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JOSHUA BASIN WATER DISTRICT

GROUND WATER MANAGEMENT PLAN

MARCH 1996

Prepared by

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SIGNATURE M E Messersmith

DATE 3-12-96

106-73
(73-GMP)
RDF/kdc

NOTICE OF PREPARATION OF A GROUND WATER MANAGEMENT PLAN

JOSHUA BASIN WATER DISTRICT

Notice is hereby given that the Joshua Basin Water District has completed a Ground Water Management Plan in accordance with California Water Code Section 10750 et seq., sometimes referred to as Assembly Bill 3030 or the Ground Water Management Planning Act. The Ground Water Management Plan, if adopted, is intended to enable the District to improve the management of ground water resources within its jurisdiction. Copies of the Ground Water Management Plan are on file at the District office, 61750 Chollita Road, Joshua Tree, CA, 92252 and can be obtained for the District's reproduction costs.

The District's Ground Water Management Plan consists of five sections, as well as an Executive Summary and an Appendix. The sections are entitled Introduction, Objectives, Existing Conditions, Anticipated Water Demands, and Management Plan. The Introduction describes the District's service area, existing and proposed water system, and authority. The Objectives section describes the District's ground water management objectives, which include greater water conservation, improved ground water monitoring and production, the prevention of water exports, the introduction of conjunctive use, and the protection of recharge areas. The Existing Conditions section describes the amount of ground water in storage, the safe yield of ground water bodies within the District's boundaries, the water quality characteristics of area ground water, and the quantity and distribution of ground water production within the District. The Anticipated Demands section describes projected growth rates and the potential level of future ground water production and overdraft. The Management Plan section describes the actions that the District may take to manage ground water resources within its boundaries; actions to be considered include water conservation efforts, improvements in ground water monitoring and production, preventing exports of water from the District's jurisdiction, introducing conjunctive use (using imported water and/or reclaimed water in conjunction with ground water), preventing and responding to ground water contamination, coordinating activities with planning agencies, and establishing a replenishment assessment regarding ground water producers.

At its meeting on April 3, 1996 at 7:00 PM, the Board of Directors of the Joshua Basin Water District will hold a public hearing regarding the Ground Water Management Plan, after which it may adopt the Plan. Any person wishing to either comment on or submit a protest regarding this matter must provide such comments or protest in writing to the District by the end of the April 3, 1996 public hearing.

DATED: MARCH 11, 1996

Robert D. Field
KRIEGER & STEWART
District Engineer
JOSHUA BASIN WATER DISTRICT

106-73
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EXECUTIVE SUMMARY

The following represents a summary of the Joshua Basin Water District's (District) Ground Water Management Plan (Plan). The summary's format approximates that of the general text, and emphasizes the most important elements of each section of the Plan.

I. INTRODUCTION

The District is presently reliant upon ground water for all of its water supply requirements. While the District overlies a significant supply of high quality ground water, the region's arid environment limits the extent to which the ground water supply is recharged. Since about 1980, the amount of ground water extracted has exceeded the estimated amount recharged, leading to a condition known as overdraft. Limited or short term overdraft is not considered a significant threat; however, excessive overdraft can result in significant problems, such as storage capacity reduction, ground water quality reductions, and even ground surface subsidence. The purpose of the Plan is to enable the District to manage the area's ground water supply in a manner that avoids excessive overdraft while simultaneously continuing to provide the present and future residents of its service area with a safe and reliable water supply.

The District is the primary water purveyor in the Joshua Tree area, and has an area of approximately 96 square miles within its boundaries. The District's service area population is relatively small and widely dispersed; recent estimates indicate that said service area has a population of about 12,000 people living in 4,400± dwelling units. The District's domestic water system consists of four water supply wells, ten booster pumping plants, 13 water storage reservoirs, and over 100 miles of transmission and distribution pipelines, and is divided into 11 separate pressure zones.

II. OBJECTIVES

In order to accomplish the overall objective of the Plan, the District has established a number of subsidiary objectives which, when realized, will enable the District to effectively manage ground water supplies. The subsidiary objectives include:

- Water Conservation - reducing water use on a per capita basis by encouraging District customers to keep water use to a minimum, and reducing water losses by replacing damaged or deteriorated pipelines.

- Ground Water Monitoring - keeping track of the quantity and quality of the area's ground water by measuring water levels and collecting water samples at a number of locations; requires the construction of monitoring wells and/or the use of existing wells (either active or inactive).

- Ground Water Production - modifying production practices by dispersing production facilities (i.e. wells) so that localized pumping depressions don't become too severe; includes restrictions on the construction of new wells by the District or any other entity.

- Water Export Prevention - prohibiting the export of water produced within the District to areas outside the District, unless such exports are expressly authorized by the District.

- Conjunctive Use - making use of surface water supplies that are newly available to the District in conjunction with ground water supplies; the surface water, which will be conveyed by the Morongo Basin Pipeline Project, will enable the District to balance the use of ground water and partially or completely eliminate the condition of overdraft.

- Recharge Area Production - preventing any type of land use that would have the potential to degrade water quality within the ground water basins through contamination; examples of potential threats include large unsewered high-density (more than two units per acré) residential developments, landfills, and improperly designed or operated manufacturing facilities.

III. EXISTING CONDITIONS

Ground water conditions in the Joshua Tree area have not been the subject of a significant Federal or State investigation for over two decades, and all descriptions of existing conditions are therefore based on old information. However, available information does allow conservative estimates to be made of the amount of ground water in storage, particularly with regard to two

specific areas, the Joshua Tree Subbasin and the Copper Mountain Subbasin. Said subbasins are the two that are currently used for essentially all water supplies in the Joshua Tree area.

According to said estimates, there is at least 300,000 acre feet (AF) of water in storage in the Joshua Tree Subbasin, and may be as much as 480,000 AF in storage. The Copper Mountain Subbasin is estimated to have about 67,000 AF in storage. Combined totals for the two subbasins therefore range between 367,000 AF and 587,000 AF.

For the purposes of ground water management, the District has identified the maximum level of cumulative overdraft as 10% of the minimum estimated amount of water in storage in the two subbasins, which is approximately 36,700 AF. As noted above, overdraft occurs when annual extractions exceed annual recharge. The estimated annual recharge of the Joshua Tree Subbasin is about 1,000 AF, and that of the Copper Mountain Subbasin is less than 800 AF.

Through the end of 1995, the Joshua Tree Subbasin had been overdrafted by at least 7,100 AF and overdraft is currently occurring therein at an estimated rate of about 600 AF/Yr. Production figures and estimated rates of overdraft are not currently available for the Copper Mountain Subbasin.

IV. ANTICIPATED WATER DEMANDS

Although it is difficult to accurately predict future water demands, the District anticipates that demands will at least remain constant, and may increase by rates as high as 4% per year, depending on the type and extent of future development. Depending on the actual extent of development, and assuming that production continues to be concentrated within the Joshua Tree Subbasin, the annual rate of overdraft would range between 590 AF and 3,240 AF in the year 2020; cumulative overdraft of said subbasin would then range between 22,440 AF and 50,970 AF through 2020.

V. MANAGEMENT PLAN

The District's Management Plan consists of evaluating and (potentially) adopting a number of management activities, including water conservation measures, ground water monitoring, ground water production standards, water export prevention, conjunctive use, ground water

contamination prevention/response, planning agency coordination, and a replenishment assessment. Each is described briefly below:

- Water Conservation - potential measures include educational pamphlets, construction of a demonstration garden, a toilet and shower head retrofit program, and continuation of the District's pipeline replacement program.

- Ground Water Monitoring - potential elements include using existing wells (both active and inactive) for monitoring water levels and quality, constructing dedicated monitoring wells, and preparing a monitoring map that would give a visual representation of current and past conditions.

- Ground Water Production - potential components include expanding District production into additional areas (particularly the Copper Mountain Subbasin) and adopting ordinances requiring that any new production well constructed by an entity be located at least 1/2 mile from any existing well (to prevent excessive localized pumping depressions).

- Water Export Prevention - potential actions consist of adopting ordinances and regulations requiring District authorization of any water export from within its boundaries, and of using any available method (e.g. legislative initiatives, litigation) to resist proposed exports.

- Conjunctive Use - potential sources would include State Water Project water imported through the Morongo Basin Pipeline Project and used for either direct water service (following treatment) and/or artificial recharge, and reclaimed water used for irrigation and industrial purposes.

- Ground Water Contamination Prevention/Response - potential measures would include adopting and enforcing well construction and abandonment standards, protecting recharge areas from potential sources of contamination, monitoring (through the ground water monitoring system) for contamination, and responding rapidly and actively to any actual or threatened contamination.

- Planning Agency Coordination - potential actions would include establishing close working relationships with planning agency personnel (San Bernardino County and U.S. Bureau of Land Management and reviewing all development proposals to ensure that they do not represent a threat to ground water quantity or quality.

- Replenishment Assessment - potential action consists of establishing an assessment that would be levied against all ground water producers; the assessment, which would be based on a unit charge for each AF produced, would have to be approved by voters, and revenues would be used to fund the Plan's management activities.

SECTION I

SECTION I
INTRODUCTION

As the primary extractor and purveyor of water in the Joshua Tree area of San Bernardino County, the Joshua Basin Water District (District), a public agency, has the greatest responsibility for managing the area's limited water supply. In order to effectively and efficiently accomplish the management of water supplies, the District has prepared this Ground Water Management Plan, which includes background information regarding ground water supply and historic water use within the District's service area, as well as measures which will enable the District and area residents to make maximum use of the limited available resources. The Ground Water Management Plan is intended to protect ground water quantity and quality from threats related to both excessive use and contaminant introduction.

Ground water management plans are a relatively recent development, having been authorized in 1992 pursuant to California Assembly Bill 3030 (AB 3030) which was authored by Assemblyman Jim Costa. AB 3030 was added to the California Water Code as Section 10750 (§10750) et seq. and lists 12 specific components that may be included in a ground water management plan. Copies of AB 3030 and §10750 et seq. are included as Appendix A.

The District has long been reliant upon ground water as its sole source of water supply for serving the needs of its customers. As explained in Section III, the District's service area overlies a large supply of high quality ground water; however, the region's arid environment limits the extent to which the ground water basin is recharged. In recent years, the annual quantity of water extracted from the ground water basin has exceeded the estimated amount of recharge, leading to a condition known as ground water overdraft. Although limited overdraft is not considered a significant threat to ground water availability or quality, long term and/or excessive overdraft can lead to significant problems, including ground surface subsidence, aquifer compaction, storage reduction, and reduced water quality. Overdraft also leads to greater depth to ground water, thus resulting in increased ground water production costs and related water service rate increases. A properly structured and implemented Ground Water Management Plan will enable the District to avoid the numerous problems associated with ground water overdraft, and will also help prevent ground water contamination by protecting ground water recharge areas.

The Ground Water Management Plan places an emphasis on reducing ground water extractions by encouraging the implementation of conservation measures, monitoring ground water conditions (both quantity and quality) to ensure that any problems therein are identified as early as possible, promoting interaction between the District and local planning entities in encouraging responsible patterns of

development, and making the most efficient possible use of existing supplies. The Ground Water Management Plan also addresses the use of newly available supplies of surface water that will soon be imported by the District via the recently completed Morongo Basin Pipeline Project. In addition, the Ground Water Management Plan includes provisions for limiting or eliminating ground water contamination by preventing pollution of ground water recharge areas and by ensuring that wells don't become conduits for contaminants. The latter measure includes implementing well construction and abandonment procedures which will prevent the inadvertent introduction of contaminants to ground water through improperly constructed or abandoned wells.

The following sections explain the District's ground water management objectives, existing conditions within the two ground water subbasins that lie within the District's boundaries, future water supply demands that the District anticipates, and details regarding the various ground water management activities that the District intends to implement. The information is supported by tables and figures which further illustrate existing conditions and the District's objectives and proposed management activities.

Once the various management activities that the District decides upon are initiated, the Ground Water Management Plan will become an ongoing Ground Water Management Program which will provide for long-term management of ground water resources. The Program will be constantly evolving in response to newly discovered opportunities, problems, solutions, and legislation; and, considering the importance of ground water to the Joshua Tree area, it will be in effect through the foreseeable future.

A. SERVICE AREA

The District's boundaries incorporate an area of approximately 96 square miles located near the southerly edge of Southern California's upper Mojave Desert region (see Figure I-1, the Vicinity Map). The District's service area includes a number of small unincorporated communities, all of which are within the County of San Bernardino. The current resident population of the District's service area is estimated to be approximately 12,000 people residing in about 4,400 dwelling units.

The environment within the District's boundaries is typical of that of the upper Mojave Desert. Temperature extremes vary between lows below 20°F during winter months to highs in excess of 110°F during summer months. Rainfall averages approximately five inches per year, with

most precipitation occurring between November and April; in addition, short duration, high intensity thunder showers occur periodically during late spring and summer months.

Development within the District's boundaries is sporadic and primarily residential, although the community of Joshua Tree has experienced a moderate level of commercial and light industrial development. Most of the area within the District's boundaries is undeveloped, and many of the area's residents must access their homes via graded dirt roads rather than improved streets.

B. WATER SYSTEM

In order to serve its widely dispersed customers, the District has constructed an expansive water supply, storage, and distribution system. The District's system currently includes four water supply wells, ten booster pumping plants, 13 water storage reservoirs, and over 100 miles of water transmission and distribution pipelines. The District currently has about 4,250 service connections, of which 3,650 are active and 600 inactive. The widely varying elevations within the District's service area have resulted in the creation of 11 separate pressure zones, an unusual number of zones for a water purveyor of the District's size.

The District's current water well production capacity is approximately 5,000 gallons per minute (gpm), which is sufficient to meet existing peak service area demands. The District's ten booster pumping plants are equipped with 23 pumping units which vary widely in capacity; the largest pumping unit can pump up to 1,025 gallons per minute (gpm), while the smallest pumping unit pumps 130 gpm. Finally, the District's current water storage capacity is approximately 5.25 million gallons (MG), which increases periodically as the District replaces small bolted steel reservoirs with larger welded steel reservoirs or adds new reservoirs to enhance its system's capabilities. The dimensions and capacities of each of the District's existing supply, boosting, and storage facilities are reflected on Table I-1.

To ensure that its customers continue to receive water service of the highest standards, the District is engaged in an ongoing program designed to upgrade its facilities in accordance with current water system standards. Each fiscal year the District identifies existing facilities that are in need of augmentation or replacement; for instance, the District has long had an annual pipeline replacement program through which it abandons undersized or dilapidated pipelines and replaces them with new pipelines that both improve service and reduce water losses from leaks.

In addition, the District is in the midst of planning a significant extension of its water system to enable it to serve the residents of the Copper Mountain Mesa area, which is not currently served by a domestic water system. Facilities to be constructed include a 0.25 MG reservoir, a 300 gpm booster pumping station, and approximately 302,000 lineal feet (L.F.) of transmission and distribution pipeline. In addition, the District's existing D1-1 Booster Pumping Plant will be modified to serve portions of the new service area. Completion of the proposed facilities will provide a safe and reliable domestic water supply to residents of an area that has never had such service, and which currently relies upon small private wells or water delivered by truck.

C. AUTHORITY

The District was organized in accordance with State of California County Water District Law (Water Code Section 30000 et seq.) for the purpose of providing domestic water supplies. The District is empowered to manage ground water resources and to construct, operate, maintain, repair, and replace water system facilities as needed to provide water service in compliance with applicable standards and regulations. The District routinely constructs new facilities, maintains them, and replaces them as necessary to maintain adequate, reliable, and safe water service to its customers.

The District's Ground Water Management Plan is authorized pursuant to Water Code §10750 et seq., which states in part that "...this part [§10570 et seq.] applies to all ground water basins in the state". Ground water basins are defined [§10752(b)] as "...any basin identified in the department's [California Department of Water Resources] Bulletin No. 118, dated September 1975 [Bulletin 118-75], and any amendments to that bulletin..."; the Copper Mountain Valley Ground Water Basin, which the District overlies and from which it produces all of its ground water, is identified on Page 85 of Bulletin 118-75. The Copper Mountain Valley Ground Water Basin is part of the area within the Colorado Desert Hydrologic Study.

D. ABBREVIATIONS AND DEFINITIONS

Since the District's Ground Water Management Plan incorporates a number of abbreviations and terms which may be unfamiliar, the following explanations are set forth for the reader's convenience.

1. Abbreviations

a.	AF	Acre Foot or Feet
b.	AF/Yr	Acre Feet per Year
c.	CDHS	Department of Health Services (California)
d.	CDWR	Department of Water Resources (California)
e.	gpm	Gallons Per Minute
f.	LF	Linear Foot or Feet
g.	MG	Million Gallons
h.	MWD	Metropolitan Water District of Southern California
i.	RWQCB	Regional Water Quality Control Board(s) (California)
j.	SWRCB	State Water Resources Control Board (California)
k.	SWTR	Surface Water Treatment Regulations
l.	TDS	Total Dissolved Solids
m.	ULF	Ultra Low Flow
n.	U.S. BLM	United States Bureau of Land Management
o.	U.S. EPA	United States Environmental Protection Agency
p.	USGS	United States Geological Survey
q.	VOC	Volatile Organic Constituent

2. Definitions

a. Acre Foot

When discussing water quantities, an acre foot is the quantity of water required to cover one acre (43,560 square feet) to a depth of one foot. An acre foot contains 43,560 cubic feet, or 325,850 gallons, of water.

b. Artificial Ground Water Recharge (also Artificial Recharge)

The intentional use of imported water or reclaimed water to recharge/replenish ground water supplies. Artificial ground water recharge is usually accomplished by the construction of either infiltration/percolation basins or injection wells; the former accomplish recharge by allowing water to infiltrate

and percolate to ground water, while the latter directly inject water into the ground water body. Artificial recharge is depicted on Figure I-3.

c. Basin Safe Yield (also Safe Yield)

The quantity of water that can be extracted from a ground water basin/subbasin that does not exceed average net annual recharge and thus does not lead to depletion of ground water in storage. For example, if a ground water subbasin's average net annual recharge is 1,000 acre feet per year, that subbasin's maximum safe yield is 1,000 acre feet per year. Exceeding safe yield over the long term leads to ground water overdraft.

d. Conjunctive Water Use (also Conjunctive Use)

The use of two or more water sources in conjunction with each other. Generally, conjunctive use consists of the use of ground water supplies together with surface water supplies, the latter consisting of either local water (i.e. from streams or lakes), imported water, or reclaimed water. Conjunctive use can take many forms; for instance, ground water can be used for domestic supply at the same time that reclaimed water is used for irrigation purposes. The intent of conjunctive use is to ensure balanced use (thereby maintaining ground water levels) over the long term, with surface water supplies used during periods of increased precipitation, and ground water supplies used during periods of limited precipitation (e.g. critically dry or drought years).

e. Consumptive Water Use/Nonconsumptive Water Return (also Consumptive Use/Nonconsumptive Return)

Consumptive water use is that portion of each unit of water that is actually used by the consuming organism (e.g. animal or plant). The portion that is unused and is returned to the ground water body is referred to as nonconsumptive water return. Consumptive use is the water that is subsequently carried away (usually in the atmosphere) following mechanisms such as evapotranspiration and evaporation. Both are usually expressed as a percentage, and represent an estimate only. For example, if 1,000 gallons of water were applied to turf in an

area with 60% consumptive use and 40% nonconsumptive return, 600 gallons would be considered consumed and therefore unavailable for ground water recharge, while the remaining 400 gallons would be considered recharge to the ground water body.

f. Ground Water Basin (also Basin)

An underground water body that is confined by various types of impermeable geologic structures, such as significant upthrusts of subterranean bedrock (known as barriers) or mountain ranges. The District's boundaries overlie portions of four separate ground water basins, the Warren Valley Basin, the Means Valley Basin, the Deadman Valley Basin, and the Copper Mountain Valley Basin (see Figure I-2); however, the District produces water only from the Copper Mountain Valley Basin.

g. Ground Water Overdraft (also Overdraft)

A phenomenon that results from producing more water from a ground water basin/subbasin than is recharged (in net terms) over the long term. For example, producing 1,500 acre feet per year from a basin (e.g. Joshua Tree Subbasin) that is only recharged with 1,000 acre feet per year results in annual ground water overdraft (hereafter referred to as overdraft) of 500 acre feet. Ground water overdraft is also considered to be ground water mining.

h. Ground Water Subbasin (also Subbasin)

A subdivision of the larger Ground Water Basin, often delineated by major fault lines. The District currently produces water from the Joshua Tree Subbasin of the Copper Mountain Valley Basin; said Subbasin is separated from the other two subbasins of the Copper Mountain Valley Basin, the Giant Rock Subbasin and the Coyote Lake/Copper Mountain Subbasin, by the Pinto Mountain fault (see Figure I-2).

i. Imported Water

Water that is brought into an area from an external source. One of the primary sources of imported water in Southern California is the State Water Project, which conveys water to the region from Northern California through the California Aqueduct; said Aqueduct consists of storage reservoirs, generating stations, pumping stations, canals, and pipelines.

j. In-Lieu Ground Water Recharge (also In-Lieu Recharge)

A method for decreasing the rate of ground water extractions. In-lieu ground water recharge (hereafter referred to as in-lieu recharge) consists of substituting other sources of water supply (such as imported water or reclaimed water) for ground water.

k. Natural Ground Water Outflow (also Natural Outflow)

The process by which ground water basins/subbasins are naturally depleted. Generally, natural ground water outflow (hereafter referred to as natural outflow) consists of seepage from one basin to an adjacent basin, the latter of which has a lower water level. Natural outflow also occurs when ground water reaches ground surface and evaporates, a common phenomena at dry lake beds in California deserts.

l. Natural Ground Water Recharge (also Natural Recharge)

The process by which ground water supplies are naturally replenished. Natural ground water recharge (hereafter referred to as natural recharge) consists of water infiltrating the ground surface and percolating to ground water. There are several sources of natural recharge, such as precipitation, rivers, and lakes. Natural recharge is depicted on Figure I-3.

m. Pumping Depression

A localized reduction in ground water levels that results from ground water extraction. A pumping depression is depicted on Figure I-4.

n. Reclaimed Water

Treated water that is then filtered and disinfected (to remove disease-causing organisms such as bacteria, viruses, *cryptosporidium*, and *giardia lamblia*) to an extent that allows it to be used for any purpose other than domestic consumption, such as irrigation of food crops, golf courses, or greenbelts.

o. Safe Yield

See Section I.D.2.c, Basin Safe Yield, above.

p. Specific Yield

That portion of the water bearing geologic structure (referred to as the saturated zone) of a ground water basin or subbasin that consists of extractable water; usually expressed as a percentage. For example, if the saturated zone of a ground water subbasin consists of 1,000,000 acre feet of saturated geologic deposits (e.g. sands, gravels, boulders) and the estimated specific yield is 15%, the quantity of extractable ground water is estimated to be 150,000 acre feet (1,000,000 x .15 = 150,000). It should be noted that specific yield is always expressed as an average (since geologic conditions can vary considerably within basins and subbasins), and represents an estimate only.

TABLE I-1

JOSHUA BASIN WATER DISTRICT
EXISTING WATER SUPPLY, BOOSTING, AND STORAGE FACILITIES

I. WELL PUMPING PLANTS

WELL NO.	DEPTH (FEET)	DIAMETER (INCHES)	HORSEPOWER	PUMPING CAPACITY (GPM)
2	500	12	75	480
10	704	16	150	1,240
11	740	16	300 – 400 *	1,200 – 2,000 ±
14	740	20	450	2,000

* WELL 11 IS EQUIPPED WITH A NATURAL GAS ENGINE DRIVE; ALL OTHERS EQUIPPED WITH ELECTRIC MOTOR DRIVES.

II. BOOSTER PUMPING PLANTS

BOOSTER NO.	NO. OF PUMPING UNITS	HORSEPOWER EACH UNIT	PUMPING CAPACITY EACH UNIT (GPM)
C-1	3	40	550 ±
	1	75	1,025 ±
D1-1	2	15	130 ±
D2-1	2	25	450
E-1	2	20	265
F-2	1	30	350
	1	20	250
G-1	2	20	270
H-1	2	15	180
I-1	2	20	285
J-1	2	15	180
NAVAJO TRAIL	2	20	150
HYDROPNEUMATIC SYSTEM	1	75	1,000

III. STORAGE RESERVOIRS

RESERVOIR NO.	TYPE	HEIGHT (FEET)	DIAMETER (FEET)	STORAGE CAPACITY (GALLONS)
A-1	WELDED STEEL	24	44	250,000
PARK RESERVOIR	WELDED STEEL	16	54	250,000
C-1	WELDED STEEL	24	98	1,250,000
C-2	BOLTED STEEL	24	55	400,000
C-3	WELDED STEEL	24	56	400,000
D2-1	WELDED STEEL	24	63	500,000
D1-1	WELDED STEEL	24	56	400,000
E-1	WELDED STEEL	40	36	300,000
F-2	WELDED STEEL	24	56	400,000
G-1	WELDED STEEL	32	37	250,000
H-1	WELDED STEEL	24	40	200,000
I-1	WELDED STEEL	32	30	150,000
J-1	WELDED STEEL	24	63	500,000

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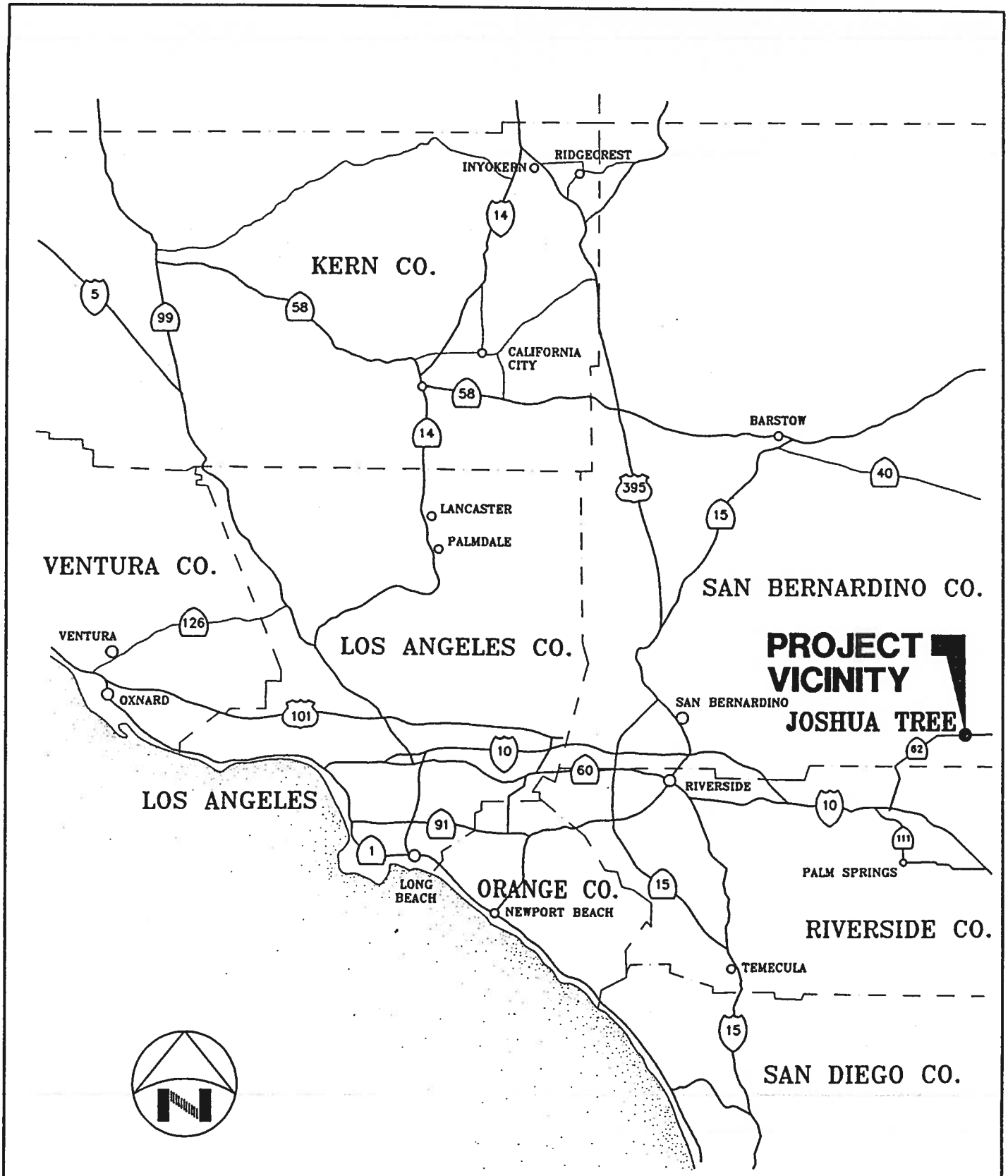

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JOSHUA BASIN WATER DISTRICT

GROUND WATER MANAGEMENT PLAN

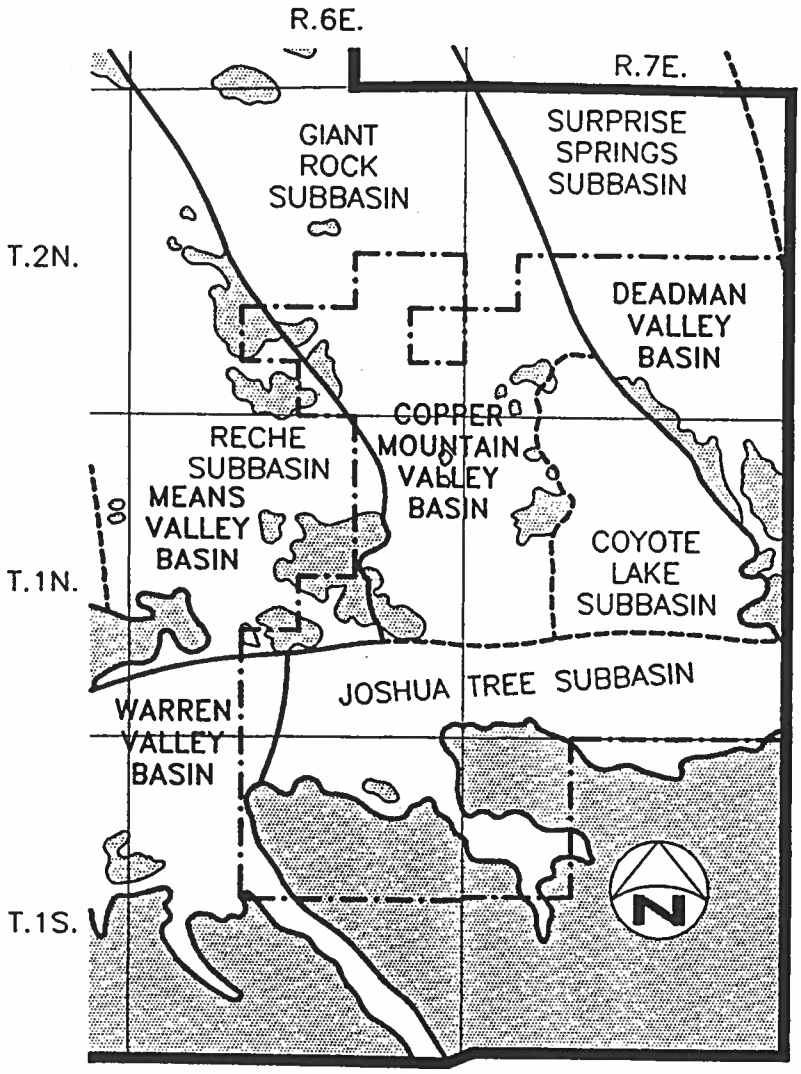
VICINITY MAP

FIGURE

I-1

SCALE: N.T.S. DATE: 4/21/95 DRAWN BY: TMW CHECKED BY: MEM W.O.: 106-73

73F6



0 4 MILES

LEGEND

- UNCONSOLIDATED DEPOSITS
- CONSOLIDATED DEPOSITS
- GROUND WATER BASIN BOUNDARY
- GROUND WATER SUBBASIN BOUNDARY
- DISTRICT BOUNDARY
- MOJAVE WATER AGENCY BOUNDARY

NOTE:

THE COYOTE LAKE SUBBASIN IS REFERRED TO LOCALLY AS THE THE COPPER MOUNTAIN SUBBASIN.

BASE MAP SOURCE:

UNITED STATES GEOLOGICAL SURVEY

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JOSHUA BASIN WATER DISTRICT

GROUND WATER MANAGEMENT PLAN

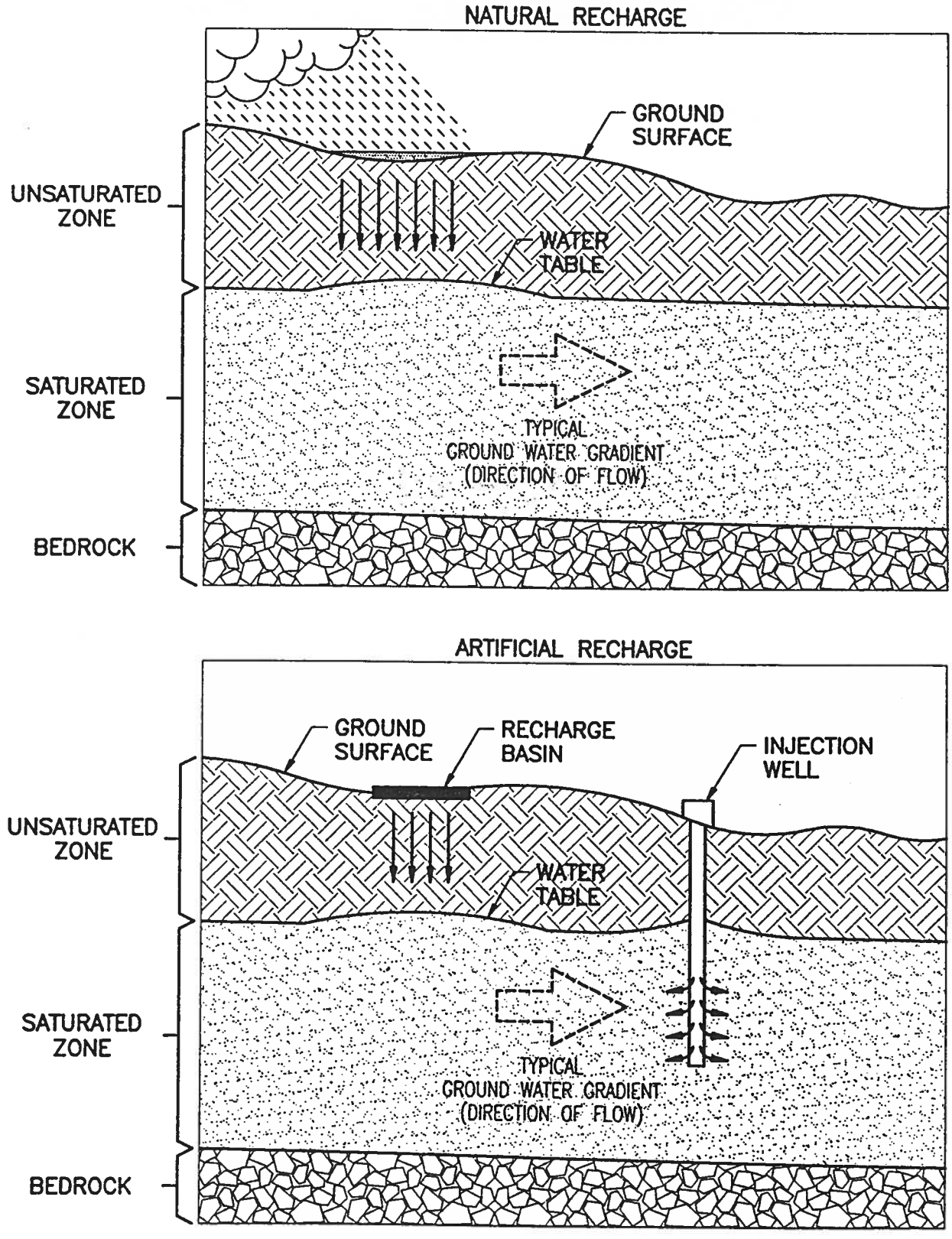
DISTRICT BOUNDARY MAP

(SUPERIMPOSED ON GROUND WATER SUBBASIN MAP)

FIGURE I-2

SCALE: 1"=20,000'± DATE: 1/24/95 DRAWN BY: SFM CHECKED BY: RDF W.O.: 106-73

73F2



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JOSHUA BASIN WATER DISTRICT

GROUND WATER MANAGEMENT PLAN

NATURAL AND ARTIFICIAL GROUND WATER RECHARGE

FIGURE

I-3

SCALE: N.T.S. DATE: 1/24/95 DRAWN BY: SFM CHECKED BY: RDF W.O.: 106-73

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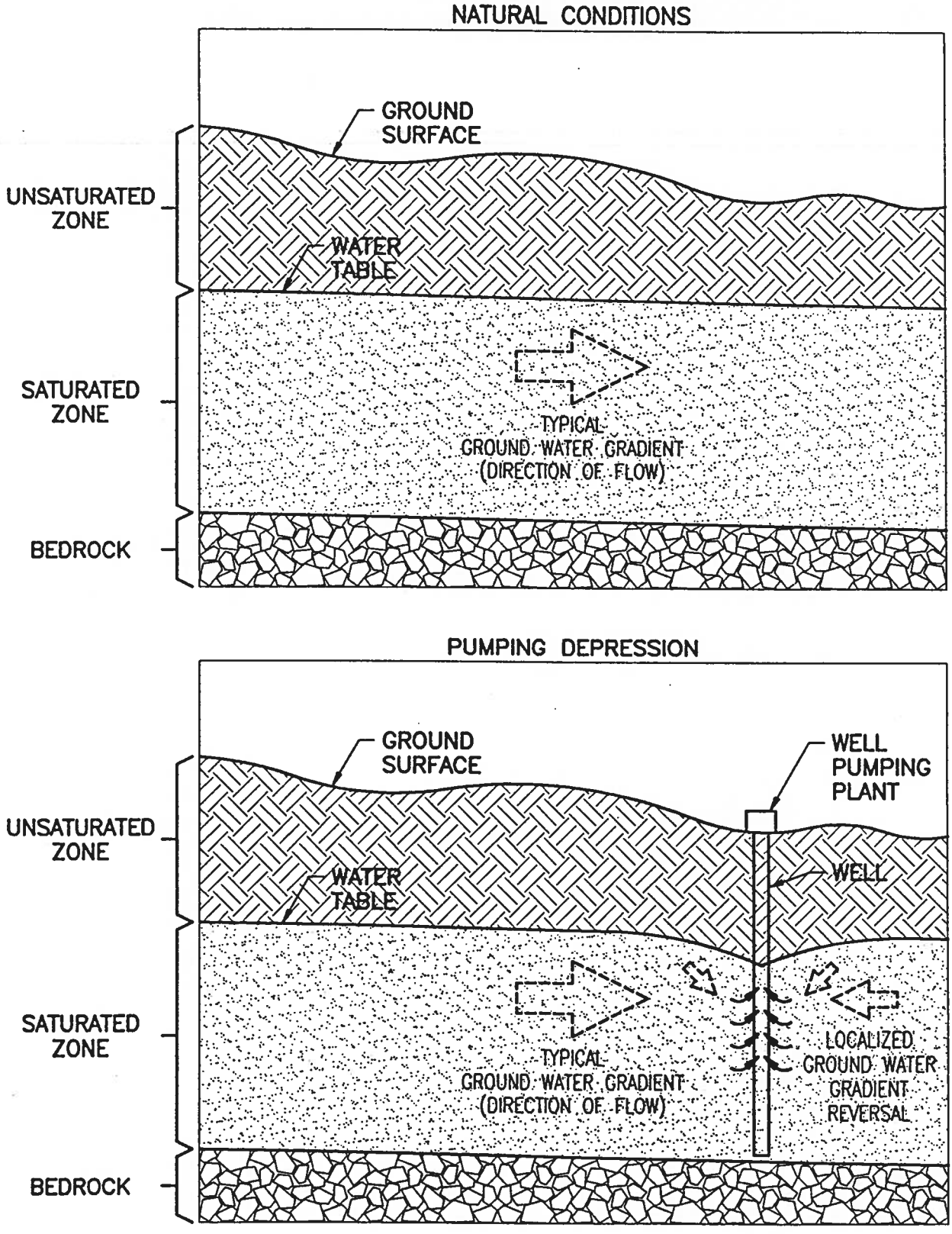

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JOSHUA BASIN WATER DISTRICT

GROUND WATER MANAGEMENT PLAN

GROUND WATER CONDITIONS AND EFFECTS OF PUMPING DEPRESSIONS

FIGURE

I-4

SCALE: N.T.S. DATE: 1/24/95 DRAWN BY: SFM CHECKED BY: RDF W.O.: 106-73

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SECTION II

SECTION II
OBJECTIVES

The overall objective of the District's Ground Water Management Plan is to protect ground water quantity and quality from degradation resulting from excessive ground water production and/or ground water contamination, and to limit or eliminate ground water overdraft. As a result of the arid, desert environment of the District's service area, the only locally available source of water supply is ground water.

There are portions of four ground water basins within the District's boundaries, the Copper Mountain Valley Basin, the Warren Valley Basin, the Means Valley Basin, and the Deadman Valley Basin, most of which are further divided into smaller subbasins. The objectives of the Ground Water Management Plan apply to and will affect all ground water resources within the District's boundaries.

In order to realize the Ground Water Management Plan's overall objective, there are a number of subsidiary objectives which must first be accomplished. These subsidiary objectives are water conservation, ground water monitoring, improved ground water production, water export prevention, and recharge area protection, and are addressed individually in the following paragraphs.

A. WATER CONSERVATION

Conservation of available resources is an extremely effective management tool, and is therefore a key objective of the District's Ground Water Management Plan. Conserving water dramatically increases the number of options available for management and simultaneously allows considerable cost savings; production facilities that might otherwise have to be constructed in the near term can be deferred or delayed, monitoring facility requirements are reduced, and some threats to ground water quality are mitigated.

A number of measures are available to encourage water conservation. Conservation education, which represents an inexpensive and effective means of encouraging water consumers to keep water use to a minimum, is an essential and fundamental element of any conservation program. Reducing leakage from damaged or deteriorated pipelines by engaging in an ongoing pipeline replacement program is another significant water conservation measure; although the District has been replacing existing pipelines for some time, the continuation of such efforts remains an important objective of the Ground Water Management Plan.

Replacing existing shower heads and toilets with ultra low flow (ULF) facilities can result in significant savings; although it is not always possible to compel people to replace their existing facilities, certain government-sponsored retrofit programs which provide funding are available periodically. Modifying and modernizing irrigation systems using new technology can also result in significant savings; for instance, new controllers and drip systems can increase irrigation efficiency. The District will evaluate various conservation measures as part of its Ground Water Management Plan and implement those that it finds economically, institutionally, and technically feasible.

B. GROUND WATER MONITORING

Monitoring the condition of the ground water body is one of the most important elements in effective ground water management, as it allows the managing agency to track the quantity and quality of the resource and thereby determine the relative success of management efforts. Monitoring also enables the managing agency to identify potential problems caused by various factors, such as excessive production from a localized area or contamination of a particular portion of the ground water body. As such, the implementation of an extensive ground water monitoring program is one of the main objectives of the Ground Water Management Plan.

There are a number of means available to provide for effective monitoring of ground water quantity and quality. The preferred method is to construct numerous dedicated monitoring wells in strategic locations to measure water levels and obtain quality samples; however, such a system is extremely costly, and not always necessary in the absence of an identified problem. A compromise method is to use information collected from existing production wells, and supplement same with dedicated monitoring wells in areas of particular concern.

C. GROUND WATER PRODUCTION

One of the most effective means for managing ground water resources is the adoption of ground water production practices that encourage the most efficient possible use of available supplies. As a result, one of the primary objectives of the Ground Water Management Plan is to improve the District's ground water production efficiency through the modification of existing production practices.

It has long been recognized that concentrating ground water production within a specific area tends to result in localized pumping depressions in ground water tables; these depressions result from the relatively rapid localized movement of ground water that is caused by significant ground water extractions, as opposed to the generally slow movement of ground water within water-bearing geologic structures. A typical pumping depression is shown on Figure I-3 in the preceding section.

Pumping depressions can lead to a number of potentially damaging effects, such as ground water gradient reversals and even (in extreme cases) localized ground surface subsidence. In order to avoid such circumstances, it is necessary to spread ground water production over a relatively wide area, and to limit production in any specific area to within reasonable limits. In addition, it is advisable to vary the locations and timing of ground water production to allow local recovery of ground water levels. The District may consider adopting an ordinance and regulations that prohibits the construction of wells in close proximity to existing wells, or that might otherwise cause significant pumping depressions.

The most reliable method of avoiding severe pumping depressions is to space water supply wells sufficiently distant from one another to cause ground water levels to decline uniformly; as a result, one of the primary objectives of the Ground Water Management Plan is to continue to locate new District wells at least 1/2 mile apart (older wells are as close as 1/8 mile to one another, while newer wells are at least 1/2 mile apart). In addition, the District may eventually construct at least one new water supply well within the limits of the Copper Mountain Subbasin, since the District does not currently produce any ground water from said subbasin.

D. WATER EXPORT PREVENTION

Since the District overlies and produces its ground water supplies from an overdrafted ground water body (the Joshua Tree Subbasin), it must do its utmost to ensure that ground water is not produced therefrom for export to areas outside its boundaries unless they are authorized by the District. Export of water from the District's boundaries would have a number of adverse effects, the most important of which would be the increased level of production (and overdraft) and reduced nonconsumptive water return. Owing to its high quality, ground water from the Joshua Tree Subbasin might be attractive to neighboring water purveyors as a supplemental supply; and owing to the potentially significant problems that would likely result from the export

of ground water therefrom, preventing exports that have not been authorized by the District is one of the most important objectives of the Plan.

E. CONJUNCTIVE USE

Conjunctive use essentially consists of making simultaneous use of two or more sources of water supply. Aside from ground water, sources of supply can include naturally occurring surface water (e.g. streams or lakes), imported surface water, and/or reclaimed water. Since the District has not had a source of surface water available to it until quite recently, conjunctive use has been impossible. However, as noted in Section I, the recently completed Morongo Basin Pipeline Project will soon enable the District to actively engage in conjunctive use of multiple water supply sources, and taking advantage of the benefits available from conjunctive use is one of the Ground Water Management Plan's prime objectives. In addition, the District may eventually determine that water reclamation is a cost effective means of ensuring that ground water quality is protected against degradation caused by discharges from septic systems while simultaneously making maximum use of available sources of supply.

The District has essentially two options for making use of its supply of imported water; it can either use the water for artificial recharge, or it can treat the water to comply with Federal and State drinking water standards and distribute the water directly to its customers. The latter alternative would require the construction of a surface water treatment facility incorporating filtration and disinfection equipment meeting the requirements of the State of California's recently adopted Surface Water Treatment Regulations (SWTR), which are highly specific and restrictive. An additional (although considerably more expensive) alternative would be to use the water for both purposes. The District is in the process of evaluating the available alternatives, and recently received a report regarding same; said report, which is entitled Imported Water Delivery Investigation (Memorandum Report), is attached as Appendix B.

In the event that the District decides to activate its latent powers to provide sewage service to portions of its service area and to construct the necessary wastewater collection and treatment facilities, it will help to accomplish two important goals of the Ground Water Management Plan: ground water quality will be protected, and reliance on ground water will be reduced. Although reclaimed water can only be used for irrigation or industrial supply purposes, its availability would have the potential to significantly reduce ground water production requirements for those purposes, and would also give the District even greater flexibility with regard to managing water

resources within its service area. The greatest drawback associated with water reclamation is cost; sewage collection, wastewater treatment, and reclaimed water distribution facilities are expensive, and a means for affordably financing same would have to be found. Nevertheless, the benefits of water reclamation are so significant that the matter warrants additional evaluation.

F. RECHARGE AREA PROTECTION

Although the District has not experienced any significant difficulties with ground water contamination to date, the prevention of same is of vital importance, especially in an area which relies upon ground water as its principal source of domestic water supply. In addition, since ground water contamination often takes many years to be detected, there is at least some chance that localized ground water contamination may have already occurred. Protection of recharge areas can take several forms, most of which are related to land use. Well construction and destruction practices or standards also have a direct effect, since wells can constitute (depending upon construction methods) a direct conduit from the surface to ground water. Protecting recharge areas and ensuring that wells are properly constructed and destroyed therefore become vital objectives of the District's Ground Water Management Plan, and the District has the authority to adopt ordinances and regulations that protect recharge areas within its jurisdiction.

It is important to ensure that all land uses within areas that either lie within tributary drainage areas or overlie significant quantities of ground water are compatible with maintaining ground water quality and preventing contamination. This goal is best accomplished by communicating with local and regional planning agencies, particularly the County of San Bernardino and the U.S. Bureau of Land Management (U.S. BLM). Examples of developments which can threaten ground water quality include certain types of manufacturing facilities (particularly those that use large quantities of heavy metals, solvents, or petroleum products), gasoline service stations, car washes, and landfills. Excessive or poorly planned residential development can also cause a number of ill effects, particularly if they lead to increased levels of ground water overdraft or result in significant increases in wastewater disposal through septic systems. Table II-1 indicates some of the numerous potential sources of ground water contamination.

Since confining the construction of the aforementioned or similar developments to areas that do not either lie within tributary drainage areas or overlie ground water bodies would be unnecessarily restrictive, and might actually prevent their construction altogether, standards of

construction for said facilities have been established that can considerably reduce the potential for ground water contamination when implemented. In addition, it may be possible to limit the construction of potentially threatening facilities to areas that are less likely to allow contaminants to infiltrate and percolate to ground water. Likewise, standards have been established for the construction and destruction of wells that dramatically reduce or eliminate the possibility that poorly constructed or abandoned wells will result in the direct transmission of contaminants to the ground water body. Said standards are included in California Department of Water Resources (CDWR) Bulletins 74-81 and 74-90, Water Well Standards: State of California.

TABLE II-1

JOSHUA BASIN WATER DISTRICT
COMMON SOURCES OF GROUND WATER CONTAMINATION*

Category	Contaminant Source	
Agricultural	Animal burial areas	Irrigation sites
	Animal feedlots	Manure spreading areas/pits
	Fertilizer storage/use	Pesticide storage/use
Commercial	Airports	Hotels/motels
	Animal shelters	Jewelry/metal plating
	Auto repair shops	Laundromats
	Boatyards	Medical institutions, including hospitals
	Construction areas	Paint shops
	Car washes	Photography establishments
	Cemeteries	Railroad tracks and yards
	Convention/meeting facilities (public and private)	Research laboratories
	Dry cleaners	Scrap and junkyards
	Gas stations	Storage tanks
	Golf courses	
Industrial	Asphalt and concrete plants	Petroleum production/ storage
	Chemical manufacture/ storage	Pipelines
	Electronics manufacture	Septage lagoons and sludge
	Electroplaters	Storage tanks
	Foundries/metal fabricators	Toxic and hazardous spills
	Machine/metal working shops	Wells (operating/abandoned)
	Mining and mine drainage	Wood preserving facilities
Residential	Apartment/condominium developments	Septic systems, cesspools
	Fuel oil	Sewer lines
	Furniture stripping/ refinishing	Swimming pools (chemicals)
	Household hazardous products	Unsewered high-density (i.e. more than two units per acre) residential development
	Household lawns	
Other	Hazardous waste landfills	Recycling/reduction facilities
	Municipal incinerators	Road deicing operations
	Municipal landfills	Road maintenance depots
	Municipal sewer lines	Storm water drains/basins
	Open burning sites	Transfer stations

*Source: U.S. Environmental Protection Agency

SECTION III

SECTION III
EXISTING CONDITIONS

Ground water conditions in the Joshua Tree/Yucca Valley area have not been the subject of a significant Federal or State investigation for at least two decades, which gives rise to a number of difficulties when attempting to describe ground water conditions. For instance, ground water conditions are constantly fluctuating as a result of changes in water use and disposal practices, changes in geologic structure (such as those caused by major earthquakes), and variations in rates of precipitation. In addition, numerous technological advances have been made in the last 20 years which have significantly increased the accuracy of ground water related research by engineers and scientists, principally hydrogeologists.

Nevertheless, the District does have a reasonably good grasp of the characteristics of the area's ground water, most of which are described in the District's 1972 General Plan and 1984 General Plan Update. The information included below is largely extracted from those two documents, supplemented by ground water production records maintained by the District. The descriptions of the area's two primary ground water subbasins are considered to be reasonably accurate, perhaps erring on the conservative side (as is appropriate given the area's reliance on ground water). The ground water production records for the District are quite accurate, and represent virtually all ground water extraction within the District's boundaries; although a number of private wells exist in the area, their production is minimal by comparison.

A. GROUND WATER IN STORAGE

Ground water subdivisions of the Joshua Tree area are shown on Figure III-1; it should be noted that the Copper Mountain Subbasin is referred to in Federal and State government reports as the Coyote Lake Subbasin. All of the water supply wells presently maintained by the District are located within the Joshua Tree Subbasin, and ground water production within the remainder of the District is currently limited to a number of private water supply wells. Estimates of the quantity of water in storage, and of each subbasin's storage capacity, are based upon information derived from well driller's logs for various wells in each subbasin and upon characteristics noted in investigations conducted by the United States Geological Survey (USGS) and CDWR.

Using data from District water supply wells located in the westerly portion (Wells 1, 2, 3, and 10) and central portion (Wells 11 and 14) of the Joshua Tree Subbasin, as well as a USGS test

bore (No. 1N/7E 34B1) located in the easterly portion of said subbasin, cross sections based on USGS topographic maps were prepared throughout the subbasin. No wells have been drilled to bedrock within the Joshua Tree Subbasin, and the bedrock profile has therefore never been mapped. Using well depth data and the best possible estimates of bedrock depth, along with reasonable estimates of average surface area (6,000± acres) and average elevation (2,290± feet) of the underground water body, an estimate of the gross volume of water bearing deposits has been established for the purpose of estimating a reasonable minimum-maximum storage volume range. The estimated minimum bedrock depth for the subbasin is based upon the elevation of the bottom of existing major water supply wells; the estimated maximum bedrock depth is derived by establishing said depth approximately 200 feet below the bottom of the same wells. The volume range thus defined is believed to provide a reasonable basis for minimum-maximum estimates of water in storage. Please note that there is no reliable data currently available to firmly establish the maximum volume estimate.

Based upon the estimate of the range of total volume of saturated water bearing deposits within the Joshua Tree Subbasin (2,000,000 AF estimated minimum, 3,200,000 AF estimated maximum), an estimate of the range of total theoretically available water in storage was prepared by applying an estimate of the average "specific yield". Specific yield is that percentage of the total volume of the saturated water bearing deposits which is water that can theoretically be extracted by pumping. Based upon information available from operational experience with existing District water supply wells, the District estimates that the specific yield of the Joshua Tree Subbasin is approximately 15%; although this estimate may be somewhat conservative, it is appropriate for management purposes. For the sake of comparison, the USGS estimates that the Joshua Tree Subbasin has an average specific yield of approximately 15%.

Applying the 15% specific yield estimate to the 2,000,000 AF minimum estimate of gross saturated water bearing deposit volume within the Joshua Tree Subbasin results in an estimated minimum of 300,000 AF of water in storage. Applying the 15% average specific yield estimate to the 3,200,000 AF maximum estimate of gross saturated water bearing deposit volume within said subbasin results in an estimated maximum of 480,000 AF of water in storage.

Performing similar evaluations of the Copper Mountain Subbasin results in an estimated total volume of water bearing deposits of about 670,000 AF; because far less well data is available regarding said Subbasin, only one estimate (rather than minimum and maximum estimates) has

been derived from the available information. Based on production information gathered from existing private water supply wells, the District estimates that the Copper Mountain Subbasin has a specific yield of approximately 10%; for the sake of comparison, the USGS estimates that the Copper Mountain Subbasin has an average specific yield of about 14%. Applying the 10% average specific yield estimate to the 670,000 AF estimate of gross saturated water bearing volume within said subbasin results in an estimated quantity of 67,000 AF of water in storage.

Combining the estimates of water in storage in the Joshua Tree Subbasin and the Copper Mountain Subbasin results in an estimated total storage for both subbasins of between 367,000 AF and 547,000 AF. Future hydrogeological and geophysical studies will undoubtedly dictate revisions of these storage estimates; however, the minimum storage estimates are considered somewhat conservative, and more definitive studies are likely to determine that a greater quantity of water is in storage.

The following is the conclusion to the section on water in storage from the District's 1972 General Plan:

> In the case of the Joshua Tree area, it would seem prudent to attempt to operate within an overdraft limitation of 10% to 20% of the calculated volume in storage. With prudent management, the Joshua Tree Subbasin can be overdrafted, within reasonable limits, to provide a water supply for the area as it develops, but it should not be assumed that the overdrafting can be continued indefinitely. This generation must plan for an imported water supply in order that future generations may have an adequate supply to meet their needs. Careful attention should be given to all of the factors which govern the proper conjunctive use of local supplies and imported supplies.

Based on the estimates of total water in storage noted above, the District can establish a reasonable cumulative overdraft limit of 10%, or approximately 37,000 AF, for the two subbasins. Since the resources of both subbasins are readily available to the District for supply purposes, the cumulative overdraft limit can be applied to said subbasins jointly, and they can be managed and utilized in unison to provide the greatest level of benefit available given the area's arid nature.

Estimates of total water in storage and reasonable cumulative overdraft limits, while a useful benchmark for water supply planning, must be used with a great deal of caution. As a matter of necessity, the assumptions used in arriving at the estimated volume in storage and overdraft limits are very approximate. In addition, it is not reasonable to assume that all of the ground water in storage can actually be withdrawn. As mentioned previously, significant ground water overdraft has the potential to result in several adverse impacts: ground surface subsidence may occur; ground water quality can be degraded; shallow wells may go dry; and pump lifts for all wells are increased, requiring pumping unit modifications and increased energy use to enable continued ground water production.

B. BASIN SAFE YIELD AND OVERDRAFT

The term "basin safe yield" (hereafter referred to as safe yield) refers to the amount of water which can be pumped from a ground water basin or subbasin annually over a long period of time without depleting the total volume of ground water in storage. A ground water basin's maximum annual safe yield is therefore approximately equivalent to that basin's annual net ground water recharge (natural recharge less natural outflow).

Table III-1 shows the volume of water produced by the District from the Joshua Tree and Copper Mountain Subbasins for the period 1967 through 1994; it should be noted that the District has not produced any ground water from the Copper Mountain Subbasin since 1982, when it ceased operation of its only water supply well (District Well 12) producing water therefrom. Production by others is considered negligible during this period, over which the District produced a total of about 30,023 AF, an average of about 1,070 AF/Yr; production over the last five years (1990-1994) has averaged about 1,540 AF/Yr. As indicated by Table III-1, the District's ground water production dropped somewhat starting in 1990, which coincides with the start of a significant downturn in California's economy. The reduced water demands from 1990 through 1994 likely represent reduced construction and commercial deliveries, as well as reduced deliveries to recreational and seasonal residents.

A certain percentage of the ground water produced and delivered returns to the subbasin through infiltration and percolation of irrigation water and percolation of septic tank discharges. It is impossible to accurately determine the quantities of water (referred to as nonconsumptive return) which return to the underlying ground water subbasin, but it may be as little as 25% to 35% within the District's service area. In addition, ground water recharge resulting from

nonconsumptive return has the potential to gradually degrade water quality; for example, septic tank return flows contain elevated concentrations of total dissolved solids (TDS) and septic tank and fertilized irrigation water return flows have increased nitrate concentrations, which in turn increase TDS and nitrate concentrations in ground water.

As noted in the District's 1972 General Plan, the net annual recharge/safe yield of the Joshua Tree and Copper Mountain Subbasins is difficult to determine using available information; to date, neither subbasin has been investigated sufficiently to allow an accurate determination to be made. Such investigations require testing and monitoring resources that are beyond the District's capability, and are generally conducted by the USGS, CDWR, the U.S. Bureau of Reclamation, or large well funded water districts. Nevertheless, conservative and very approximate estimates of net annual recharge can be derived from available information. The estimates included in the 1972 General Plan (and repeated in the 1984 General Plan) indicate that the maximum safe yield of the Joshua Tree Subbasin is less than 1,000 AF/Yr, and that of the Copper Mountain Subbasin is less than 800 AF/Yr.

Table III-2 indicates the estimated past and current rate of overdraft of the Joshua Tree Subbasin, as well as the estimated cumulative overdraft of said subbasin. It should again be noted that the District's production is currently concentrated entirely within the Joshua Tree Subbasin, primarily as a result of development patterns and resultant distribution of demands. The amounts of annual and cumulative overdraft of the Joshua Tree Subbasin are based upon the aforementioned estimate of its safe yield, rounded to 1,000 AF/Yr.

C. GROUND WATER QUALITY

Ground water produced from the Joshua Tree and Copper Mountain Subbasins is of relatively high quality, and meets all Federal and State standards for drinking water. As shown by Table III-3, a comparison of water quality analyses for samples collected from District wells with Federal and State standards indicates that the District's wells produce water that is superior by a considerable margin when compared with virtually all standards.

In addition, it appears that the amount of ground water overdraft experienced in the Joshua Tree Subbasin to date has not had a significant adverse impact upon water quality; water quality analyses from 1983 are essentially the same as those from 1993. The consistently high quality of the ground water extracted should not be taken as an indication that continued overdraft is

advisable, but rather that ground water therein appears to be of almost uniformly high quality; the greatest threat to said water quality would come from either significant and excessive ground water overdraft, or contamination by various introduced constituents such as petroleum products, heavy metals, or volatile organic constituents (VOCs).

D. GROUND WATER PRODUCTION

The District currently produces ground water from four water supply wells, all of which extract water from the Joshua Tree Subbasin. Two of the wells, Well 2 and Well 10, are located in the westerly portion of the District and produce only limited quantities of water. The District's other two active wells, Well 11 and Well 14, are located in the central portion of the District and produce the bulk of the water served within the District's service area. Production figures for each of the four active water supply wells from 1983 through 1994 are noted on Table III-4.

As a brief review of Table III-4 will indicate, the District has produced and served ground water primarily from Well 14 since 1986. Like the remainder of the wells in the District's system, Well 14 produces water of relatively high quality. In addition, Well 14 is the District's most modern and efficient production facility.

There are some concerns associated with the District's reliance on Well 14, most of which relate to concentrating such a significant percentage (over 70% in 1994, down from a high of over 98% in 1991) of the District's production at one site. Of particular concern is the likelihood that a pumping depression is being created around Well 14, giving rise to potential problems such as progressively increased pump lifts and energy requirements for said well. In addition, large pumping depressions can (under certain circumstances) result in localized ground water gradient reversals which in turn can draw contaminants into the portion of the aquifer from which the water supply well is producing water; a typical pumping depression and local ground water gradient reversal is depicted on Figure I-3 (see Section I). As noted in Section II.C. above, the District intends to introduce production practices which will reduce its reliance upon Well 14 and allow local ground water levels to recover periodically.

TABLE III–1

JOSHUA BASIN WATER DISTRICT
GROUNDWATER PRODUCTION
1967–1994

YEAR	TOTAL WATER PRODUCED (AF)
1967	370
1968	416
1969	409
1970	424
1971	493
1972	607
1973	655
1974	703
1975	719
1976	788
1977	1,144
1978	900
1979	891
1980	1,054
1981	1,211
1982	1,126
1983	1,198
1984	1,325
1985	1,415
1986	1,500
1987	1,576
1988	1,652
1989	1,740
1990	1,616
1991	1,509
1992	1,488
1993	1,508
1994	1,586
TOTAL	30,023

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1/26/96

TABLE III–2

JOSHUA BASIN WATER DISTRICT
ESTIMATED JOSHUA TREE SUBBASIN OVERDRAFT
1980–1995 (IN AF)

YEAR	PRODUCTION	ANNUAL OVERDRAFT*	CUMULATIVE OVERDRAFT
1980	1,054	54	54
1981	1,211	211	265
1982	1,126	126	391
1983	1,198	198	589
1984	1,325	325	914
1985	1,415	415	1,329
1986	1,500	500	1,829
1987	1,576	576	2,405
1988	1,652	652	3,057
1989	1,740	740	3,797
1990	1,616	616	4,413
1991	1,509	509	4,922
1992	1,488	488	5,410
1993	1,508	508	5,918
1994	1,586	586	6,504
1995	1,590	590	7,094

* BASED ON NET ANNUAL RECHARGE/MAXIMUM SAFE YIELD ESTIMATE OF 1,000 AF/YR

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TABLE III-3

JOSHUA BASIN WATER DISTRICT
WATER QUALITY ANALYSES FOR DISTRICT PRODUCTION WELLS

CONSTITUENTS	MAXIMUM CONTAMINANT LEVELS MG/L OR AS NOTED			WELL 2			WELL 10			WELL 11			WELL 12*		WELL 14**
	RECOM-MENDED	UPPER	SHORT TERM	11/24/65	9/01/82	3/21/94	8/19/68	9/01/82	7/11/94	10/06/78	9/01/82	7/11/94	8/09/78	9/01/82	7/11/94
Total Hardness, CaCO3	N/A	N/A	N/A	80	69	55	54	84	52	51	58	52	48	59	56
Calcium, Ca	N/A	N/A	N/A	19	16	16	17	14	18	15	13	14	16	15	16
Magnesium, Mg	N/A	N/A	N/A	3	7	4	3	7	4	3	8	3	1	5	3
Sodium, Na	N/A	N/A	N/A	28	30	32	29	33	31	34	34	32	41	38	40
Potassium, K	N/A	N/A	N/A	1	2	2	2	2	2	3	2	2	5	2	2
Total Alkalinity, CaCO3	N/A	N/A	N/A	–	90	94	–	88	84	–	88	80	90	88	88
Hydroxide, OH	N/A	N/A	N/A	0	0	<4	–	0	0	0	0	1	0	0	<1
Carbonate, CO3	N/A	N/A	N/A	0	0	0	0	0	0	0	0	<1	0	0	<1
Bicarbonate, HCO3	N/A	N/A	N/A	113	110	115	116	107	103	110	107	98	110	107	107
Sulfate, SO4	250	500	600	8	9	11	6	12	14	11	9	13	23	21	22
Chloride, CL	250	500	600	14	12	10	12	16	12	11	14	13	11	11	17
Nitrate, NO3	N/A	N/A	45	8	11	10	7	14	11	17	14	14	15	11	12
Elect. Conductivity (Micromhos)	900	1,600	2,200	215	240	250	240	250	250	250	250	260	260	280	310
pH	N/A	N/A	N/A	7.5	8.2	8.1	7.3	8.0	8.1	7.5	8.0	8.1	8.0	8.1	8.2
Color	N/A	N/A	15 Units	0	<5	–	0	<5	–	0	<5	–	0	<5	–
Odor	N/A	N/A	3 Units	0	0	–	0	0	–	1	0	–	1	0	–
Turbidity	N/A	N/A	5 Units	0	0.25	–	0	0.5	–	0	0.15	–	0	0.10	–
Total Solids, TDS	500	1,000	1,500	178	150	142	198	155	139	160	145	140	150	160	164
Arsenic, As	N/A	N/A	<0.05	–	<0.01	–	–	<0.01	<0.002	–	<0.01	<0.002	0	<0.01	<0.02
Barium, Ba	N/A	N/A	1.	–	<0.5	–	–	<0.5	<0.1	–	<0.5	<0.1	0	<0.5	<0.1
Boron, B	N/A	N/A	N/A	–	–	–	–	–	–	0.3	–	–	–	–	–
Cadmium, Cd	N/A	N/A	0.01	–	<0.005	–	–	<0.005	<0.001	–	<0.005	<0.001	0	<0.005	<0.001
Chromium, Cr	N/A	N/A	0.05	–	<0.01	–	–	0.01	<0.01	–	0.02	<0.01	0.05	.04	<0.01
Copper, Cu	N/A	N/A	1.0	–	<0.01	–	–	<0.01	<0.05	–	<0.01	<0.01	0	<0.01	<0.05
Flouride, F	N/A	1.0	N/A	0.6	0.6	0.6	0.8	0.6	0.5	0.6	0.6	0.5	0.6	0.7	0.5
Iron, Fe	N/A	N/A	0.3	0.12	0.03	–	0.9	0.09	<0.1	0.12	0.02	<0.1	0.07	0.04	<0.1
Lead, Pb	N/A	N/A	0.05	–	<0.01	–	–	<0.01	<0.005	–	<0.01	<0.005	0	<0.01	<0.005
Manganese, Mn	N/A	N/A	0.05	0.0	<0.01	–	0	<0.01	<0.03	0	<0.01	<0.03	0	<0.01	<0.03
Mercury, Hg	N/A	N/A	0.002	–	<0.001	–	–	<0.001	<0.001	–	<0.001	<0.001	0	<0.001	<0.001
MBAS	N/A	N/A	0.5	–	<0.1	<0.02	–	<0.1	<0.02	–	<0.1	<0.02	–	<0.1	<0.02
Selenium, Se	N/A	N/A	0.01	–	<0.01	–	–	<0.01	<0.005	–	<0.01	<0.005	0	<0.01	<0.005
Silver, Ag	N/A	N/A	0.05	–	<0.01	–	–	<0.01	<0.01	–	<0.01	<0.01	0	<0.01	<0.01
Zinc, Zn	N/A	N/A	5.0	–	<0.01	–	–	<0.01	<0.05	–	<0.01	<0.05	0.01	<0.01	<0.05

* District Well No. 12 overlies the Coyote Lake/Copper Mountain Subbasin and is no longer in service.
** District Well No. 14 was not placed into operation until 1984.

TABLE III–4

JOSHUA BASIN WATER DISTRICT
GROUNDWATER PRODUCTION BY WELL
1983–1994

	GALLONS	ACRE FEET	PERCENTAGE
1983			
WELL 2	5,168,000	16	1.3
WELL 10	79,197,000	243	20.3
WELL 11	305,900,000	939	78.4
TOTALS	390,265,000	1,198	100.0
1984			
WELL 2	8,819,000	27	2.0
WELL 10	51,340,000	158	11.9
WELL 11	265,945,000	816	61.6
WELL 14	105,624,000	324	24.5
TOTALS	431,728,000	1,325	100.0
1985			
WELL 2	64,461,000	198	14.0
WELL 10	293,974,000	902	63.8
WELL 11	73,050,000	224	15.8
WELL 14	29,449,000	90	6.4
TOTALS	460,934,000	1,414	100.0
1986			
WELL 2	1,754,000	5	0.3
WELL 10	14,702,000	45	3.0
WELL 11	21,343,000	66	4.4
WELL 14	450,969,000	1,384	92.3
TOTALS	488,768,000	1,500	100.0
1987			
WELL 2	1,502,000	4	0.3
WELL 10	28,676,000	88	5.6
WELL 11	70,973,000	217	13.8
WELL 14	412,448,000	1,265	80.3
TOTALS	513,599,000	1,574	100.0

TABLE III–4 (Cont'd)

JOSHUA BASIN WATER DISTRICT
GROUNDWATER PRODUCTION BY WELL
1983–1994

	GALLONS	ACRE FEET	PERCENTAGE
1988			
WELL 2	2,548,000	8	0.5
WELL 10	19,633,000	60	3.6
WELL 11	26,833,000	82	5.0
WELL 14	489,188,000	1,502	90.9
TOTALS	538,202,000	1,652	100.0
1989			
WELL 2	1,034,000	3	0.2
WELL 10	6,120,000	19	1.1
WELL 11	3,682,000	11	0.6
WELL 14	556,244,000	1,707	98.1
TOTALS	567,080,000	1,740	100.0
1990			
WELL 2	807,000	2	0.1
WELL 10	9,796,000	30	1.9
WELL 11	5,104,000	16	1.0
WELL 14	510,649,000	1,567	97.0
TOTALS	526,356,000	1,615	100.0
1991			
WELL 2	,649,000	2	0.1
WELL 10	6,824,000	21	1.4
WELL 11	296,000	1	0.1
WELL 14	483,784,000	1,485	98.4
TOTALS	491,553,000	1,509	100.0
1992			
WELL 2	6,343,000	20	1.3
WELL 10	23,842,000	73	4.9
WELL 11	32,986,000	101	6.8
WELL 14	421,630,000	1,294	87.0
TOTALS	484,801,000	1,488	100.0

JOSHUA BASIN WATER DISTRICT
GROUNDWATER PRODUCTION BY WELL
1983–1994

	GALLONS	ACRE FEET	PERCENTAGE
1993			
WELL 2	7,301,000	22	1.5
WELL 10	36,129,000	111	7.4
WELL 11	102,216,000	314	20.8
WELL 14	345,871,000	1,061	70.3
TOTALS	491,517,000	1,508	100.0
1994			
WELL 2	24,775,000	76	4.8
WELL 10	62,522,000	192	12.1
WELL 11	67,214,000	206	13.0
WELL 14	362,386,000	1,112	70.1
TOTALS	516,897,000	1,586	100.0

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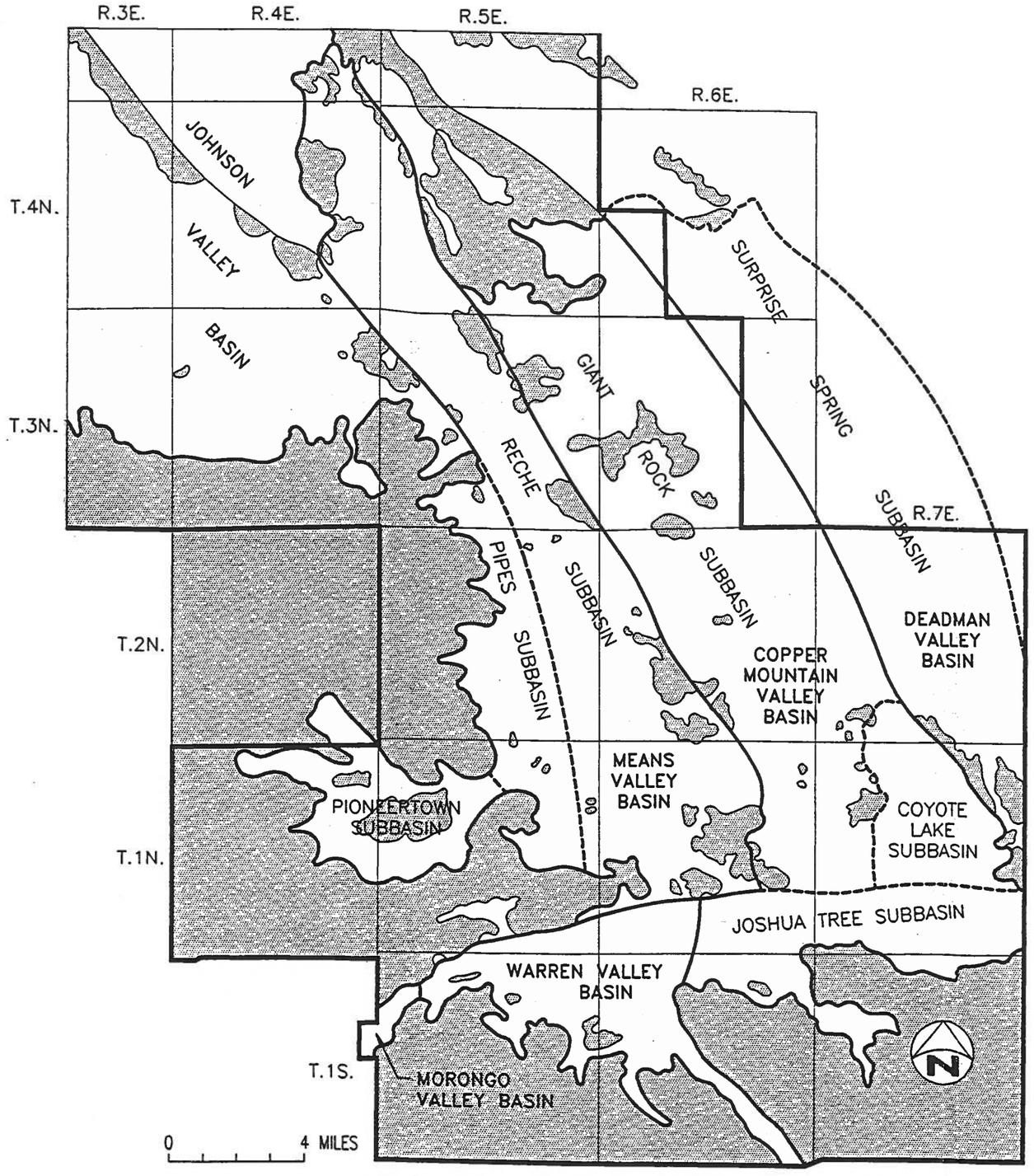


LEGEND

- UNCONSOLIDATED DEPOSITS
- CONSOLIDATED DEPOSITS
- GROUND WATER BASIN BOUNDARY
- GROUND WATER SUBBASIN BOUNDARY

NOTE:

THE COYOTE LAKE SUBBASIN IS REFERRED TO LOCALLY AS THE THE COPPER MOUNTAIN SUBBASIN.

BASE MAP SOURCE:

UNITED STATES GEOLOGICAL SURVEY

KRIEGER & STEWART INCORPORATED
3602 University Ave. • Riverside, CA. 92501 • 909-684-6900

JOSHUA BASIN WATER DISTRICT

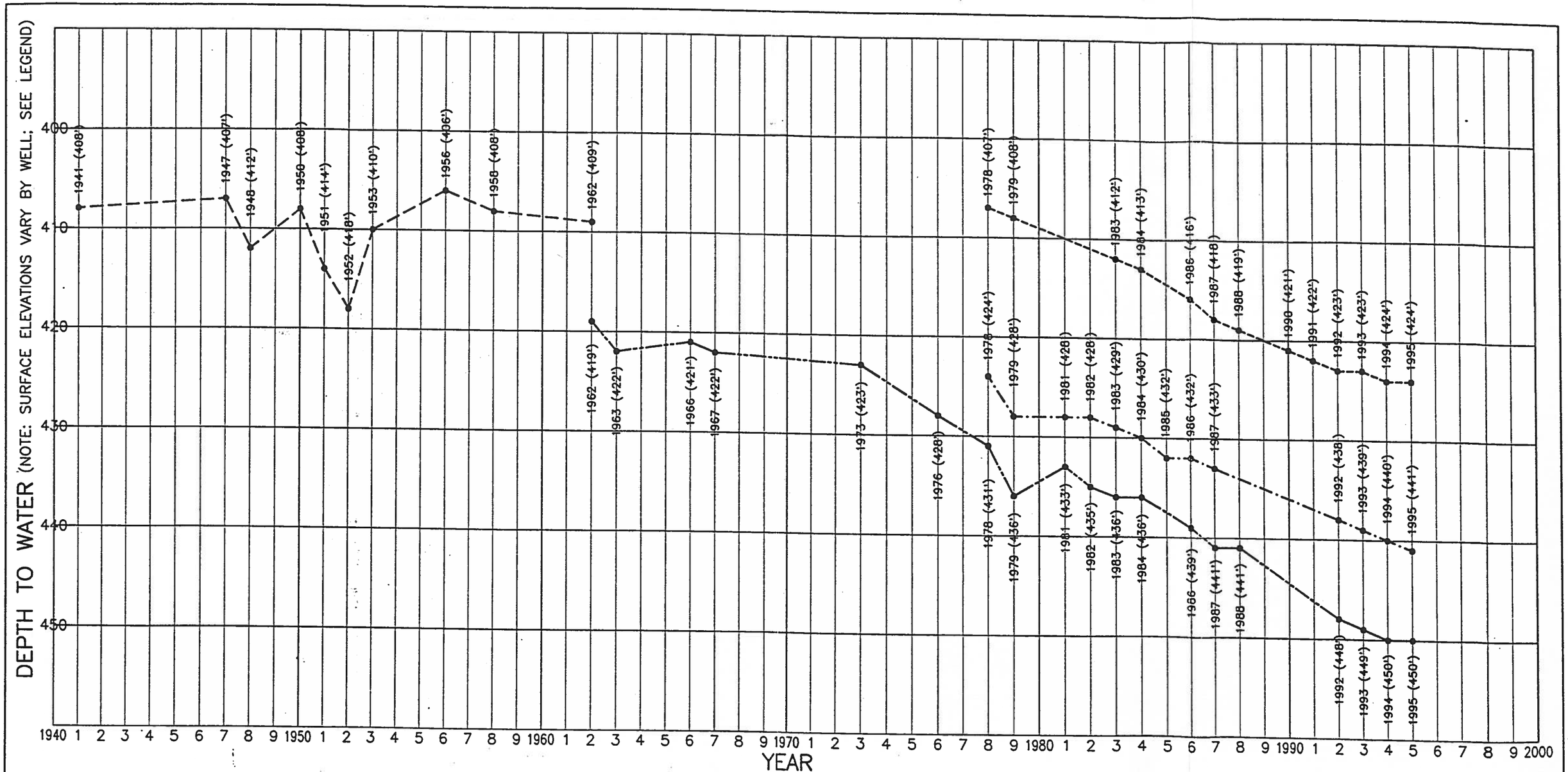
GROUND WATER MANAGEMENT PLAN

GROUND WATER BASIN AND SUBBASIN BOUNDARIES

FIGURE III-1

SCALE: 1"=20,000'± DATE: 1/24/95 DRAWN BY: SFM CHECKED BY: RDF W.O.: 106-73

73F1



LEGEND

——— DISTRICT WELL 1* (GROUND SURFACE ELEVATION=2,714')

——— DISTRICT WELL 2 (GROUND SURFACE ELEVATION=2,722')

—·—·— DISTRICT WELL 10 (GROUND SURFACE ELEVATION=2,713')

- - - - - - DISTRICT WELL 11 (GROUND SURFACE ELEVATION=2,698')

* DISTRICT WELL 1 REMOVED FROM SERVICE IN 1962.

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JOSHUA BASIN WATER DISTRICT

GROUND WATER MANAGEMENT PLAN

DEPTH TO WATER IN WELLS
LOCATED WITHIN SECTION 25, T.1N., R.6E., SBM

FIGURE III-2

73F7

SECTION IV

SECTION IV
ANTICIPATED WATER DEMANDS

Fluctuations in water requirements are linked to increases or decreases in population, the extent of commercial activity (including recreational uses), and the level of construction activity. Although recent trends within the District's boundaries have indicated limited increases in both population and water requirements, this phenomenon is considered an aberration related primarily to the recent economic recession, and growth is expected to resume at moderate rates in the near future.

A. PROJECTED GROWTH

For purposes of estimating future water requirements, the District anticipates an annual growth rate of between 0% and 4%. Please note that estimated growth rates and related water requirement projections are inherently ambiguous; the projections are considered somewhat conservative, and are meant to ensure that management planning is effective in protecting ground water resources.

As indicated on Tables IV-1 through IV-5, the annual water requirement within the District's service area is expected to increase to a level as high as 4,200 AF/Yr by the year 2020 given a 4% annual increase in population, or will continue to be at least 1,590 AF/Yr given no increase in the area's population. Production at this level in the absence of additional water supplies could result in significant and excessive overdraft, particularly if the District's ground water production continues to be concentrated within the Joshua Tree Subbasin.

B. GROUND WATER OVERDRAFT

Based on the information included in Section III regarding estimated ground water recharge, maximum safe yield, and annual water production, it becomes apparent that the Joshua Tree Subbasin has been in a state of light overdraft since about 1980. The extent of said overdraft, which is noted in Table III-2, is currently estimated to total about 7,100 AF, or about 19% of the recommended maximum allowable level of cumulative overdraft, which is approximately 37,000 AF. Overdraft is currently occurring at a rate of about 600 AF/Yr, or about 1.6% of the maximum allowable cumulative overdraft. As shown on Figure III-2, ground water levels measured at various District production wells have been declining steadily for a number of years; the decline has averaged about one foot per year since at least 1978.

California's economic recovery is expected to result in some additional demands in the area, which will only serve to exacerbate the problem. As shown on Table IV-5, overdraft could become as great as 3,200 AF/Yr by 2020 given a growth rate of about 4% per year. These estimates emphasize the urgency of adopting and implementing appropriate management actions at the earliest opportunity.

TABLE IV–1

JOSHUA BASIN WATER DISTRICT
ANTICIPATED WATER DEMANDS AND OVERDRAFT
(ASSUMING 0%/YR INCREASE)
1996–2020 (IN AF/YR)

YEAR	ANTICIPATED DEMANDS*	CUMULATIVE OVERDRAFT (1)**	% OF MAXIMUM CUMULATIVE OVERDRAFT (2)
1996	1,590	8,000	22
2000	1,590	10,000	27
2005	1,590	13,000	35
2010	1,590	16,000	43
2015	1,590	19,000	51
2020	1,590	22,000	59

* ROUNDED TO NEAREST 10 AF
** ROUNDED TO NEAREST 1,000 AF

NOTES:

1) ASSUMES CONTINUED CONCENTRATION OF PRODUCTION IN THE JOSHUA TREE SUBBASIN, AND THAT OVERDRAFT OCCURS THEREIN WHEN PRODUCTION EXCEEDS 1,000 AF/YR. BASED ON ESTIMATED CUMULATIVE OVERDRAFT OF 7,100 AF THROUGH 1995.

2) MAXIMUM RECOMMENDED CUMULATIVE OVERDRAFT FOR JOSHUA TREE SUBBASIN AND COPPER MOUNTAIN SUBBASIN COMBINED IS APPROXIMATELY 37,000 AF.

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TABLE IV–2

JOSHUA BASIN WATER DISTRICT
ANTICIPATED WATER DEMANDS AND OVERDRAFT
(ASSUMING 1%/YR INCREASE)
1996–2020 (IN AF/YR)

YEAR	ANTICIPATED DEMANDS*	CUMULATIVE OVERDRAFT (1)**	% OF MAXIMUM CUMULATIVE OVERDRAFT (2)
1996	1,610	8,000	22
2000	1,670	10,000	27
2005	1,760	14,000	38
2010	1,850	18,000	49
2015	1,940	22,000	59
2020	2,040	27,000	73

* ROUNDED TO NEAREST 10 AF
** ROUNDED TO NEAREST 1,000 AF

NOTES:

1) ASSUMES CONTINUED CONCENTRATION OF PRODUCTION IN THE JOSHUA TREE SUBBASIN, AND THAT OVERDRAFT OCCURS THEREIN WHEN PRODUCTION EXCEEDS 1,000 AF/YR. BASED ON ESTIMATED CUMULATIVE OVERDRAFT OF 7,100 AF THROUGH 1995.

2) MAXIMUM RECOMMENDED CUMULATIVE OVERDRAFT FOR JOSHUA TREE SUBBASIN AND COPPER MOUNTAIN SUBBASIN COMBINED IS APPROXIMATELY 37,000 AF.

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TABLE IV–3

JOSHUA BASIN WATER DISTRICT
ANTICIPATED WATER DEMANDS AND OVERDRAFT
(ASSUMING 2%/YR INCREASE)
1996–2020 (IN AF/YR)

YEAR	ANTICIPATED DEMANDS*	CUMULATIVE OVERDRAFT (1)**	% OF MAXIMUM CUMULATIVE OVERDRAFT (2)
1996	1,620	8,000	22
2000	1,760	11,000	30
2005	1,940	15,000	41
2010	2,140	20,000	54
2015	2,360	27,000	73
2020	2,610	34,000	92

* ROUNDED TO NEAREST 10 AF
** ROUNDED TO NEAREST 1,000 AF

NOTES:

1) ASSUMES CONTINUED CONCENTRATION OF PRODUCTION IN THE JOSHUA TREE SUBBASIN, AND THAT OVERDRAFT OCCURS THEREIN WHEN PRODUCTION EXCEEDS 1,000 AF/YR. BASED ON ESTIMATED CUMULATIVE OVERDRAFT OF 7,100 AF THROUGH 1995.

2) MAXIMUM RECOMMENDED CUMULATIVE OVERDRAFT FOR JOSHUA TREE SUBBASIN AND COPPER MOUNTAIN SUBBASIN COMBINED IS APPROXIMATELY 37,000 AF.

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TABLE IV–4

JOSHUA BASIN WATER DISTRICT
ANTICIPATED WATER DEMANDS AND OVERDRAFT
(ASSUMING 3%/YR INCREASE)
1996–2020 (IN AF/YR)

YEAR	ANTICIPATED DEMANDS*	CUMULATIVE OVERDRAFT (1)**	% OF MAXIMUM CUMULATIVE OVERDRAFT (2)
1996	1,640	8,000	22
2000	1,840	11,000	30
2005	2,140	16,000	43
2010	2,450	23,000	62
2015	2,870	31,000	84
2020	3,330	42,000	114

* ROUNDED TO NEAREST 10 AF
** ROUNDED TO NEAREST 1,000 AF

NOTES:

1) ASSUMES CONTINUED CONCENTRATION OF PRODUCTION IN THE JOSHUA TREE SUBBASIN, AND THAT OVERDRAFT OCCURS THEREIN WHEN PRODUCTION EXCEEDS 1,000 AF/YR. BASED ON ESTIMATED CUMULATIVE OVERDRAFT OF 7,100 AF THROUGH 1995.

2) MAXIMUM RECOMMENDED CUMULATIVE OVERDRAFT FOR JOSHUA TREE SUBBASIN AND COPPER MOUNTAIN SUBBASIN COMBINED IS APPROXIMATELY 37,000 AF.

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TABLE IV–5

JOSHUA BASIN WATER DISTRICT
ANTICIPATED WATER DEMANDS AND OVERDRAFT
(ASSUMING 4%/YR INCREASE)
1996–2020 (IN AF/YR)

YEAR	ANTICIPATED DEMANDS*	CUMULATIVE OVERDRAFT (1)**	% OF MAXIMUM CUMULATIVE OVERDRAFT (2)
1996	1,650	8,000	22
2000	1,930	11,000	30
2005	2,350	17,000	46
2010	2,860	25,000	68
2015	3,480	36,000	98
2020	4,240	51,000	138

* ROUNDED TO NEAREST 10 AF
** ROUNDED TO NEAREST 1,000 AF

NOTES:

1) ASSUMES CONTINUED CONCENTRATION OF PRODUCTION IN THE JOSHUA TREE SUBBASIN, AND THAT OVERDRAFT OCCURS THEREIN WHEN PRODUCTION EXCEEDS 1,000 AF/YR. BASED ON ESTIMATED CUMULATIVE OVERDRAFT OF 7,100 AF THROUGH 1995.

2) MAXIMUM RECOMMENDED CUMULATIVE OVERDRAFT FOR JOSHUA TREE SUBBASIN AND COPPER MOUNTAIN SUBBASIN COMBINED IS APPROXIMATELY 37,000 AF.

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3/4/96

SECTION V

SECTION V
MANAGEMENT PLAN

In order to be successful, a ground water management plan must include a number of different components that account for the full spectrum of potential concerns related to overproduction and/or contamination of ground water resources. The various components outlined below would have some beneficial effect if implemented on their own; however, implementing all of them would have significantly greater cumulative effects than simply implementing one or two. Regardless, in light of the information outlined in the preceding sections, it is important that the District introduce as many ground water management practices as its technical and financial resources allow.

The following components of the District's Ground Water Management Plan vary considerably in their complexity and the ease with which they can be implemented. Certain of the components (e.g. those related to water conservation) can be implemented in relatively short order, while those requiring the construction of significant capital improvements (e.g. those related to changes in production practices) will have to be implemented over a period of several years.

A. WATER CONSERVATION

One of the least expensive, simplest, and most cost effective means for managing ground water is to reduce water use. Of the numerous means available to encourage water conservation by residents of the District's service area, several are outlined below.

When implementing water conservation measures, it is important to establish specific goals. Said goals are best established in terms of reducing water use per capita or per dwelling unit to a specified level. Establishing water conservation goals will enable the District to evaluate the success of water conservation efforts, and will allow it to enhance existing measures and/or introduce new measures to increase the water conservation program's effectiveness. Water conservation goals should be reasonable in terms of both extent and schedule in order to avoid placing undue hardships upon District customers. A timetable reflecting the District's water conservation goals is attached as Table V-1. The District will evaluate a variety of education programs, a toilet and shower head retrofit program, and a pipeline replacement program; each potential program is discussed separately below.

1. Education

An extremely effective method for encouraging people to conserve water is to educate them as to both the importance of conserving water and the numerous methods available to accomplish water conservation. The District will therefore implement a program designed to alert its customers to the potentially significant adverse effects associated with excessive water use and explain methods available to them to reduce water use.

The element of the education program intended to warn District customers about overuse will emphasize items of particular concern to individual customers, such as increased water rates and decreased water quality that will result from excessive use of the resource. This portion of the education program will include exhibits which provide details regarding the effects of ground water overdraft and the projected extent of overdraft within the District.

The element of the education program concerned with educating the District's customers about means for reducing water use will incorporate a number of suggestions relating to virtually every type of water use that the average customer may engage in. Components may include:

a. A demonstration garden which displays various types of water efficient irrigation systems and drought tolerant plant species.

b. Educational pamphlets which explain various household practices that will reduce water use, such as minimizing household uses and scheduling irrigation for night time hours when evaporation rates are reduced. The latter element will include suggestions such as taking shorter showers, ensuring that laundry and dishwasher loads are made as large and water efficient as possible, and installing modern, water efficient appliances.

2. Toilet and Shower Head Retrofit Program

A toilet and shower head retrofit program will be evaluated and (if found to be cost-effective) implemented to encourage District customers to replace inefficient toilets and shower heads with ULF facilities; said facilities have been demonstrated to result in

significant cumulative water savings. A similar ongoing program sponsored by the Metropolitan Water District of Southern California (MWD) has resulted in the replacement of tens of thousands of inefficient toilets and shower heads.

According to the Water Education Foundation, the amount of water conserved is quite dramatic; for instance, ULF toilets discharge just 1.6 gallons per flush, as opposed to the 6 gallons or more expended per flush by conventional toilets and 3 gallons per flush for low flush toilets. ULF shower heads reduce water use by 50% or more, which equates to about 3 gallons per minute per shower.

3. Pipeline Replacement Program

In order to reduce water losses through the District's water conveyance and Distribution system, the District has implemented a pipeline replacement program designed to replace as much aging and deteriorated pipeline as possible. No changes to said program are included as part of this program; rather, the existing pipeline replacement program is incorporated herein, and will be continued as funds allow.

B. GROUND WATER MONITORING

A soundly designed, constructed, and operated system of monitoring wells is necessary to determine and monitor ground water quantity and quality conditions within ground water basins and subbasins; however, there is currently no monitoring well system available in either the Joshua Tree or Copper Mountain Subbasins. Instead, existing water wells are used to monitor ground water levels and ground water quality. As such, improving the current level of ground water monitoring is one of the key components of the Plan.

To fully determine the quantity and quality of ground water in the subbasins, the ground water monitoring system should ultimately consist of a series of monitoring wells constructed within strategically selected areas of each subbasin. The monitoring wells (one piezometer per aquifer zone for separate measurements and samples) should be constructed to bedrock in order to provide information about the region's bedrock profile.

Since the costs and technical demands associated with designing, constructing, and operating a monitoring system of the magnitude necessary to obtain complete information about the Joshua

Tree and Copper Mountain Subbasins would be substantial, the District will solicit financial and technical assistance from both USGS and CDWR in the event that it decides to proceed with same; each agency has considerable experience in ground water monitoring programs, and may wish to participate in the development and expansion of a ground water monitoring system for the area.

To provide potential cost savings and allow some additional monitoring to begin within one to two years, the District may decide to examine some existing wells which are no longer in operation and determine their suitability to serve as interim monitoring wells. A number of wells lying within the District's boundaries have been abandoned (but probably not destroyed) over the years, and some may be useful in determining water levels and water quality in various areas. In the event that an area of particular concern is identified by the monitoring of such wells, additional steps (such as constructing a dedicated monitoring well) can be implemented.

1. Scheduling

Although it would be desirable to construct a complete monitoring well system immediately, fiscal constraints prevent construction on so large a scale. In recognition of same, the District will use existing wells for monitoring purposes until funds are available for constructing dedicated monitoring wells. An implementation schedule for the monitoring system has been prepared which is arranged by priority; the first wells to be monitored will be concentrated within areas of significant ground water production in the Joshua Tree Subbasin. Subsequent wells will be located in other areas at later dates as finances allow. A recommended implementation timetable is reflected by Table V-2.

In order to ensure that useful information is gathered, it will be necessary to measure ground water levels and collect water quality samples on a regular basis, and the District will have to establish a monitoring schedule that can be strictly adhered to on a continual basis. The recommended schedule consists of measuring ground water levels quarterly, and collecting and analyzing water quality samples annually; however, the schedule may need to be modified based upon observations as the monitoring system is developed and expanded.

2. Mapping

To provide a visual representation of the information gathered by the monitoring wells, a District-wide ground water monitoring program map will be created which will indicate the location of each well from which water level data and water quality samples are collected. The map may be prepared using AutoCAD software, which would enable it to be kept current as new information is gathered over the course of the monitoring program.

The map will indicate the following: the ground surface elevation of each well, referenced to mean sea level; the depth to ground water at each well and the date of measurement; and certain key ground water quality indicators (such as total dissolved solids and nitrates) and the date of sample collection. The ground water monitoring program map will enable interested parties to determine current ground water conditions within the District's boundaries, and to compare same with past conditions to determine whether or not there have been any notable changes in ground water quantities or quality.

C. GROUND WATER PRODUCTION

As noted in Section II.C., spreading ground water production over as wide an area as possible can have significant beneficial effects upon ground water bodies; instead of creating pumping depressions, ground water levels decline more uniformly, resulting in a lesser but widespread lowering of the water table rather than a greater but localized lowering of same. The District's existing ground water production facilities are relatively widespread, with the largest water supply wells located at least 1/2 mile from each other, although its two smallest wells are only 1/8 mile apart. At its current production capacity, the District is spreading ground water production over a reasonably large area. Regardless, the construction of additional water supply wells at distances of at least 1/2 mile from any existing wells is a significant component of the Ground Water Management Plan.

1. Production Areas

While it is important to spread production facilities over as great an area as possible, it is also important to keep capital and operations costs as low as practicable; therefore,

new production facilities are proposed to be constructed as near as possible to existing conveyance facilities and within appropriate pressure zones in order to limit costs. In addition, at least one water supply well is proposed for construction within the Copper Mountain Subbasin in order to make use of resources that are currently unused.

The water supply well(s) to be constructed within the Copper Mountain Subbasin will be used to serve District customers residing within portions of the District's service area that overlie said Subbasin. Although most residents of the area currently secure their own supplies (primarily from bulk water haulers), the District is in the process of extending service to approximately 1,250 parcels in the area as part of its Copper Mountain Mesa Water Facilities project. A connection with the District's existing system will be constructed to provide service until the District constructs production facilities within the Copper Mountain Subbasin's boundaries.

2. Water Supply Well Locations

To ensure that water supply wells are far enough apart to prevent them from creating excessive and undesirable overlapping pumping depressions, the District will not construct or permit the construction of any new wells that are not at least 1/2 mile (and preferably one mile) from existing wells. At the same time, the District will attempt to keep associated conveyance costs as low as possible by constructing new water supply wells in reasonable proximity to existing conveyance and storage facilities.

D. WATER EXPORT PREVENTION

As noted in Section II.D., the District considers it necessary to prevent unauthorized exports of water from within its boundaries, particularly if the exported water is to be used in areas where the nonconsumptive return will not recharge the District's ground water supply. The District will therefore pursue all available means of preventing any party (private or public) from exporting ground water from anywhere within its boundaries, unless such exports are authorized by the District. It will be the District's policy to regard any effort to export ground water from within its boundaries as a potential threat to the ground water resources it has the responsibility of managing, and to resist any such efforts on that basis. Specific means of resisting exports will be developed over the life of the Plan, and will include litigation and legislative initiatives.

E. CONJUNCTIVE USE (IMPORTED WATER)

As noted in previous sections, conjunctive use consists of using ground water in conjunction with surface water to meet service area water requirements. In the District's case, conjunctive use has historically been impossible due to the complete lack of surface water within the District; however, the recent completion of the Morongo Basin Pipeline Project has finally made surface water available and will enable the District to initiate a conjunctive use program. The benefits of conjunctive use to the District are significant, in that they will enable the District to reduce its reliance upon ground water and thus arrest or reduce the current overdraft of the Joshua Tree Subbasin.

The Morongo Basin Pipeline Project is being constructed, operated, and maintained by the Mojave Water Agency, and will benefit five Morongo Basin water purveyors, including the District, the Hi-Desert Water District, the Bighorn/Desert View Water Agency, County Service Area No. 70/Improvement Zone W-1, and County Service Area No. 70/Improvement Zone W-4. The Morongo Basin Pipeline Project consists of a connection to the California Aqueduct, approximately 7 miles of 54" pipeline, approximately 63 miles of 30" pipeline, two booster pumping plants, and a 5 MG water storage reservoir located approximately 5 miles west of the District's westerly boundary.

The District will take delivery of State Water Project water through the Hi-Desert Extension, which consists of a connection to the aforementioned 5 MG reservoir and approximately 44,500 L.F. of 24" pipeline, connecting to the Hi-Desert Project recharge basins. The Hi-Desert Extension includes a 24" outlet which is dedicated to District use and is located approximately 1/3 mile west of the District's westerly boundary, 500 feet south of the intersection of Linda Lee Drive and Nelson Avenue.

The Mojave Water Agency has allocated 7,257 AF/Yr to the five Morongo Basin water purveyors mentioned above. Of that quantity, the District's share is 1,959 AF/Yr, or 27% of the total. Assuming that the full amount is delivered each year, the imported water will increase annual recharge of the Joshua Tree Subbasin by between 100% and 200%, thereby alleviating concerns regarding ground water overdraft in the near term; however, as noted in Section IV.A., excessive reliance upon State Water Project water is not advisable owing to the uncertain regulatory and legislative environment. Nevertheless, the availability of imported water

represents a significant opportunity for the District, and greatly enhances the flexibility of the District's Ground Water Management Plan.

1. Conveyance Facility Requirements

In order to take delivery of imported water supplies, the District will have to construct conveyance facilities from the Hi-Desert Extension to the proposed location of use. Based on the alternatives evaluated to date, the District will have to construct a transmission pipeline to the point of delivery, which will be to either the District's system or to recharge basins. In addition, should the District decide to treat the imported water to drinking water standards and distribute same to its service area for domestic consumption, a surface water treatment facility will have to be constructed. Flows to the District will be by gravity, and no booster pumping facilities are expected to be required to deliver imported water to a surface water treatment facility or recharge basins.

2. Alternatives

As noted above, the District has essentially two alternatives for conjunctive use: it can treat the imported water to within drinking water standards and distribute same to its customers, thereby reducing the need to produce ground water; or it can construct recharge basins within the Joshua Tree subbasin and use the imported water for artificial recharge, thereby increasing overall recharge by the amount of water delivered (less losses to evaporation, which would be expected to be at least 5% but not more than 10%).

The first alternative consists of the construction of a surface water treatment plant, which would probably be constructed adjacent to one of the District's existing or proposed water storage reservoirs. The surface water treatment facility would have to be constructed in order to filter and disinfect the water prior to distribution, as specified in the State of California's Surface Water Treatment Regulations (SWTR).

The second alternative consists of the construction of recharge basins capable of recharging the Joshua Tree Subbasin. This alternative would require construction of a transmission pipeline, and of construction of approximately 5-1/2 acres of recharge

basins. The system would function by flowing water into the recharge basins by gravity, from which the water would percolate to ground water.

Adoption of either of the alternatives will result in immediate and direct benefits to the Joshua Tree Subbasin. It should be noted that the Copper Mountain Subbasin will only be indirectly affected by either alternative, since it is separated from the Joshua Tree Subbasin by geologic barriers; the only potential benefit to the Copper Mountain Subbasin would be a reduction of demands upon said subbasin, resulting in in-lieu recharge.

3. Constraints on Availability

In considering the potential associated with conjunctive use, one should keep in mind that deliveries of State Water Project water may fluctuate depending on a number of factors. For instance, recent legislative and regulatory changes have periodically resulted in significantly reduced State Water Project deliveries. In addition, the State Water Project is still essentially incomplete, and can only deliver approximately 50% of the supply originally anticipated when the Project was initiated; the conveyance facilities have a capacity of about 4.4 million AF/Yr, but the supply facilities can only provide about 2.2 million AF/Yr.

The water supply limitation will be rectified when the San Francisco Bay/Sacramento Delta system is appropriately modified to allow maximum utilization of available supplies while simultaneously protecting the Bay/Delta's fragile environment. "Fixing" the Delta will require the construction of Delta conveyance facilities; one alternative for the construction of said facilities is known as the Peripheral Canal, construction of which was defeated by California voters in 1982. Until regulatory actions become consistent and Delta conveyance facilities are constructed, State Water Project supplies will never be continuously available, and strict reliance upon same is not advisable.

F. CONJUNCTIVE USE (RECLAIMED WATER)

As noted in Section V.E. above, conjunctive use affords a number of benefits and advantages with regard to managing water resources and reducing reliance upon ground water. While the District will soon implement a conjunctive use program following completion of the facilities

necessary to import State Water Project water to its service area, another source of supply for conjunctive use (one that is currently unused by the District) is available in the form of reclaimed water.

As matters currently stand, there are no facilities available within the District for the collection and treatment of wastewater; all wastewater is currently processed by individual disposal systems (e.g. septic tanks) and discharged to seepage lines or pits and allowed to percolate to ground water. This method of disposal may result in a slow but steady degradation in ground water quality; however, the impacts on water quality to date have been slight because of the area's limited and dispersed development.

In order to determine the extent of the benefits that might be derived from water reclamation and to establish the costs associated therewith, it would be necessary to conduct an extensive study that is beyond the scope of this Ground Water Management Plan; however, the commissioning of such a study is of considerable importance, and is related directly to the District's ground water management efforts. The District may have an evaluation of the potential benefits and costs of initiating a reclaimed water program prepared and, based on the results and recommendations of the evaluation, may in turn determine that the construction of the required facilities would represent a good investment in the protection of the area's ground water supplies.

G. GROUND WATER CONTAMINATION PREVENTION/RESPONSE

The threatened or potential contamination of ground water is a matter of considerable concern in all areas of the country, but particularly so in areas like that served by the District. Contamination can take many forms and be caused by numerous factors; for instance, it can result from various types of pollution, such as disposal of petroleum products, or from the migration or percolation of physical materials such as total dissolved solids and nitrates. Should ground water in the Joshua Tree area become contaminated, the area's sole reliable local source of domestic water would be threatened. It is therefore important that ground water resources in the area be protected from contamination to the greatest extent possible. Although contaminated ground water can be treated sufficiently to allow domestic consumption, the costs and operational difficulties associated with same are considerable. In order to prevent ground water contamination, the District has incorporated within its Ground Water Management Plan a number of measures designed to help prevent ground water contamination from occurring.

As indicated by Table III-4, the water quality of water produced by District wells remains excellent. The actions proposed below are intended to help ensure that: a) the possibility of ground water contamination is limited to the greatest practicable extent, and b) the District is prepared to respond to any contamination that may occur. Owing to the area's limited development (particularly commercial and industrial development), it is unlikely that contamination has occurred; however, the importance of ground water to the area dictates that the potential threat of contamination be addressed.

1. Well Construction and Abandonment Standards

Since wells are direct conduits to and from ground water, they represent a significant potential means for transmitting contaminants (particularly pollutants) directly into ground water. In recognition of this potential, CDWR has prepared a highly specific and lengthy set of standards for the construction and abandonment of water wells. Said standards, which are included in CDWR Bulletins 74-81 and 74-90, Water Well Standards: State of California, contain rigidly defined specifications; for example, said Bulletins require that all wells to be abandoned be pressure grouted with cement grout throughout the perforated portions of the well casing to ensure that they are incapable of transmitting contaminants. Although CDWR's well construction and abandonment standards are theoretically in force state-wide, the District is incorporating same in the Ground Water Management Plan in order to ensure that they are enforced during the construction or abandonment of any well within the District's boundaries.

The District is also incorporating a program for the location and proper destruction of area wells that have either been incorrectly constructed or inadequately abandoned. In order to accomplish same, the District will secure well driller's logs from CDWR for all wells constructed within the District's boundaries. In addition, the District may solicit the participation and cooperation of individual well owners within its boundaries, and will request that any individuals with knowledge of wells that may have been inadequately abandoned alert the District regarding same so that they can be properly destroyed.

2. Recharge Area Protection

Recharge area protection essentially consists of ensuring that land uses within watersheds or areas overlying ground water bodies do not pose a threat of ground water contamination. As noted in Section II.E., there are numerous types of developments and land uses which, if not constructed in compliance with applicable standards, pose direct and significant threats to ground water quality. In addition, unlawful activities (e.g. illegal garbage dumping, disposal of hazardous wastes, disposal of dead animals) can also result in ground water contamination.

The most effective means of preventing contamination is to interact and cooperate with agencies that have responsibility for land use planning and/or standards enforcement. As such, it will be necessary for the District to establish a good working relationship with responsible staff members from various federal, state, and county agencies that have jurisdiction over areas of potential concern; indeed, the following subsection of the Ground Water Management Plan is largely concerned with coordinating with planning agencies to ensure that future land uses do not threaten ground water supplies. The list of agencies that the District will involve includes, but is not limited to, the following: the U.S. Bureau of Land Management (U.S. BLM), the California Integrated Waste Management Board (CIWMB), the California Regional Water Quality Control Board (RWQCB)-Colorado River Basin Region, the State Water Resources Control Board (SWRCB), the County of San Bernardino Planning Department, and the County of San Bernardino Public Health Department.

3. Monitoring for Contamination

As noted in Section V.B. above, the District intends to ultimately establish a ground water monitoring system that will enable it to monitor ground water levels and quality within its boundaries. One of the reasons that monitoring is important is that, in the absence of a carefully planned monitoring well grid, contamination could easily occur within a ground water body as large as the Joshua Tree Subbasin and not be detected for a number of months or years. Failure to detect contamination could result in a significant and widespread contaminant plume, which would have the potential to rob the area of at least a portion of its ground water supply. The District intends to monitor for ground water quality on an annual basis, although the frequency of said monitoring

may be increased, particularly in areas that are considered likely to be contaminated owing to overlying land uses.

4. Responses to Contamination

In the event that ground water contamination is detected, the District will immediately assess the severity of the contamination and confer with various regulatory and enforcement agencies (e.g. U.S. EPA, SWRCB, RWQCB, etc.), and develop and implement a response plan. The response to any contamination that may be detected in the future will be dictated by its severity, and may range from blending the contaminated supply with untainted supplies to bring the product water to within federal and state drinking water standards, to constructing well head treatment facilities. Owing to the significant numbers of contaminated sites around the United States, a number of technologies have been developed that enable agencies to react rapidly to episodes of contamination in order to protect public health, and the District will make use of same should the need arise.

Since remediation of ground water contamination is usually quite expensive, the District will emphasize working with the aforementioned regulatory agencies in identifying the party(ies) responsible for any contamination that may be detected in the future, and will take any steps necessary to ensure that cleanup activities are performed at no cost to the District or its customers. There are a number of laws available to help ensure that responsible party(ies) are held accountable, particularly the Federal Comprehensive Environmental Response, Compensation, and Liability Act (better known as Superfund) and the Resource Conservation and Recovery Act, as well as the California Superfund. These laws are designed to ensure that contaminated environments are restored, and that those responsible for the contamination are held responsible and liable for cleanup activities.

H. PLANNING AGENCY COORDINATION

In order to ensure that land uses within the District's boundaries are consistent with the protection of both ground water quantity and quality, it will be necessary to coordinate with those agencies that have planning authority over lands within said boundaries. It has long been the practice of planning agencies in various areas of California to make land use decisions with

little or no regard for the needs and requirements of the local water purveyor, a circumstance which has lead in some cases to significant difficulties for local purveyors; for instance, water agencies have been left to develop additional sources of supply to serve areas that have experienced growth that has in turn caused water requirements to exceed available supplies.

To prevent significant adverse impacts upon ground water resources within its boundaries as a result of poorly planned or excessive development, it will be necessary for the District to participate in the planning activities of those agencies which have planning authority over lands in the Joshua Tree area. The two agencies with primary responsibility for land use planning in the area are the County of San Bernardino Planning Department and the U.S. Bureau of Land Management. Specific details regarding the District's planned future relationship with each agency are outlined below.

1. County of San Bernardino Planning Department

Since the area within the District's boundaries is unincorporated, the San Bernardino County Planning Department makes most of the land use decisions that are likely to affect development (and therefore water resources) in the Joshua Tree area. It is important for the District to establish a direct relationship with members of the County Planning Department's staff who have responsibility for reviewing and making recommendations regarding proposed land uses and development within the District's boundaries. Examples of land use decisions that might affect the District include the size and location of residential subdivisions, the locations of certain types of commercial facilities (particularly those dealing in petroleum products, such as gasoline service stations, or those that require large quantities of water, such as car washes and commercial laundries), and the types and locations of industrial facilities.

Establishing a close working relationship with County staff will enable the District to provide comments early in the planning process rather than having to respond after a project has already reached the approval stage. Ideally, the District will be notified any time a development proposal is submitted to the County Planning Department and will be afforded the opportunity to participate in the review and approval process. In addition, the District will seek the opportunity to comment upon any future amendments to the portions of the County's General Plan which are concerned with development in the Joshua Tree area. Based upon estimates of available water supply and ground water

conditions, the District will prepare and provide to the County Planning Department a projection of the maximum supportable build-out population for the Joshua Tree area. Specific District interests and concerns regarding residential, commercial, and industrial developments are outlined below.

a. Residential Development

The area within the District's boundaries has only experienced sporadic residential development to date, with most housing consisting of single family residences located on large lots that are widely dispersed. An indication of the area's limited development is the density of dwelling units; there are only 4,400 units within the 96 square mile District, or one unit for every 14 acres. While it is difficult to accurately predict future development (in terms of both quantity and location), past growth patterns indicate that it will probably be limited in scope and widely dispersed, although it is possible that large-lot/low-density tract development could occur, particularly in areas near Highway 62.

The principal concerns with future residential development have to do with ensuring that water supplies are available to serve existing and future residents without creating significant overdraft. Residential development proposals will be reviewed with regard to the anticipated size of the development, water use associated with both construction and occupancy, and incorporation of water-conserving features. The latter concern will call for ensuring that development proposals include water-efficient landscaping and irrigation, ULF toilets and shower heads, and water-efficient appliances such as dishwashers.

Residential developments will also be reviewed to ensure that they won't cause water quality degradation. Large unsewered residential areas may concentrate septic tank discharges, which can in turn lead to increased concentrations of various contaminants in ground water. In addition, large scale residential developments often lead to large quantities of contaminant-bearing stormwater runoff, which can in turn lead to ground water contamination after the stormwater infiltrates and percolates to ground water. The District will carefully review large residential development proposals to ensure that these

types of concerns are appropriately addressed in advance to prevent the necessity of costly remediation measures.

b. Commercial Development

As is the case with residential development, the Joshua Tree area has experienced only limited commercial development, most of which has occurred along Highway 62. Most existing commercial development consists of small businesses serving the needs of area residents, travelers of Highway 62, and users of the Hi-Desert Airport. Institutional developments, including the Hi-Desert Medical Center and various government offices (e.g. California Highway Patrol office, post office, fire station), also serve the area. Again, it is difficult to predict future commercial and institutional development; however, any such development that does occur will probably be located either along Highway 62 or near the Airport.

There are numerous types of commercial development, any of which can result in ground water related problems if not properly constructed or operated. For instance, gasoline service stations can cause ground water contamination through leaks in gasoline storage tanks or through improper waste oil disposal. Golf courses can lead to ground water overdraft, since they consume significant quantities of water for landscaping. Car washes can cause both quantity and quality problems; they use large quantities of water, and generate significant quantities of wastewater containing petroleum contaminants that may then find their way to the ground water body as the wastewater recharges the ground water body. Owing to the wide variety of potential concerns, the District will continue to review any proposed commercial developments on a case-by-case basis.

c. Industrial Development

The Joshua Tree area has experienced virtually no industrial development to date, which is likely a result of its relative isolation; however, the burgeoning growth in Yucca Valley and the relatively low cost of land in Joshua Tree both make limited industrial growth (particularly light industry) a possibility. The

area around the Hi-Desert Airport in particular would appear to lend itself to some industrial development (e.g. through the construction of an industrial park), and supports the area's only significant industrial enterprise, a concrete plant which is located on Two Mile Drive.

Concerns regarding industrial developments are similar to those associated with commercial development, although concerns regarding potential contamination are enhanced by some of the processes used during certain types of manufacturing. Some types of industry rely heavily upon petroleum based solvents or heavy metals, both of which have significant potential to contaminate ground water if mishandled, poorly stored, or improperly/illegally disposed of. The District will therefore carefully review any proposed industrial development to ensure that adequate safeguards are incorporated in the proposed design and that the site is not inappropriate (e.g. located in a primary ground water recharge area).

2. U.S. Bureau of Land Management

Significant tracts of land within the District's boundaries are owned by the U.S. Government and managed by the U.S. BLM. Private entities and government organizations periodically make application to the U.S. BLM to use Federal lands for a variety of purposes, some of which may ultimately represent a threat to ground water resources. Examples of types of facilities which are sometimes sited upon Federal land include landfills, military facilities, hazardous waste disposal areas, and mining operations, to name but a few.

While proposals to use Federal lands are generally subjected to review and comment by both other governmental agencies and the general public, formal opportunities for comment are often somewhat limited, and it will serve the District's best interests to establish a working relationship with appropriate U.S. BLM representatives to ensure that the District is involved early on in the application review process. Becoming involved in the process will enable the District to ensure that proposed uses that are incompatible with the objectives of the Ground Water Management Plan are not approved unless sufficiently modified to remove potential threats to ground water quantity or quality.

I. REPLENISHMENT ASSESSMENT

Preparation of a Ground Water Management Plan and subsequent implementation of a Ground Water Management Program are important concepts, but their components can neither be implemented nor their objectives realized unless funds are available therefor. To ensure that funding is available, the District will consider implementing a Replenishment Assessment Program that will permit the collection of funds from ground water producers sufficient to pay for the various components of the Ground Water Management Plan that the District implements.

Replenishment assessment programs have been used by a number of other special districts throughout California with considerable success; indeed, two of the District's neighbors to the south, the Coachella Valley Water District (CVWD) and the Desert Water Agency (DWA), have had replenishment assessment programs in place for more than 15 years, and have used the funds to pay for a highly successful artificial ground water recharge program (recharging the Upper Coachella Valley Ground Water Basin with imported water).

In order to implement the Replenishment Assessment Program, the District will have to either submit the matter to registered voters for approval or have a replenishment assessment approved by the California Legislature and the Governor. The election requirement (§10754.3 of the California Water Code) specifies that the District receive the authorization of a simple majority (50% + 1) of voters residing in the area affected by the assessment, which in this case includes the entire area within the District's boundaries. §10754.3 requires that the issue be submitted to the voters in a general election following adoption of the Ground Water Management Plan. Alternatively, the District could request that the legislature adopt legislation allowing it to levy the replenishment assessment; it was this course that CVWD and DWA followed when they decided to institute their replenishment assessment programs.

1. Purpose

The purpose of a replenishment assessment is to collect funds directly from ground water producers to pay for programs that result in ground water replenishment that arrests or reduces ground water overdraft, and preserves the ground water supply; replenishment assessments can therefore be used to pay for many of the components of the District's Ground Water Management Plan. Generally, ground water producers are

assessed for the specific quantities (units) of ground water produced (e.g. $/AF). Each producer's assessment is based on the assessment rate and the units of ground water produced.

Depending on the specific replenishment assessment program established, the District would be able to set the replenishment rate at a level sufficient to pay for water secured from MWA through the Morongo Basin Pipeline Project, as well as spreading basin operations (direct recharge) and/or imported water treatment (indirect or in lieu recharge). The replenishment assessment would be levied against all purveyors, including the District, and all replenishment assessments collected would be placed in a replenishment program account or fund dedicated to ground water management activities.

As the primary ground water producer within its boundaries, the District would have to pay most of the replenishment assessment, and would therefore have to secure funds for payment of the assessment from sources such as water rates and charges or water availability or standby assessments. Secondary producers within the District would have to pay their proportionate shares of the total replenishment assessment. Regardless, ground water producers would be paying for ground water replenishment.

The Replenishment Assessment Program would allow the District to account for the money spent on Ground Water Management Plan/Program activities, and would also enable the District to closely monitor the quantities of ground water produced from areas within its jurisdiction, since most (if not all) area ground water producers would be required to report their annual ground water production.

2. Applicability

The Replenishment Assessment Program would apply to all ground water producers (including the District) lying within the District's boundaries. The only exception would be minimal pumpers, which for the purposes of this Program are preliminarily defined as producers who extract less than 2 AF/Yr. In order to determine which well owners qualify as minimal pumpers, it would be necessary for the District to identify area well owners and confer with them to determine (and to subsequently confirm through various verification techniques) their annual water production.

3. Replenishment Assessment Rate Determination

In order to establish the replenishment assessment rate each year, the District would prepare an engineer's report on the Replenishment Assessment Program. The engineer's report would detail the anticipated costs associated with the program, as well as the anticipated replenishment assessment rate necessary to recover said costs. The engineer's report would explain each of the factors involved in determining the replenishment assessment rate, and would also include estimates of the Replenishment Assessment Program's effectiveness and the condition of ground water within the subbasins underlying the District's boundaries. The engineer's report would therefore provide the District with an annual review of ground water conditions within the District and describe the basis for the replenishment assessment rate.

TABLE V-I

JOSHUA BASIN WATER DISTRICT
WATER CONSERVATION OBJECTIVES TIME TABLE

	Program Study and Development Fiscal Year	Pilot Program Fiscal Year*	Program Implementation Fiscal Year*
1. Education Programs			
a. Demonstration Garden	1996/97	1996/97	1997/98
b. Pamphlets	1996/97	1996/97	1997/98
2. Toilet and Shower Head Retrofit Program	1997/98	N/A	1998/99
3. Pipeline Replacement Program	Ongoing	N/A	Ongoing

*If the program is adopted.

TABLE V-2

JOSHUA BASIN WATER DISTRICT
MONITORING SYSTEM IMPLEMENTATION TIME TABLE

	Fiscal Year
1. Identification/Evaluation of Existing Wells (Operational and Inoperative/Abandoned) for Use as Monitoring Wells	1997/98
2. Commence Monitoring	1998/99
3. Ground Water Monitoring Program Map	1998/99

TABLE V-3

JOSHUA BASIN WATER DISTRICT
REVISED PRODUCTION PRACTICES CONSTRUCTION AND OPERATION TIME TABLE

	Fiscal Year
1. Identify Potential Well Sites - Joshua Tree Subbasin	1996/97
2. Identify Potential Well Sites - Copper Mountain Subbasin	1997/98
3. Construct Well in Joshua Tree Subbasin to Supplement Existing Water Production Facilities	1997/98
4. Construct Well in Copper Mountain Subbasin to Supplement Existing Water Production Facilities	1998/99
5. Construct Additional Wells in Joshua Tree and Copper Mountain Subbasins	As Required to Meet Additional Water Requirements

APPENDIX A

CALIFORNIA WATER CODE SECTION 10750 ET SEQ.

§ 10717. Termination of local agency's powers upon implementation of municipal central water system

A local agency shall no longer be authorized to exercise the powers conferred by this part upon the completion and implementation of a municipal central water system supplying water to the inhabitants within the boundaries of the local agency.

Added Stats 1987 ch 472 § 1.

PART 2.75

Groundwater Management

[Added Stats 1992 ch 947 § 2 (AB 3030). Former Part 2.75, entitled "Groundwater Resources," consisting of §§ 10750–10767, was added Stats 1991 ch 903 § 1 (AB 255) and repealed Stats 1992 ch 947 § 1 (AB 3030).]

Chapter

Note—Stats 1992 ch 947 provides:

SEC. 3. The Department of Water Resources shall, on or before January 1, 1998, prepare and publish, in a bulletin of the department published pursuant to Section 130 of the Water Code, a report on the status of groundwater management plans adopted and implemented pursuant to Part 2.75 (commencing with Section 10750) of Division 6 of the Water Code.

NOTES OF DECISIONS

State statutes relating to water use, taken collectively, do not occupy the field of groundwater regulation, and thus did not invalidate a county ordinance regulating the pumping practices and uses of groundwater. The test of occupation is whether the nature and extent of the coverage of a field is such that it could be said to display a patterned approach to the subject. No such pattern exists. No implication can be drawn that the Legislature intended to impair the constitutional exercise of the police power over groundwater because it has granted limited authority over groundwater to local agencies that draw their power solely from state legislation, and no pattern of regulation can be seen in the restrictions of Wat. Code, § 1220, on the export of water from the Sacramento Basin. The converse implication is more naturally made. There is a common thread in these statutes suggesting that problems of groundwater management should be addressed on the local level. Baldwin v County of Tehama (1994, 3rd Dist) 31 Cal App 4th 166, 36 Cal Rptr 2d 886.

CHAPTER 1

General Provisions

Section

§ 10750. Legislative fi

The Legislature finds resource in California, tion and its quality. It cies to work cooperat jurisdictions.

Added Stats 1992 ch 947 § 2 (

Former Sections:

Former § 10750, similar to pres 1992 ch 947 § 1 (AB 3030).

§ 10750.2. Application

(a) Subject to subdivisi state.

(b) This part does no subject to groundwat pursuant to other pro unless the local agenc

Added Stats 1992 ch 947 § 2 (

Historical Derivation:

Former §§ 10750, 10765, as a

§ 10750.4. Effect of p

Nothing in this part r adopt or implement a agement program pur

Added Stats 1992 ch 947 § 2 (

§ 10750.6. Effect of p

Nothing in this part a to manage groundwat judgment, or decree.

Added Stats 1992 ch 947 § 2

§ 10750.7. Manageme not critically overdra

(a) A local agency ma the service area of an Public Utilities Comr ment of that other en

(b) This section appl overdrafted.

Added Stats 1992 ch 947 § 2

Historical Derivation:

Former § 10762, as added St

§ 10750.8. Managem agency; Basin critica

(a) A local agency ma

§ 10750. Legislative findings and declarations

The Legislature finds and declares that groundwater is a valuable natural resource in California, and should be managed to ensure both its safe production and its quality. It is the intent of the Legislature to encourage local agencies to work cooperatively to manage groundwater resources within their jurisdictions.

Added Stats 1992 ch 947 § 2 (AB 3030).

Former Sections:

Former § 10750, similar to present § 10750.2, was added Stats 1991 ch 903 § 1 (AB 255) and repealed Stats 1992 ch 947 § 1 (AB 3030).

§ 10750.2. Application of part

(a) Subject to subdivision (b), this part applies to all groundwater basins in the state.

(b) This part does not apply to any portion of a groundwater basin that is subject to groundwater management by a local agency or a watermaster pursuant to other provisions of law or a court order, judgment, or decree, unless the local agency or watermaster agrees to the application of this part.

Added Stats 1992 ch 947 § 2 (AB 3030).

Historical Derivation:

Former §§ 10750, 10765, as added Stats 1991 ch 903 § 1 (AB 255).

§ 10750.4. Effect of part on local agency overlying groundwater basin

Nothing in this part requires a local agency overlying a groundwater basin to adopt or implement a groundwater management plan or groundwater management program pursuant to this part.

Added Stats 1992 ch 947 § 2 (AB 3030).

§ 10750.6. Effect of part on authority of local agency or watermaster

Nothing in this part affects the authority of a local agency or a watermaster to manage groundwater pursuant to other provisions of law or a court order, judgment, or decree.

Added Stats 1992 ch 947 § 2 (AB 3030).

§ 10750.7. Management of groundwater in service area of other entity; Basin not critically overdrafted

(a) A local agency may not manage groundwater pursuant to this part within the service area of another local agency, a water corporation regulated by the Public Utilities Commission, or a mutual water company without the agreement of that other entity.

(b) This section applies only to groundwater basins that are not critically overdrafted.

Added Stats 1992 ch 947 § 2 (AB 3030).

Historical Derivation:

Former § 10762, as added Stats 1991 ch 903 § 1.

§ 10750.8. Management of groundwater in service area of another local agency; Basin critically overdrafted

(a) A local agency may not manage groundwater pursuant to this part within

the service area of another local agency without the agreement of that other entity.

(b) This section applies only to groundwater basins that are critically overdrafted.

Added Stats 1992 ch 947 § 2 (AB 3030).

Historical Derivation:

Former § 10762, as added Stats 1991 ch 903 § 1.

§ 10750.9. Adoption of ordinance or resolution; Amendment of groundwater management program

(a) A local agency that commences procedures, prior to January 1, 1993, to adopt an ordinance or resolution to establish a program for the management of groundwater pursuant to Part 2.75 (commencing with Section 10750), as added by Chapter 903 of the Statutes of 1991, may proceed to adopt the ordinance or resolution pursuant to * * * Part 2.75, and the completion of those procedures is deemed to meet the requirements of this part.

(b) A local agency that has adopted an ordinance or resolution pursuant to Part 2.75 (commencing with Section 10750), as added by Chapter 903 of the Statutes of 1991, may amend its groundwater management program by ordinance or resolution of the governing body of the local agency to include any of the plan components set forth in Section 10753.7.

Added Stats 1992 ch 947 § 2 (AB 3030). Amended Stats 1993 ch 320 § 1 (AB 1152).

Amendments:

1993 Amendment: (1) Designated the former section to be subd (a); (2) deleted "that" before "Part 2.75," the second time it appears in subd (a); and (3) added subd (b).

§ 10750.10. Cumulative nature of part

This part is in addition to, and not a limitation on, the authority granted to a local agency pursuant to other provisions of law.

Added Stats 1992 ch 947 § 2 (AB 3030).

Historical Derivation:

Former § 10766, as added Stats 1991 ch 903 § 1.

§ 10751. [Section repealed 1992.]

Added Stats 1991 ch 903 § 1 (AB 255). Repealed Stats 1992 ch 947 § 1 (AB 3030). See § 10752.

CHAPTER 2

Definitions

Section

§ 10752. Definitions governing construction of part

Unless the context otherwise requires, the following definitions govern the construction of this part:

(a) "Groundwater" means all water beneath the surface of the earth within the zone below the water table in which the soil is completely saturated with water, but does not include water which flows in known and definite channels.

(b) "Groundwater basin" means any basin identified in the department's Bulletin No. 118, dated September 1975, and any amendments to that bulletin,

but does not include a
gallons per minute.

(c) "Groundwater extr
extraction of groundwa

(d) "Groundwater mar
describes the activities i
program.

(e) "Groundwater mana
and ongoing activity un
portion of a groundwate
adopted pursuant to thi

(f) "Groundwater rech
natural or artificial mea

(g) "Local agency" mea
to all or a portion of it
formed by local public

*(h) "Recharge area" m
groundwater basin and*

*(i) "Watermaster" mea
other provisions of law.*

*(j) "Wellhead protectio
rounding a water well o
which contaminants ar
well field.*

Added Stats 1992 ch 947 § 2 (A

Former Sections:

Former § 10752, similar to prese
1992 ch 947 § 1 (AB 3030).

Amendments:

1993 Amendment: Added (1) ",
provided water service" in subd

Historical Derivation:

Former § 10751, as added Stats

Section

§ 10753. Authorization

(a) Any local agency, v

but does not include a basin in which the average well yield is less than 100 gallons per minute.

(c) "Groundwater extraction facility" means any device or method for the extraction of groundwater within a groundwater basin.

(d) "Groundwater management plan" or "plan" means a document that describes the activities intended to be included in a groundwater management program.

(e) "Groundwater management program" or "program" means a coordinated and ongoing activity undertaken for the benefit of a groundwater basin, or a portion of a groundwater basin, pursuant to a groundwater management plan adopted pursuant to this part.

(f) "Groundwater recharge" means the augmentation of groundwater, by natural or artificial means, with surface water or recycled water.

(g) "Local agency" means any local public agency that provides water service to all or a portion of its service area, *and includes a joint powers authority formed by local public agencies that provide water service.*

(h) "Recharge area" means the area that supplies water to an aquifer in a groundwater basin and includes multiple wellhead protection areas.

(i) "Watermaster" means a watermaster appointed by a court or pursuant to other provisions of law.

(j) "Wellhead protection area" means the surface and subsurface area surrounding a water well or well field that supplies a public water system through which contaminants are reasonably likely to migrate toward the water well or well field.

Added Stats 1992 ch 947 § 2 (AB 3030). Amended Stats 1993 ch 320 § 2 (AB 1152).

Former Sections:

Former § 10752, similar to present § 10753, was added Stats 1991 ch 903 § 1 (AB 255) and repealed Stats 1992 ch 947 § 1 (AB 3030).

Amendments:

1993 Amendment: Added (1) ", and includes a joint powers authority formed by local public agencies that provided water service" in subd (g); and (2) subds (h)—(j).

Historical Derivation:

Former § 10751, as added Stats 1991 ch 903 § 1.

CHAPTER 3

Groundwater Management Plans

Section

§ 10753. Authorization to adopt and implement plan

(a) Any local agency, whose service area includes a groundwater basin, or a

portion of a groundwater basin, that is not subject to groundwater management pursuant to other provisions of law or a court order, judgment, or decree, may, by ordinance, or by resolution if the local agency is not authorized to act by ordinance, adopt and implement a groundwater management plan pursuant to this part within all or a portion of its service area.

(b) Notwithstanding subdivision (a), a local public agency, other than an agency defined in subdivision (g) of Section 10752, *that provides flood control, groundwater management, or groundwater replenishment, or a local agency formed pursuant to this code for the principal purpose of providing water service that has not yet provided that service,* may exercise the authority of this part within a groundwater basin *that is located within its boundaries within areas that are either* of the following:

(1) *Not served* by a local agency.

(2) *Served by a local agency whose governing body, by a majority vote, declines to exercise the authority of this part and enters into an agreement with the local public agency pursuant to Section 10750.7 or 10750.8.*

Added Stats 1992 ch 947 § 2 (AB 3030). Amended Stats 1993 ch 320 § 3 (AB 1152).

Former Sections:

Former § 10753, similar to present § 10753.2, was added Stats 1991 ch 903 § 1 (AB 255) and repealed Stats 1992 ch 947 § 1 (AB 3030).

Amendments:

1993 Amendment: (1) Amended the introductory clause of subd (b) by (a) adding "that provides flood control, groundwater management, or groundwater replenishment, or a local agency formed pursuant to this code for the principal purpose of providing water service that has not yet provided that service,"; and (b) substituting "that is located within its boundaries within areas that are either" for "if both" near the end of the clause; and (2) substituted subds (b)(1) and (b)(2) for former subds (b)(1) and (b)(2) which read: "(1) Water service is not provided by a local agency.

"(2) The local public agency provides flood control, groundwater quality management, or groundwater replenishment."

Historical Derivation:

Former § 10752, as added Stats 1991 ch 903 § 1.

§ 10753.2. Hearing on adoption of resolution of intention

(a) Prior to adopting a resolution of intention to draft a groundwater management plan, a local agency shall hold a hearing, after publication of notice pursuant to Section 6066 of the Government Code, on whether or not to adopt a resolution of intention to draft a groundwater management plan pursuant to this part for the purposes of implementing the plan and establishing a groundwater management program.

(b) At the conclusion of the hearing, the local agency may draft a resolution of intention to adopt a groundwater management plan pursuant to this part for the purposes of implementing the plan and establishing a groundwater management program.

Added Stats 1992 ch 947 § 2 (AB 3030).

Historical Derivation:

Former § 10753, as added Stats 1991 ch 903 § 1.

§ 10753.3. Publication of resolution of intention; Copy

(a) After the conclusion of the hearing, and if the local agency adopts a resolution of intention, the local agency shall publish the resolution of intention in the same manner that notice for the hearing held under Section 10753.2 was published.

(b) Upon written request,
with a copy of the resolu
Added Stats 1992 ch 947 § 2 (AB
Historical Derivation:
Former § 10754, as added Stats 19

§ 10753.4. Preparation ar

The local agency shall pr
years of the date of the a
not adopted within two y
may be adopted except p
accordance with this chap
Added Stats 1992 ch 947 § 2 (AB

§ 10753.5. Hearing on ad

(a) After a groundwater r
hold a second hearing to
hearing shall be given pur
notice shall include a sun
plan may be obtained for
agency.

(b) At the second hearin
adoption of the plan. At a
ing, any landowner with
withdraw a protest previo
Added Stats 1992 ch 947 § 2 (AB
Historical Derivation:
Former § 10755, as added Stats 19

§ 10753.6. Protest by lanc

(a) A written protest file
signature and a descriptio
A public agency owning l
making a written protest.

(b) The secretary of the l
descriptions on the prote
county assessors.

(c)(1) A majority protest
of the local agency finds tl
conclusion of the second
sessed value of the land
management pursuant to

(2) If the local agency det
water plan may not be ad
ing a plan for the area p
period of one year after th

(3) If a majority protest h
after the conclusion of t
management plan.

Added Stats 1992 ch 947 § 2 (AB 3
Historical Derivation:
Former §§ 10756, 10757, as added

(b) Upon written request, the local agency shall provide any interested person with a copy of the resolution of intention.

Added Stats 1992 ch 947 § 2 (AB 3030).

Historical Derivation:

Former § 10754, as added Stats 1991 ch 903 § 1.

§ 10753.4. Preparation and adoption of plan

The local agency shall prepare a groundwater management plan within two years of the date of the adoption of the resolution of intention. If the plan is not adopted within two years, the resolution of intention expires, and no plan may be adopted except pursuant to a new resolution of intention adopted in accordance with this chapter.

Added Stats 1992 ch 947 § 2 (AB 3030).

§ 10753.5. Hearing on adoption of plan

(a) After a groundwater management plan is prepared, the local agency shall hold a second hearing to determine whether to adopt the plan. Notice of the hearing shall be given pursuant to Section 6066 of the Government Code. The notice shall include a summary of the plan and shall state that copies of the plan may be obtained for the cost of reproduction at the office of the local agency.

(b) At the second hearing, the local agency shall consider protests to the adoption of the plan. At any time prior to the conclusion of the second hearing, any landowner within the local agency may file a written protest or withdraw a protest previously filed.

Added Stats 1992 ch 947 § 2 (AB 3030).

Historical Derivation:

Former § 10755, as added Stats 1991 ch 903 § 1.

§ 10753.6. Protest by landowner

(a) A written protest filed by a landowner shall include the landowner's signature and a description of the land owned sufficient to identify the land. A public agency owning land is deemed to be a landowner for the purpose of making a written protest.

(b) The secretary of the local agency shall compare the names and property descriptions on the protest against the property ownership records of the county assessors.

(c)(1) A majority protest shall be determined to exist if the governing board of the local agency finds that the protests filed and not withdrawn prior to the conclusion of the second hearing represent more than 50 percent of the assessed value of the land within the local agency subject to groundwater management pursuant to this part.

(2) If the local agency determines that a majority protest exists, the groundwater plan may not be adopted and the local agency shall not consider adopting a plan for the area proposed to be included within the program for a period of one year after the date of the second hearing.

(3) If a majority protest has not been filed, the local agency, within 35 days after the conclusion of the second hearing, may adopt the groundwater management plan.

Added Stats 1992 ch 947 § 2 (AB 3030).

Historical Derivation:

Former §§ 10756, 10757, as added Stats 1991 ch 903 § 1.

§ 10753.7. Components of plan

A groundwater management plan may include components relating to all of the following:

(a) The control of saline water intrusion.

(b) Identification and management of wellhead protection areas and recharge areas.

(c) Regulation of the migration of contaminated groundwater.

(d) The administration of a well abandonment and well destruction program.

(e) Mitigation of conditions of overdraft.

(f) Replenishment of groundwater extracted by water producers.

(g) Monitoring of groundwater levels and storage.

(h) Facilitating conjunctive use operations.

(i) Identification of well construction policies.

(j) The construction and operation by the local agency of groundwater contamination cleanup, recharge, storage, conservation, water recycling, and extraction projects.

(k) The development of relationships with state and federal regulatory agencies.

(*l*) The review of land use plans and coordination with land use planning agencies to assess activities which create a reasonable risk of groundwater contamination.

Added Stats 1992 ch 947 § 2 (AB 3030).

§ 10753.8. Adoption of rules and regulations

(a) A local agency shall adopt rules and regulations to implement and enforce a groundwater management plan adopted pursuant to this part.

(b) Nothing in this part shall be construed as authorizing the local agency to make a binding determination of the water rights of any person or entity.

(c) Nothing in this part shall be construed as authorizing the local agency to limit or suspend extractions unless the local agency has determined through study and investigation that groundwater replenishment programs or other alternative sources of water supply have proved insufficient or infeasible to lessen the demand for groundwater.

Added Stats 1992 ch 947 § 2 (AB 3030).

§ 10753.9. Consideration of impact of rules and regulations on business activities

In adopting rules and regulations pursuant to Section 10753.8, the local agency shall consider the potential impact of those rules and regulations on business activities, including agricultural operations, and to the extent practicable and consistent with the protection of the groundwater resources, minimize any adverse impacts on those business activities.

Added Stats 1992 ch 947 § 2 (AB 3030).

CHAPTER 4

Finances

Section

§ 10754. Authority assessments

For purposes of gr groundwater manag water replenishmen 60220) of Division groundwater manag tion 60300) of Divis

Added Stats 1992 ch 947 §

Former Sections:

Former § 10754, similar to 1992 ch 947 § 1 (AB 3030)

Historical Derivation:

Former § 10760, as added

§ 10754.2. Fees and

(a) Subject to Sectic agency that adopts may impose equitab ment based on the basin within the arc for costs incurred b ing, but not limited ment water, admini capital facilities nec

(b) The local agenc and replacement ol program required by *with the local agenc*

Added Stats 1992 ch 947 §

Amendments:

1993 Amendment: Added " (b).

Historical Derivation:

Former § 10759, as added

§ 10754.3. Election

Before a local agenc Section 10754.2 or extraction of grounc an election on the authorized to levy a fees for the replenis shall be so authorize of the proposition. T by the laws applicabl then as prescribed b conducted only wit subject to groundwa

Added Stats 1992 ch 947 §

Historical Derivation:

Former § 10761, as added S

§ 10754. Authority as water replenishment district to fix and collect fees and assessments

For purposes of groundwater management, a local agency that adopts a groundwater management plan pursuant to this part has the authority of a water replenishment district pursuant to Part 4 (commencing with Section 60220) of Division 18 and may fix and collect fees and assessments for groundwater management in accordance with Part 6 (commencing with Section 60300) of Division 18.

Added Stats 1992 ch 947 § 2 (AB 3030).

Former Sections:

Former § 10754, similar to present § 10753.3, was added Stats 1991 ch 903 § 1 (AB 255) and repealed Stats 1992 ch 947 § 1 (AB 3030).

Historical Derivation:

Former § 10760, as added Stats 1991 ch 903 § 1.

§ 10754.2. Fees and assessments based on amount of groundwater extracted

(a) Subject to Section 10754.3, except as specified in subdivision (b), a local agency that adopts a groundwater management plan pursuant to this part, may impose equitable annual fees and assessments for groundwater management based on the amount of groundwater extracted from the groundwater basin within the area included in the groundwater management plan to pay for costs incurred by the local agency for groundwater management, including, but not limited to, the costs associated with the acquisition of replenishment water, administrative and operating costs, and costs of construction of capital facilities necessary to implement the groundwater management plan.

(b) The local agency may not impose fees or assessments on the extraction and replacement of groundwater pursuant to a groundwater remediation program required by other provisions of law *or a groundwater storage contract with the local agency*.

Added Stats 1992 ch 947 § 2 (AB 3030). Amended Stats 1993 ch 320 § 4 (AB 1152).

Amendments:

1993 Amendment: Added "or a groundwater storage contract with the local agency" at the end of subd (b).

Historical Derivation:

Former § 10759, as added Stats 1991 ch 903 § 1.

§ 10754.3. Election granting authorization

Before a local agency may levy a water management assessment pursuant to Section 10754.2 or otherwise fix and collect fees for the replenishment or extraction of groundwater pursuant to this part, the local agency shall hold an election on the proposition of whether or not the local agency shall be authorized to levy a groundwater management assessment or fix and collect fees for the replenishment or extraction of groundwater. The local agency shall be so authorized if a majority of the votes cast at the election is in favor of the proposition. The election shall be conducted in the manner prescribed by the laws applicable to the local agency or, if there are no laws so applicable, then as prescribed by laws relating to local elections. The election shall be conducted only within the portion of the jurisdiction of the local agency subject to groundwater management pursuant to this part.

Added Stats 1992 ch 947 § 2 (AB 3030).

Historical Derivation:

Former § 10761, as added Stats 1991 ch 903 § 1.

CHAPTER 5

Miscellaneous

Section

§ 10755. Annexation of land subject to plan

(a) If a local agency annexes land subject to a groundwater management plan adopted pursuant to this part, the local agency annexing the land shall comply with the groundwater management plan for the annexed property.

(b) If a local agency subject to a groundwater management plan adopted pursuant to this part annexes land not subject to a groundwater management plan adopted pursuant to this part at the time of annexation, the annexed territory shall be subject to the groundwater management plan of the local agency annexing the land.

Added Stats 1992 ch 947 § 2 (AB 3030).

Former Sections:

Former § 10755, similar to present § 10753.5, was added Stats 1991 ch 903 § 1 (AB 255) and repealed Stats 1992 ch 947 § 1 (AB 3030).

Historical Derivation:

Former § 10764, as added Stats 1991 ch 903 § 1.

§ 10755.2. Coordinated plan; Joint powers agreement; Agreement with public or private entities

(a) It is the intent of the Legislature to encourage local agencies, within the same groundwater basin, that are authorized to adopt groundwater management plans pursuant to this part, to adopt and implement a coordinated groundwater management plan.

(b) For the purpose of adopting and implementing a coordinated groundwater management program pursuant to this part, a local agency may enter into a joint powers agreement pursuant to Chapter 5 (commencing with Section 6500) of Division 7 of Title 1 of the Government Code with public agencies, or a memorandum of understanding with public or private entities providing water service.

(c) A local agency may enter into agreements with *public entities or* private parties for the purpose of implementing a coordinated groundwater management plan.

Added Stats 1992 ch 947 § 2 (AB 3030). Amended Stats 1993 ch 320 § 5 (AB 1152).

Amendments:

1993 Amendment: Added "public entities or" in subd (a).

Historical Derivation:

Former § 10758, as added Stats 1991 ch 903 § 1.

§ 10755.3. Meetings

Local agencies with programs within tha *either manage grou to groundwater with* those programs.

Added Stats 1992 ch 947 §

Historical Derivation:

Former § 10763, as added S

§ 10755.4. Exceptio

Except in those gro groundwater overdr revised on Decembe ment plan that is i extraction of ground is used to provide w if applicable, any dw tion 65852.1 or 6585

Added Stats 1992 ch 947 § :

§§ 10756–10766. [Se

Added Stats 1991 ch 903 § 1 10750.8, 10750.10, 10753.6,

§ 10767. [Section rep

Added Stats 1991 ch 903 § related to effect of part on sp

Agric

[Added

Chapter

Section

§ 10800. (Operative te

This part shall be k Management Planning

Added Stats 1986 ch 954 § 1.

§ 10755.3. Meetings to coordinate programs

Local agencies within the same groundwater basin that conduct groundwater programs within that basin pursuant to this part, *and cities and counties that either manage groundwater pursuant to this part or have ordinances relating to groundwater within that basin,* shall, at least annually, meet to coordinate those programs.

Added Stats 1992 ch 947 § 2 (AB 3030). Amended Stats 1995 ch 833 § 2 (SB 1305).

Historical Derivation:

Former § 10763, as added Stats 1991 ch 903 § 1.

§ 10755.4. Exception to application of requirements of plan

Except in those groundwater basins that are subject to critical conditions of groundwater overdraft, as identified in the department's Bulletin 118-80, revised on December 24, 1982, the requirements of a groundwater management plan that is implemented pursuant to this part do not apply to the extraction of groundwater by means of a groundwater extraction facility that is used to provide water for domestic purposes to a single-unit residence and, if applicable, any dwelling unit authorized to be constructed pursuant to Section 65852.1 or 65852.2 of the Government Code.

Added Stats 1992 ch 947 § 2 (AB 3030).

§§ 10756–10766. [Sections repealed 1992.]

Added Stats 1991 ch 903 § 1 (AB 255). Repealed Stats 1992 ch 947 § 1 (AB 3030). See §§ 10750.2, 10750.7, 10750.8, 10750.10, 10753.6, 10754, 10754.2, 10754.3, 10755, 10755.2, 10755.3.

§ 10767. [Section repealed 1992.]

Added Stats 1991 ch 903 § 1 (AB 255). Repealed Stats 1992 ch 947 § 1 (AB 3030). The repealed section related to effect of part on specified duties of local agencies.

PART 2.8

Agricultural Water Management Planning

[Added Stats 1986 ch 954 § 1, operative term contingent.]

Chapter

CHAPTER 1

General Declarations and Policy

Section

§ 10800. (Operative term contingent) Citation of part

This part shall be known and may be cited as the Agricultural Water Management Planning Act.

Added Stats 1986 ch 954 § 1, operative term contingent.