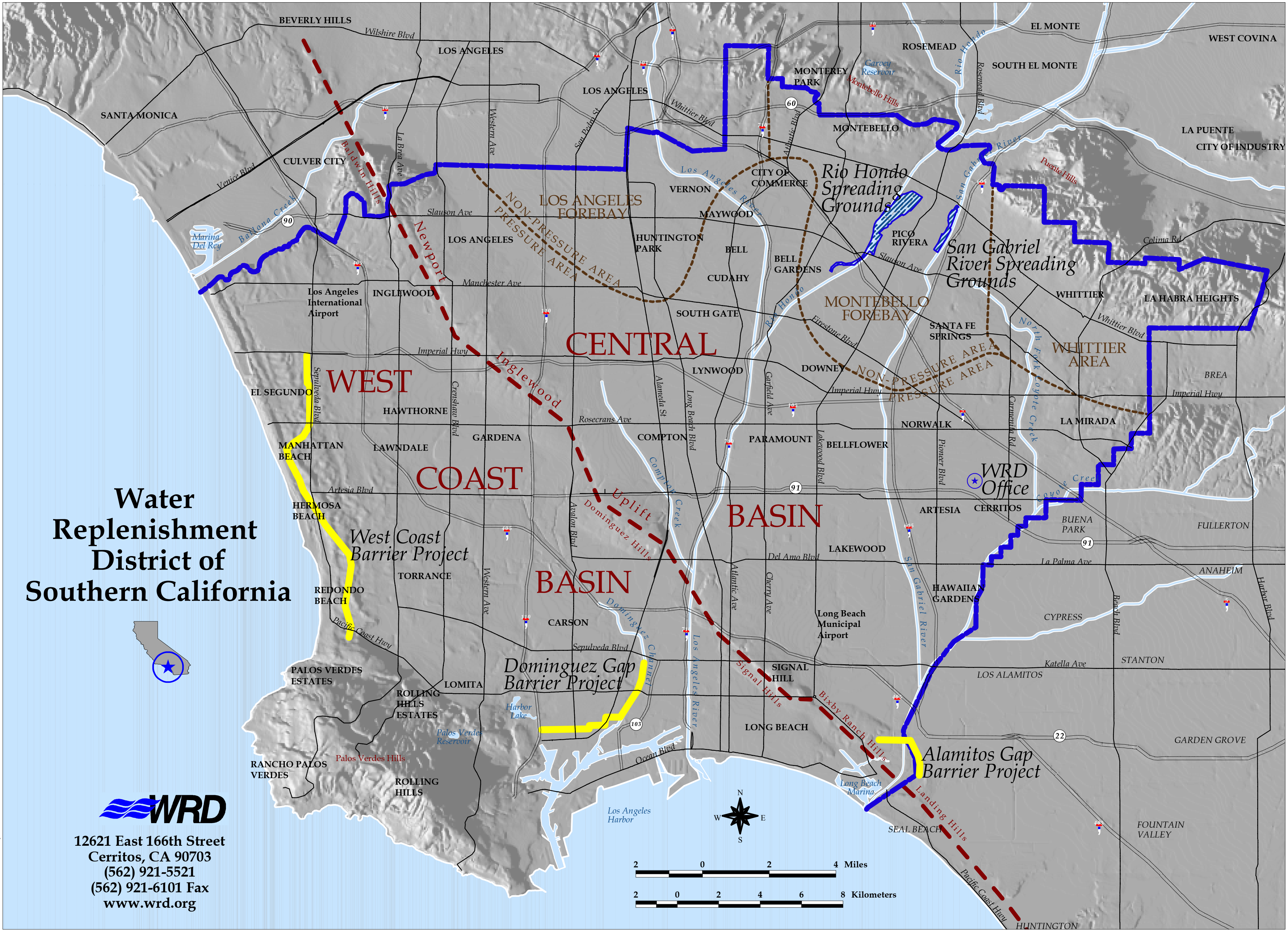
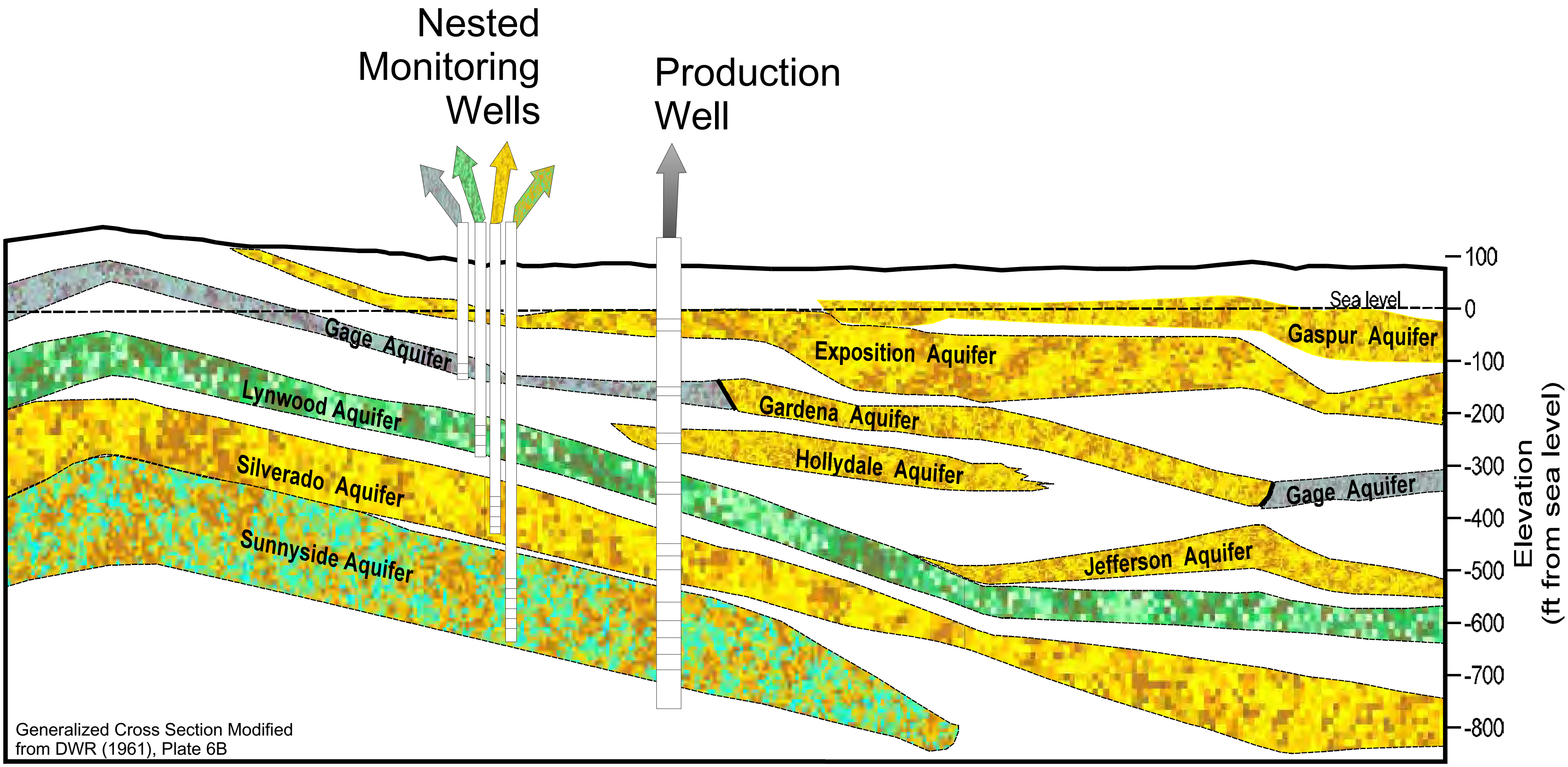

Water Replenishment District of Southern California
WRD
12621 East 166th Street
Cerritos, CA 90703
(562) 921-5521
(562) 921-6101 Fax
www.wrd.org
WEST COAST BASIN
CENTRAL BASIN
LOS ANGELES FOREBAY
MONTEBELLO FOREBAY
WHITTIER AREA
NON-PRESSURE AREA
PRESSURE AREA
Rio Hondo Spreading Grounds
San Gabriel River Spreading Grounds
West Coast Barrier Project
Dominguez Gap Barrier Project
Alamitos Gap Barrier Project
WRD Office
Newport Inglewood Uplift
Baldwin Hills
Dominguez Hills
Signal Hills
Bixby Ranch Hills
Landing Hills
Montebello Hills
Puente Hills
Palos Verdes Hills
BEVERLY HILLS
LOS ANGELES
SANTA MONICA
CULVER CITY
EL MONTE
WEST COVINA
ROSEMEAD
SOUTH EL MONTE
MONTEREY PARK
MONTEBELLO
LA PUENTE
CITY OF INDUSTRY
CITY OF COMMERCE
VERNON
MAYWOOD
HUNTINGTON PARK
BELL
BELL GARDENS
CUDAHY
PICO RIVERA
WHITTIER
LA HABRA HEIGHTS
SOUTH GATE
SANTA FE SPRINGS
DOWNEY
LYNWOOD
Los Angeles International Airport
INGLEWOOD
EL SEGUNDO
HAWTHORNE
MANHATTAN BEACH
LAWNDALE
GARDENA
COMPTON
PARAMOUNT
BELLFLOWER
NORWALK
LA MIRADA
BREA
HERMOSA BEACH
ARTESIA
CERRITOS
BUENA PARK
FULLERTON
LAKEWOOD
TORRANCE
REDONDO BEACH
HAWAIIAN GARDENS
ANAHEIM
CARSON
Long Beach Municipal Airport
CYPRESS
STANTON
LOS ALAMITOS
PALOS VERDES ESTATES
LOMITA
ROLLING HILLS ESTATES
SIGNAL HILL
LONG BEACH
GARDEN GROVE
RANCHO PALOS VERDES
ROLLING HILLS
SEAL BEACH
FOUNTAIN VALLEY
HUNTINGTON
Los Angeles River
San Gabriel River
Rio Hondo
Ballona Creek
Compton Creek
Dominguez Channel
Coyote Creek
North Fork Coyote Creek
Marina Del Rey
Garvey Reservoir
Harbor Lake
Palos Verdes Reservoir
Los Angeles Harbor
Long Beach Marina
Wilshire Blvd
Whittier Blvd
Venice Blvd
Slauson Ave
Manchester Ave
Imperial Hwy
Rosecrans Ave
Artesia Blvd
Del Amo Blvd
Sepulveda Blvd
Pacific Coast Hwy
Ocean Blvd
Firestone Blvd
Colima Rd
La Palma Ave
Katella Ave
Western Ave
La Brea Ave
Crenshaw Blvd
Avalon Blvd
Alameda St
Long Beach Blvd
Atlantic Ave
Garfield Ave
Cherry Ave
Lakewood Blvd
Pioneer Blvd
Carmenita Rd
Beach Blvd
Harbor Blvd
Rosemead Blvd
San Pedro St
Atlantic Blvd
N
W
E
S
2 0 2 4 Miles
2 0 2 4 6 8 Kilometers

Figure 1.1

NESTED WELLS versus PRODUCTION WELLS FOR AQUIFER-SPECIFIC DATA



Production wells are typically perforated across multiple aquifers producing an average water quality. Nested monitoring wells are screened in a portion of a specific aquifer, providing water quality and water level information for the specific zone.

WRD

Figure 1.2

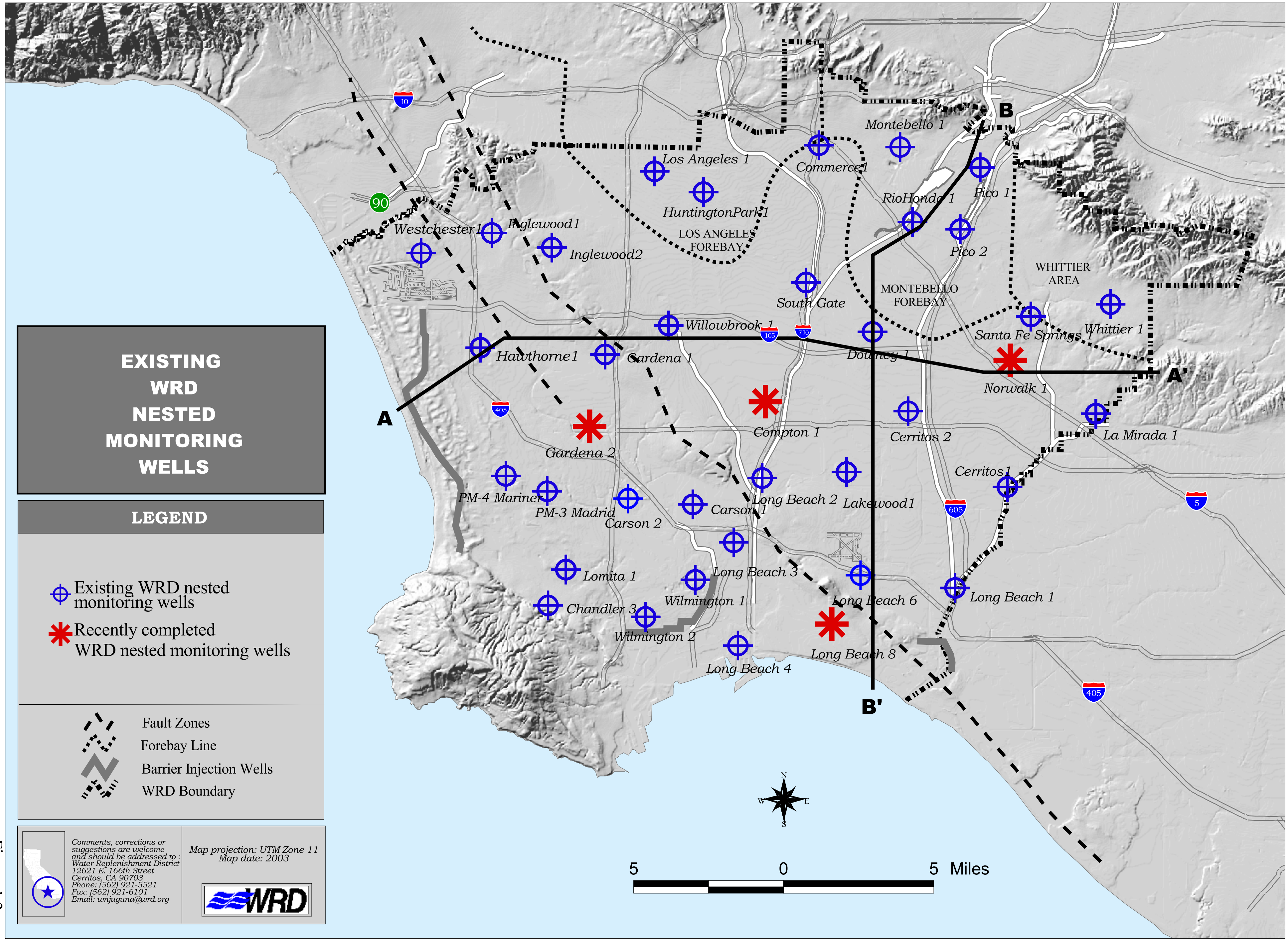
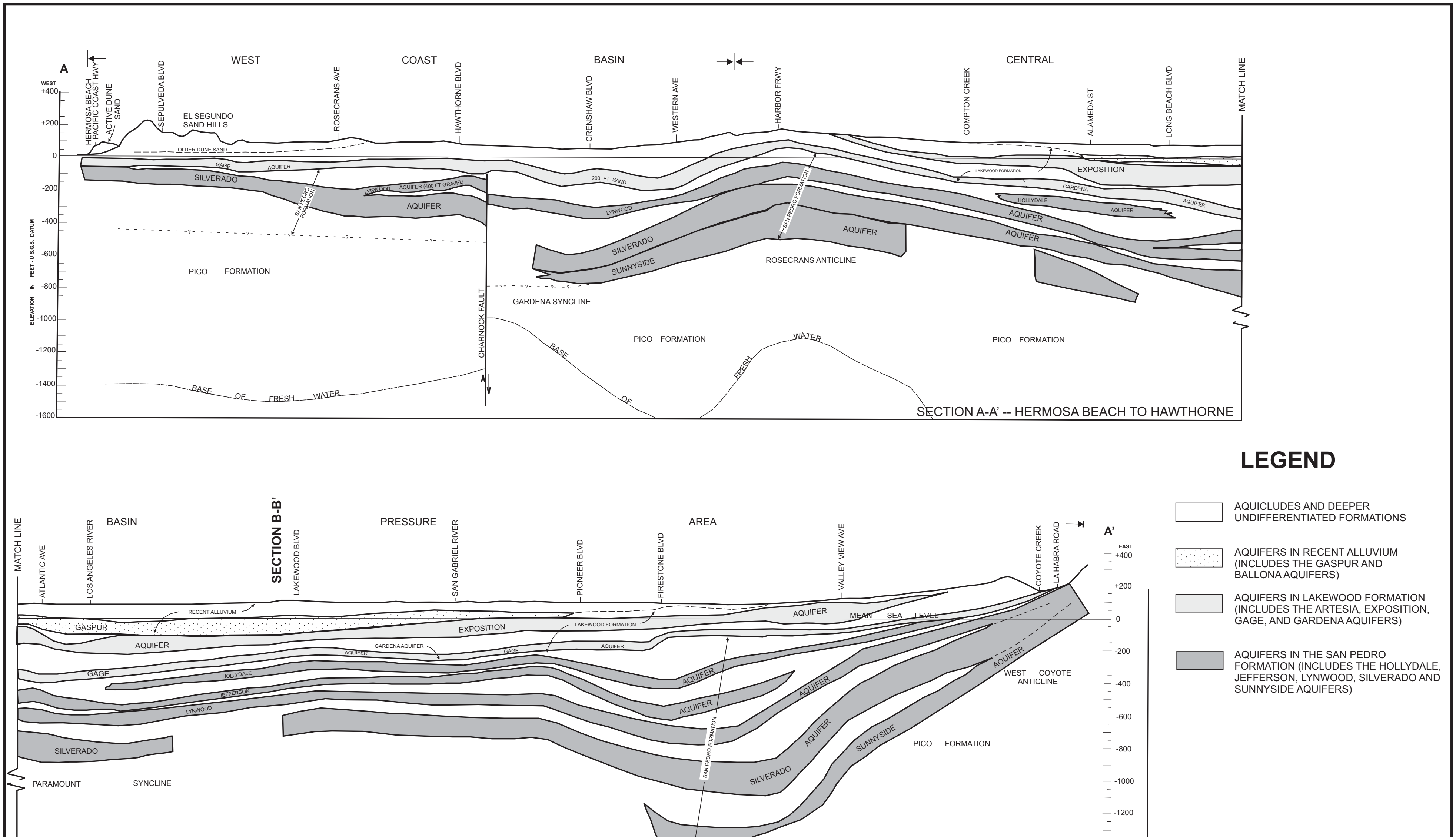
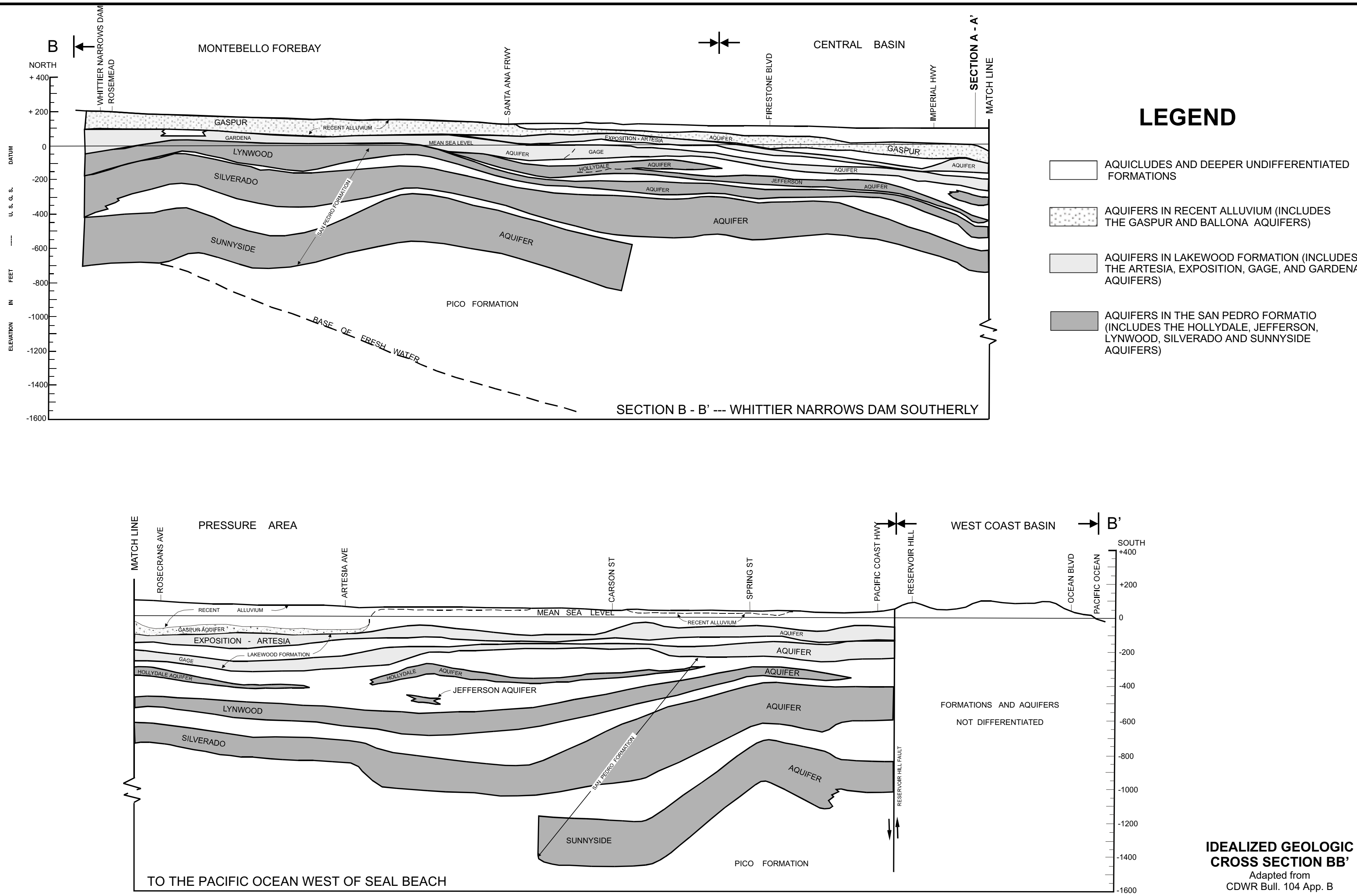

EXISTING WRD NESTED MONITORING WELLS
LEGEND
Existing WRD nested monitoring wells
Recently completed WRD nested monitoring wells
Fault Zones
Forebay Line
Barrier Injection Wells
WRD Boundary
Comments, corrections or suggestions are welcome and should be addressed to : Water Replenishment District 12621 E. 166th Street Cerritos, CA 90703 Phone: (562) 921-5521 Fax: (562) 921-6101 Email: wnjuguna@wrd.org
Map projection: UTM Zone 11
Map date: 2003
WRD
5 0 5 Miles
N
S
E
W
A
A'
B
B'
LOS ANGELES FOREBAY
MONTEBELLO FOREBAY
WHITTIER AREA
Los Angeles 1
Commerce 1
Montebello 1
HuntingtonPark1
RioHondo 1
Pico 1
Pico 2
Westchester1
Inglewood1
Inglewood2
South Gate
Willowbrook 1
Downey 1
Santa Fe Springs 1
Whittier 1
Hawthorne1
Gardena 1
Norwalk 1
La Mirada 1
Compton 1
Cerritos 2
Gardena 2
Cerritos1
PM-4 Mariner
PM-3 Madrid
Carson 2
Carson 1
Long Beach 2
Lakewood1
Long Beach 3
Lomita 1
Chandler 3
Wilmington 1
Wilmington 2
Long Beach 6
Long Beach 1
Long Beach 8
Long Beach 4
10
90
105
710
405
605
5

Figure 1.3



IDEALIZED GEOLOGIC CROSS SECTION AA'
Adapted from
CDWR Bull. 104 App. B

FIGURE 1.4



IDEALIZED GEOLOGIC CROSS SECTION BB'
Adapted from
CDWR Bull. 104 App. B

FIGURE 1.5

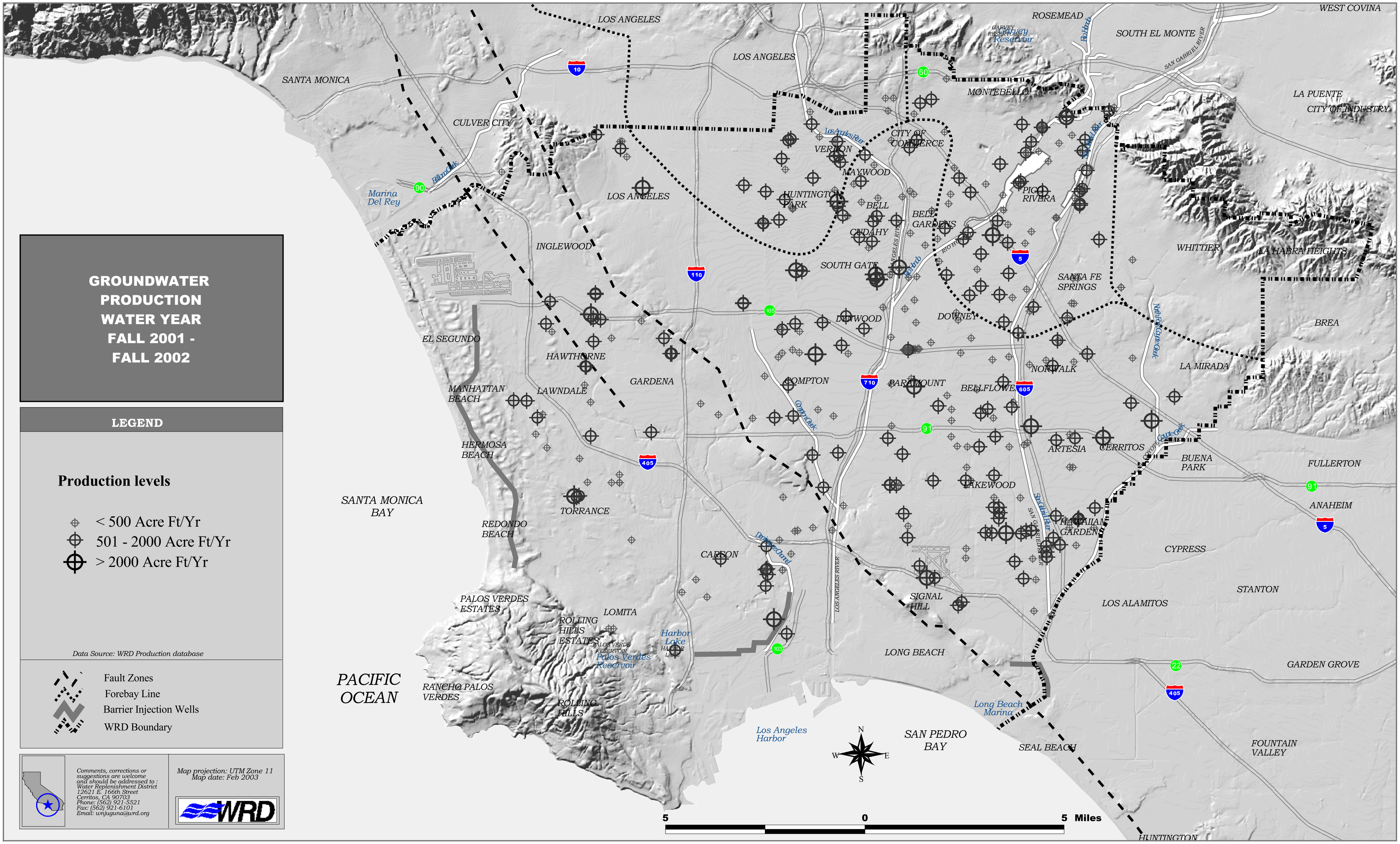
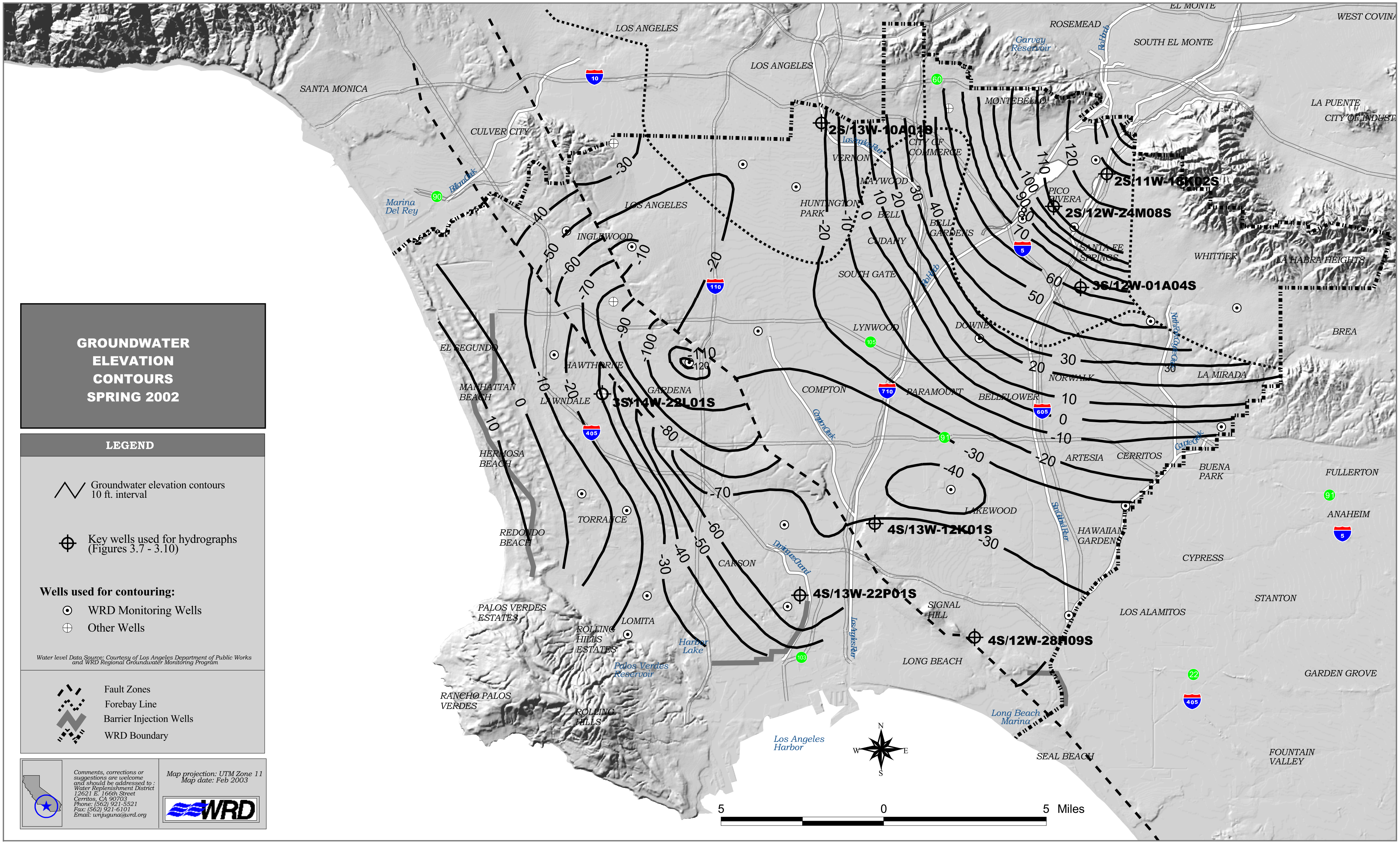

GROUNDWATER PRODUCTION WATER YEAR FALL 2001 - FALL 2002
LEGEND
Production levels
< 500 Acre Ft/Yr
501 - 2000 Acre Ft/Yr
> 2000 Acre Ft/Yr
Data Source: WRD Production database
Fault Zones
Forebay Line
Barrier Injection Wells
WRD Boundary
Comments, corrections or suggestions are welcome and should be addressed to : Water Replenishment District 12621 E. 166th Street Cerritos, CA 90703 Phone: (562) 921-5521 Fax: (562) 921-6101 Email: wnjuguna@wrd.org
Map projection: UTM Zone 11
Map date: Feb 2003
WRD
5
0
5 Miles
PACIFIC OCEAN
SANTA MONICA BAY
SAN PEDRO BAY
SANTA MONICA
CULVER CITY
Marina Del Rey
LOS ANGELES
INGLEWOOD
EL SEGUNDO
HAWTHORNE
MANHATTAN BEACH
LAWNDALE
GARDENA
HERMOSA BEACH
REDONDO BEACH
TORRANCE
CARSON
PALOS VERDES ESTATES
LOMITA
ROLLING HILLS ESTATES
RANCHO PALOS VERDES
ROLLING HILLS
Harbor Lake
Palos Verdes Reservoir
Los Angeles Harbor
LONG BEACH
SIGNAL HILL
Long Beach Marina
SEAL BEACH
HUNTINGTON
VERNON
MAYWOOD
HUNTINGTON PARK
BELL
CUDAHY
BELL GARDENS
SOUTH GATE
CITY OF COMMERCE
MONTEBELLO
ROSEMEAD
SOUTH EL MONTE
WEST COVINA
LA PUENTE
CITY OF INDUSTRY
PICO RIVERA
WHITTIER
LA HABRA HEIGHTS
SANTA FE SPRINGS
DOWNEY
LYNWOOD
COMPTON
PARAMOUNT
BELLFLOWER
NORWALK
LA MIRADA
BREA
ARTESIA
CERRITOS
BUENA PARK
FULLERTON
ANAHEIM
LAKEWOOD
HAWAIIAN GARDENS
CYPRESS
STANTON
LOS ALAMITOS
GARDEN GROVE
FOUNTAIN VALLEY
LOS ANGELES RIVER
SAN GABRIEL RIVER
Rio Hondo
Compton Creek
Coyote Creek
Dominguez Channel
N
S
E
W

Figure 3.1



GROUNDWATER ELEVATION CONTOURS SPRING 2002
LEGEND
Groundwater elevation contours 10 ft. interval
Key wells used for hydrographs (Figures 3.7 - 3.10)
Wells used for contouring:
WRD Monitoring Wells
Other Wells
Water level Data Source: Courtesy of Los Angeles Department of Public Works and WRD Regional Groundwater Monitoring Program
Fault Zones
Forebay Line
Barrier Injection Wells
WRD Boundary
Comments, corrections or suggestions are welcome and should be addressed to : Water Replenishment District 12621 E. 166th Street Cerritos, CA 90703 Phone: (562) 921-5521 Fax: (562) 921-6101 Email: wnjuguna@wrd.org
Map projection: UTM Zone 11
Map date: Feb 2003
WRD
2S/13W-10A01S
2S/11W-16K02S
2S/12W-24M08S
3S/12W-01A04S
3S/14W-22L01S
4S/13W-12K01S
4S/13W-22P01S
4S/12W-28H09S
LOS ANGELES
SANTA MONICA
CULVER CITY
Marina Del Rey
INGLEWOOD
EL SEGUNDO
HAWTHORNE
MANHATTAN BEACH
LAWNDALE
GARDENA
HERMOSA BEACH
TORRANCE
REDONDO BEACH
CARSON
PALOS VERDES ESTATES
LOMITA
ROLLING HILLS ESTATES
RANCHO PALOS VERDES
ROLLING HILLS
Harbor Lake
Palos Verdes Reservoir
Los Angeles Harbor
LONG BEACH
SIGNAL HILL
Long Beach Marina
SEAL BEACH
LAKEWOOD
HAWAIIAN GARDENS
COMPTON
PARAMOUNT
BELLFLOWER
LYNWOOD
DOWNEY
SOUTH GATE
CUDAHY
BELL
BELL GARDENS
MAYWOOD
HUNTINGTON PARK
VERNON
CITY OF COMMERCE
MONTEBELLO
ROSEMEAD
Garvey Reservoir
EL MONTE
SOUTH EL MONTE
WEST COVINA
LA PUENTE
CITY OF INDUSTRY
PICO RIVERA
SANTA FE SPRINGS
WHITTIER
LA HABRA HEIGHTS
BREA
LA MIRADA
NORWALK
ARTESIA
CERRITOS
BUENA PARK
FULLERTON
ANAHEIM
CYPRESS
STANTON
LOS ALAMITOS
GARDEN GROVE
FOUNTAIN VALLEY
N
E
S
W
5
0
5 Miles

Figure 3.2

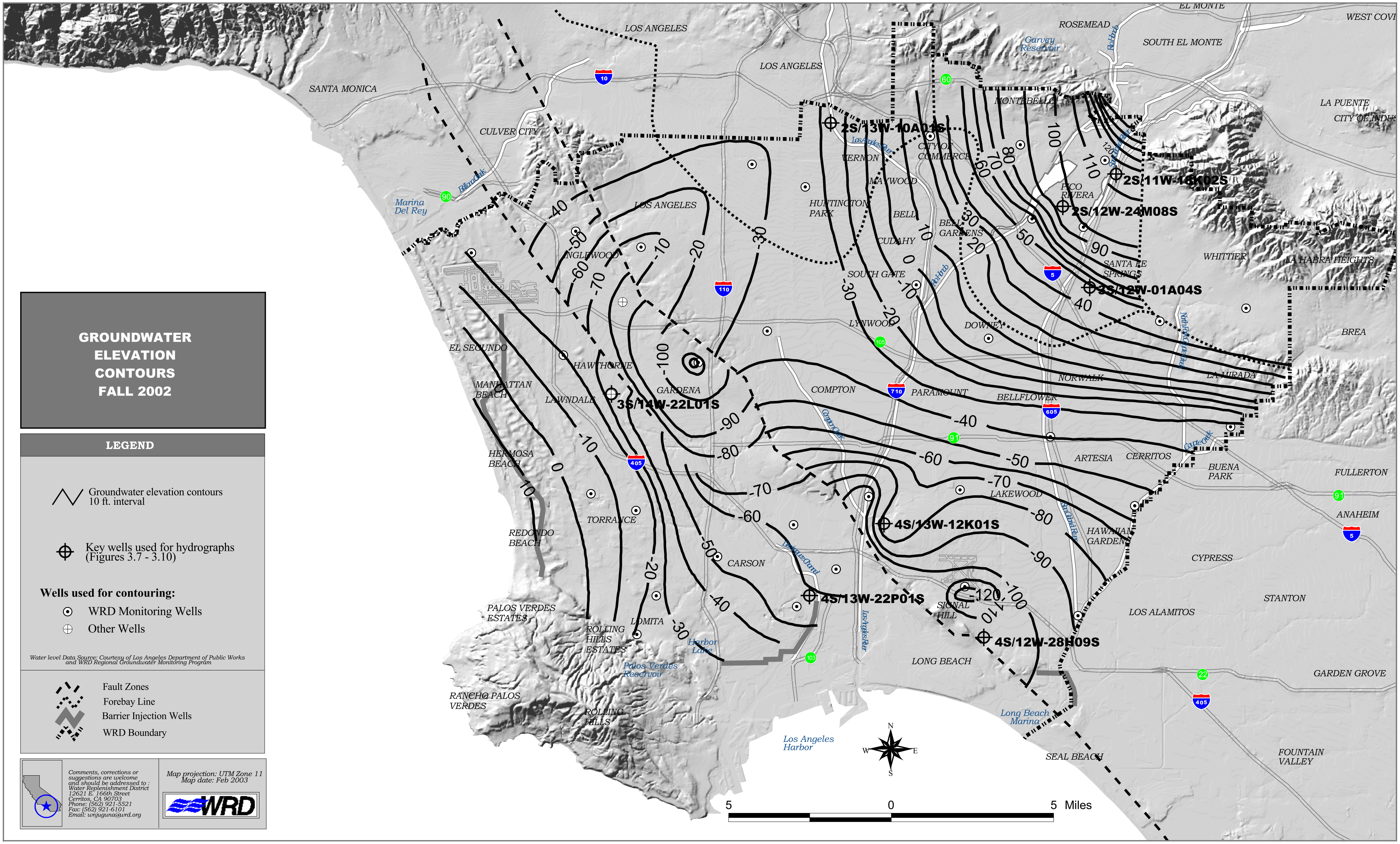

GROUNDWATER ELEVATION CONTOURS FALL 2002
LEGEND
Groundwater elevation contours 10 ft. interval
Key wells used for hydrographs (Figures 3.7 - 3.10)
Wells used for contouring:
WRD Monitoring Wells
Other Wells
Water level Data Source: Courtesy of Los Angeles Department of Public Works and WRD Regional Groundwater Monitoring Program
Fault Zones
Forebay Line
Barrier Injection Wells
WRD Boundary
Map projection: UTM Zone 11
Map date: Feb 2003
WRD
2S/13W-10A01S
2S/11W-18K02S
2S/12W-24M08S
3S/12W-01A04S
3S/14W-22L01S
4S/13W-12K01S
4S/13W-22P01S
4S/12W-28H09S
5 0 5 Miles

Figure 3.3

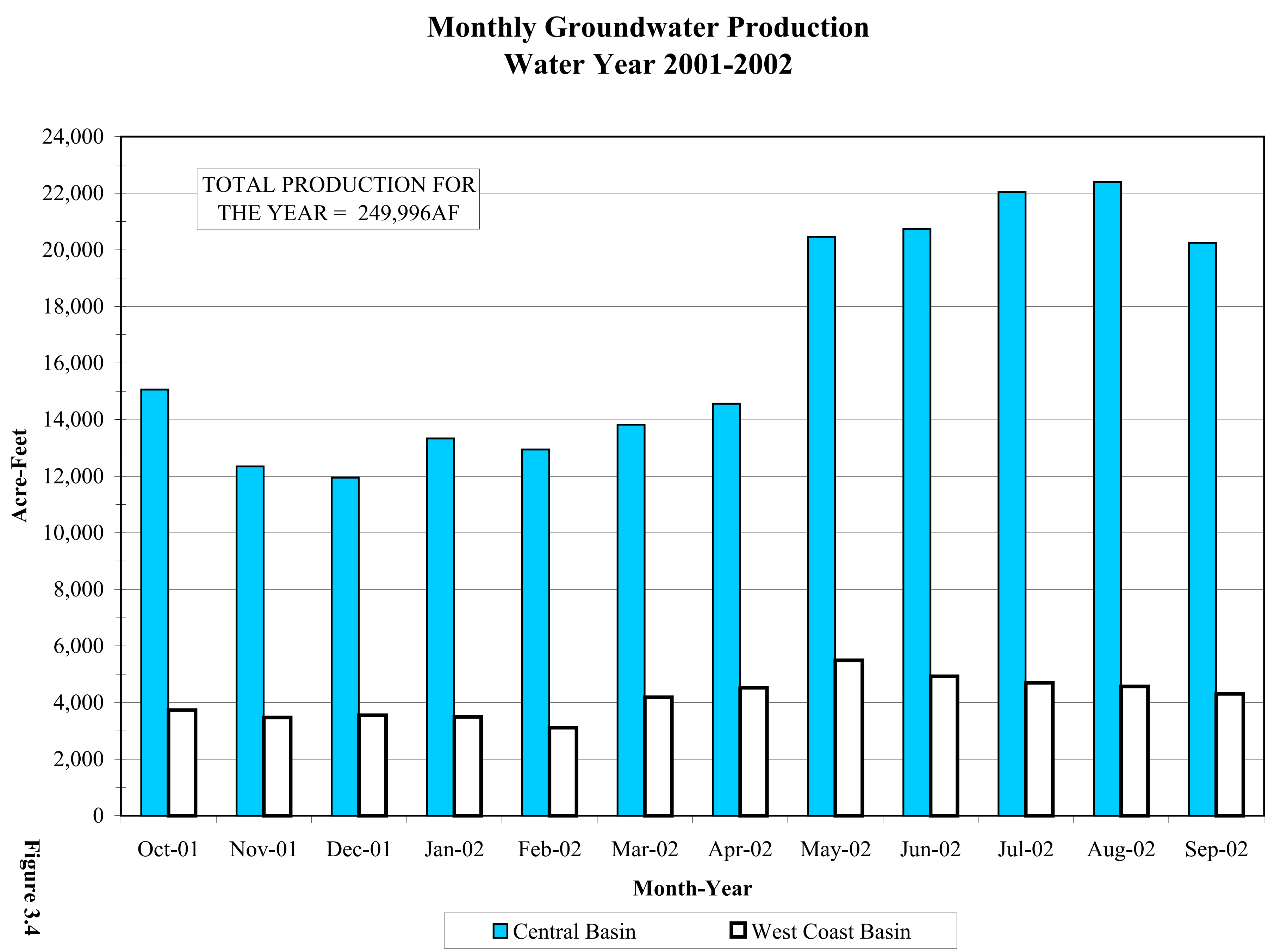

Monthly Groundwater Production
Water Year 2001-2002
TOTAL PRODUCTION FOR
THE YEAR = 249,996AF
Acre-Feet
24,000
22,000
20,000
18,000
16,000
14,000
12,000
10,000
8,000
6,000
4,000
2,000
0
Oct-01
Nov-01
Dec-01
Jan-02
Feb-02
Mar-02
Apr-02
May-02
Jun-02
Jul-02
Aug-02
Sep-02
Month-Year
Central Basin
West Coast Basin

Figure 3.4

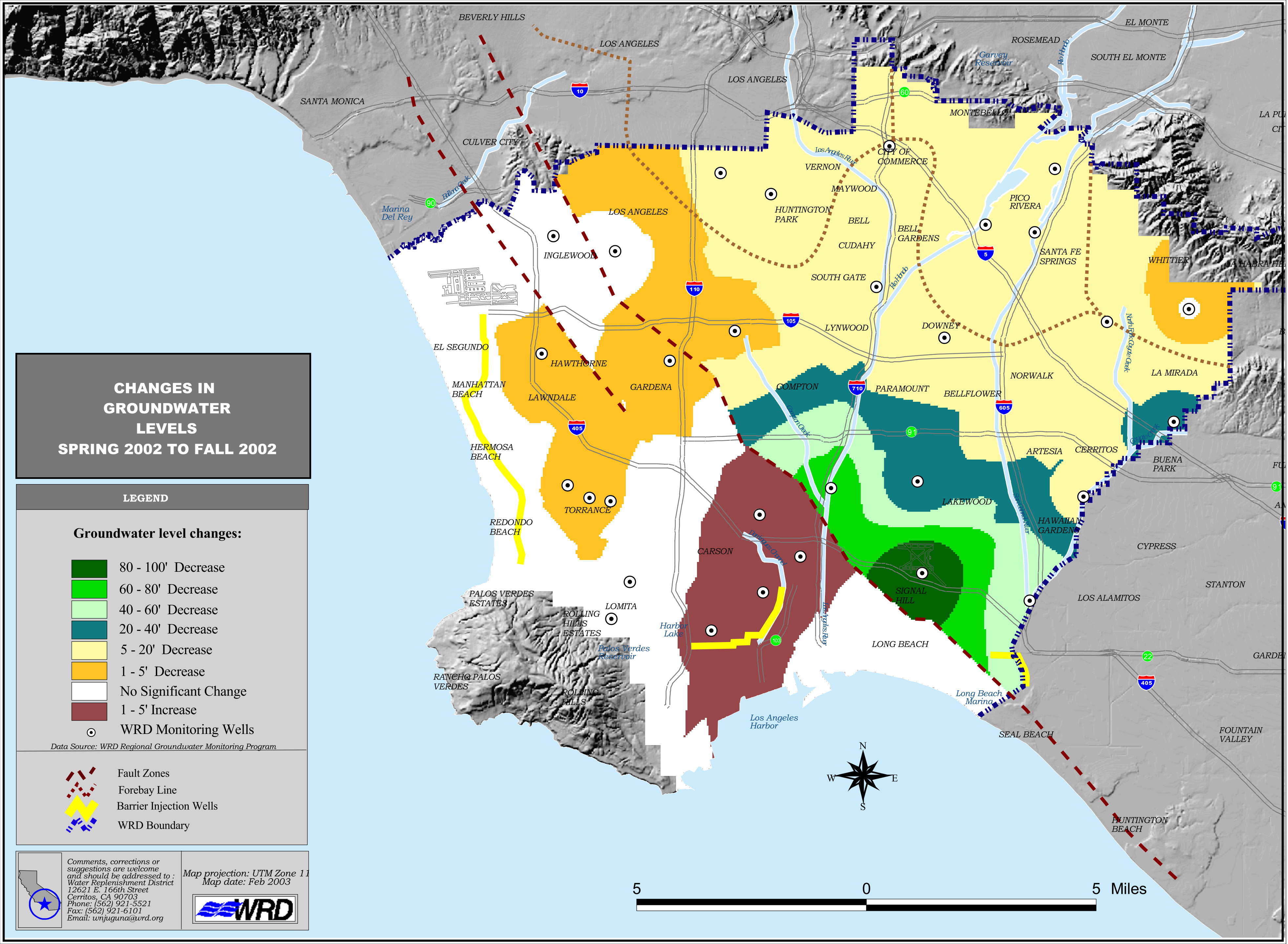

CHANGES IN GROUNDWATER LEVELS SPRING 2002 TO FALL 2002
LEGEND
Groundwater level changes:
80 - 100' Decrease
60 - 80' Decrease
40 - 60' Decrease
20 - 40' Decrease
5 - 20' Decrease
1 - 5' Decrease
No Significant Change
1 - 5' Increase
WRD Monitoring Wells
Data Source: WRD Regional Groundwater Monitoring Program
Fault Zones
Forebay Line
Barrier Injection Wells
WRD Boundary
Comments, corrections or suggestions are welcome and should be addressed to : Water Replenishment District 12621 E. 166th Street Cerritos, CA 90703 Phone: (562) 921-5521 Fax: (562) 921-6101 Email: umjuguna@wrd.org
Map projection: UTM Zone 11
Map date: Feb 2003
WRD
5
0
5 Miles
N
S
E
W
BEVERLY HILLS
LOS ANGELES
SANTA MONICA
CULVER CITY
Marina Del Rey
EL MONTE
ROSEMEAD
SOUTH EL MONTE
MONTEBELLO
CITY OF COMMERCE
VERNON
MAYWOOD
HUNTINGTON PARK
BELL
BELL GARDENS
CUDAHY
PICO RIVERA
SANTA FE SPRINGS
WHITTIER
INGLEWOOD
SOUTH GATE
LYNWOOD
DOWNEY
EL SEGUNDO
HAWTHORNE
GARDENA
LAWNDALE
MANHATTAN BEACH
COMPTON
PARAMOUNT
BELLFLOWER
NORWALK
LA MIRADA
HERMOSA BEACH
ARTESIA
CERRITOS
BUENA PARK
REDONDO BEACH
TORRANCE
LAKEWOOD
HAWAIIAN GARDENS
CYPRESS
CARSON
SIGNAL HILL
LOS ALAMITOS
STANTON
PALOS VERDES ESTATES
LOMITA
ROLLING HILLS ESTATES
Harbor Lake
Palos Verdes Reservoir
RANCHO PALOS VERDES
ROLLING HILLS
LONG BEACH
Long Beach Marina
Los Angeles Harbor
SEAL BEACH
HUNTINGTON BEACH
FOUNTAIN VALLEY

Figure 3.5

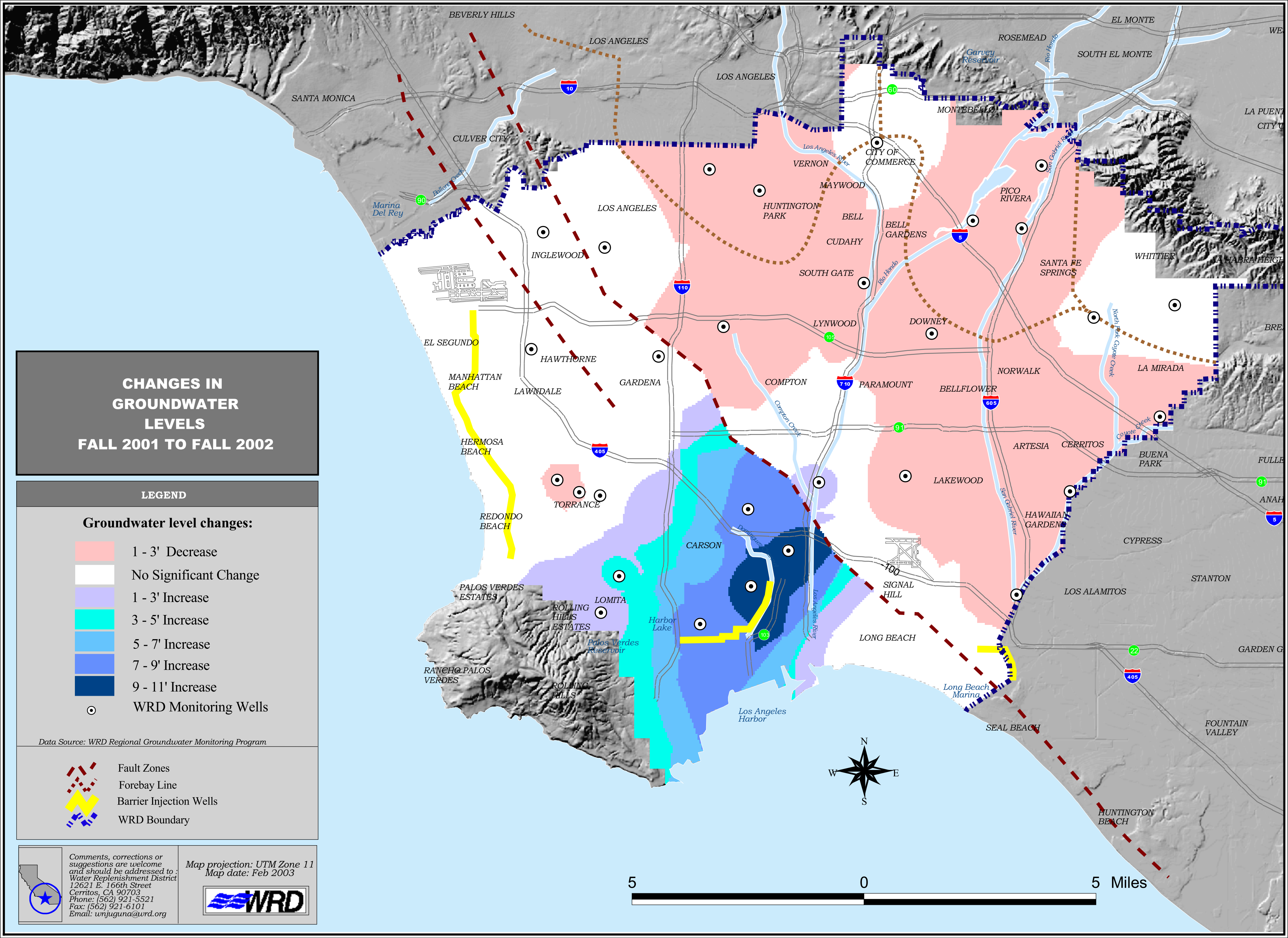

CHANGES IN GROUNDWATER LEVELS FALL 2001 TO FALL 2002
LEGEND
Groundwater level changes:
1 - 3' Decrease
No Significant Change
1 - 3' Increase
3 - 5' Increase
5 - 7' Increase
7 - 9' Increase
9 - 11' Increase
WRD Monitoring Wells
Data Source: WRD Regional Groundwater Monitoring Program
Fault Zones
Forebay Line
Barrier Injection Wells
WRD Boundary
Comments, corrections or suggestions are welcome and should be addressed to : Water Replenishment District 12621 E. 166th Street Cerritos, CA 90703 Phone: (562) 921-5521 Fax: (562) 921-6101 Email: wnjuguna@wrd.org
Map projection: UTM Zone 11
Map date: Feb 2003
WRD
5
0
5 Miles
N
S
E
W
BEVERLY HILLS
LOS ANGELES
SANTA MONICA
CULVER CITY
Marina Del Rey
INGLEWOOD
EL SEGUNDO
HAWTHORNE
MANHATTAN BEACH
LAWNDALE
GARDENA
HERMOSA BEACH
TORRANCE
REDONDO BEACH
PALOS VERDES ESTATES
ROLLING HILLS ESTATES
LOMITA
RANCHO PALOS VERDES
ROLLING HILLS
Palos Verdes Reservoir
Harbor Lake
CARSON
Los Angeles Harbor
LONG BEACH
SIGNAL HILL
Long Beach Marina
SEAL BEACH
HUNTINGTON BEACH
VERNON
MAYWOOD
HUNTINGTON PARK
BELL
CUDAHY
BELL GARDENS
SOUTH GATE
CITY OF COMMERCE
MONTEBELLO
ROSEMEAD
EL MONTE
SOUTH EL MONTE
Garvey Reservoir
PICO RIVERA
SANTA FE SPRINGS
WHITTIER
LYNWOOD
DOWNEY
COMPTON
PARAMOUNT
BELLFLOWER
NORWALK
LA MIRADA
ARTESIA
CERRITOS
BUENA PARK
LAKEWOOD
HAWAIIAN GARDENS
CYPRESS
LOS ALAMITOS
STANTON
FOUNTAIN VALLEY

Figure 3.6

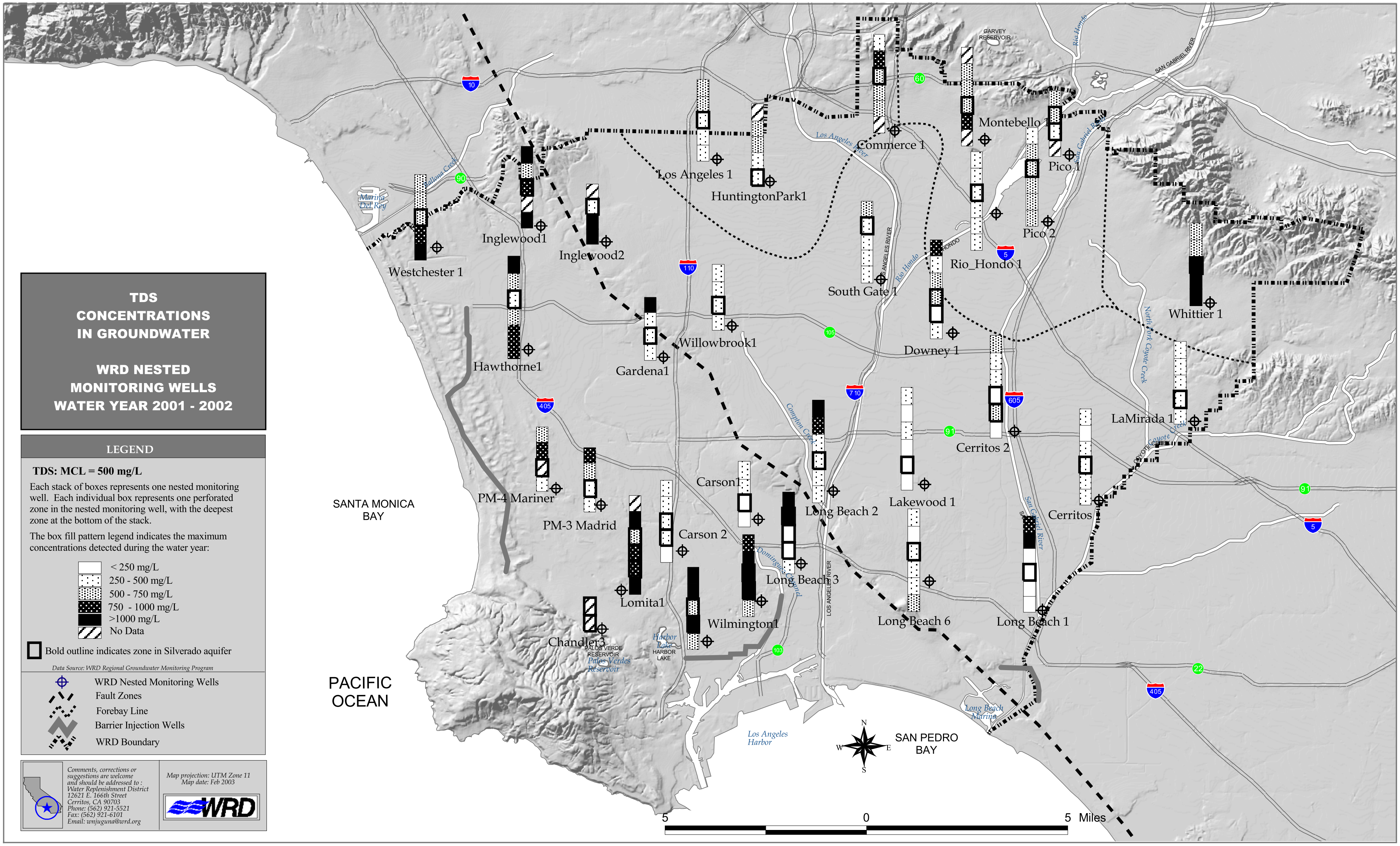

TDS
CONCENTRATIONS
IN GROUNDWATER
WRD NESTED
MONITORING WELLS
WATER YEAR 2001 - 2002
LEGEND
TDS: MCL = 500 mg/L
Each stack of boxes represents one nested monitoring well. Each individual box represents one perforated zone in the nested monitoring well, with the deepest zone at the bottom of the stack.
The box fill pattern legend indicates the maximum concentrations detected during the water year:
< 250 mg/L
250 - 500 mg/L
500 - 750 mg/L
750 - 1000 mg/L
>1000 mg/L
No Data
Bold outline indicates zone in Silverado aquifer
Data Source: WRD Regional Groundwater Monitoring Program
WRD Nested Monitoring Wells
Fault Zones
Forebay Line
Barrier Injection Wells
WRD Boundary
Comments, corrections or suggestions are welcome and should be addressed to : Water Replenishment District 12621 E. 166th Street Cerritos, CA 90703 Phone: (562) 921-5521 Fax: (562) 921-6101 Email: wnjuguna@wrd.org
Map projection: UTM Zone 11
Map date: Feb 2003
WRD
SANTA MONICA BAY
PACIFIC OCEAN
SAN PEDRO BAY
Westchester 1
Inglewood1
Inglewood2
Hawthorne1
Gardena1
Willowbrook1
Los Angeles 1
HuntingtonPark1
Commerce 1
Montebello 1
Pico 1
Pico 2
South Gate 1
Rio_Hondo 1
Downey 1
Whittier 1
LaMirada 1
Cerritos 2
Cerritos 1
Lakewood 1
Long Beach 2
Long Beach 3
Long Beach 6
Long Beach 1
Carson1
Carson 2
PM-4 Mariner
PM-3 Madrid
Lomita1
Wilmington1
Chandler3
Los Angeles Harbor
Long Beach Marina
Marina Del Rey
Harbor Lake
PALOS VERDE RESERVOIR
GARVEY RESERVOIR
5 0 5 Miles

Figure 4.1

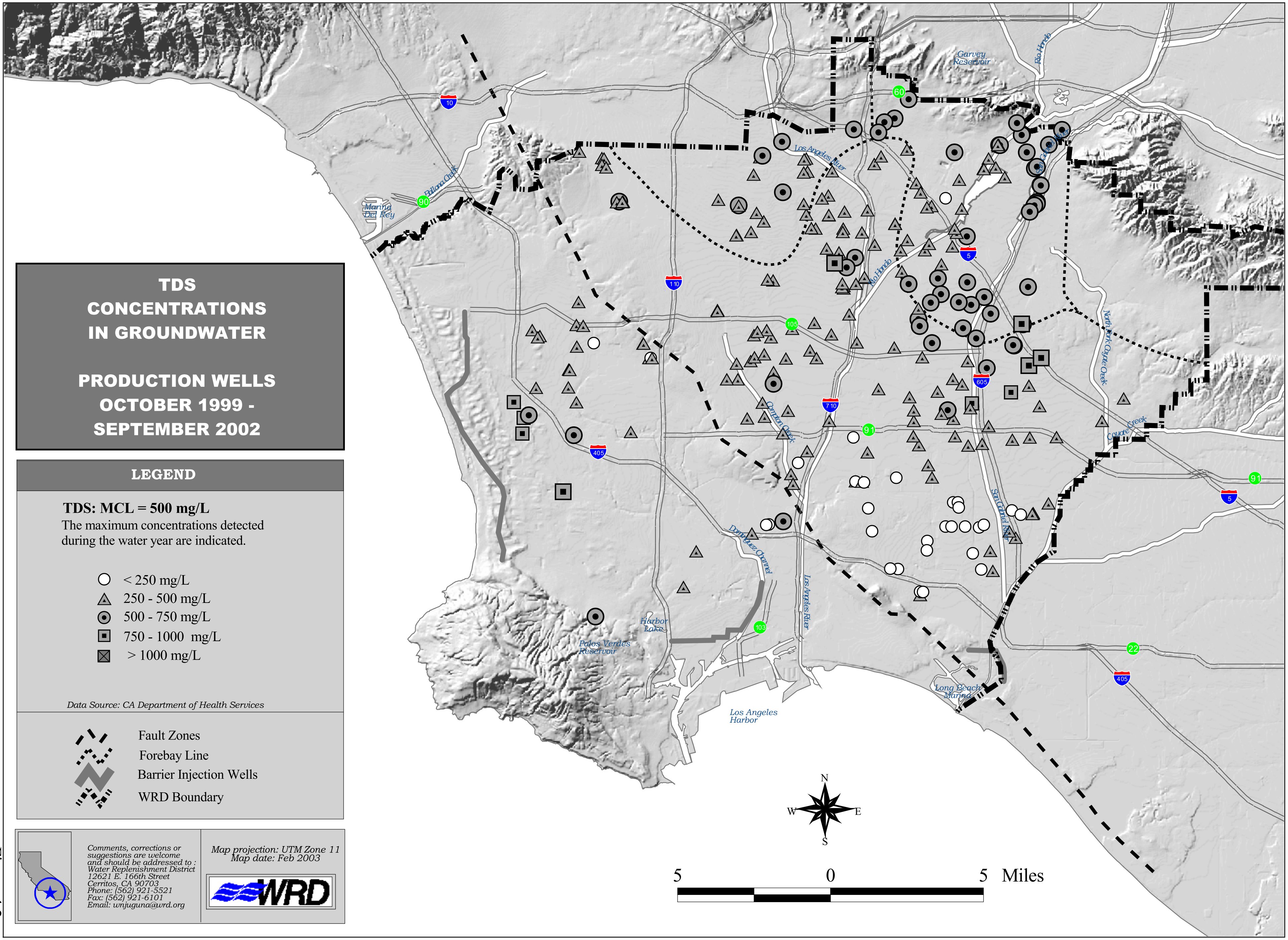

TDS
CONCENTRATIONS
IN GROUNDWATER
PRODUCTION WELLS
OCTOBER 1999 -
SEPTEMBER 2002
LEGEND
TDS: MCL = 500 mg/L
The maximum concentrations detected
during the water year are indicated.
< 250 mg/L
250 - 500 mg/L
500 - 750 mg/L
750 - 1000 mg/L
> 1000 mg/L
Data Source: CA Department of Health Services
Fault Zones
Forebay Line
Barrier Injection Wells
WRD Boundary
Comments, corrections or suggestions are welcome and should be addressed to : Water Replenishment District 12621 E. 166th Street Cerritos, CA 90703 Phone: (562) 921-5521 Fax: (562) 921-6101 Email: wnjuguna@wrd.org
Map projection: UTM Zone 11
Map date: Feb 2003
WRD
5 0 5 Miles
N
S
E
W
Garvey Reservoir
Rio Hondo
Los Angeles River
Marina Del Rey
Ballona Creek
Compton Creek
Dominguez Channel
San Gabriel River
North Fork Coyote Creek
Coyote Creek
Harbor Lake
Palos Verdes Reservoir
Los Angeles Harbor
Long Beach Marina

Figure 4.2

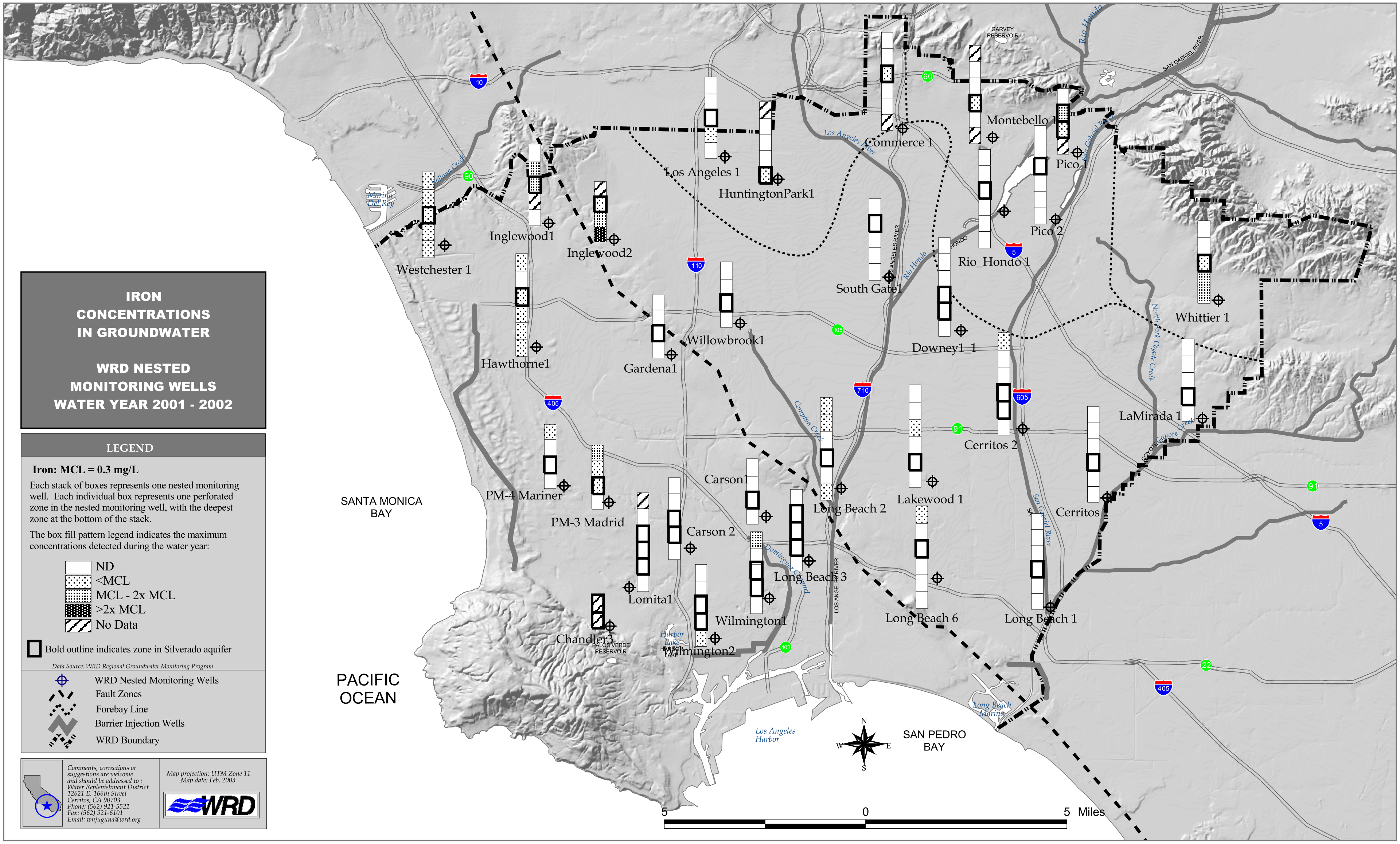

IRON
CONCENTRATIONS
IN GROUNDWATER
WRD NESTED
MONITORING WELLS
WATER YEAR 2001 - 2002
LEGEND
Iron: MCL = 0.3 mg/L
Each stack of boxes represents one nested monitoring well. Each individual box represents one perforated zone in the nested monitoring well, with the deepest zone at the bottom of the stack.
The box fill pattern legend indicates the maximum concentrations detected during the water year:
ND
<MCL
MCL - 2x MCL
>2x MCL
No Data
Bold outline indicates zone in Silverado aquifer
Data Source: WRD Regional Groundwater Monitoring Program
WRD Nested Monitoring Wells
Fault Zones
Forebay Line
Barrier Injection Wells
WRD Boundary
Comments, corrections or suggestions are welcome and should be addressed to :
Water Replenishment District
12621 E. 166th Street
Cerritos, CA 90703
Phone: (562) 921-5521
Fax: (562) 921-6101
Email: wnjuguna@wrd.org
Map projection: UTM Zone 11
Map date: Feb, 2003
WRD
SANTA MONICA BAY
PACIFIC OCEAN
SAN PEDRO BAY
Westchester 1
Inglewood1
Inglewood2
Hawthorne1
Los Angeles 1
HuntingtonPark1
Commerce 1
Montebello 1
Pico 1
Pico 2
Rio_Hondo 1
South Gate1
Downey1_1
Whittier 1
Gardena1
Willowbrook1
LaMirada 1
Cerritos 2
Cerritos
Lakewood 1
Long Beach 2
Long Beach 3
Long Beach 6
Long Beach 1
Carson1
Carson 2
PM-4 Mariner
PM-3 Madrid
Lomita1
Wilmington1
Wilmington2
Chandler3
Los Angeles River
Rio Hondo
Compton Creek
Dominguez Channel
San Gabriel River
Coyote Creek
North Fork Coyote Creek
Los Angeles Harbor
Long Beach Marina
Marina Del Rey
Harbor Lake
Palos Verde Reservoir
Garvey Reservoir
10
405
110
710
605
5
90
60
105
91
103
22
N
S
E
W
5
0
5 Miles

Figure 4.3

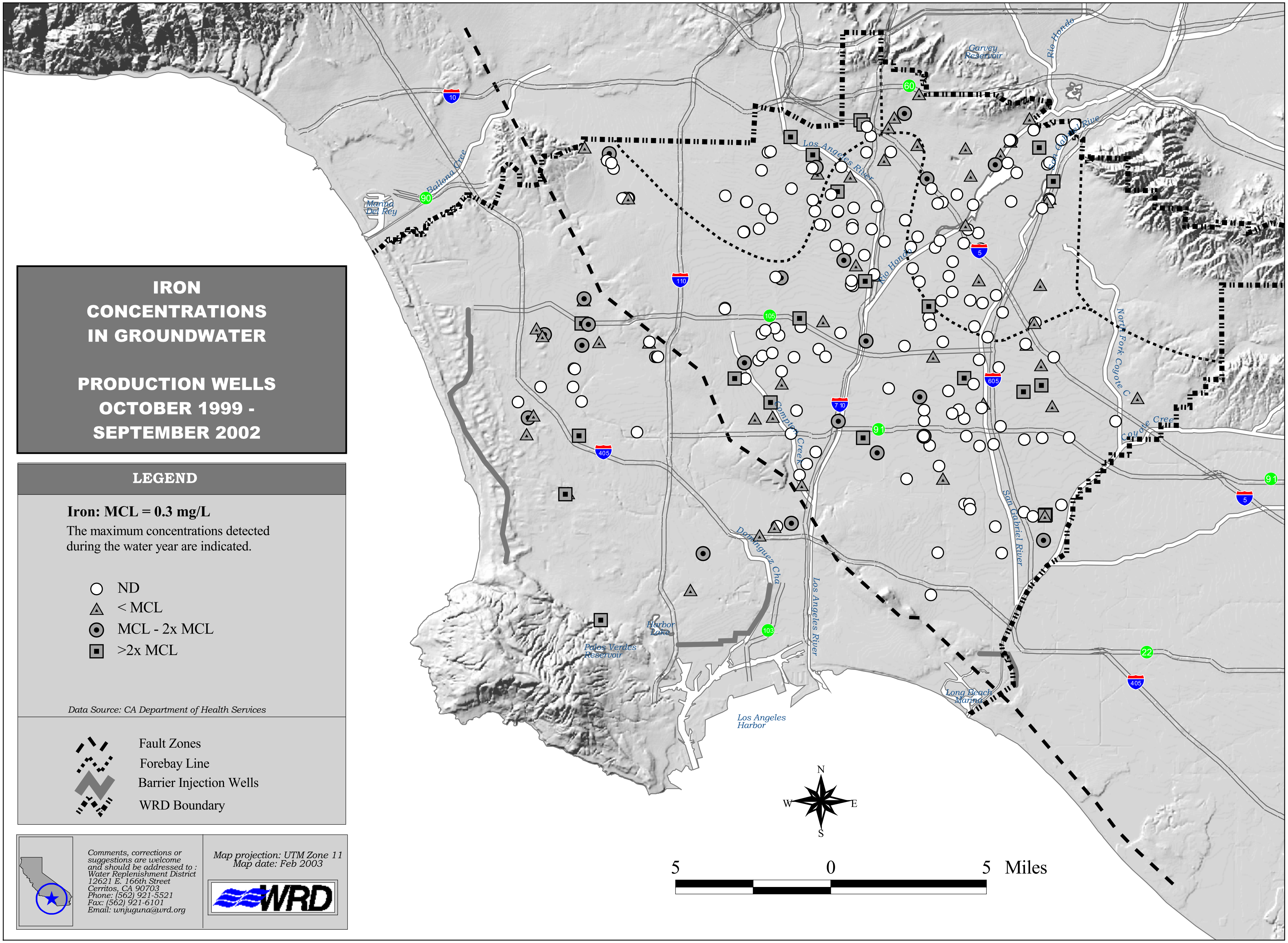
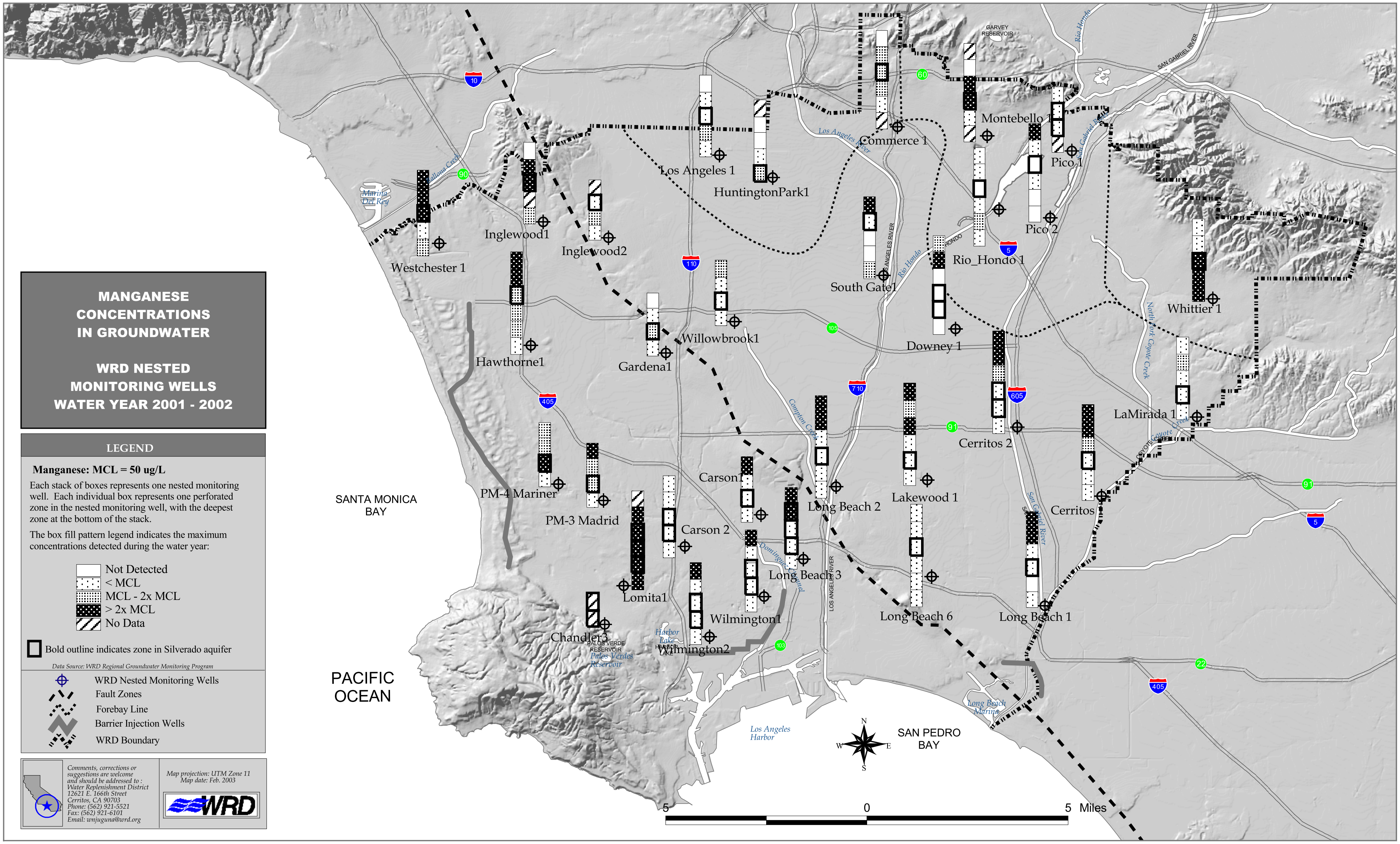
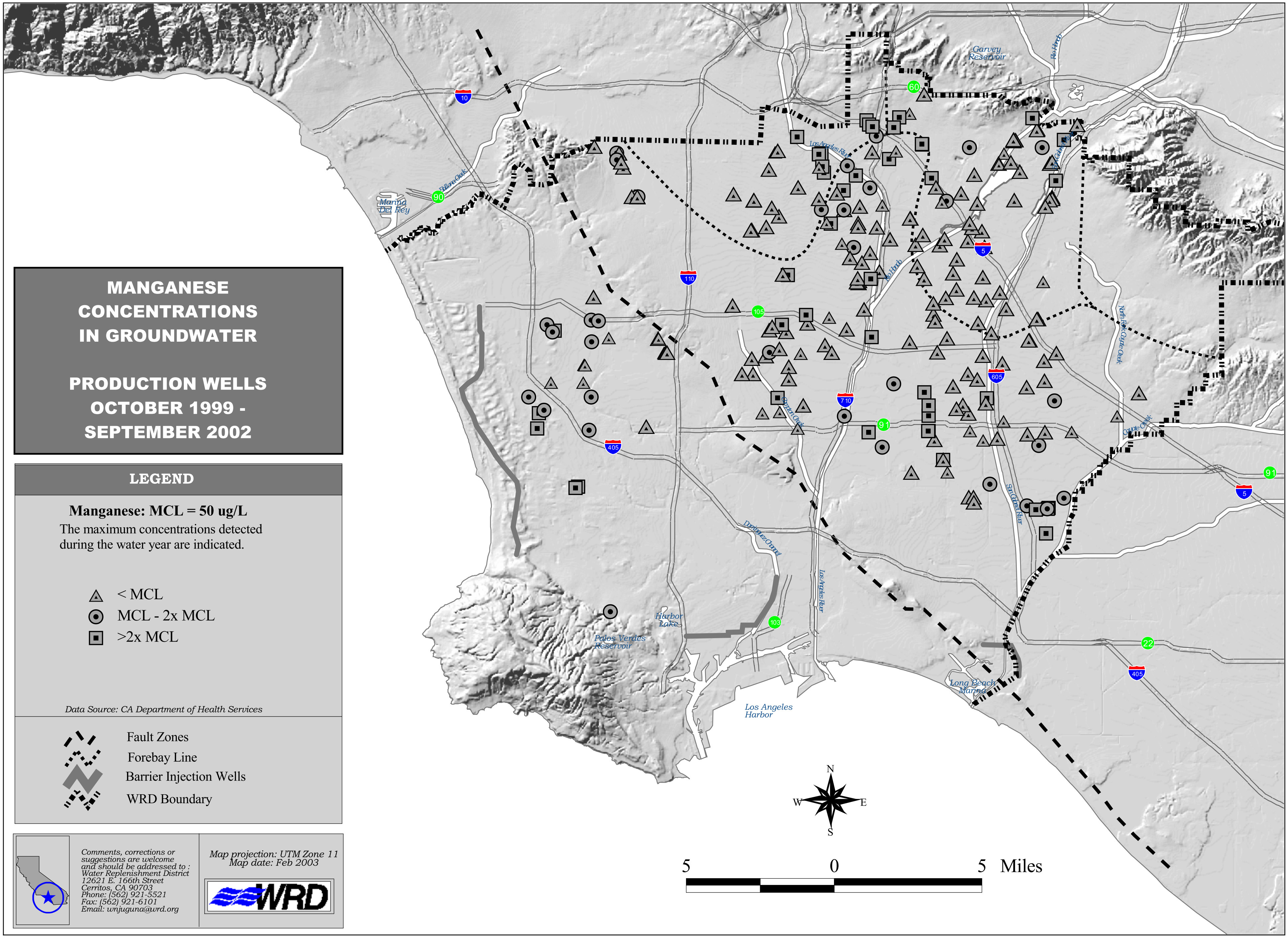

IRON
CONCENTRATIONS
IN GROUNDWATER
PRODUCTION WELLS
OCTOBER 1999 -
SEPTEMBER 2002
LEGEND
Iron: MCL = 0.3 mg/L
The maximum concentrations detected during the water year are indicated.
ND
< MCL
MCL - 2x MCL
>2x MCL
Data Source: CA Department of Health Services
Fault Zones
Forebay Line
Barrier Injection Wells
WRD Boundary
Comments, corrections or suggestions are welcome and should be addressed to : Water Replenishment District 12621 E. 166th Street Cerritos, CA 90703 Phone: (562) 921-5521 Fax: (562) 921-6101 Email: wnjuguna@wrd.org
Map projection: UTM Zone 11
Map date: Feb 2003
WRD
Garvey Reservoir
Rio Hondo
Ballona Creek
Marina Del Rey
Los Angeles River
Rio Hondo
San Gabriel River
North Fork Coyote C
Coyote Creek
Compton Creek
Dominguez Cha
Los Angeles River
Harbor Lake
Palos Verdes Reservoir
Los Angeles Harbor
Long Beach Marina
N
W
E
S
5
0
5
Miles

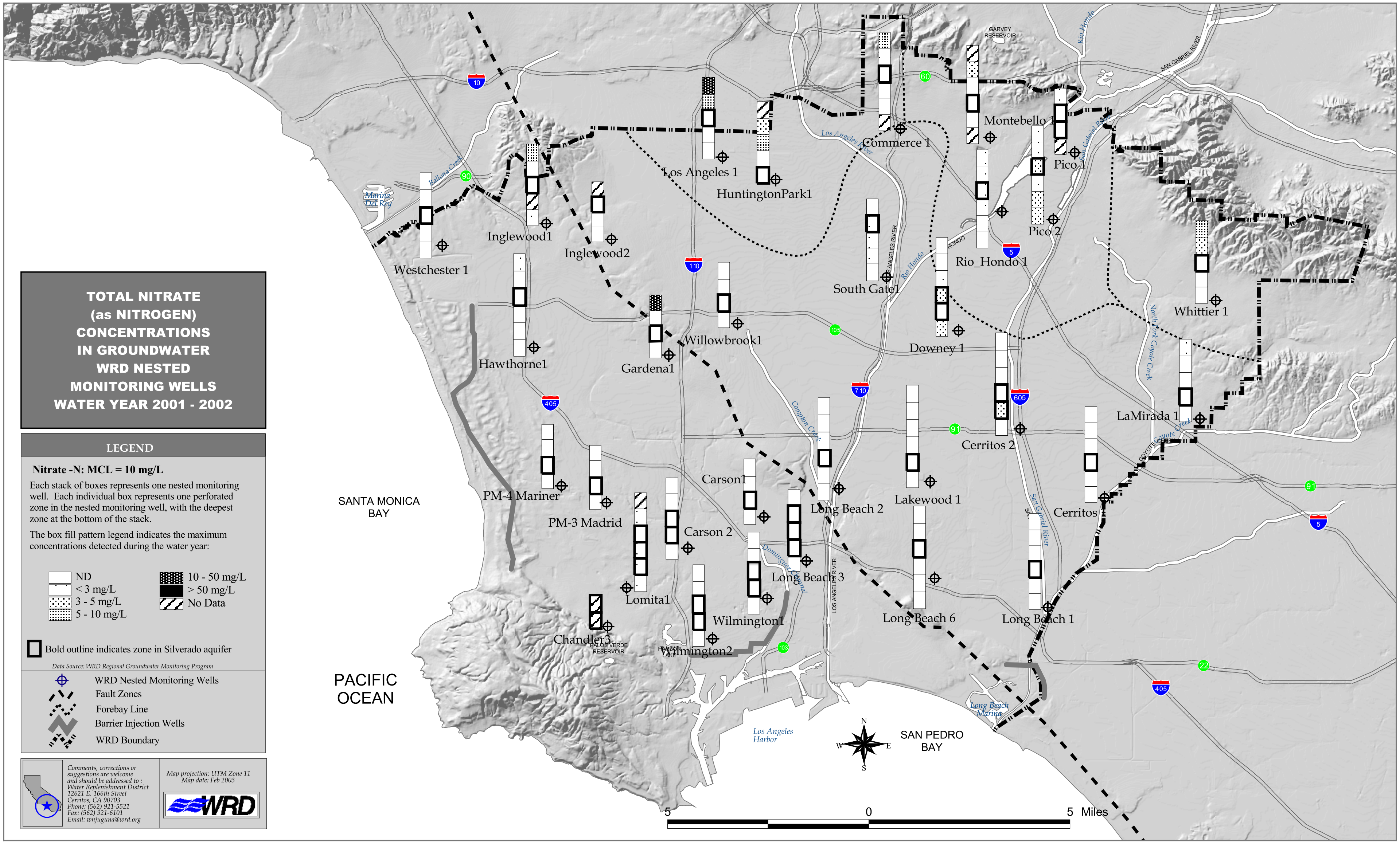
Figure 4.4

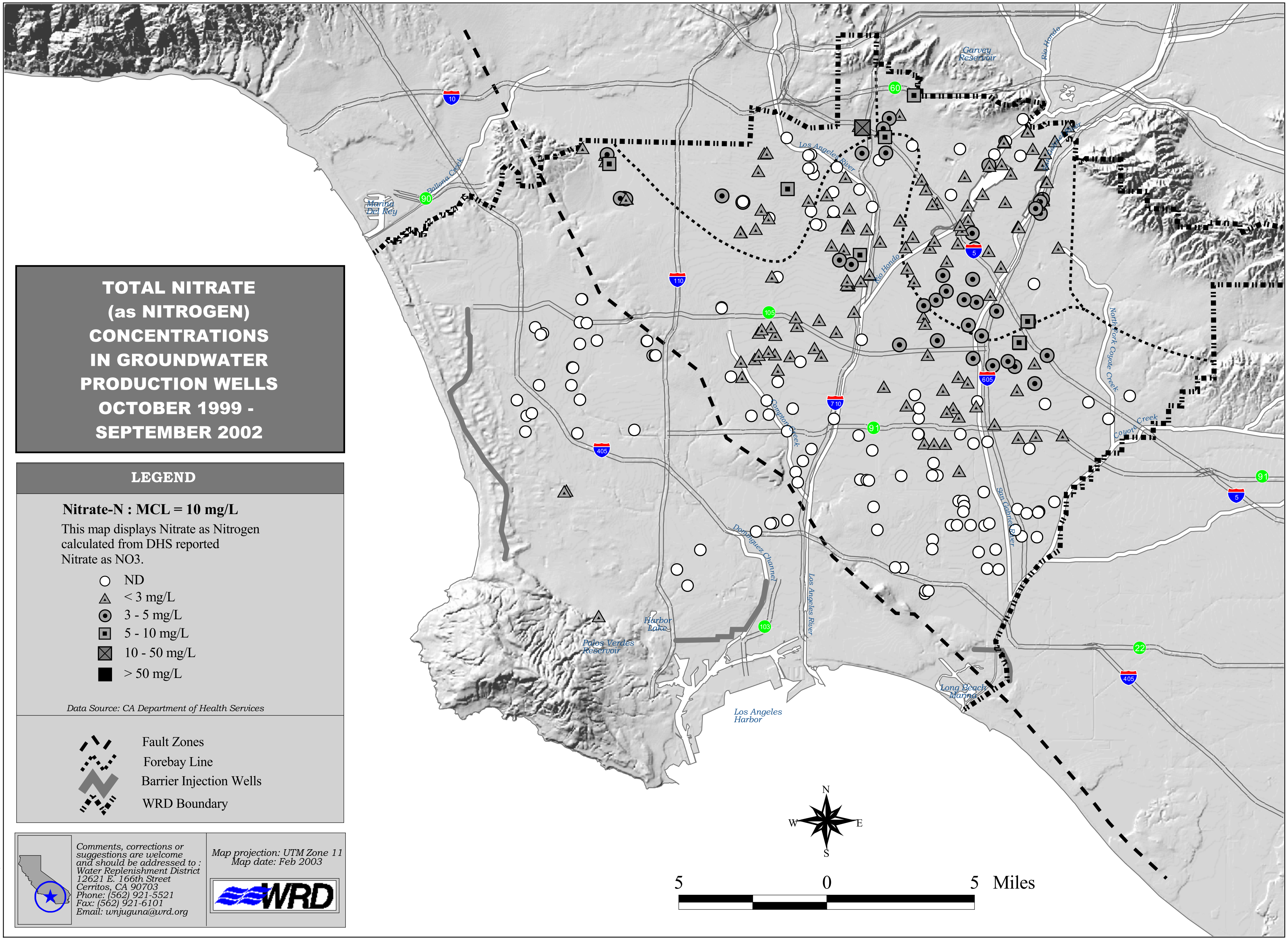


MANGANESE CONCENTRATIONS IN GROUNDWATER
WRD NESTED MONITORING WELLS
WATER YEAR 2001 - 2002
LEGEND
Manganese: MCL = 50 ug/L
Each stack of boxes represents one nested monitoring well. Each individual box represents one perforated zone in the nested monitoring well, with the deepest zone at the bottom of the stack.
The box fill pattern legend indicates the maximum concentrations detected during the water year:
Not Detected
< MCL
MCL - 2x MCL
> 2x MCL
No Data
Bold outline indicates zone in Silverado aquifer
Data Source: WRD Regional Groundwater Monitoring Program
WRD Nested Monitoring Wells
Fault Zones
Forebay Line
Barrier Injection Wells
WRD Boundary
Comments, corrections or suggestions are welcome and should be addressed to :
Water Replenishment District
12621 E. 166th Street
Cerritos, CA 90703
Phone: (562) 921-5521
Fax: (562) 921-6101
Email: wnjuguna@wrd.org
Map projection: UTM Zone 11
Map date: Feb. 2003
SANTA MONICA BAY
PACIFIC OCEAN
SAN PEDRO BAY
Westchester 1
Inglewood1
Inglewood2
Hawthorne1
Gardena1
Los Angeles 1
HuntingtonPark1
Willowbrook1
Commerce 1
South Gate1
Montebello 1
Pico 1
Pico 2
Rio_Hondo 1
Downey 1
Whittier 1
LaMirada 1
Cerritos 2
Cerritos
Lakewood 1
Long Beach 2
Long Beach 3
Long Beach 6
Long Beach 1
Carson1
Carson 2
PM-4 Mariner
PM-3 Madrid
Lomita1
Wilmington1
Wilmington2
Chandler3
Marina Del Rey
Los Angeles Harbor
Long Beach Marina
Harbor Lake
Palos Verdes Reservoir
GARVEY RESERVOIR
Los Angeles River
Rio Hondo
San Gabriel River
Compton Creek
Dominguez Channel
North Fork Coyote Creek
5 0 5 Miles
N S E W

Figure 4.5


MANGANESE CONCENTRATIONS IN GROUNDWATER
PRODUCTION WELLS OCTOBER 1999 - SEPTEMBER 2002
LEGEND
Manganese: MCL = 50 ug/L
The maximum concentrations detected during the water year are indicated.
< MCL
MCL - 2x MCL
>2x MCL
Data Source: CA Department of Health Services
Fault Zones
Forebay Line
Barrier Injection Wells
WRD Boundary
Comments, corrections or suggestions are welcome and should be addressed to : Water Replenishment District 12621 E. 166th Street Cerritos, CA 90703 Phone: (562) 921-5521 Fax: (562) 921-6101 Email: wnjuguna@wrd.org
Map projection: UTM Zone 11
Map date: Feb 2003
WRD
Garvey Reservoir
Marina Del Rey
Harbor Lake
Palos Verdes Reservoir
Los Angeles Harbor
Long Beach Marina
N
S
E
W
5
0
5
Miles
10
60
90
110
105
710
605
91
405
5
103
22
Figure 4.6


TOTAL NITRATE
(as NITROGEN)
CONCENTRATIONS
IN GROUNDWATER
WRD NESTED
MONITORING WELLS
WATER YEAR 2001 - 2002
LEGEND
Nitrate -N: MCL = 10 mg/L
Each stack of boxes represents one nested monitoring well. Each individual box represents one perforated zone in the nested monitoring well, with the deepest zone at the bottom of the stack.
The box fill pattern legend indicates the maximum concentrations detected during the water year:
ND
< 3 mg/L
3 - 5 mg/L
5 - 10 mg/L
10 - 50 mg/L
> 50 mg/L
No Data
Bold outline indicates zone in Silverado aquifer
Data Source: WRD Regional Groundwater Monitoring Program
WRD Nested Monitoring Wells
Fault Zones
Forebay Line
Barrier Injection Wells
WRD Boundary
Comments, corrections or suggestions are welcome and should be addressed to : Water Replenishment District 12621 E. 166th Street Cerritos, CA 90703 Phone: (562) 921-5521 Fax: (562) 921-6101 Email: wnjuguna@wrd.org
Map projection: UTM Zone 11
Map date: Feb 2003
WRD
SANTA MONICA BAY
PACIFIC OCEAN
SAN PEDRO BAY
Los Angeles Harbor
Long Beach Marina
Marina Del Rey
Westchester 1
Inglewood1
Inglewood2
Los Angeles 1
HuntingtonPark1
Commerce 1
Montebello 1
Pico 1
Pico 2
Rio_Hondo 1
South Gate1
Whittier 1
Hawthorne1
Gardena1
Willowbrook1
Downey 1
LaMirada 1
Cerritos 2
Cerritos
Lakewood 1
Long Beach 2
Carson1
Carson 2
PM-4 Mariner
PM-3 Madrid
Lomita1
Long Beach 3
Wilmington1
Wilmington2
Chandler3
Long Beach 6
Long Beach 1
5 0 5 Miles
N S E W
Figure 4.7



TOTAL NITRATE
(as NITROGEN)
CONCENTRATIONS
IN GROUNDWATER
PRODUCTION WELLS
OCTOBER 1999 -
SEPTEMBER 2002
LEGEND
Nitrate-N : MCL = 10 mg/L
This map displays Nitrate as Nitrogen calculated from DHS reported Nitrate as NO3.
ND
< 3 mg/L
3 - 5 mg/L
5 - 10 mg/L
10 - 50 mg/L
> 50 mg/L
Data Source: CA Department of Health Services
Fault Zones
Forebay Line
Barrier Injection Wells
WRD Boundary
Comments, corrections or suggestions are welcome and should be addressed to :
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12621 E. 166th Street
Cerritos, CA 90703
Phone: (562) 921-5521
Fax: (562) 921-6101
Email: wnjuguna@wrd.org
Map projection: UTM Zone 11
Map date: Feb 2003
WRD
Garvey Reservoir
Rio Hondo
Los Angeles River
Ballona Creek
Marina Del Rey
North Fork Coyote Creek
Coyote Creek
Compton Creek
San Gabriel River
Dominguez Channel
Harbor Lake
Palos Verdes Reservoir
Los Angeles Harbor
Long Beach Marina
N
W
E
S
5
0
5
Miles

Figure 4.8

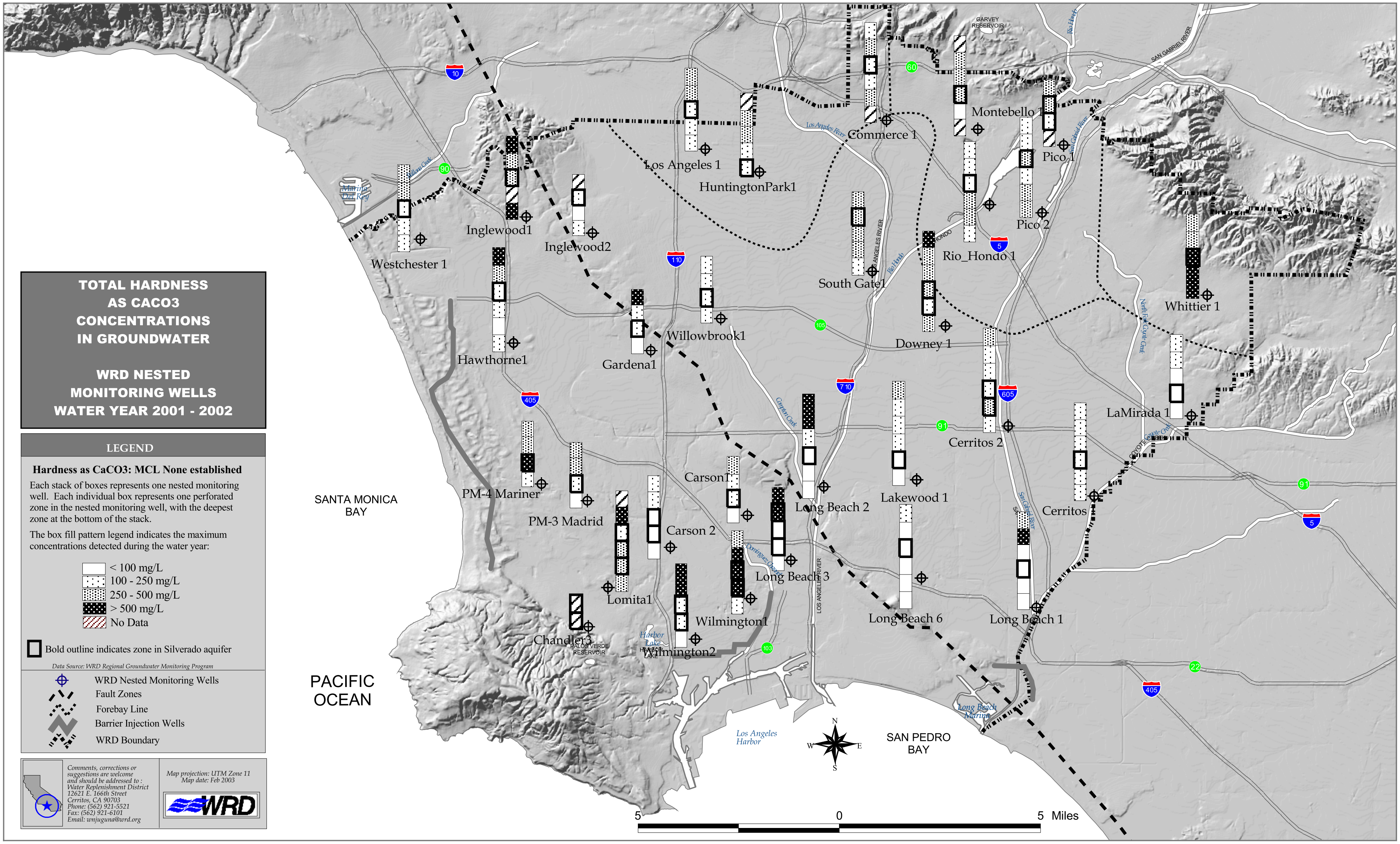

TOTAL HARDNESS
AS CACO3
CONCENTRATIONS
IN GROUNDWATER
WRD NESTED
MONITORING WELLS
WATER YEAR 2001 - 2002
LEGEND
Hardness as CaCO3: MCL None established
Each stack of boxes represents one nested monitoring well. Each individual box represents one perforated zone in the nested monitoring well, with the deepest zone at the bottom of the stack.
The box fill pattern legend indicates the maximum concentrations detected during the water year:
< 100 mg/L
100 - 250 mg/L
250 - 500 mg/L
> 500 mg/L
No Data
Bold outline indicates zone in Silverado aquifer
Data Source: WRD Regional Groundwater Monitoring Program
WRD Nested Monitoring Wells
Fault Zones
Forebay Line
Barrier Injection Wells
WRD Boundary
Comments, corrections or suggestions are welcome and should be addressed to : Water Replenishment District 12621 E. 166th Street Cerritos, CA 90703 Phone: (562) 921-5521 Fax: (562) 921-6101 Email: wnjuguna@wrd.org
Map projection: UTM Zone 11
Map date: Feb 2003
SANTA MONICA BAY
PACIFIC OCEAN
SAN PEDRO BAY
Los Angeles Harbor
Westchester 1
Inglewood1
Inglewood2
Los Angeles 1
HuntingtonPark1
Commerce 1
Montebello 1
Pico 1
Pico 2
Rio_Hondo 1
South Gate1
Whittier 1
Hawthorne1
Gardena1
Willowbrook1
Downey 1
LaMirada 1
Cerritos 2
PM-4 Mariner
PM-3 Madrid
Carson1
Carson 2
Long Beach 2
Lakewood 1
Cerritos
Lomita1
Long Beach 3
Wilmington1
Chandler3
Wilmington2
Long Beach 6
Long Beach 1
5 0 5 Miles

Figure 4.9

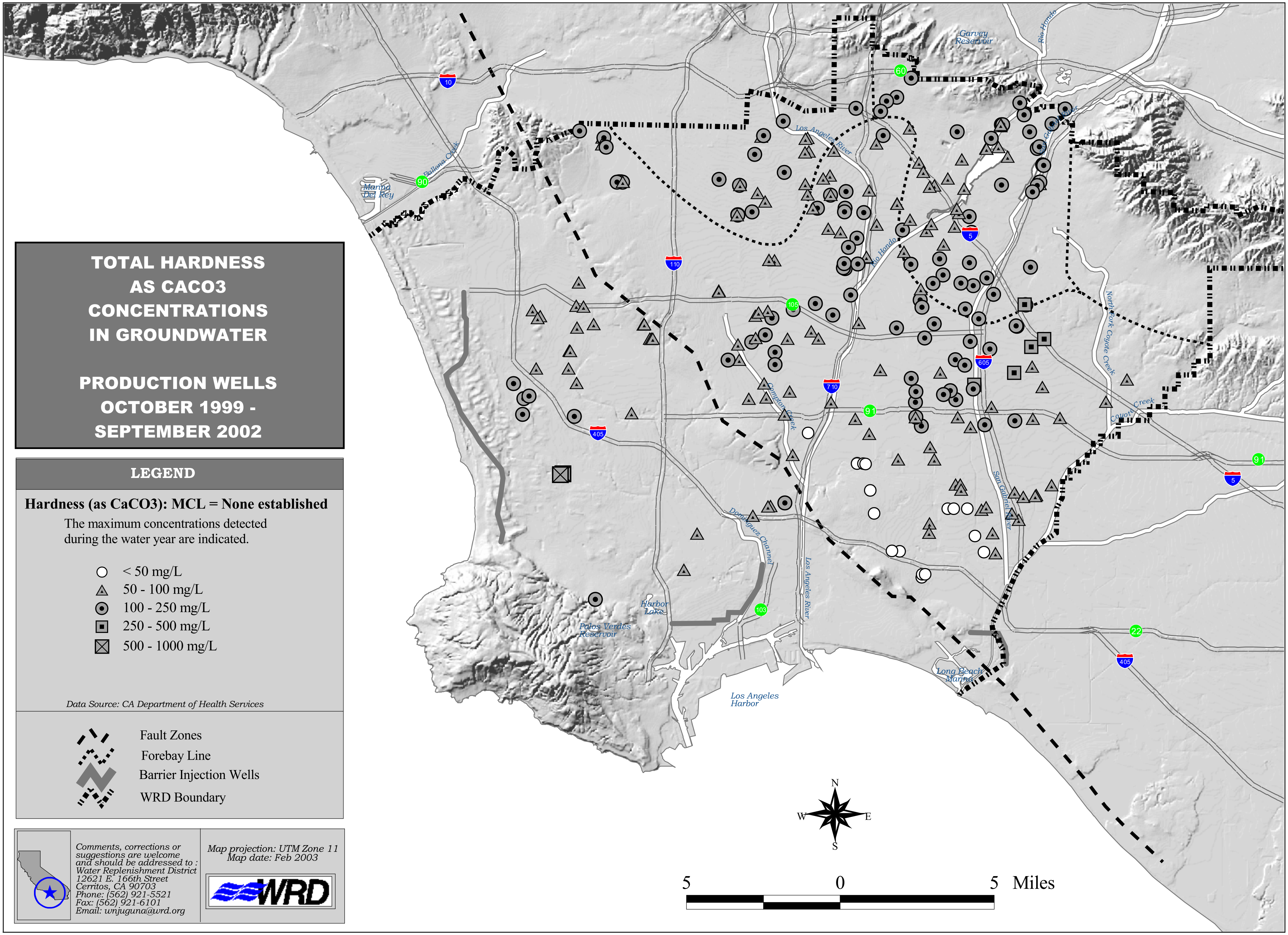
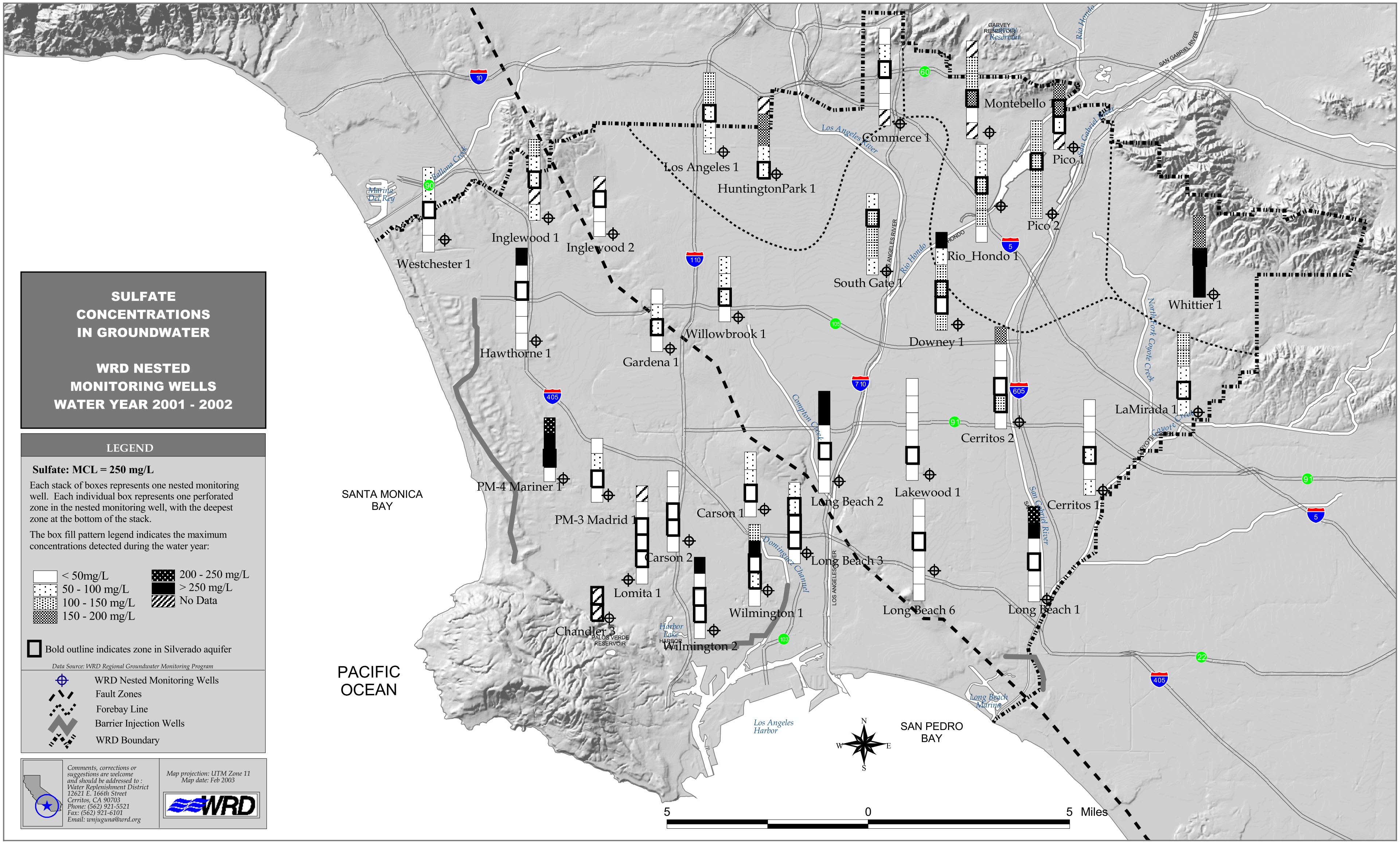

TOTAL HARDNESS
AS CACO3
CONCENTRATIONS
IN GROUNDWATER
PRODUCTION WELLS
OCTOBER 1999 -
SEPTEMBER 2002
LEGEND
Hardness (as CaCO3): MCL = None established
The maximum concentrations detected during the water year are indicated.
< 50 mg/L
50 - 100 mg/L
100 - 250 mg/L
250 - 500 mg/L
500 - 1000 mg/L
Data Source: CA Department of Health Services
Fault Zones
Forebay Line
Barrier Injection Wells
WRD Boundary
Comments, corrections or suggestions are welcome and should be addressed to : Water Replenishment District 12621 E. 166th Street Cerritos, CA 90703 Phone: (562) 921-5521 Fax: (562) 921-6101 Email: wnjuguna@wrd.org
Map projection: UTM Zone 11
Map date: Feb 2003
WRD
Garvey Reservoir
Rio Hondo
Los Angeles River
San Gabriel River
Ballona Creek
Marina Del Rey
North Fork Coyote Creek
Coyote Creek
Compton Creek
Dominguez Channel
Harbor Lake
Palos Verdes Reservoir
Los Angeles Harbor
Long Beach Marina
10
60
90
110
105
605
710
5
91
405
103
22
N
W
E
S
5
0
5
Miles

Figure 4.10


SULFATE
CONCENTRATIONS
IN GROUNDWATER
WRD NESTED
MONITORING WELLS
WATER YEAR 2001 - 2002
LEGEND
Sulfate: MCL = 250 mg/L
Each stack of boxes represents one nested monitoring well. Each individual box represents one perforated zone in the nested monitoring well, with the deepest zone at the bottom of the stack.
The box fill pattern legend indicates the maximum concentrations detected during the water year:
< 50mg/L
50 - 100 mg/L
100 - 150 mg/L
150 - 200 mg/L
200 - 250 mg/L
> 250 mg/L
No Data
Bold outline indicates zone in Silverado aquifer
Data Source: WRD Regional Groundwater Monitoring Program
WRD Nested Monitoring Wells
Fault Zones
Forebay Line
Barrier Injection Wells
WRD Boundary
Comments, corrections or suggestions are welcome and should be addressed to :
Water Replenishment District
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Cerritos, CA 90703
Phone: (562) 921-5521
Fax: (562) 921-6101
Email: wnjuguna@wrd.org
Map projection: UTM Zone 11
Map date: Feb 2003
WRD
SANTA MONICA
BAY
PACIFIC
OCEAN
SAN PEDRO
BAY
Westchester 1
Inglewood 1
Inglewood 2
Hawthorne 1
Gardena 1
Willowbrook 1
Los Angeles 1
HuntingtonPark 1
Commerce 1
Montebello 1
Pico 1
Pico 2
South Gate 1
Rio_Hondo 1
Downey 1
Whittier 1
LaMirada 1
Cerritos 2
Cerritos 1
Lakewood 1
Long Beach 2
Long Beach 3
Long Beach 6
Long Beach 1
PM-4 Mariner 1
PM-3 Madrid 1
Carson 1
Carson 2
Lomita 1
Chandler 3
Wilmington 1
Wilmington 2
Marina Del Rey
Ballona Creek
Los Angeles River
Rio Hondo
San Gabriel River
Compton Creek
Dominguez Channel
North Fork Coyote Creek
Coyote Creek
Harbor Lake
Los Angeles Harbor
Long Beach Marina
GARVEY RESERVOIR
PALOS VERDE RESERVOIR
N
S
E
W
5
0
5 Miles

Figure 4.11

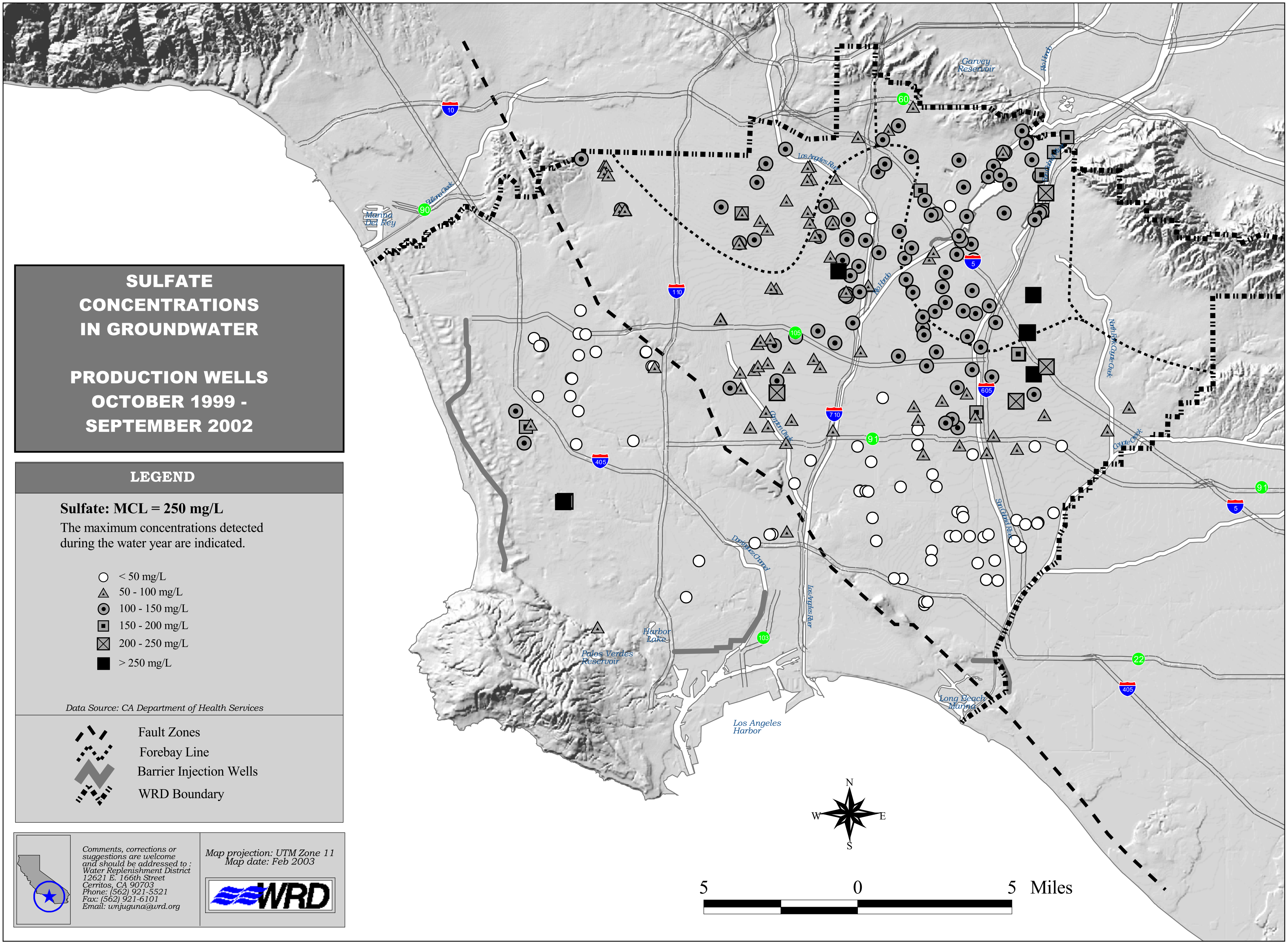

SULFATE
CONCENTRATIONS
IN GROUNDWATER
PRODUCTION WELLS
OCTOBER 1999 -
SEPTEMBER 2002
LEGEND
Sulfate: MCL = 250 mg/L
The maximum concentrations detected
during the water year are indicated.
< 50 mg/L
50 - 100 mg/L
100 - 150 mg/L
150 - 200 mg/L
200 - 250 mg/L
> 250 mg/L
Data Source: CA Department of Health Services
Fault Zones
Forebay Line
Barrier Injection Wells
WRD Boundary
Comments, corrections or suggestions are welcome and should be addressed to : Water Replenishment District 12621 E. 166th Street Cerritos, CA 90703 Phone: (562) 921-5521 Fax: (562) 921-6101 Email: wnjuguna@wrd.org
Map projection: UTM Zone 11
Map date: Feb 2003
WRD
Garvey Reservoir
Marina Del Rey
Palos Verdes Reservoir
Harbor Lake
Los Angeles Harbor
Long Beach Marina
N
W
E
S
5
0
5
Miles

Figure 4.12

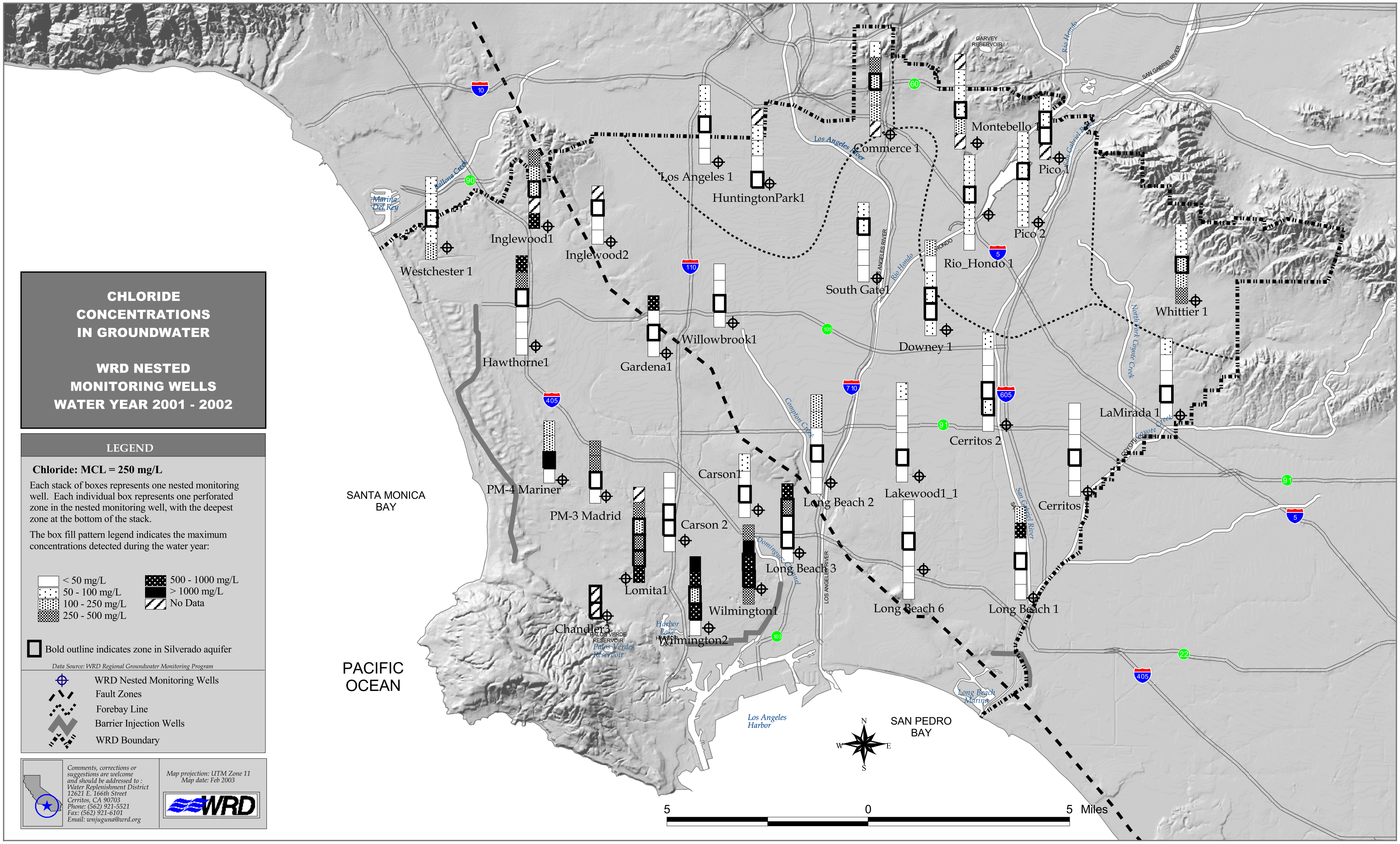
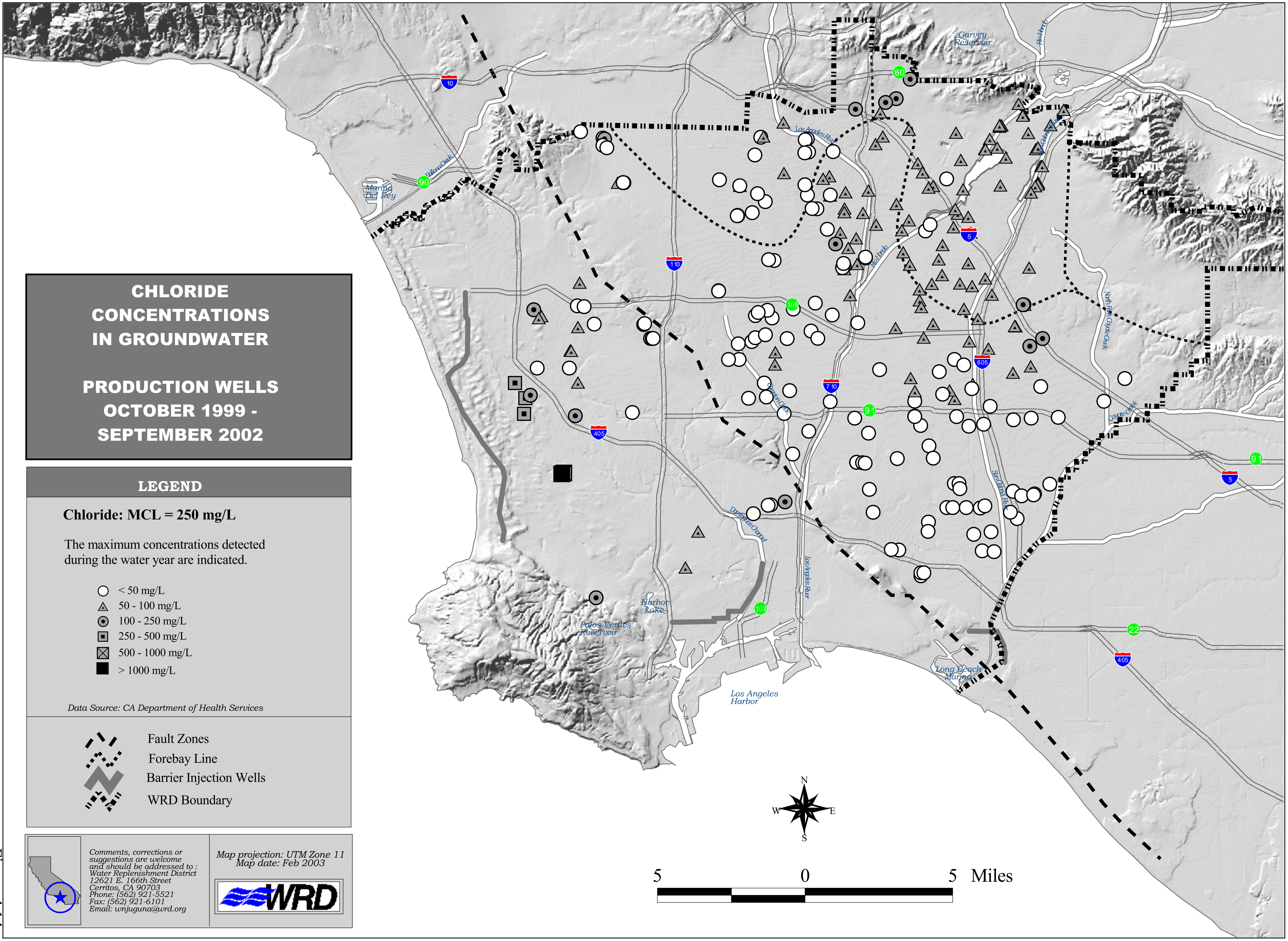

CHLORIDE CONCENTRATIONS IN GROUNDWATER
WRD NESTED MONITORING WELLS
WATER YEAR 2001 - 2002
LEGEND
Chloride: MCL = 250 mg/L
Each stack of boxes represents one nested monitoring well. Each individual box represents one perforated zone in the nested monitoring well, with the deepest zone at the bottom of the stack.
The box fill pattern legend indicates the maximum concentrations detected during the water year:
< 50 mg/L
50 - 100 mg/L
100 - 250 mg/L
250 - 500 mg/L
500 - 1000 mg/L
> 1000 mg/L
No Data
Bold outline indicates zone in Silverado aquifer
Data Source: WRD Regional Groundwater Monitoring Program
WRD Nested Monitoring Wells
Fault Zones
Forebay Line
Barrier Injection Wells
WRD Boundary
Comments, corrections or suggestions are welcome and should be addressed to : Water Replenishment District 12621 E. 166th Street Cerritos, CA 90703 Phone: (562) 921-5521 Fax: (562) 921-6101 Email: wnjuguna@wrd.org
Map projection: UTM Zone 11
Map date: Feb 2003
WRD
SANTA MONICA BAY
PACIFIC OCEAN
SAN PEDRO BAY
Westchester 1
Inglewood1
Inglewood2
Hawthorne1
Gardena1
Willowbrook1
Los Angeles 1
HuntingtonPark1
Commerce 1
Montebello
Pico 1
Pico 2
Rio_Hondo 1
South Gate1
Downey 1
Whittier 1
LaMirada 1
Cerritos 2
Cerritos
Lakewood1_1
Long Beach 2
Long Beach 3
Long Beach 6
Long Beach 1
Carson1
Carson 2
Wilmington1
Wilmington2
Lomita1
Chandler3
PM-4 Mariner
PM-3 Madrid
Marina Del Rey
Los Angeles Harbor
Long Beach Marina
GARVEY RESERVOIR
5 0 5 Miles
N
S
E
W

Figure 4.13

CHLORIDE CONCENTRATIONS IN GROUNDWATER

PRODUCTION WELLS OCTOBER 1999 - SEPTEMBER 2002



LEGEND

Chloride: MCL = 250 mg/L

The maximum concentrations detected during the water year are indicated.

- < 50 mg/L
- 50 - 100 mg/L
- 100 - 250 mg/L
- 250 - 500 mg/L
- 500 - 1000 mg/L
- > 1000 mg/L

Data Source: CA Department of Health Services

- Fault Zones
- Forebay Line
- Barrier Injection Wells
- WRD Boundary

Comments, corrections or suggestions are welcome and should be addressed to : Water Replenishment District 12621 E. 166th Street Cerritos, CA 90703 Phone: (562) 921-5521 Fax: (562) 921-6101 Email: wnjuguna@wrd.org

Map projection: UTM Zone 11
Map date: Feb 2003

WRD

Figure 4.14

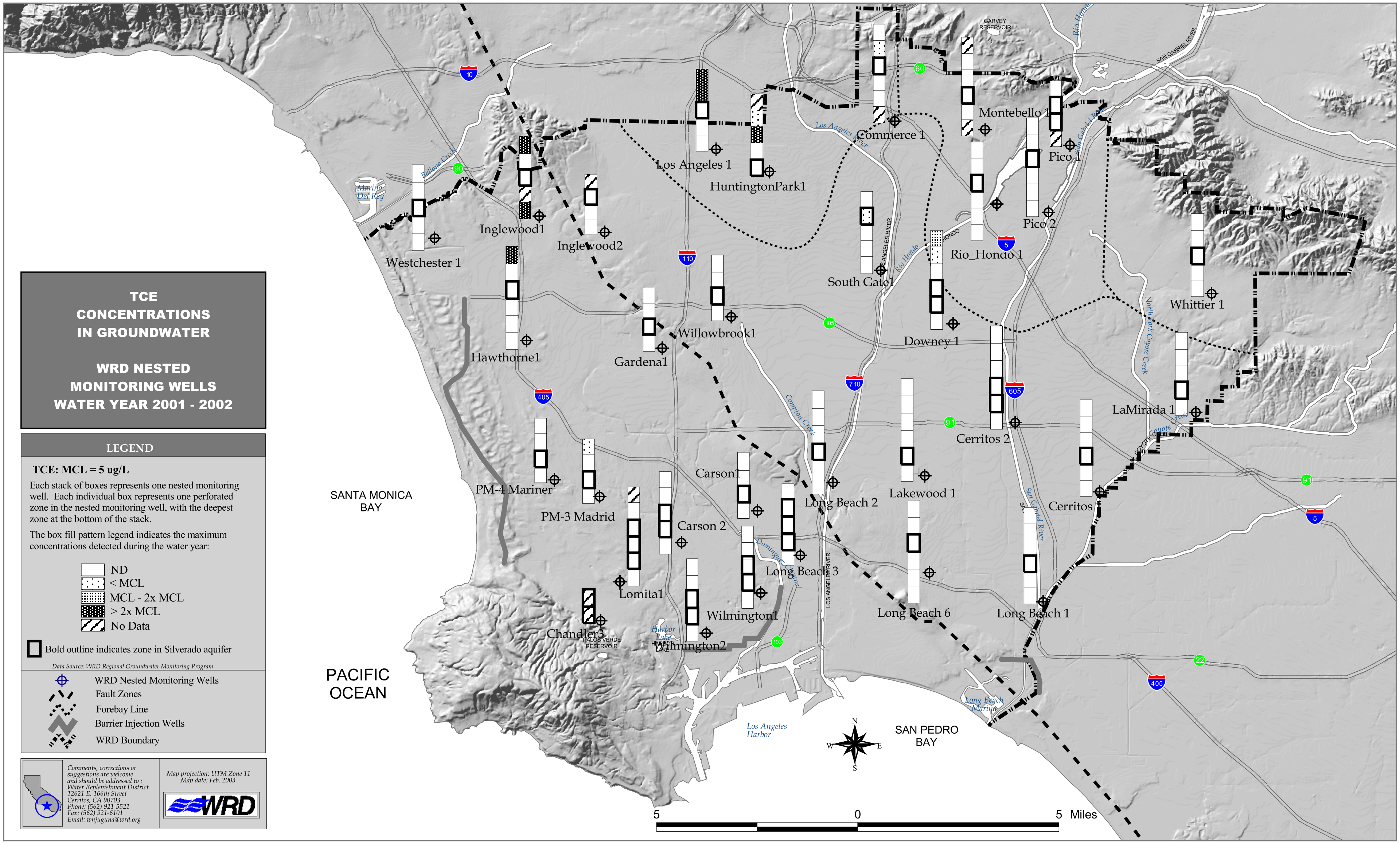
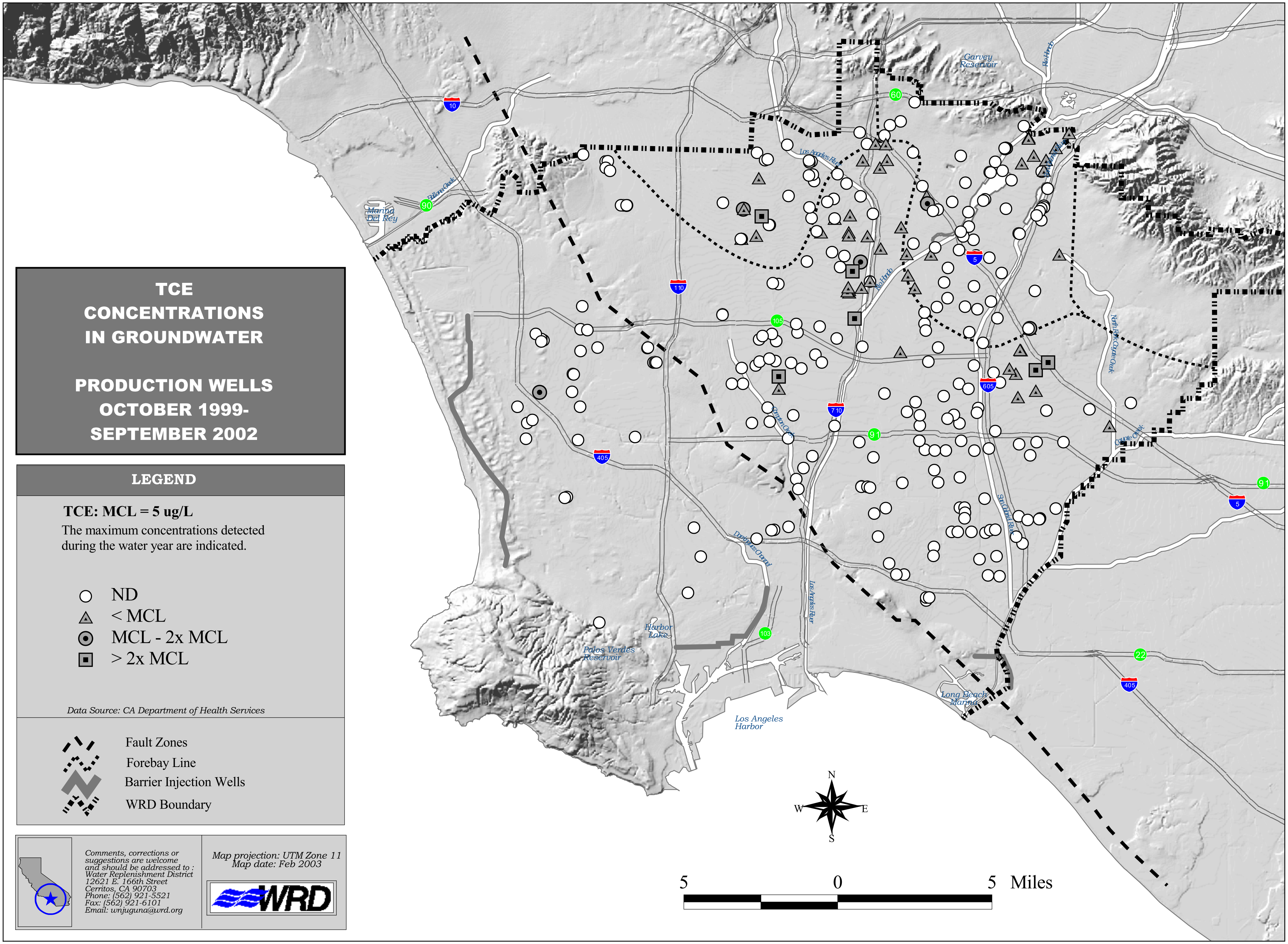

TCE
CONCENTRATIONS
IN GROUNDWATER
WRD NESTED
MONITORING WELLS
WATER YEAR 2001 - 2002
LEGEND
TCE: MCL = 5 ug/L
Each stack of boxes represents one nested monitoring well. Each individual box represents one perforated zone in the nested monitoring well, with the deepest zone at the bottom of the stack.
The box fill pattern legend indicates the maximum concentrations detected during the water year:
ND
< MCL
MCL - 2x MCL
> 2x MCL
No Data
Bold outline indicates zone in Silverado aquifer
Data Source: WRD Regional Groundwater Monitoring Program
WRD Nested Monitoring Wells
Fault Zones
Forebay Line
Barrier Injection Wells
WRD Boundary
Comments, corrections or suggestions are welcome and should be addressed to : Water Replenishment District 12621 E. 166th Street Cerritos, CA 90703 Phone: (562) 921-5521 Fax: (562) 921-6101 Email: wnjuguna@wrd.org
Map projection: UTM Zone 11
Map date: Feb. 2003
WRD
SANTA MONICA BAY
PACIFIC OCEAN
SAN PEDRO BAY
Westchester 1
Inglewood1
Inglewood2
Hawthorne1
Los Angeles 1
HuntingtonPark1
Commerce 1
Montebello 1
Pico 1
Pico 2
Rio_Hondo 1
South Gate1
Downey 1
Whittier 1
Gardena1
Willowbrook1
LaMirada 1
Cerritos 2
PM-4 Mariner
PM-3 Madrid
Carson1
Carson 2
Long Beach 2
Lakewood 1
Cerritos
Lomita1
Long Beach 3
Long Beach 6
Long Beach 1
Wilmington1
Wilmington2
Chandler 3
Los Angeles Harbor
Long Beach Marina
Marina Del Rey
N
S
E
W
5
0
5 Miles

Figure 4.15



TCE CONCENTRATIONS IN GROUNDWATER
PRODUCTION WELLS
OCTOBER 1999- SEPTEMBER 2002
LEGEND
TCE: MCL = 5 ug/L
The maximum concentrations detected during the water year are indicated.
ND
< MCL
MCL - 2x MCL
> 2x MCL
Data Source: CA Department of Health Services
Fault Zones
Forebay Line
Barrier Injection Wells
WRD Boundary
Comments, corrections or suggestions are welcome and should be addressed to : Water Replenishment District 12621 E. 166th Street Cerritos, CA 90703 Phone: (562) 921-5521 Fax: (562) 921-6101 Email: wnjuguna@wrd.org
Map projection: UTM Zone 11
Map date: Feb 2003
WRD
Garvey Reservoir
Marina Del Rey
Palos Verdes Reservoir
Harbor Lake
Los Angeles Harbor
Long Beach Marina
N
S
E
W
5
0
5
Miles

Figure 4.16

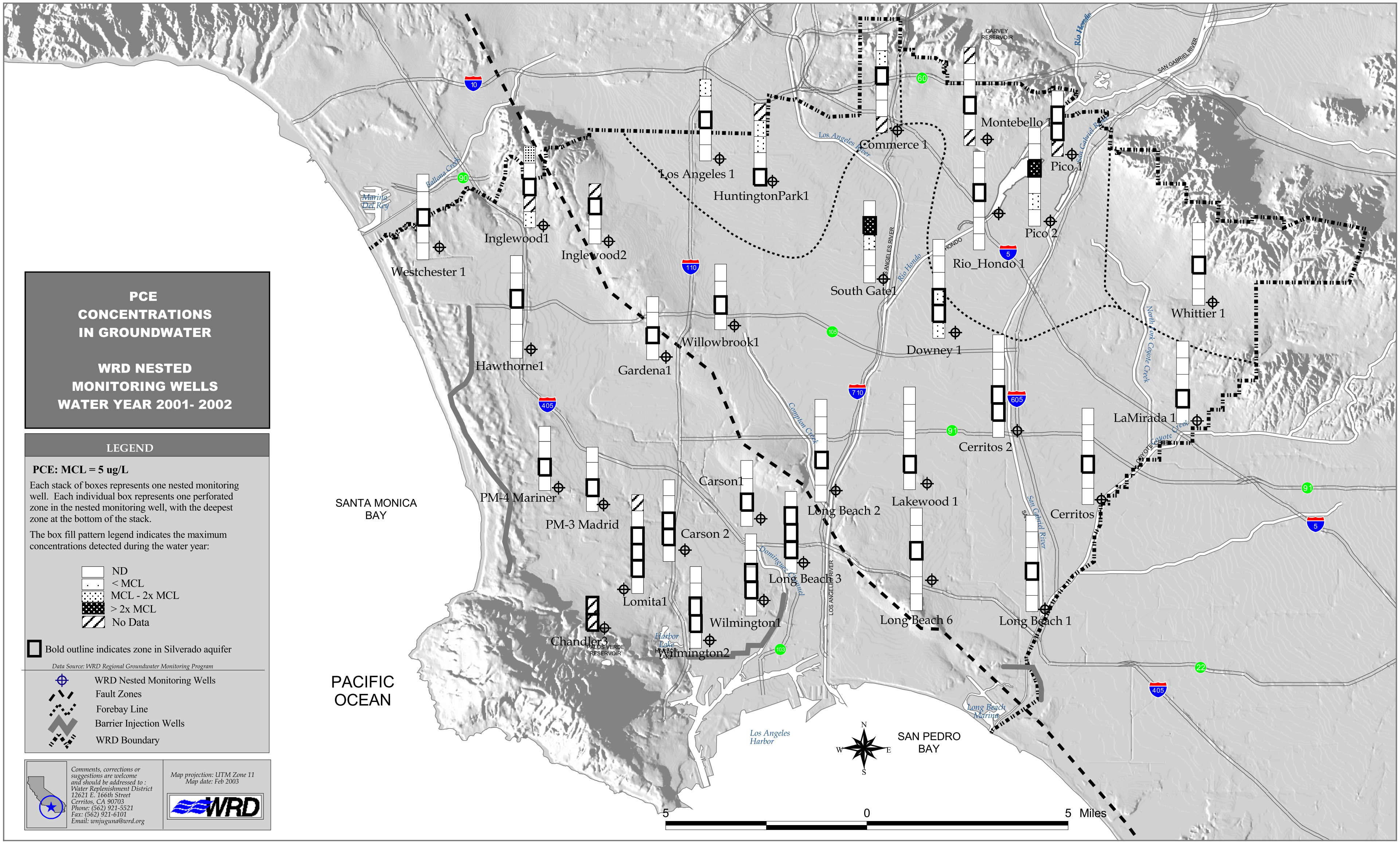

PCE
CONCENTRATIONS
IN GROUNDWATER
WRD NESTED
MONITORING WELLS
WATER YEAR 2001- 2002
LEGEND
PCE: MCL = 5 ug/L
Each stack of boxes represents one nested monitoring well. Each individual box represents one perforated zone in the nested monitoring well, with the deepest zone at the bottom of the stack.
The box fill pattern legend indicates the maximum concentrations detected during the water year:
ND
< MCL
MCL - 2x MCL
> 2x MCL
No Data
Bold outline indicates zone in Silverado aquifer
Data Source: WRD Regional Groundwater Monitoring Program
WRD Nested Monitoring Wells
Fault Zones
Forebay Line
Barrier Injection Wells
WRD Boundary
Comments, corrections or suggestions are welcome and should be addressed to :
Water Replenishment District
12621 E. 166th Street
Cerritos, CA 90703
Phone: (562) 921-5521
Fax: (562) 921-6101
Email: wnjuguna@wrd.org
Map projection: UTM Zone 11
Map date: Feb 2003
WRD
SANTA MONICA BAY
PACIFIC OCEAN
SAN PEDRO BAY
Westchester 1
Inglewood1
Inglewood2
Los Angeles 1
HuntingtonPark1
Commerce 1
Montebello 1
Pico 1
Pico 2
Rio_Hondo 1
South Gate1
Whittier 1
Hawthorne1
Gardena1
Willowbrook1
Downey 1
Cerritos 2
LaMirada 1
PM-4 Mariner
PM-3 Madrid
Carson1
Carson 2
Lomita1
Long Beach 2
Lakewood 1
Cerritos
Long Beach 3
Chandler3
Wilmington1
Wilmington2
Long Beach 6
Long Beach 1
Los Angeles Harbor
Long Beach Marina
Marina Del Rey
Ballona Creek
Los Angeles River
Rio Hondo
San Gabriel River
Compton Creek
Dominguez Channel
Coyote Creek
North Fork Coyote Creek
GARVEY RESERVOIR
PALOS VERDE RESERVOIR
Harbor Lake
5
0
5 Miles

Figure 4.17

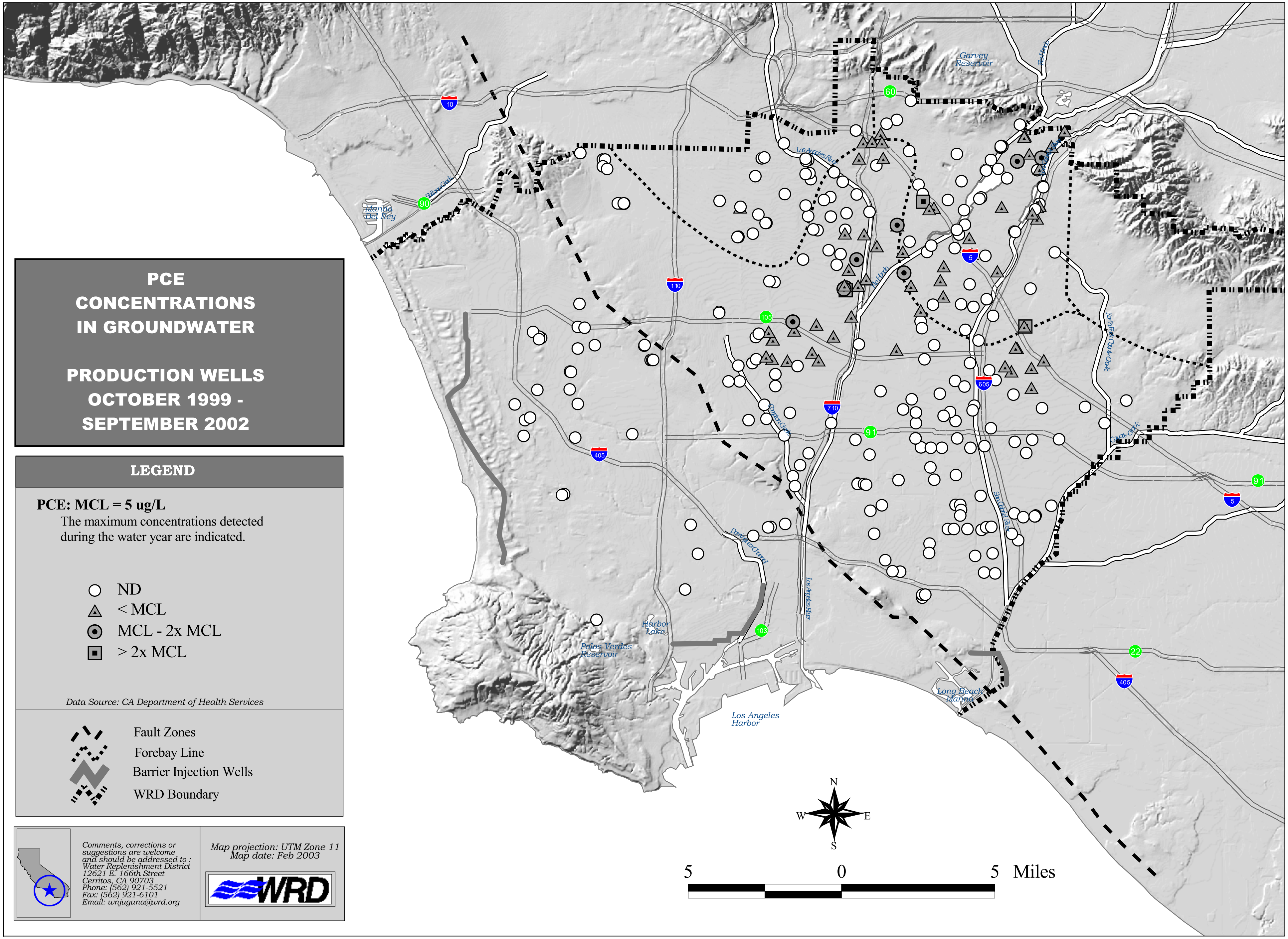

PCE
CONCENTRATIONS
IN GROUNDWATER
PRODUCTION WELLS
OCTOBER 1999 -
SEPTEMBER 2002
LEGEND
PCE: MCL = 5 ug/L
The maximum concentrations detected
during the water year are indicated.
ND
< MCL
MCL - 2x MCL
> 2x MCL
Data Source: CA Department of Health Services
Fault Zones
Forebay Line
Barrier Injection Wells
WRD Boundary
Comments, corrections or suggestions are welcome and should be addressed to :
Water Replenishment District
12621 E. 166th Street
Cerritos, CA 90703
Phone: (562) 921-5521
Fax: (562) 921-6101
Email: wnjuguna@wrd.org
Map projection: UTM Zone 11
Map date: Feb 2003
WRD
Garvey Reservoir
Marina Del Rey
Palos Verdes Reservoir
Harbor Lake
Los Angeles Harbor
Long Beach Marina
N
W
E
S
5
0
5
Miles

Figure 4.18

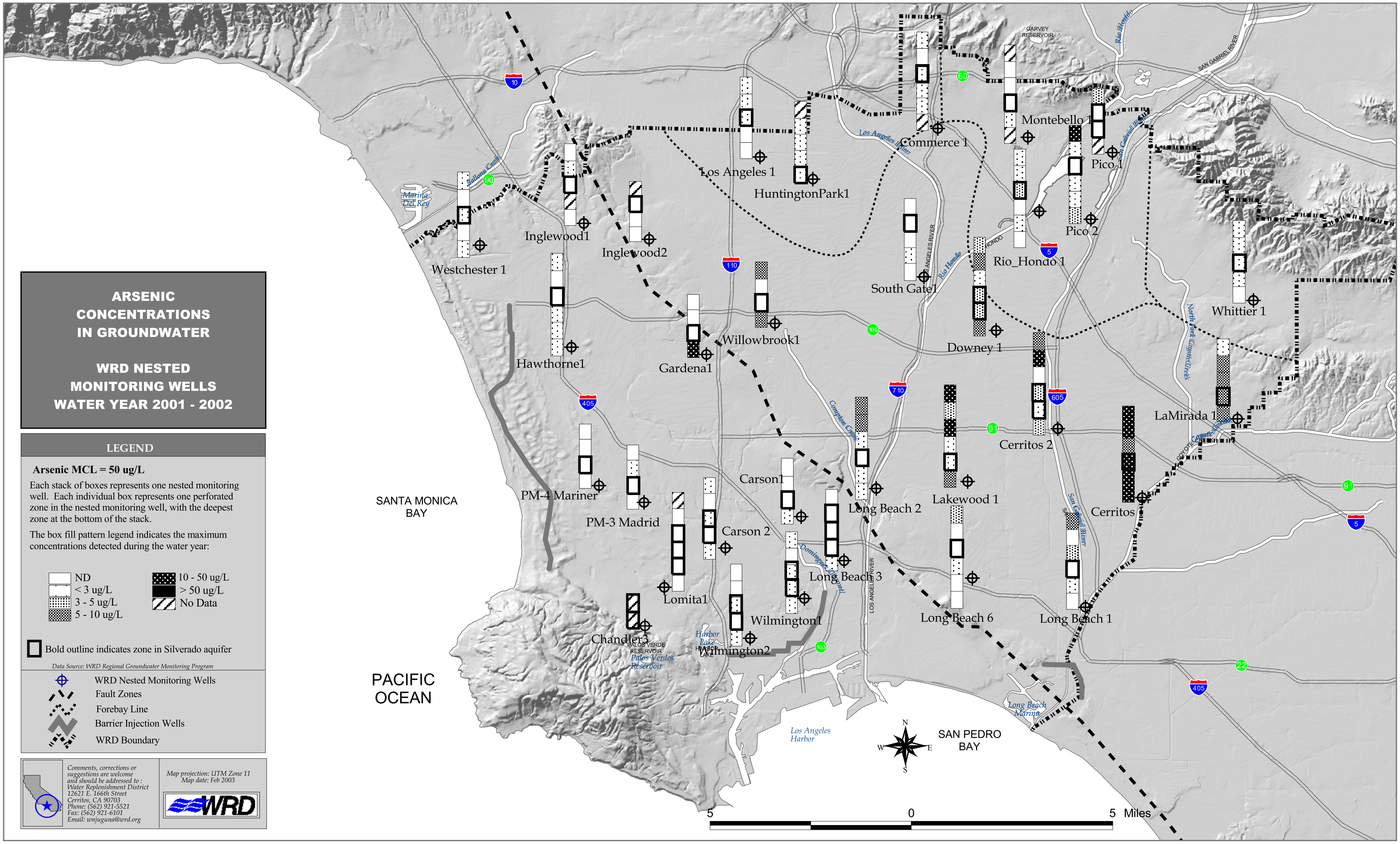

ARSENIC CONCENTRATIONS IN GROUNDWATER
WRD NESTED MONITORING WELLS
WATER YEAR 2001 - 2002
LEGEND
Arsenic MCL = 50 ug/L
Each stack of boxes represents one nested monitoring well. Each individual box represents one perforated zone in the nested monitoring well, with the deepest zone at the bottom of the stack.
The box fill pattern legend indicates the maximum concentrations detected during the water year:
ND
< 3 ug/L
3 - 5 ug/L
5 - 10 ug/L
10 - 50 ug/L
> 50 ug/L
No Data
Bold outline indicates zone in Silverado aquifer
Data Source: WRD Regional Groundwater Monitoring Program
WRD Nested Monitoring Wells
Fault Zones
Forebay Line
Barrier Injection Wells
WRD Boundary
Comments, corrections or suggestions are welcome and should be addressed to :
Water Replenishment District
12621 E. 166th Street
Cerritos, CA 90703
Phone: (562) 921-5521
Fax: (562) 921-6101
Email: wnjuguna@wrd.org
Map projection: UTM Zone 11
Map date: Feb 2003
WRD
SANTA MONICA
BAY
PACIFIC
OCEAN
SAN PEDRO
BAY
Westchester 1
Inglewood1
Inglewood2
Los Angeles 1
HuntingtonPark1
Commerce 1
Montebello 1
Pico 1
Pico 2
Rio_Hondo 1
South Gate1
Whittier 1
Hawthorne1
Gardena1
Willowbrook1
Downey 1
LaMirada 1
Cerritos 2
Cerritos 1
Lakewood 1
Long Beach 2
Carson1
Carson 2
PM-4 Mariner
PM-3 Madrid
Lomita1
Long Beach 3
Wilmington1
Wilmington2
Chandler3
Long Beach 6
Long Beach 1
Marina Del Rey
Los Angeles River
Rio Hondo
San Gabriel River
Compton Creek
Dominguez Channel
Harbor Lake
Palos Verdes Reservoir
Los Angeles Harbor
Long Beach Marina
GARVEY RESERVOIR
10
90
405
110
105
710
605
5
60
91
22
103
N
S
E
W
5
0
5 Miles

Figure 4.19

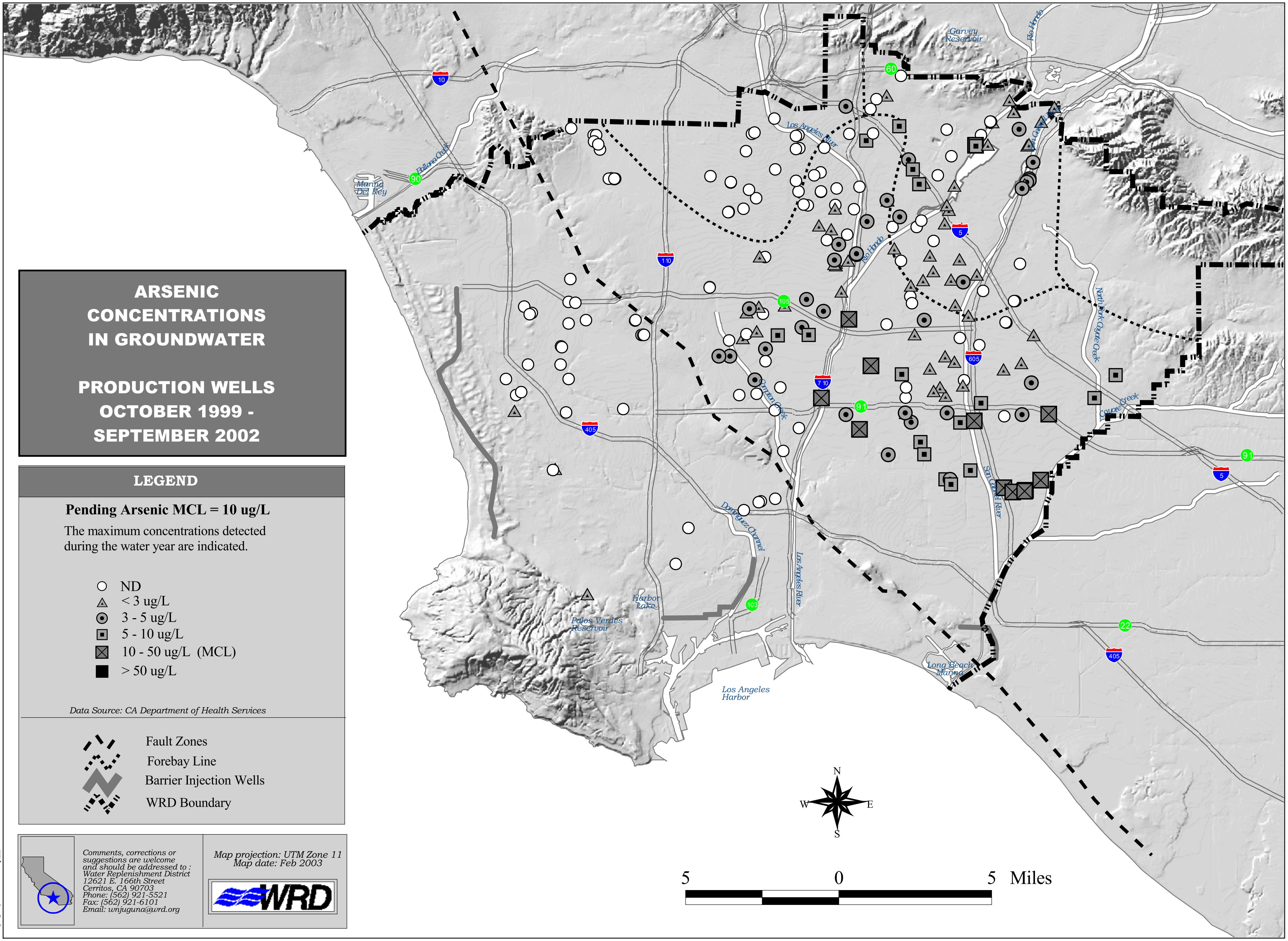

ARSENIC CONCENTRATIONS IN GROUNDWATER
PRODUCTION WELLS
OCTOBER 1999 - SEPTEMBER 2002
LEGEND
Pending Arsenic MCL = 10 ug/L
The maximum concentrations detected during the water year are indicated.
ND
< 3 ug/L
3 - 5 ug/L
5 - 10 ug/L
10 - 50 ug/L (MCL)
> 50 ug/L
Data Source: CA Department of Health Services
Fault Zones
Forebay Line
Barrier Injection Wells
WRD Boundary
Comments, corrections or suggestions are welcome and should be addressed to :
Water Replenishment District
12621 E. 166th Street
Cerritos, CA 90703
Phone: (562) 921-5521
Fax: (562) 921-6101
Email: wnjuguna@wrd.org
Map projection: UTM Zone 11
Map date: Feb 2003
WRD
Garvey Reservoir
Rio Hondo
Los Angeles River
Ballona Creek
Marina Del Rey
North Fork Coyote Creek
Coyote Creek
Compton Creek
Dominguez Channel
San Gabriel River
Harbor Lake
Palos Verdes Reservoir
Los Angeles Harbor
Long Beach Marina
N
S
E
W
5
0
5
Miles

Figure 4.20

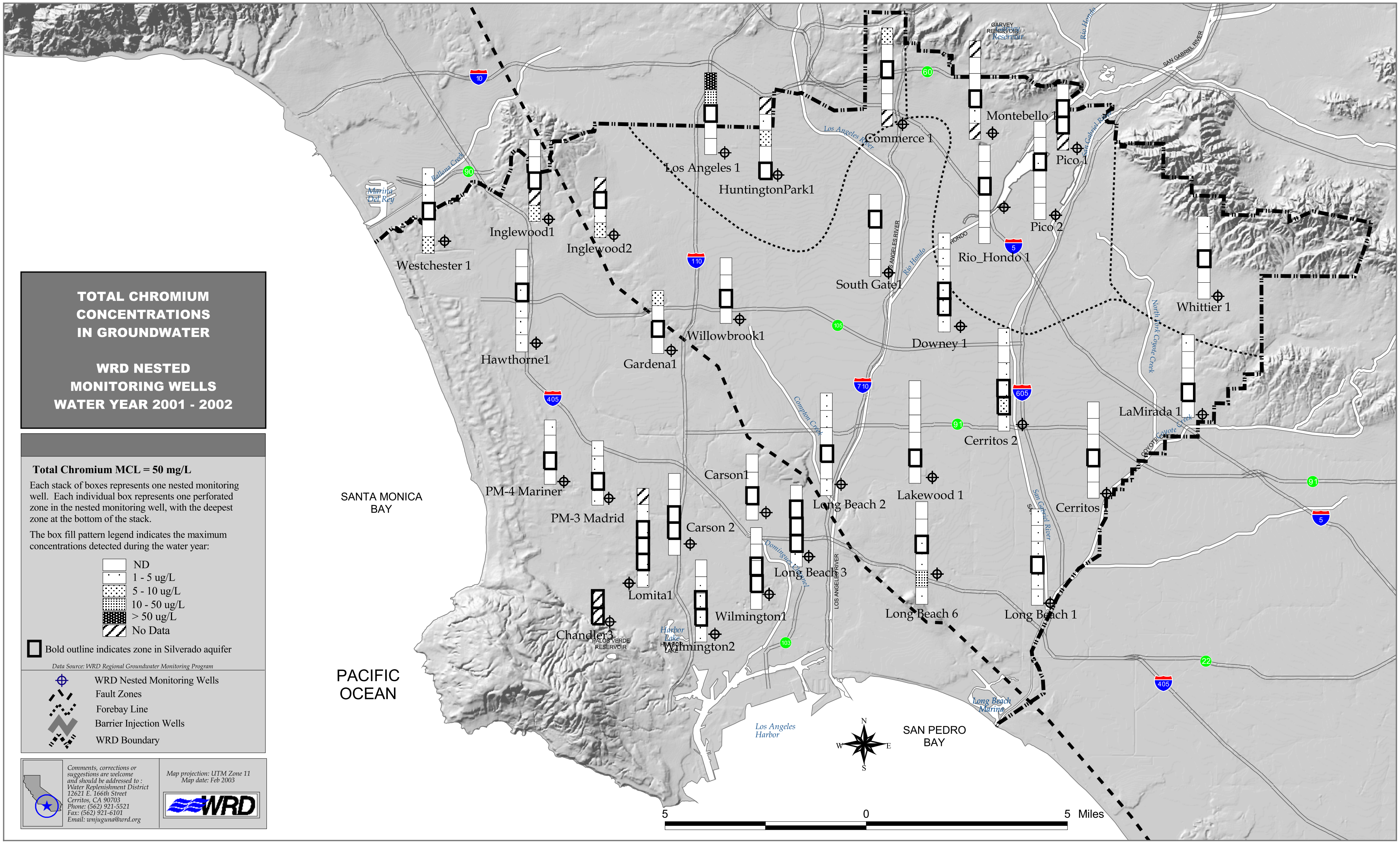

TOTAL CHROMIUM CONCENTRATIONS IN GROUNDWATER
WRD NESTED MONITORING WELLS
WATER YEAR 2001 - 2002
Total Chromium MCL = 50 mg/L
Each stack of boxes represents one nested monitoring well. Each individual box represents one perforated zone in the nested monitoring well, with the deepest zone at the bottom of the stack.
The box fill pattern legend indicates the maximum concentrations detected during the water year:
ND
1 - 5 ug/L
5 - 10 ug/L
10 - 50 ug/L
> 50 ug/L
No Data
Bold outline indicates zone in Silverado aquifer
Data Source: WRD Regional Groundwater Monitoring Program
WRD Nested Monitoring Wells
Fault Zones
Forebay Line
Barrier Injection Wells
WRD Boundary
Comments, corrections or suggestions are welcome and should be addressed to : Water Replenishment District 12621 E. 166th Street Cerritos, CA 90703 Phone: (562) 921-5521 Fax: (562) 921-6101 Email: wnjuguna@wrd.org
Map projection: UTM Zone 11
Map date: Feb 2003
WRD
SANTA MONICA BAY
PACIFIC OCEAN
SAN PEDRO BAY
Westchester 1
Inglewood1
Inglewood2
Los Angeles 1
HuntingtonPark1
Commerce 1
Montebello 1
Pico 1
Pico 2
Rio_Hondo 1
South Gate1
Whittier 1
Hawthorne1
Gardena1
Willowbrook1
Downey 1
LaMirada 1
Cerritos 2
Cerritos
Lakewood 1
Long Beach 2
Carson1
Carson 2
PM-4 Mariner
PM-3 Madrid
Long Beach 3
Lomita1
Wilmington1
Wilmington2
Chandler3
Long Beach 6
Long Beach 1
Los Angeles Harbor
Long Beach Marina
5 0 5 Miles

Figure 4.21

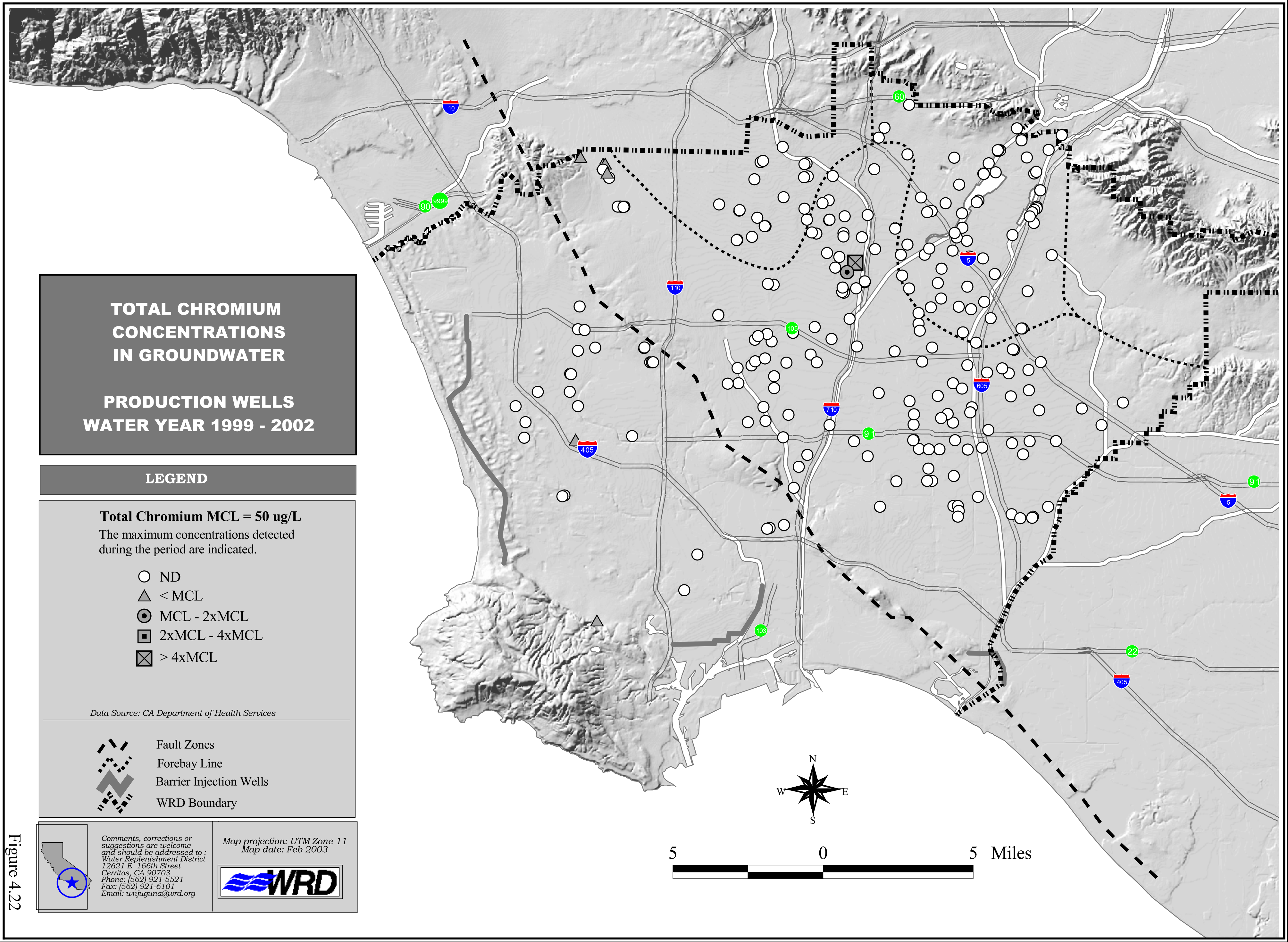

TOTAL CHROMIUM
CONCENTRATIONS
IN GROUNDWATER
PRODUCTION WELLS
WATER YEAR 1999 - 2002
LEGEND
Total Chromium MCL = 50 ug/L
The maximum concentrations detected during the period are indicated.
ND
< MCL
MCL - 2xMCL
2xMCL - 4xMCL
> 4xMCL
Data Source: CA Department of Health Services
Fault Zones
Forebay Line
Barrier Injection Wells
WRD Boundary
Comments, corrections or suggestions are welcome and should be addressed to : Water Replenishment District 12621 E. 166th Street Cerritos, CA 90703 Phone: (562) 921-5521 Fax: (562) 921-6101 Email: unjuguna@wrd.org
Map projection: UTM Zone 11
Map date: Feb 2003
WRD
10
60
90
9999
110
105
5
605
710
91
405
103
22
N
W
E
S
5
0
5
Miles

Figure 4.22

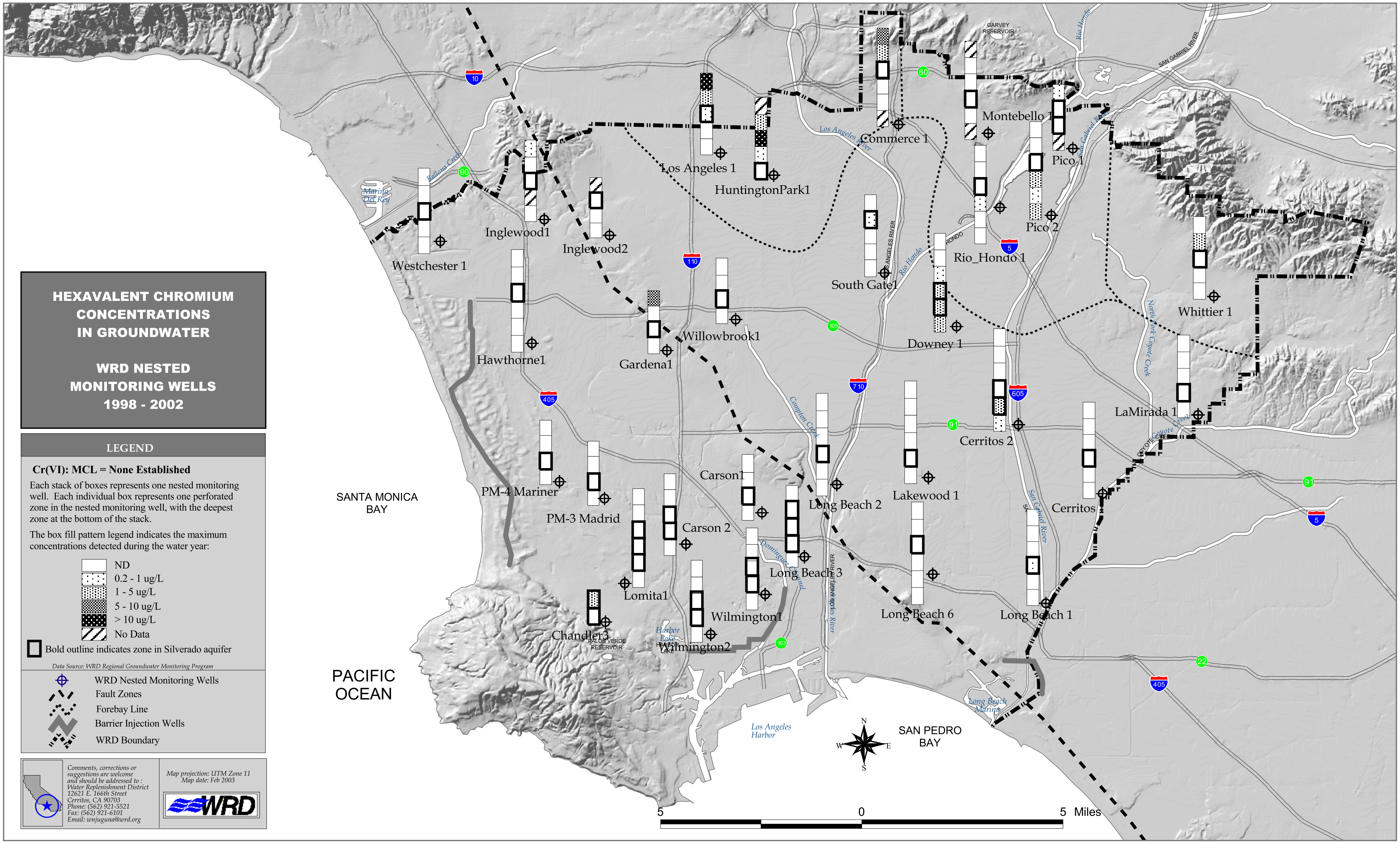

HEXAVALENT CHROMIUM CONCENTRATIONS IN GROUNDWATER
WRD NESTED MONITORING WELLS
1998 - 2002
LEGEND
Cr(VI): MCL = None Established
Each stack of boxes represents one nested monitoring well. Each individual box represents one perforated zone in the nested monitoring well, with the deepest zone at the bottom of the stack.
The box fill pattern legend indicates the maximum concentrations detected during the water year:
ND
0.2 - 1 ug/L
1 - 5 ug/L
5 - 10 ug/L
> 10 ug/L
No Data
Bold outline indicates zone in Silverado aquifer
Data Source: WRD Regional Groundwater Monitoring Program
WRD Nested Monitoring Wells
Fault Zones
Forebay Line
Barrier Injection Wells
WRD Boundary
Comments, corrections or suggestions are welcome and should be addressed to : Water Replenishment District 12621 E. 166th Street Cerritos, CA 90703 Phone: (562) 921-5521 Fax: (562) 921-6101 Email: wnjuguna@wrd.org
Map projection: UTM Zone 11
Map date: Feb 2003
WRD
SANTA MONICA BAY
PACIFIC OCEAN
SAN PEDRO BAY
Los Angeles Harbor
Long Beach Marina
Marina Del Rey
Westchester 1
Inglewood1
Inglewood2
Hawthorne1
Gardena1
Willowbrook1
Los Angeles 1
HuntingtonPark1
Commerce 1
Montebello 1
Pico 1
Pico 2
Rio_Hondo 1
South Gate1
Downey 1
Whittier 1
LaMirada 1
Cerritos 2
Cerritos 1
Lakewood 1
Long Beach 2
Long Beach 3
Long Beach 6
Long Beach 1
Carson1
Carson 2
PM-4 Mariner
PM-3 Madrid
Lomita1
Chandler3
Wilmington1
Wilmington2
5
0
5 Miles
N
S
E
W

Figure 4.23

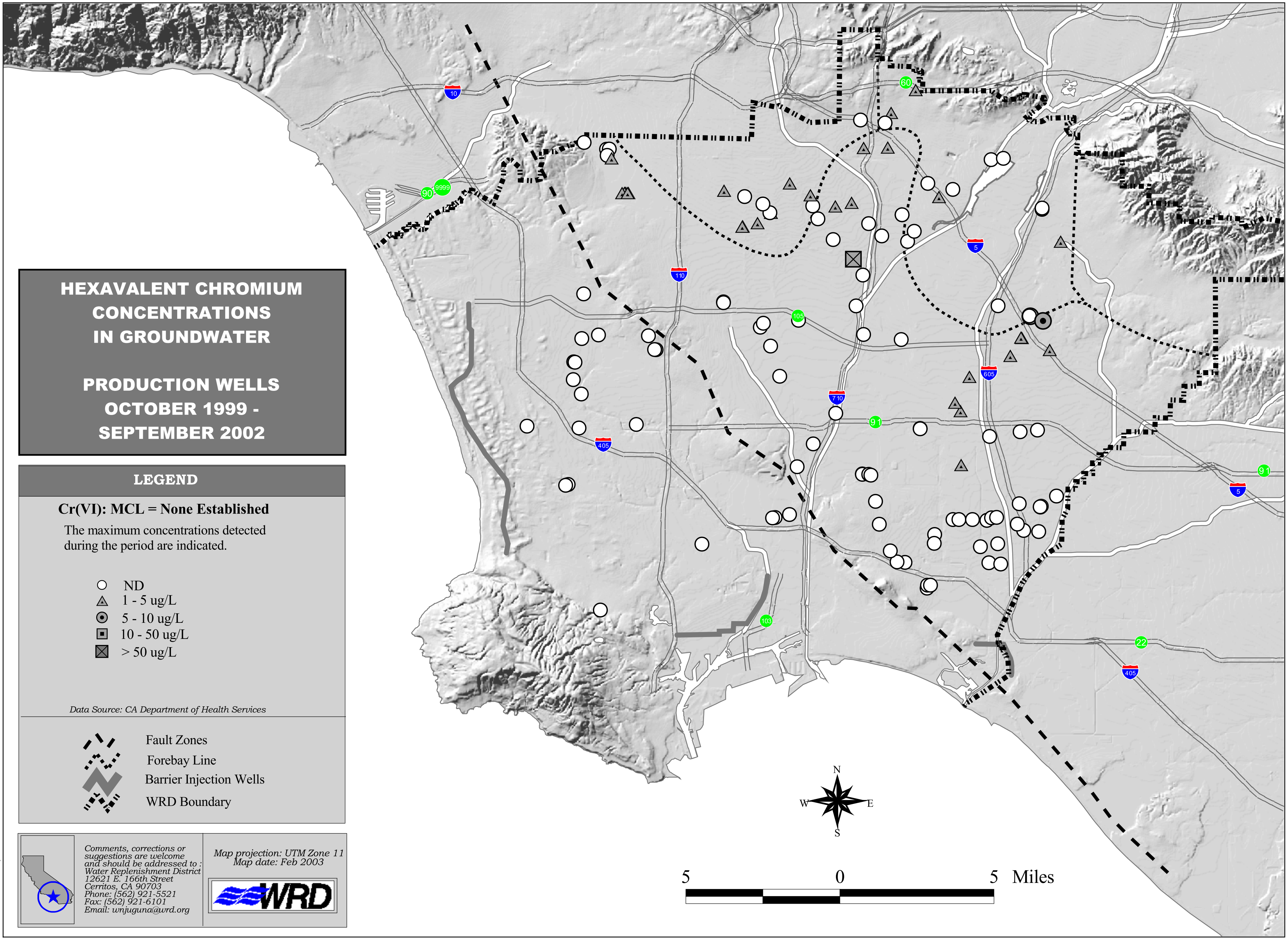

HEXAVALENT CHROMIUM CONCENTRATIONS IN GROUNDWATER
PRODUCTION WELLS OCTOBER 1999 - SEPTEMBER 2002
LEGEND
Cr(VI): MCL = None Established
The maximum concentrations detected during the period are indicated.
ND
1 - 5 ug/L
5 - 10 ug/L
10 - 50 ug/L
> 50 ug/L
Data Source: CA Department of Health Services
Fault Zones
Forebay Line
Barrier Injection Wells
WRD Boundary
Comments, corrections or suggestions are welcome and should be addressed to : Water Replenishment District 12621 E. 166th Street Cerritos, CA 90703 Phone: (562) 921-5521 Fax: (562) 921-6101 Email: wnjuguna@wrd.org
Map projection: UTM Zone 11
Map date: Feb 2003
WRD
N
S
E
W
5
0
5
Miles
10
110
405
5
605
710
60
90
91
103
105
22

Figure 4.24

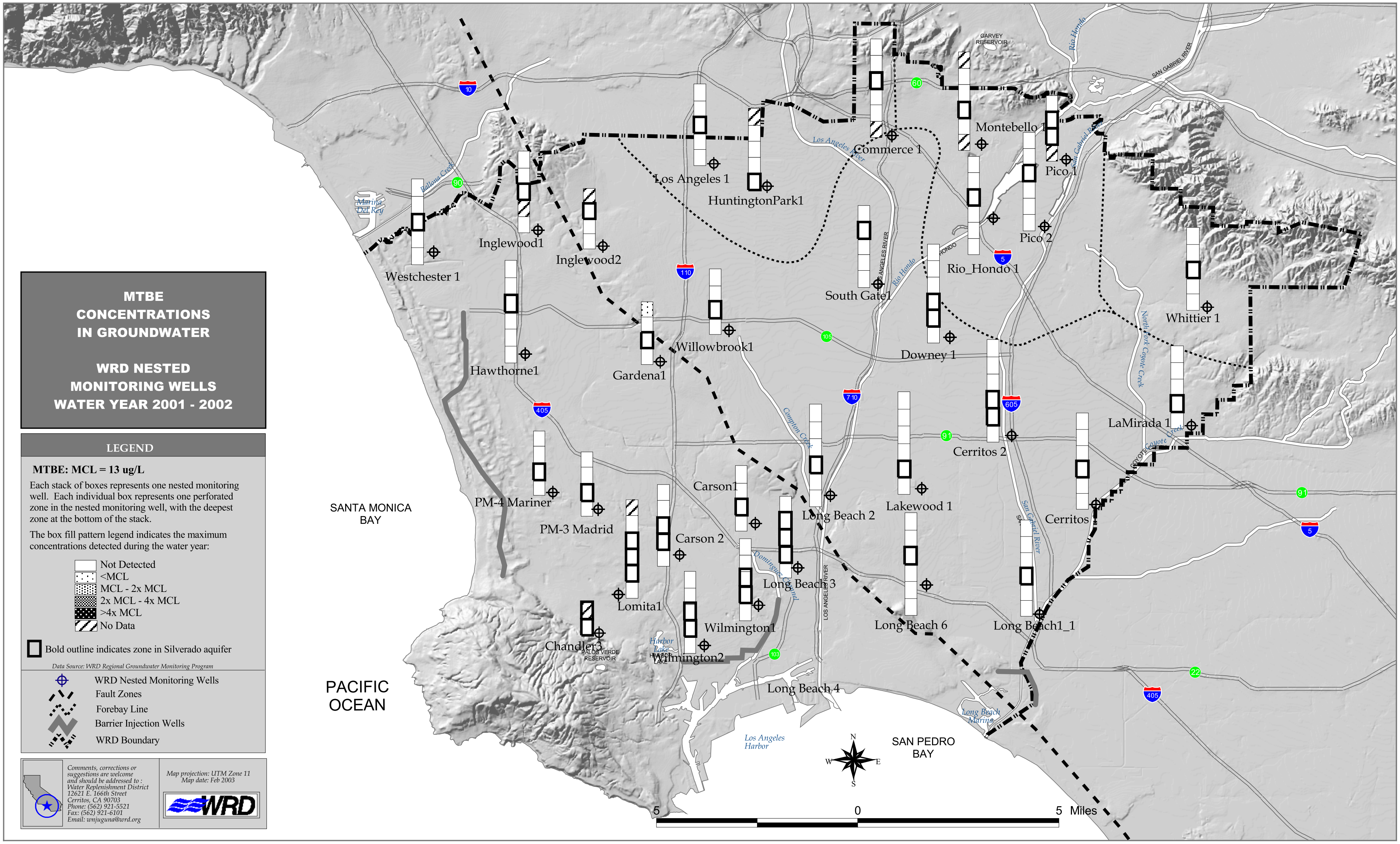
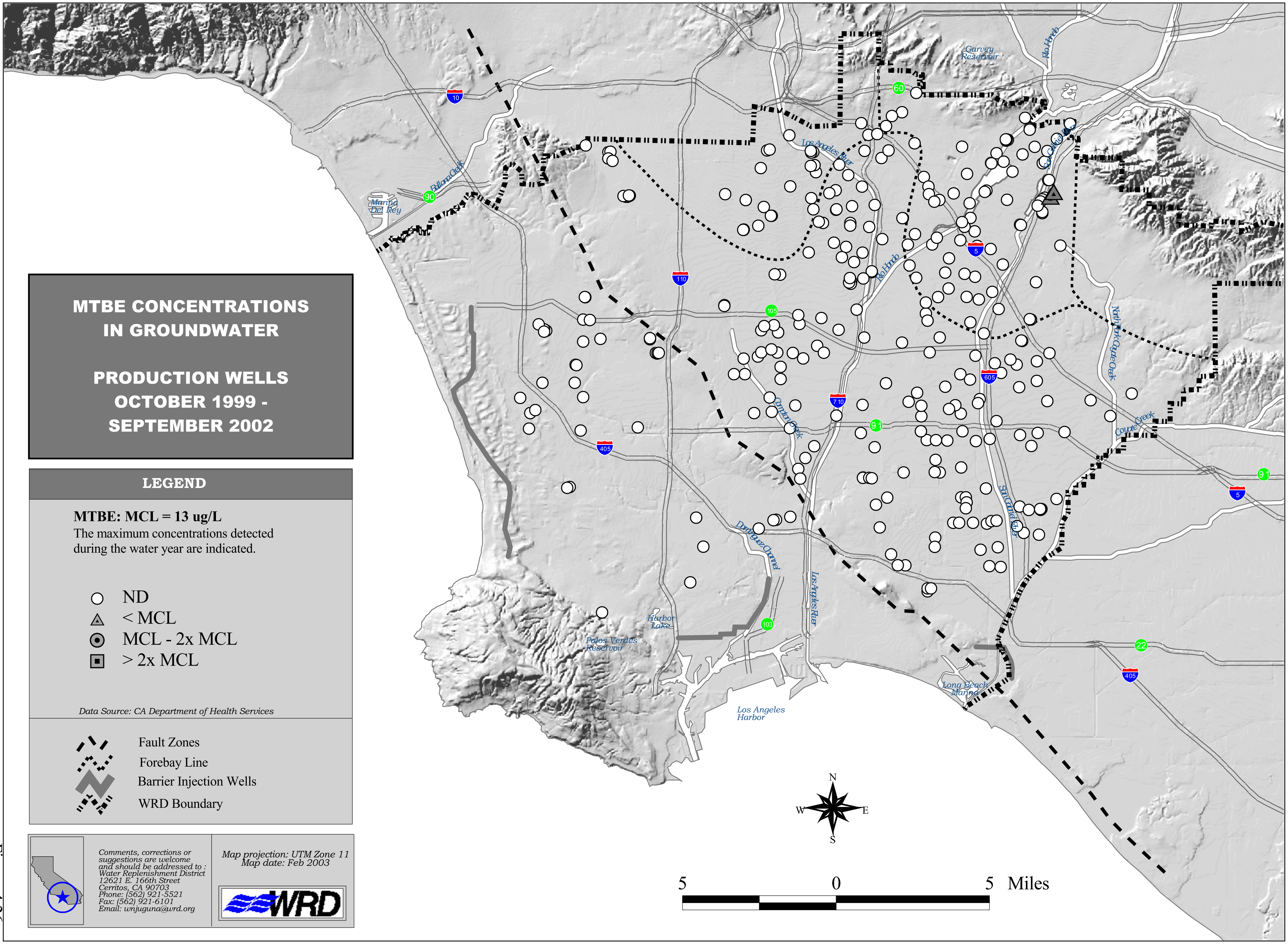
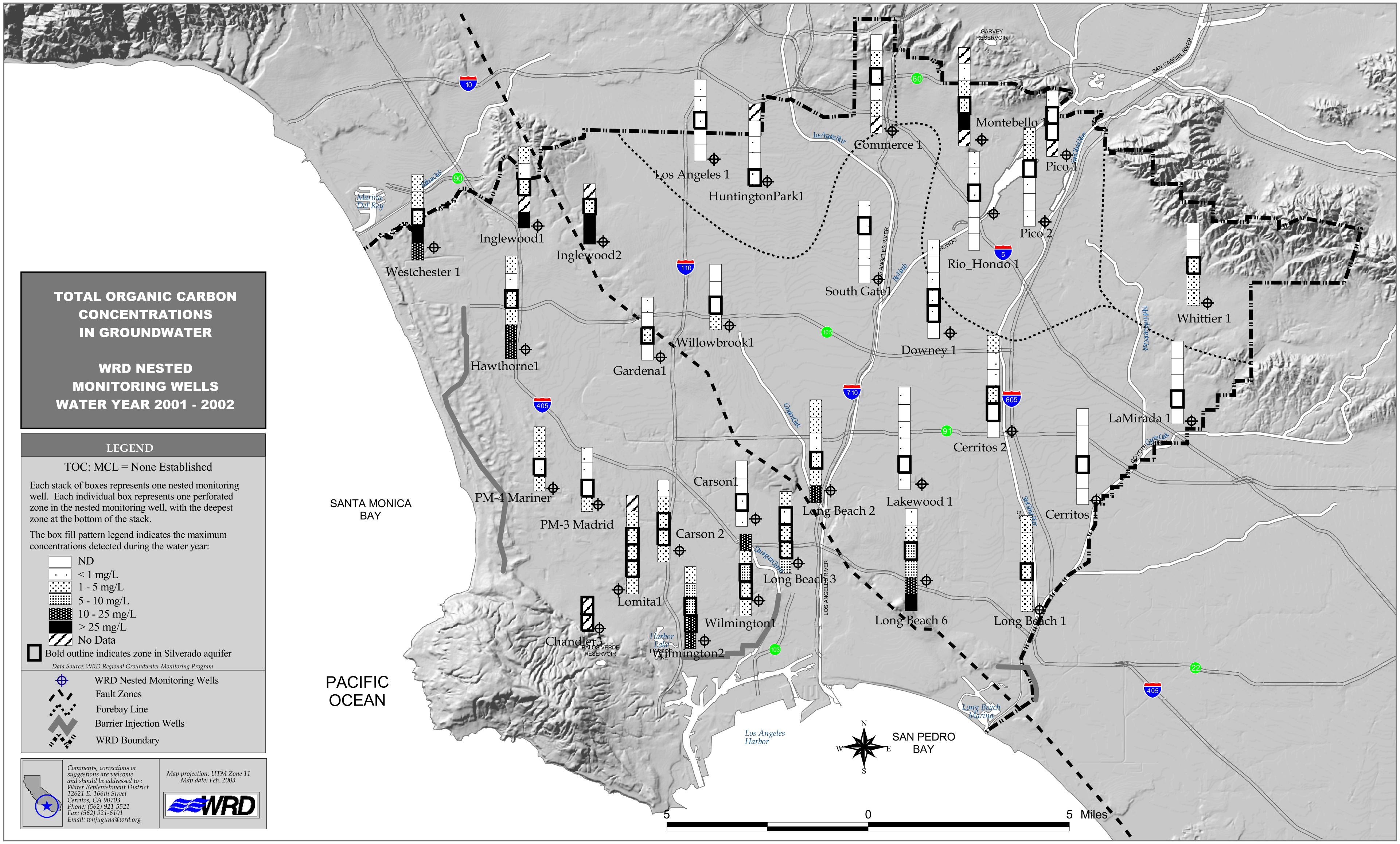

MTBE
CONCENTRATIONS
IN GROUNDWATER
WRD NESTED
MONITORING WELLS
WATER YEAR 2001 - 2002
LEGEND
MTBE: MCL = 13 ug/L
Each stack of boxes represents one nested monitoring well. Each individual box represents one perforated zone in the nested monitoring well, with the deepest zone at the bottom of the stack.
The box fill pattern legend indicates the maximum concentrations detected during the water year:
Not Detected
<MCL
MCL - 2x MCL
2x MCL - 4x MCL
>4x MCL
No Data
Bold outline indicates zone in Silverado aquifer
Data Source: WRD Regional Groundwater Monitoring Program
WRD Nested Monitoring Wells
Fault Zones
Forebay Line
Barrier Injection Wells
WRD Boundary
Comments, corrections or suggestions are welcome and should be addressed to :
Water Replenishment District
12621 E. 166th Street
Cerritos, CA 90703
Phone: (562) 921-5521
Fax: (562) 921-6101
Email: wnjuguna@wrd.org
Map projection: UTM Zone 11
Map date: Feb 2003
WRD
SANTA MONICA
BAY
PACIFIC
OCEAN
SAN PEDRO
BAY
Westchester 1
Inglewood1
Inglewood2
Los Angeles 1
HuntingtonPark1
Commerce 1
Montebello 1
Pico 1
Pico 2
Rio_Hondo 1
South Gate1
Whittier 1
Hawthorne1
Gardena1
Willowbrook1
Downey 1
LaMirada 1
Cerritos 2
Cerritos
Lakewood 1
Long Beach 2
Carson1
Carson 2
PM-4 Mariner
PM-3 Madrid
Lomita1
Chandler3
Wilmington1
Wilmington2
Long Beach 3
Long Beach 4
Long Beach 6
Long Beach1_1
Marina Del Rey
Ballona Creek
Los Angeles River
Rio Hondo
San Gabriel River
SAN GABRIEL RIVER
GARVEY RESERVOIR
Compton Creek
Dominguez Channel
North Fork Coyote Creek
Coyote Creek
LOS ANGELES RIVER
PALOS VERDE RESERVOIR
Harbor Lake
Los Angeles Harbor
Long Beach Marina
10
110
405
710
605
5
90
60
105
91
103
22
N
S
E
W
5
0
5 Miles

Figure 4.25



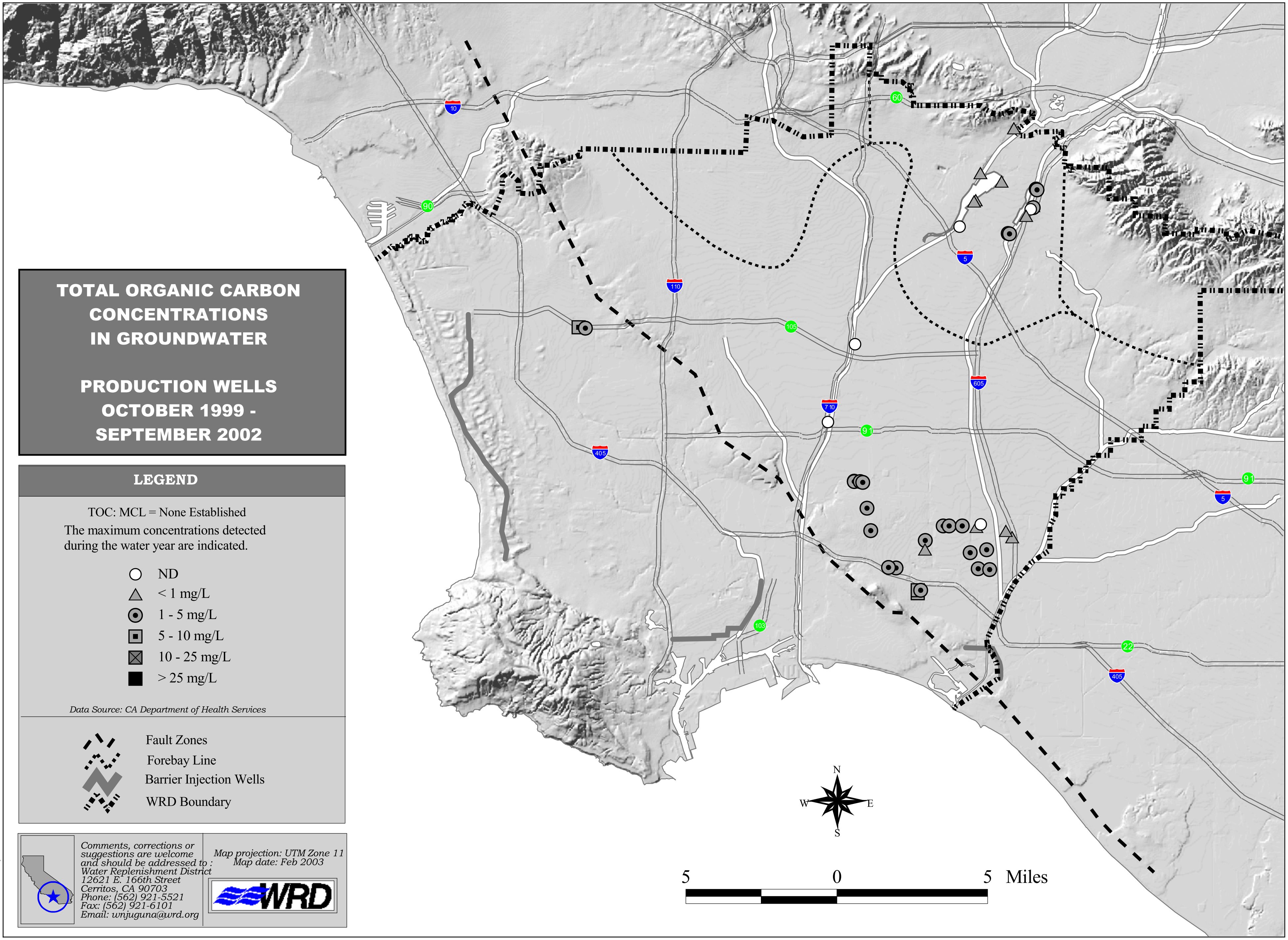
MTBE CONCENTRATIONS IN GROUNDWATER
PRODUCTION WELLS OCTOBER 1999 - SEPTEMBER 2002
LEGEND
MTBE: MCL = 13 ug/L
The maximum concentrations detected during the water year are indicated.
ND
< MCL
MCL - 2x MCL
> 2x MCL
Data Source: CA Department of Health Services
Fault Zones
Forebay Line
Barrier Injection Wells
WRD Boundary
Comments, corrections or suggestions are welcome and should be addressed to : Water Replenishment District 12621 E. 166th Street Cerritos, CA 90703 Phone: (562) 921-5521 Fax: (562) 921-6101 Email: wnjuguna@wrd.org
Map projection: UTM Zone 11
Map date: Feb 2003
WRD
Garvey Reservoir
Rio Hondo
Marina Del Rey
Ballona Creek
Los Angeles River
San Gabriel River
North Fork Coyote Creek
Coyote Creek
Compton Creek
Dominguez Channel
Harbor Lake
Palos Verdes Reservoir
Los Angeles Harbor
Long Beach Marina
N
S
E
W
5
0
5
Miles

Figure 4.26



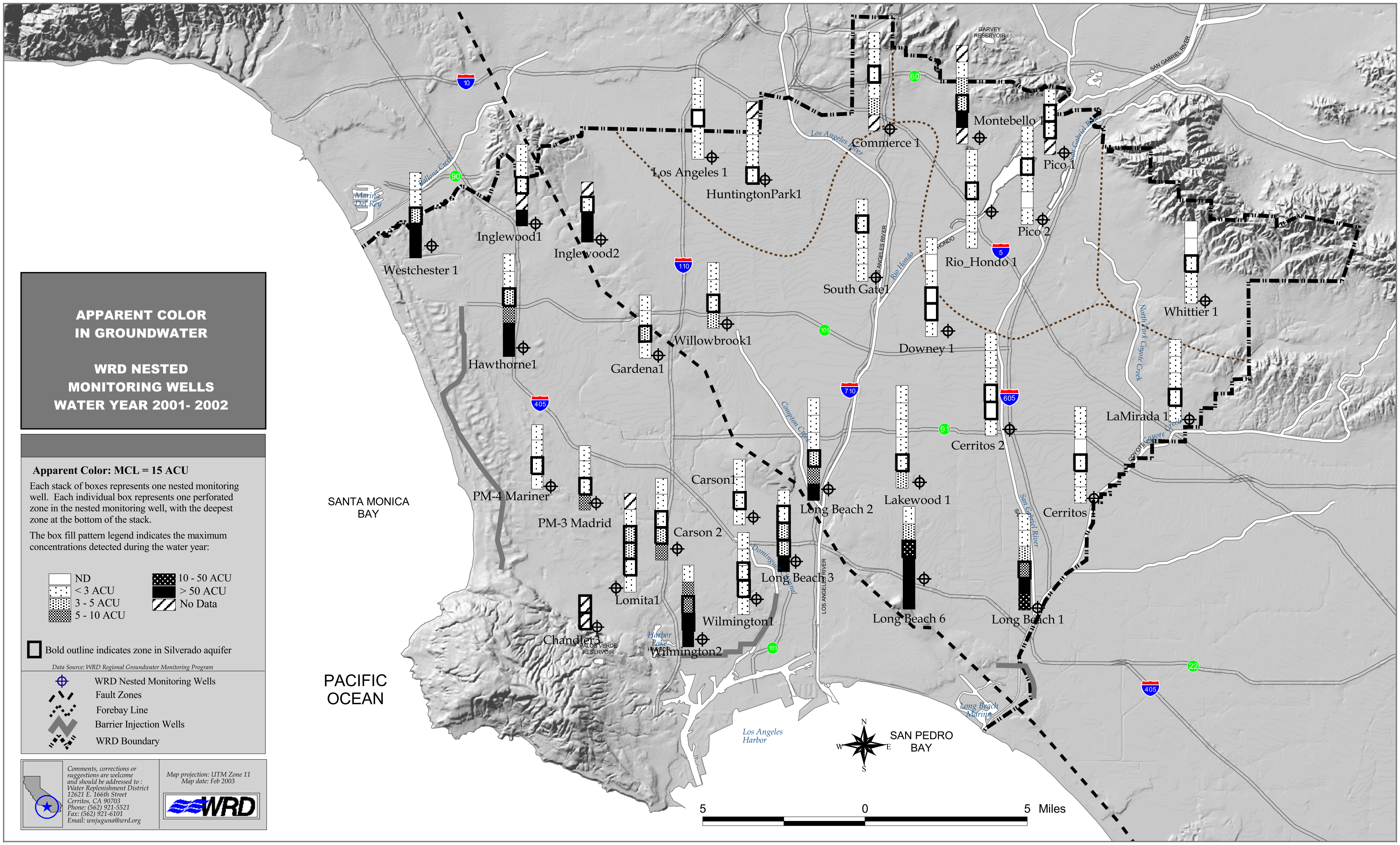
TOTAL ORGANIC CARBON CONCENTRATIONS IN GROUNDWATER
WRD NESTED MONITORING WELLS
WATER YEAR 2001 - 2002
LEGEND
TOC: MCL = None Established
Each stack of boxes represents one nested monitoring well. Each individual box represents one perforated zone in the nested monitoring well, with the deepest zone at the bottom of the stack.
The box fill pattern legend indicates the maximum concentrations detected during the water year:
ND
< 1 mg/L
1 - 5 mg/L
5 - 10 mg/L
10 - 25 mg/L
> 25 mg/L
No Data
Bold outline indicates zone in Silverado aquifer
Data Source: WRD Regional Groundwater Monitoring Program
WRD Nested Monitoring Wells
Fault Zones
Forebay Line
Barrier Injection Wells
WRD Boundary
Comments, corrections or suggestions are welcome and should be addressed to : Water Replenishment District 12621 E. 166th Street Cerritos, CA 90703 Phone: (562) 921-5521 Fax: (562) 921-6101 Email: wnjuguna@wrd.org
Map projection: UTM Zone 11
Map date: Feb. 2003
Westchester 1
Inglewood1
Inglewood2
Los Angeles 1
HuntingtonPark1
Commerce 1
Montebello 1
Pico 1
Pico 2
Rio_Hondo 1
South Gate1
Downey 1
Whittier 1
Hawthorne1
Gardena1
Willowbrook1
LaMirada 1
Cerritos 2
Cerritos
Lakewood 1
Long Beach 2
Long Beach 3
Long Beach 6
Long Beach 1
Carson1
Carson 2
PM-4 Mariner
PM-3 Madrid
Lomita1
Chandler3
Wilmington1
Wilmington2
SANTA MONICA BAY
PACIFIC OCEAN
SAN PEDRO BAY
Los Angeles Harbor
Long Beach Marina
Harbor Lake
GARVEY RESERVOIR
SAN GABRIEL RIVER
LOS ANGELES RIVER
5 0 5 Miles

Figure 4.27



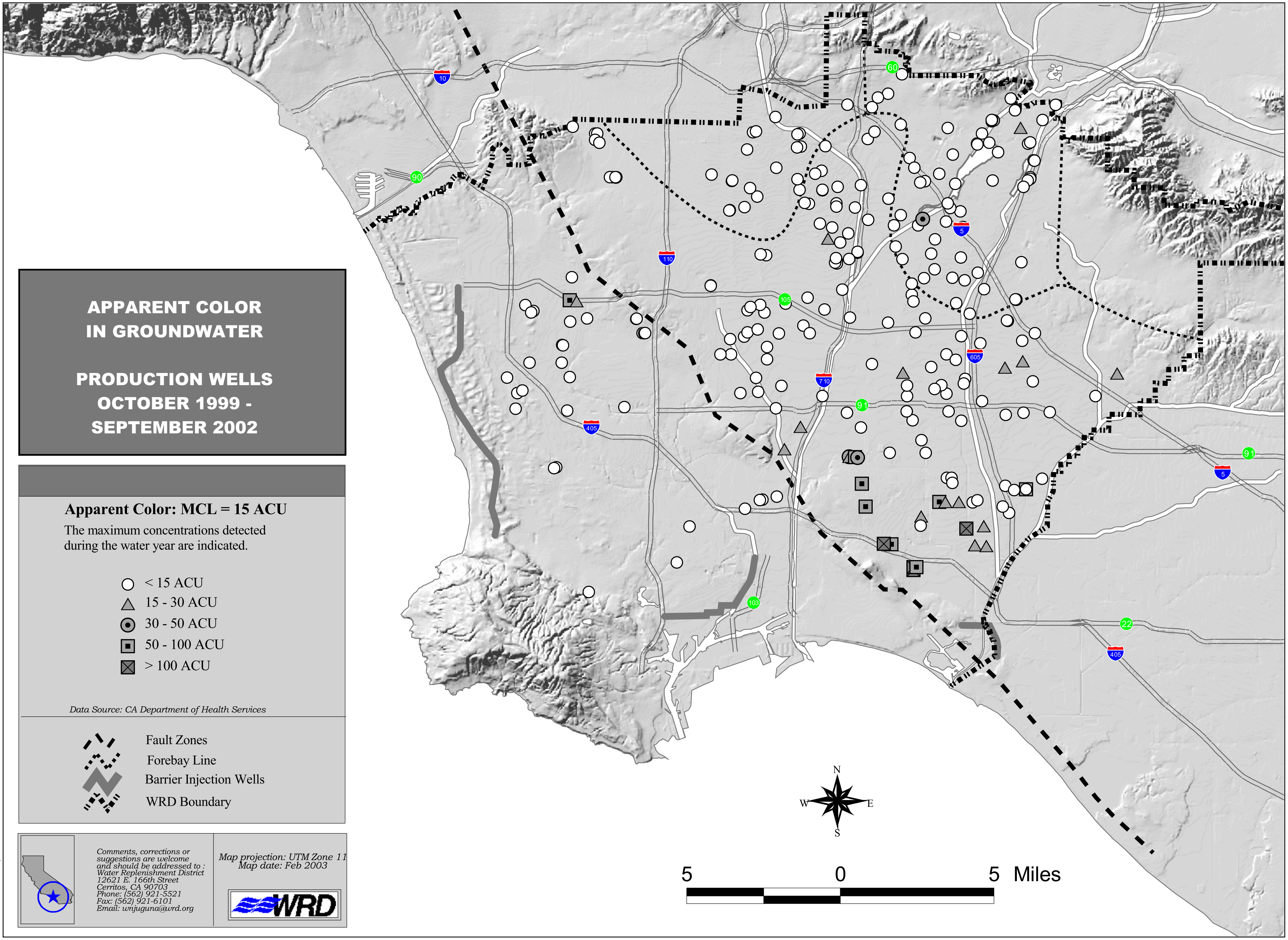
TOTAL ORGANIC CARBON CONCENTRATIONS IN GROUNDWATER
PRODUCTION WELLS OCTOBER 1999 - SEPTEMBER 2002
LEGEND
TOC: MCL = None Established
The maximum concentrations detected during the water year are indicated.
ND
< 1 mg/L
1 - 5 mg/L
5 - 10 mg/L
10 - 25 mg/L
> 25 mg/L
Data Source: CA Department of Health Services
Fault Zones
Forebay Line
Barrier Injection Wells
WRD Boundary
Comments, corrections or suggestions are welcome and should be addressed to : Water Replenishment District 12621 E. 166th Street Cerritos, CA 90703 Phone: (562) 921-5521 Fax: (562) 921-6101 Email: wnjuguna@wrd.org
Map projection: UTM Zone 11
Map date: Feb 2003
WRD
N
W
E
S
5
0
5
Miles
10
110
105
405
710
91
605
5
60
90
103
22

Figure 4.28



APPARENT COLOR
IN GROUNDWATER
WRD NESTED
MONITORING WELLS
WATER YEAR 2001- 2002
Apparent Color: MCL = 15 ACU
Each stack of boxes represents one nested monitoring well. Each individual box represents one perforated zone in the nested monitoring well, with the deepest zone at the bottom of the stack.
The box fill pattern legend indicates the maximum concentrations detected during the water year:
ND
< 3 ACU
3 - 5 ACU
5 - 10 ACU
10 - 50 ACU
> 50 ACU
No Data
Bold outline indicates zone in Silverado aquifer
Data Source: WRD Regional Groundwater Monitoring Program
WRD Nested Monitoring Wells
Fault Zones
Forebay Line
Barrier Injection Wells
WRD Boundary
Comments, corrections or suggestions are welcome and should be addressed to : Water Replenishment District 12621 E. 166th Street Cerritos, CA 90703 Phone: (562) 921-5521 Fax: (562) 921-6101 Email: wnjuguna@wrd.org
Map projection: UTM Zone 11
Map date: Feb 2003
SANTA MONICA BAY
PACIFIC OCEAN
SAN PEDRO BAY
Westchester 1
Inglewood1
Inglewood2
Los Angeles 1
HuntingtonPark1
Commerce 1
Montebello 1
Pico 1
Pico 2
Rio_Hondo 1
South Gate1
Whittier 1
Hawthorne1
Gardena1
Willowbrook1
Downey 1
LaMirada 1
Cerritos 2
PM-4 Mariner
PM-3 Madrid
Carson1
Carson 2
Long Beach 2
Lakewood 1
Cerritos 1
Lomita1
Long Beach 3
Wilmington1
Long Beach 6
Long Beach 1
Chandler3
Wilmington2
Los Angeles Harbor
Long Beach Marina
5
0
5 Miles

Figure 4.29


APPARENT COLOR
IN GROUNDWATER
PRODUCTION WELLS
OCTOBER 1999 -
SEPTEMBER 2002
Apparent Color: MCL = 15 ACU
The maximum concentrations detected
during the water year are indicated.
< 15 ACU
15 - 30 ACU
30 - 50 ACU
50 - 100 ACU
> 100 ACU
Data Source: CA Department of Health Services
Fault Zones
Forebay Line
Barrier Injection Wells
WRD Boundary
Comments, corrections or suggestions are welcome and should be addressed to : Water Replenishment District 12621 E. 166th Street Cerritos, CA 90703 Phone: (562) 921-5521 Fax: (562) 921-6101 Email: wnjuguna@wrd.org
Map projection: UTM Zone 11
Map date: Feb 2003
WRD
N
S
E
W
5
0
5 Miles
10
90
110
405
105
710
91
605
5
60
103
22
Figure 4.30

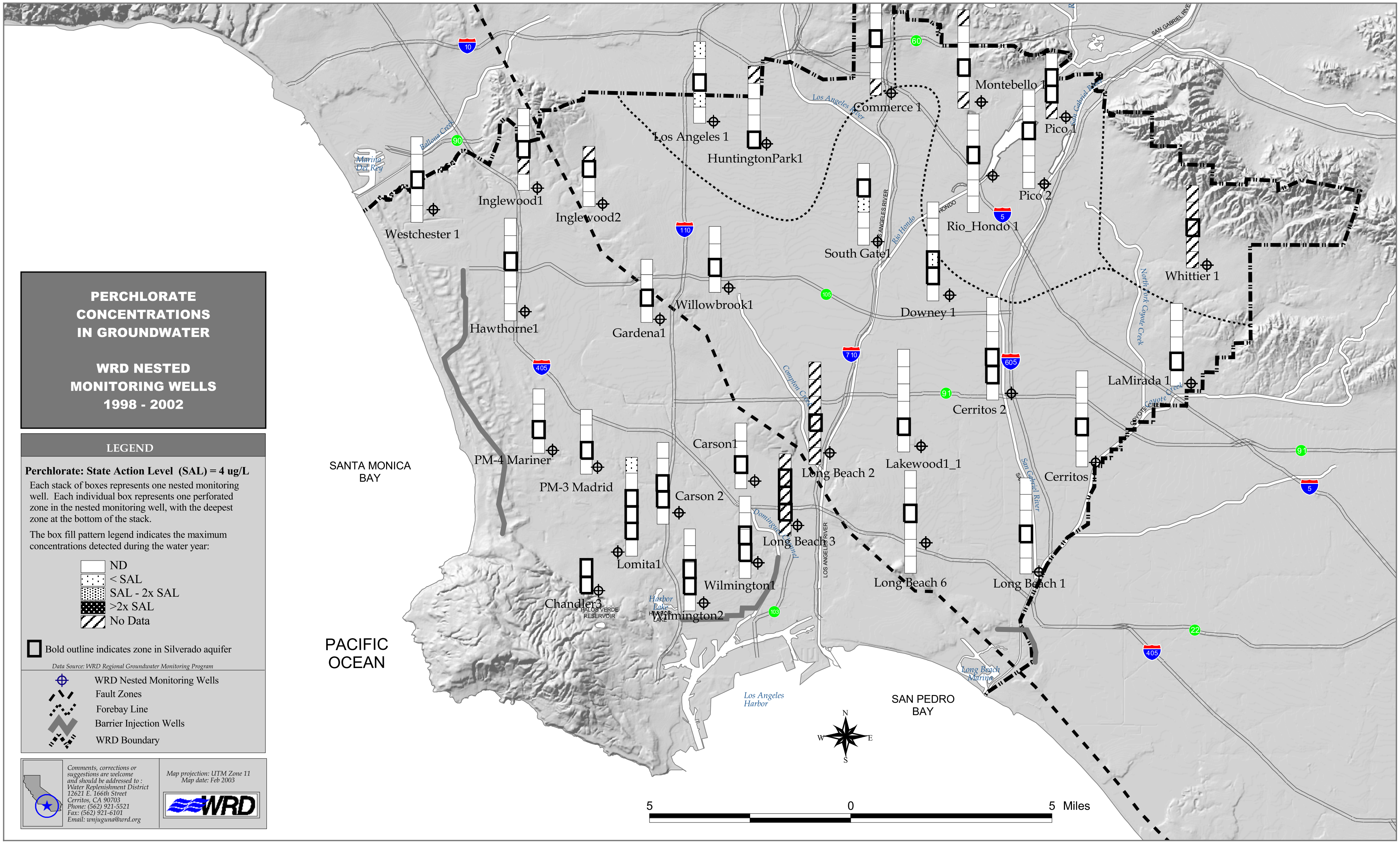

PERCHLORATE CONCENTRATIONS IN GROUNDWATER
WRD NESTED MONITORING WELLS
1998 - 2002
LEGEND
Perchlorate: State Action Level (SAL) = 4 ug/L
Each stack of boxes represents one nested monitoring well. Each individual box represents one perforated zone in the nested monitoring well, with the deepest zone at the bottom of the stack.
The box fill pattern legend indicates the maximum concentrations detected during the water year:
ND
< SAL
SAL - 2x SAL
>2x SAL
No Data
Bold outline indicates zone in Silverado aquifer
Data Source: WRD Regional Groundwater Monitoring Program
WRD Nested Monitoring Wells
Fault Zones
Forebay Line
Barrier Injection Wells
WRD Boundary
Comments, corrections or suggestions are welcome and should be addressed to :
Water Replenishment District
12621 E. 166th Street
Cerritos, CA 90703
Phone: (562) 921-5521
Fax: (562) 921-6101
Email: wnjuguna@wrd.org
Map projection: UTM Zone 11
Map date: Feb 2003
WRD
SANTA MONICA BAY
PACIFIC OCEAN
SAN PEDRO BAY
Westchester 1
Inglewood1
Inglewood2
Los Angeles 1
HuntingtonPark1
Commerce 1
Montebello 1
Pico 1
Pico 2
South Gate1
Rio_Hondo 1
Whittier 1
Hawthorne1
Gardena1
Willowbrook1
Downey 1
LaMirada 1
Cerritos 2
PM-4 Mariner
PM-3 Madrid
Carson1
Carson 2
Long Beach 2
Lakewood1_1
Cerritos
Lomita1
Long Beach 3
Long Beach 6
Long Beach 1
Chandler3
Wilmington1
Wilmington2
Marina Del Rey
Ballona Creek
Los Angeles River
Rio Hondo
San Gabriel River
Compton Creek
Dominguez Channel
Coyote Creek
North Fork Coyote Creek
Harbor Lake
Los Angeles Harbor
Long Beach Marina
10
90
110
405
710
605
5
60
105
91
22
103
N
S
E
W
5
0
5 Miles

Figure 4.31

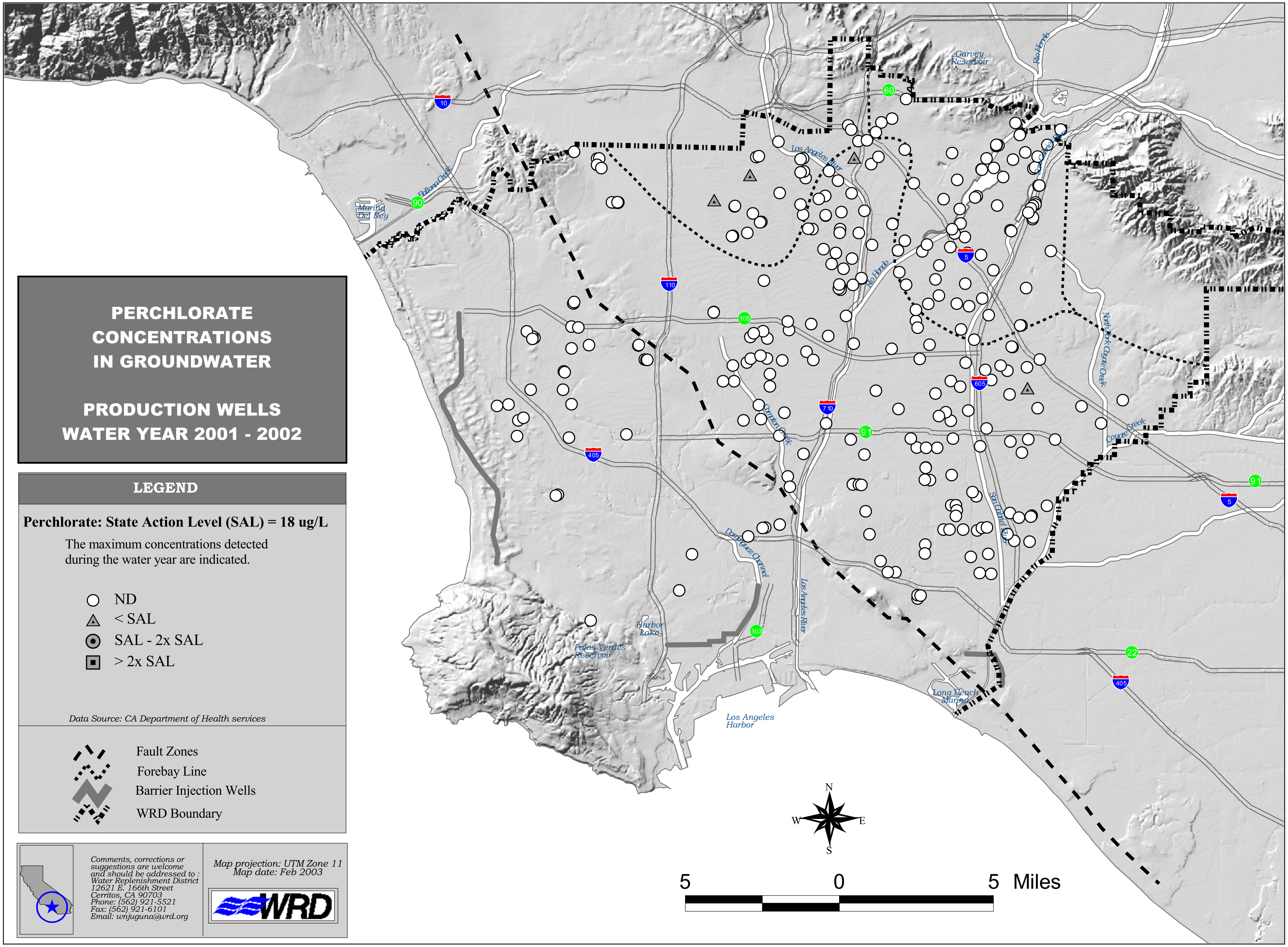

PERCHLORATE CONCENTRATIONS IN GROUNDWATER
PRODUCTION WELLS
WATER YEAR 2001 - 2002
LEGEND
Perchlorate: State Action Level (SAL) = 18 ug/L
The maximum concentrations detected during the water year are indicated.
ND
< SAL
SAL - 2x SAL
> 2x SAL
Data Source: CA Department of Health services
Fault Zones
Forebay Line
Barrier Injection Wells
WRD Boundary
Comments, corrections or suggestions are welcome and should be addressed to : Water Replenishment District 12621 E. 166th Street Cerritos, CA 90703 Phone: (562) 921-5521 Fax: (562) 921-6101 Email: wnjuguna@wrd.org
Map projection: UTM Zone 11
Map date: Feb 2003
WRD
Garvey Reservoir
Rio Hondo
Los Angeles River
Ballona Creek
Marina Del Rey
Compton Creek
Dominguez Channel
San Gabriel River
North Fork Coyote Creek
Coyote Creek
Harbor Lake
Palos Verdes Reservoir
Los Angeles Harbor
Long Beach Marina
10
90
110
105
405
710
605
5
60
91
103
22
N
S
E
W
5
0
5 Miles

Figure 4.32