Chapter 1
Introduction

Groundwater is one of California's most valuable natural resources and requires proper protection and management in order to maintain its beneficial uses. The California Department of Water Resources (DWR) defines groundwater management as the planned and coordinated monitoring, operation, and administration of a groundwater basin with the long-term goal of sustainability of the resources. In an average water supply year, groundwater meets about 30% of California's urban and agriculture demand and during drought years, 40% or more.[1] In 1995, approximately 43% of Californians used groundwater for at least a portion of their public supply needs.[2]

Many agencies managing groundwater resources lack the appropriate management and coordination between local agencies to properly manage their local groundwater basin. In the years to come, demand on groundwater is expected to increase significantly as the population in California is projected to reach nearly 46 million. Many agencies throughout California are unable to maintain beneficial uses of groundwater, with problems such as overdraft and poor water quality arising because of lack of management and/or coordination between agencies. The California Groundwater Management Planning Act (Water Code Sections 10750, *et seq.*) was adopted with the intent of encouraging local agencies to work cooperatively to manage groundwater resources within their jurisdictions. This Groundwater Management Plan is a compendium of Zone 7 Water Agency's existing groundwater management policies and programs, documenting Zone 7's compliance with the requirements of the Groundwater Management Planning Act.

1.1 Alameda County Flood Control and Water Conservation District

The Alameda County Flood Control and Water Conservation District (ACFCWCD) was created in 1949 by the state legislature through passage of Act 205 of the California Uncodified Water Act (District Act). ACFCWCD was formed to provide control of flood and stormwater and to conserve and manage local water for beneficial uses. ACFCWCD is vested with the power to store

[1] California Department of Water Resources 2003.
[2] Solley et al. 1998.

water in surface or underground reservoirs within or outside of the district for the common benefit of the district; to conserve and reclaim water for present and future use within the district; to appropriate and acquire water and water rights; and to import water into the district. ACFCWCD is further authorized by statute to prevent interference with or diminution of, or to declare rights in the natural flow of any stream or surface or subterranean supply of waters used or useful for any purpose of the district and to prevent contamination, pollution or otherwise rendering unfit for beneficial use the surface or subsurface water used or useful in the district. ACFCWCD is also authorized to levy replenishment assessments upon the production of groundwater from all water-producing facilities, whether public or private, in the district.

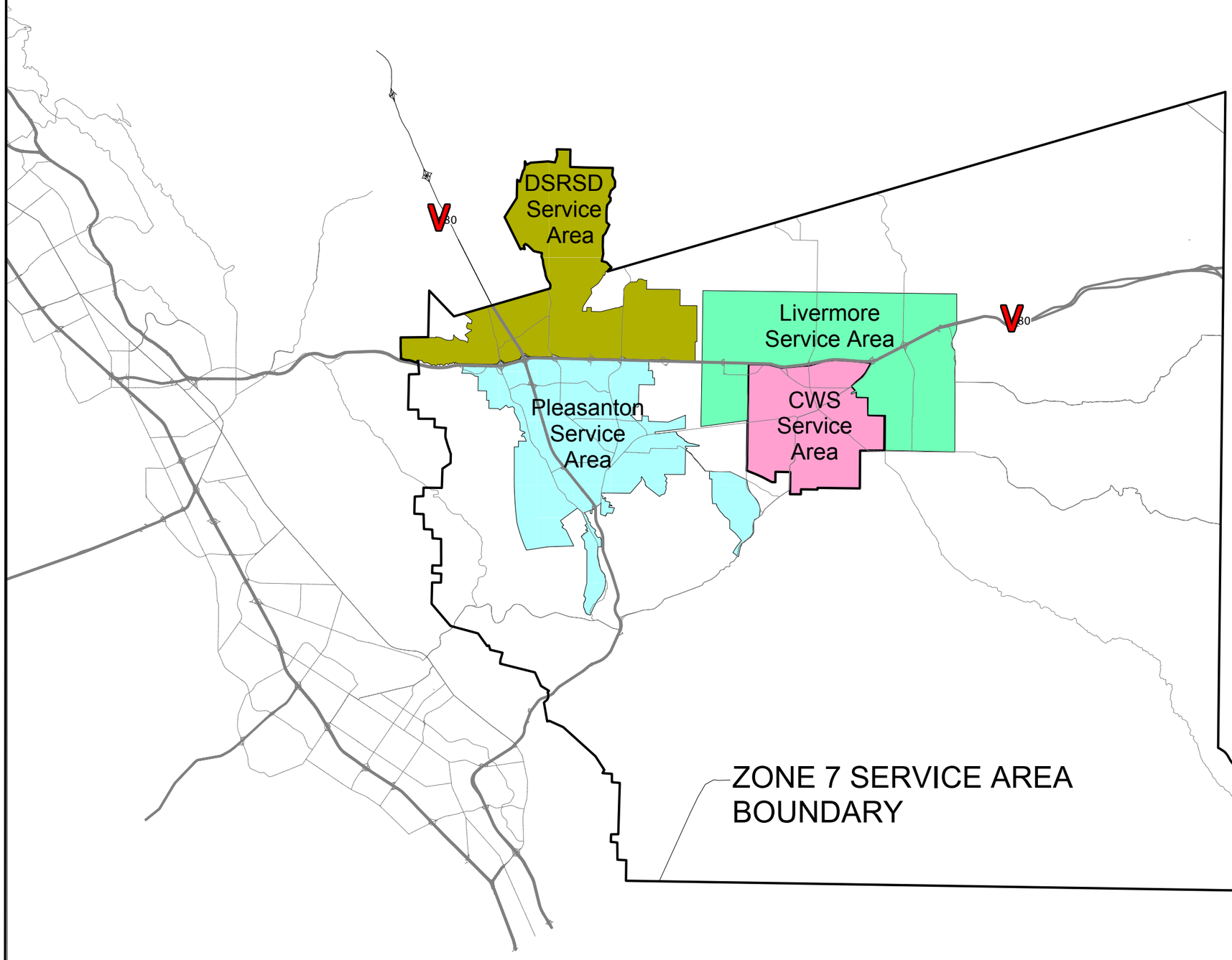
1.2 Zone 7 Water Agency

ACFCWCD comprises 10 active zones, of which Zone 7 covers the eastern portion of Alameda County, which includes the cities of Dublin, Pleasanton, and Livermore. Pursuant to Section 36 of the District Act, Zone 7 of the ACFCWCD (Zone 7 Water Agency, or Zone 7) was established in 1957 to address regional and water supply issues. Zone 7 is governed by an elected seven-member board of directors who, with the passage of Assembly Bill (AB) 1125 in 2003, have full authority and autonomy to govern matters solely affecting Zone 7, independent of the Alameda County Board of Supervisors who govern the other nine zones of the ACFCWCD.

As one of the 29 state water contractors, Zone 7 is the water wholesaler for the Tri-Valley Area (Dublin, Pleasanton, and Livermore; also known as the Livermore-Amador Valley), as well as the area's flood control agency. Zone 7 imports surface water from the State Water Project (SWP) through the South Bay Aqueduct (SBA) for treatment, storage, and recharge. Zone 7 Water Agency supplies treated drinking water to four water retail agencies: Dublin San Ramon Services District, the City of Pleasanton, the City of Livermore, and California Water Service Company (see Figure 1-1). These water retailers deliver water to homes in their specific service areas. The four retail agencies have formed both the Committee of Valley Water Retailers (CoVWR) and, on the staff level, the Tri-Valley Water Retailers Group (TWRG). The water retailers, in turn, deliver water to homes in their specific service areas. Zone 7 also supplies untreated water for local industry and agriculture. Thus, Zone 7 indirectly serves water to an area with a population of approximately 190,000 people.

One of Zone 7 Water Agency's main missions is to serve as guardian of the groundwater in the Tri-Valley (Livermore, Dublin, Pleasanton) area; this role is recognized by the California Regional Water Quality Control Board—San Francisco Bay Region (RWQCB). For more than thirty years, Zone 7 has managed regional water supplies, including DWR Basin 2-10, in a complex, interrelated program that defines groundwater extraction goals for major regional pumpers. Zone 7 also operates local flood control and recharge facilities to optimize instream recharge. In addition, Zone 7 works closely with DWR, which

Figure 1-1



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ZONE 7 WATER AGENCY
100 NORTH CANYONS PKWY, LIVERMORE, CA 94551

DRAWN BY: Gerald Gates
DESIGNED BY: Gerald Gates
CHECKED BY:
APPROVED BY:

WATER RESOURCES
ZONE 7 SERVICE AREA BOUNDARY

SCALE: 1" = 6000'
DATE: 18 FEBRUARY 2002
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manages Lake Del Valle and dam to augment imported water supplies with local watershed runoff.

In summary, Zone 7 Water Agency imports surface water via the SWP's SBA, stores local runoff in Lake Del Valle, maintains flood control, maintains and operates recharge facilities in the area, manages both surface and groundwater supplies to maximize conjunctive use of the supplies, treats regional drinking water, and wholesales potable water to local retail water supply agencies, who in turn retail it to residents and other customers.

1.3 Zone 7's Groundwater Management

Zone 7 manages both surface and groundwater supplies to maximize conjunctive use and reliability of water supplies. Zone 7 has actively managed DWR Groundwater Basin Number 2-10, the Livermore-Amador Valley Groundwater Basin (underlying the Tri-Valley, as shown in DWR Bulletin118 Update 2003; see Figure 1-2, for more than 30 years. Groundwater typically makes up 20–25% of the water supplied by Zone 7 to its retail water supply agencies; in addition, two of the four retailers independently operate supply wells, so total groundwater makes up a higher percentage of the total regional supply (30%).

Over the 30 years of regional groundwater management, Zone 7 Water Agency has developed numerous interrelated programs to monitor, assess, and manage the basin. These programs are outlined below. The various existing programs and resolutions, taken together, satisfy the intent of the Groundwater Management Planning Act.

This document serves to clarify the various components of Zone 7's existing groundwater management and conjunctive use programs and policies, incorporate them by reference in this new Groundwater Management Plan, and to serve as the framework for discussing future changes to groundwater policy and procedures. Any such changes would be developed in a collaborative effort with the Tri-Valley Water Retailers Group (TWRG) and its member agencies.

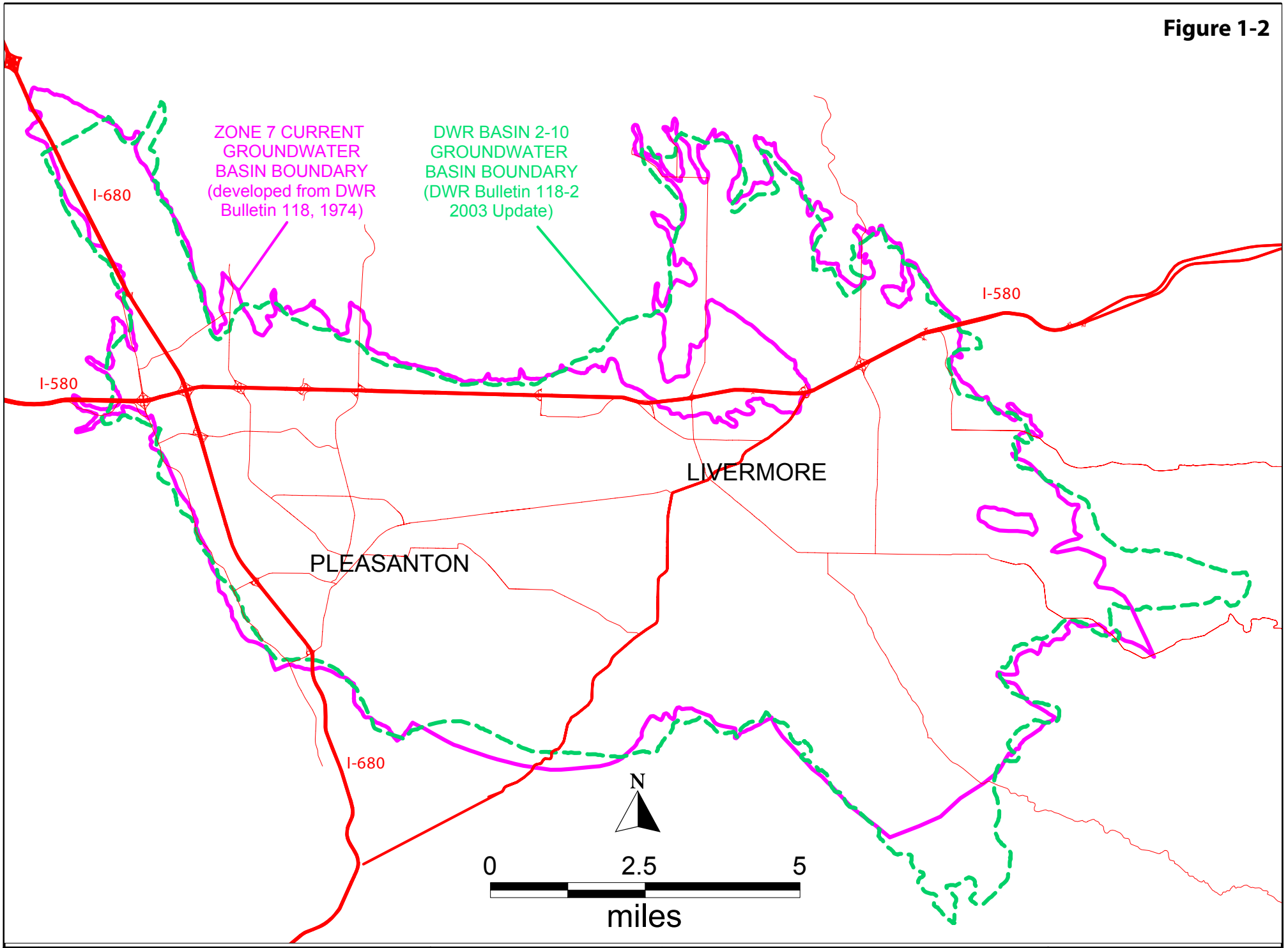
1.4 Groundwater Basin Management Objectives

The primary groundwater Basin Management Objectives (BMOs) of Zone 7 provide for the control and conservation of waters for beneficial future uses, the conjunctive use of groundwater and surface water, the importation of additional surface water, and the use of the groundwater basin to provide water storage for imported surface water used during drought periods.

The primary BMOs implemented by Zone 7 include:

- Monitoring and maintenance of groundwater levels through conjunctive use and management of regional water supplies:
  - maintain the balance between the combination of natural and artificial recharge and withdrawal,
  - maintain water levels high enough to provide emergency reserves adequate for worst credible drought and unplanned import outages,
  - store surface water supplies in the groundwater basin for use during emergencies and drought-related shortages,
  - allow for gravel mining by optimizing groundwater levels to allow for gravel mining while maintaining adequate reserves for municipal supply, and
  - prevent overdraft that would otherwise occur from too much pumping (maintain total pumping at or below sustainable/safe yields);
- Groundwater quality—monitoring and management, as well as tracking and addressing any degradation:
  - protect and enhance the quality of the groundwater,
  - halt degradation from salt buildup,
  - reduce flow of poor quality shallow groundwater into deep aquifers,
  - offset impacts of water recycling and wastewater disposal through integrated Salt Management Plan (SMP),
  - recharge with relatively low total dissolved solids (TDS)/hardness imported or storm/local surface water,
  - manage quality on a regional basis as measured at municipal wells (such as those operated by both the retail water agencies and Zone 7), protecting and improving groundwater quality within the Main Basin (as described in Chapter 3), and
  - minimize threats of groundwater pollution through groundwater protection;
- Monitor and prevent inelastic land surface subsidence from occurring as a result of groundwater withdrawals:
  - protect the storage capacity of aquifer,
  - maintain water levels above historic lows,
  - monitor and minimize any identified impacts of gravel mining on the upper aquifer by encouraging the implementation of mitigation measures by mining companies, and
  - monitor benchmark elevations and shift pumping to other wells if inelastic subsidence is detected;

Figure 1-2



ZONE 7 WATER AGENCY 100 N. CANYONS PARKWAY LIVERMORE CA 94551	DRAWN BY: Gerald Gates DESIGNED BY: Gerald Gates CHECKED BY: APPROVED BY:	WATER RESOURCES LIVERMORE-AMADOR VALLEY GROUNDWATER BASIN BOUNDARIES	SCALE: 1" = 2 MILES DATE: 22 JULY 2005 FILE NO.: MAPINFO\GEODATA\HYDROBASINS\DWR BASINS.WOR	

- Monitor and manage changes in surface flow and surface quality, especially as they affect groundwater levels or quality, or are caused by groundwater pumping in the basin:
  - Augment stream flow through artificial recharge releases to improve groundwater supply and quality, and
  - monitor and protect recharge capacity of local arroyos.

Following is a list of some key Zone 7 objectives and policies that are included in Appendix E and which articulate objectives to:

- provide sustainable water supply,
- provide sustainable water quality,
- minimize operational costs, and
- manage the groundwater basin.

In addition, Zone 7 has adopted policies related to protection of the groundwater basin through wastewater management. These include:

- Wastewater Management Policy (Resolution 1137), and
- prohibition against use of septic tanks for new development zoned for commercial or industrial use (Resolution 1165).

Zone 7's Board of Directors adopted the Water Quality Policy (Resolution 03-2494), as well as the Salt Management Plan, which includes:

- protect and enhance the quality of groundwater,
- offset current and future salt loading,
- maintain or improve groundwater mineral quality,
- provide more comparable delivered water quality to retailers, and
- utilize Water Operations Plan to achieve these goals.

Furthermore, Zone 7's Board of Directors adopted the Reliability Policy for Municipal and Industrial (M&I) Water Supplies (Resolution 04-2662), which includes:

- Meet 100% of its treated water customers' water supply needs in accordance with Zone 7's most current retail contracts.
- Provide sufficient treated water production capacity and infrastructure to meet at least 75% of Zone 7's maximum daily M&I contractual demands should any single one of Zone 7's major supply, production, or transmission facilities experience an extended, unplanned outage.

Zone 7 has also had a long-standing policy of managing the groundwater basin to maximize conjunctive use, reliability and storage opportunities. The "Statement on Zone 7 Groundwater Management" was adopted on August 19, 1987 and is incorporated herein by reference.

The Salt Management Plan (SMP), also incorporated herein by reference (see Executive Summary in Appendix D), was originally prepared in fulfillment of Master Water Recycling Permit Order No. 93-159 Provision D.1.c.ii and General Water Recycling Permit Order No. 96-011 Provision D.4. This document not only provides a comprehensive and effective approach for administering, regulating and encouraging water recycling in the Livermore-Amador Valley, it also provides guidance to the area's agencies in ways to address the historical trend of increasing TDS in the main groundwater basin. It was developed by Zone 7 staff and consultants in partnership with a technical advisory group (TAG) composed of local water retailers, and a Zone 7 citizens committee—the Groundwater Management Advisory Committee (GMAC). The RWQCB accepted the SMP in October 2004.

All Zone 7 objectives include a basic philosophy of working cooperatively with the public, the Tri-Valley Retail Group and the four individual retail agencies (Dublin San Ramon Services District [DSRSD], City of Livermore, City of Pleasanton and the California Water Service Company [CWS]). These objectives include:

- to develop information, policies, and procedures for the effective long-term management of the groundwater basin;
- to inform the public and relevant governmental agencies of the Zone's water supply potential and management policies and to solicit their input and cooperation; and
- to work cooperatively with the gravel mining industry to implement the Chain of Lakes reclamation plan.

1.5 Purpose of Zone 7's GMP

The purpose of Zone 7's Groundwater Management Plan (GMP) is to document and compile in one place all of Zone 7's existing programs and policies that together serve as the basis for successfully manageing groundwater resources and to develop a framework for considering future amendments to policy and procedures collaboratively with other basin users such as the Tri-Valley Retail Group and its member agencies, DSRSD, CWS, Pleasanton and Livermore. Simply put, this GMP revises the Statement on Zone 7 Groundwater Management, approved by the Zone 7 Board on August 19, 1987 (1987 GWMP), incorporating by reference all current related programs and policies at Zone 7 (especially the SMP) and demonstrating overall program compliance with the requirements of the Groundwater Management Planning Act.

1.6 GMP Components

In developing GMP components, the California Department of Water Resources (DWR) recognizes that the goal of a GMP is to ensure a long-term, sustainable, reliable, high-quality groundwater supply. Of the required and recommended

components found in Appendix C of DWR Bulletin 118 Update, this Zone 7 GMP includes:

1. Control of saline water intrusion—although saline water intrusion, per se, is not an issue for Zone 7 (which is inland from bays and oceans), the level of salt and minerals in the groundwater basin is of significant concern to Zone 7. The following address salt management and are incorporated by reference:

    a. Salt Management Plan, approved by the California Regional Water Quality Control Board—San Francisco Bay Region, October 2004;

    b. Salt Management Program Implementation Plan (Zone 7 Resolution 99-2068);

    c. Master Water Recycling Permit (RWQCB–San Francisco Bay Region Order No. 93-159); and

    d. Wastewater Management Plan for the Unsewered, Unincorporated Area of Alameda Creek Watershed Above Niles and Related Policies (Resolutions 1037 and 1165).

2. Identification and management of wellhead protection areas throughout the whole basin and specific requirements for recharge areas. The following address wellhead protection and are incorporated by reference:

    a. Drinking Water Source Assessment and Protection (DWSAP) Plan for each Zone 7 well, as submitted to the California Department of Health Services (DHS) Division of Drinking Water;

    b. groundwater protection ordinance program;

    c. commercial septic tank program and related policy statements and resolutions, including Wastewater Management Plan for the Unsewered, Unincorporated Area of Alameda Creek Watershed Above Niles (WMP);

    d. mapping of known contamination plumes;

    e. referral program which includes ongoing reviews and coordination of proposed development projects through lead local land use and planning agencies (cities and county);

    f. sub-watershed–based monitoring of all recharge areas; and

    g. protection of key stream recharge reaches (i.e., creek cleanups, monitoring, kiosks).

3. Regulation of the migration of contaminated groundwater. The following programs have been developed to address contaminated groundwater:

    a. toxic site surveillance program, assisting lead agencies in groundwater cleanup efforts;

    b. Geotracker program (active participation in development and public outreach elements with Lawrence Livermore National Laboratory (LLNL) and GMAC which assisted Zone 7 in its development of the SMP); and

c. Groundwater Ambient Monitoring and Assessment (GAMA) program (active participation in development and public outreach elements with LLNL and GMAC).

4. Administration of a well-abandonment and well-destruction program:

   a. Well Ordinance Administration (Well Ordinance adopted 1973, County Ordinance No. 73-68; similar City Well Ordinances)—addresses well construction/destruction, soil borings, etc., in compliance with state standards and additional requirements as required (case-by-case basis);

   b. agreements with cities to administer City Well Ordinances; and

   c. identification of abandoned wells through development review process and subsequent issuance of requests for destruction.

5. Mitigation of conditions of overdraft through management, recharge and development of alternate water supplies. The following program components outline Zone 7's approach that has been developed over the years to mitigate historical conditions of overdraft:

   a. initial contractual groundwater pumping quotas established to manage retailer pumping/extractions from the main groundwater basin;

   b. manage Zone 7 pumping so groundwater levels do not fall below historic lows to recover from overdraft conditions;

   c. regional recycled water programs (DSRSD–EBMUD Recycled Water Authority [DERWA] and Livermore);

   d. chain of lakes/mining fees;

   e. SWP imports to reduce demand on groundwater supplies;

   f. use of SWP imports in temporary off-stream recharge facility in the 1960's and '70's (Las Positas Recharge Pit);

   g. instream natural and artificial recharge, latter using imported SWP water, allowing conjunctive use and storage of imported supplies in groundwater basin;

   h. expansion of existing recharge facilities to include off-stream storage and recharge (future Chain of Lakes);

   i. management of local runoff (Lake Del Valle);

   j. water conservation;

   k. maintain records of basin-wide groundwater pumping to guard against future overdraft conditions; and

   l. maintain records of groundwater basin safe/sustainable yield.

6. Replenishment of groundwater extracted by water producers. The following conjunctive use program components outline Zone 7's approach that has been developed over the years to replenish historically depleted groundwater

supplies. Note that Zone 7 has artificially recharged approximately 66,000 acre-feet more than has been extracted:

a. SWP imports,

b. instream recharge (natural and artificial),

c. annual hydrologic inventory monitoring in preparation of following year's water supply operations planning documents,

d. chain of lakes recharge program (future), and

e. groundwater model.

7. Monitoring of groundwater levels and storage (Appendix A). The following monitoring program components outline Zone 7's approach that has been developed over the years to track regional groundwater levels and storage:

   a. continuous monitoring of water levels in certain key wells;

   b. monthly and semiannual well monitoring programs;

   c. climatological monitoring program;

   d. recharge monitoring (both natural and artificial);

   e. metering and data management of groundwater pumping quantities (municipal);

   f. groundwater model and associated databases; and

   g. complete hydrologic inventory of basin supply, use, and storage.

8. Facilitating conjunctive use operations. The following conjunctive use program components outline Zone 7's approach that has been developed over the years to replenish historically depleted groundwater supplies:

   a. multi-year conjunctive use modeling for sustainable water supply report;

   b. water supply forecast to determine possible conjunctive use opportunities;

   c. integrated water supply operations plan to coordinate conjunctive use;

   d. artificial stream recharge program;

   e. flood control management such as Lake del Valle flood releases;

   f. expanded artificial recharge with chain of lakes (future);

   g. reporting of water supply operations and planning;

   h. stream recharge management/reporting (e.g., monthly groundwater supply and utilization report)—using imported water delivered from SWP;

   i. annual water balance/hydrologic inventory/water levels;

   j. monitor new supply well plans through well permit program;

   k. meet with local agency planners periodically; and

l. attend/participate in: agricultural committee meetings, Fisheries Restoration workgroups, Watershed Advisory Committee meetings.

9. Identification of well construction policies:

   a. well ordinance administration—addresses well construction/destruction, soil borings, etc., in compliance with state standards and additional requirements as required (case-by-case basis).

10. Construction and operation by the local agency of groundwater contamination cleanup, recharge, storage, conservation, water recycling, and extraction projects. The following programs have been developed to address contaminated groundwater remediation projects:

    a. monitoring through GPP and providing input/guidance to lead agencies, as necessary;

    b. water quality policy for potable and nonpotable water (Resolution 03-2494);

    c. groundwater demineralization project;

    d. well master plan;

    e. construction of production wells;

    f. construction of aquifer storage and recovery (ASR) wells for evaluation and potential future use;

    g. construction and/or replacement of monitoring wells, as needed;

    h. chain of lakes recharge facilities (future);

    i. investigating feasibility of recycled water storage facility at future chain of lakes site.

11. Development of relationships with state and federal regulatory agencies:

    a. DHS (regulating drinking water and municipal wells);

    b. DWR (state water project contract administrator; contributed to Bulletin 118-2 “Evaluation of Livermore Valley Groundwater Basin 1974; cooperative Well Sampling; joint management of local CIMIS station to enhance weather monitoring and improve water conservation efforts);

    c. RWQCB (lead agency for National Pollutant Discharge Elimination System [NPDES], recycled water, and basin planning; close cooperation over toxic spill sites; contributed to basin plan development; review all NPDES monitoring reports for mining discharges and wastewater dischargers; cooperate in State Wide Ambient Monitoring Program [SWAMP]);

    d. Alameda County environmental health (local implementing agency [LIA] for leaking underground fuel tanks [LUFT] sites where groundwater has been affected; septic tank ordinance update);

e. California Department of Fish and Game (DFG)/U.S. Fish and Wildlife Service (USFWS)—for recharge program operations and facilities;

f. U.S. Army Corps of Engineers (Corps)—for diversion and creek projects; and

g. Lawrence Livermore National Laboratory (LLNL)—for site cleanups, groundwater monitoring and scientific/technical support.

12. Review of land use plans and coordination with land use planning agencies to assess activities that create a reasonable risk of groundwater contamination and to assess groundwater use:

    a. DWSAP for each of Zone 7's wells;

    b. ongoing reviews and coordination through local land use and planning agencies (cities and county);

    c. development referrals; site review reporting, mapping and analysis;

    d. California Environmental Quality Act (CEQA) reviews (for new projects and developments);

    e. well permit and commercial septic tank programs;

    f. tracking and quantifying all groundwater pumping; and

    g. mapping, monitoring, and analyzing all recycled water use.