Engineer's Report

Special Assessments for Ground-Water Management

Santa Maria Valley Water Conservation District

Special Improvement District No. 1

prepared for

Santa Maria Valley
Water Conservation District

June 1997

LUHDORFF & SCALMANINI
CONSULTING ENGINEERS

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by

Luhdorff and Scalmanini
Consulting Engineers

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96-1-065

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Introduction

Proposition 218, which was approved by the voters of California in November 1996, requires that any public agency seeking to impose a new assessment submit that assessment to a vote of the landowners who would be required to pay the assessment. Proposition 218 further requires that each proposed assessment be supported by a report prepared by an engineer registered by the State of California. The Santa Maria Valley Water Conservation District (the "Conservation District") has requested Luhdorff and Scalmanini, Consulting Engineers (LSCE) to prepare the necessary report in preparation for a vote of the landowners on a proposed assessment for ground-water management within the Santa Maria basin.

This report is organized in four parts. Section 1 provides background information on the Santa Maria Valley ground-water basin. Section 2 describes a proposed workplan for conducting ground-water management that the District intends to use for the decade from 1997 to 2007. Section 3 describes the proposed assessment. Section 4 concludes the report by making certain findings required by Proposition 218.

Background on the Santa Maria Valley Ground-Water Basin

The Santa Maria Valley ground-water basin includes approximately 225 square miles comprised of river bed, alluvial plain, and upland (mesa) areas within Santa Barbara and San Luis Obispo Counties. The boundary of the ground-water basin has been previously identified (USGS, 1951, 1966, and 1977; California DWR, 1980) based on geologic and hydrologic conditions, and there is general agreement on the western, southern, and eastern boundaries but different interpretations of the northern boundary (Figure 1). It appears that the basin encompasses the Santa Maria and Sisquoc plains, the Orcutt upland, and at least the southern portion of the Nipomo Mesa; it is mainly drained by the Santa Maria and Sisquoc Rivers. The basin is surrounded by the Casmalia and Solomon Hills to the south, the San Rafael Mountains to the southeast, the Sierra Madre Mountains to the east and northeast, the remaining portion of the Nipomo Mesa to the north, and some point beneath the Pacific Ocean to the west. The following are descriptions of the basin geology, hydrologic conditions, and ground-water quality.

Basin Geology

The Santa Maria ground-water basin is underlain by unconsolidated alluvial sediments ("deposits" of primarily gravel, sand, silt and clay) typically ranging in thickness from 1,200 to 2,800 feet. These deposits comprise the valley's aquifer systems. The deposits in turn overlie and fill in a natural trough ("syncline") comprised of folded and highly-consolidated rock formations beneath the valley. The consolidated rocks also flank the valley in the surrounding hills and mountains, and typically these formations do not yield significant amounts of ground-water to wells.

The alluvial deposits are composed of the **Paso Robles Formation (Fm.)** at depth, and the **Orcutt Fm., Quaternary Alluvium**, and river channel and dune sand deposits at the surface (USGS, 1951). The **Paso Robles Fm.** comprises the greatest thickness of the alluvial deposits with the deepest point located beneath the Orcutt area; the **Orcutt Fm.** is typically 160 to 200 feet thick and underlies the Orcutt upland; and the **Quaternary Alluvium** is typically 100 to 200 feet thick and underlies the central valley plain areas. The principal aquifers in the valley consist of these three deposits, although some wells are reported to be completed in the dune sand underlying the Nipomo Mesa (USGS, 1951). A generalized geologic map and a geologic cross section across the western end of the valley illustrate the general geologic conditions within the valley (Figures 2 and 3).

Three points of particular importance in regard to the geologic conditions are that, first, the **Quaternary Alluvium**, which constitutes one of the principal aquifers, is comprised of an upper fine-grained member and a lower coarse-grained member throughout the valley. The upper member of the **Quaternary Alluvium** becomes finer grained toward the Ocean such that it confines ground-water in the lower member from the approximate area of the City of Santa Maria's waste water treatment plant westward. The result of this is artesian conditions in the western valley area (historically, flowing artesian wells were reported until the early 1940s in the westernmost portion of the valley) (USGS, 1951).

Secondly, the **Quaternary alluvium** and the **Paso Robles Fm.** aquifers continue from the valley to beneath the Pacific Ocean, with no known structural or lithologic isolation from the Ocean. Thus, at some unknown distance from the shore, the water in these aquifers changes from fresh to salt water, and the potential exists for the salt water to intrude into the coastal (landward) portions of the aquifers if hydrologic conditions within them were to change. Thirdly, the **Quaternary Alluvium** and **Paso Robles Fm.** aquifers continue some distance northward beneath the Nipomo Mesa (they underlie the old sand dune deposits that comprise the Mesa). This alone indicates that the ground-water basin may also continue some distance beneath the Mesa. As discussed in the next subsection, hydrologic conditions indicate that this is the case.

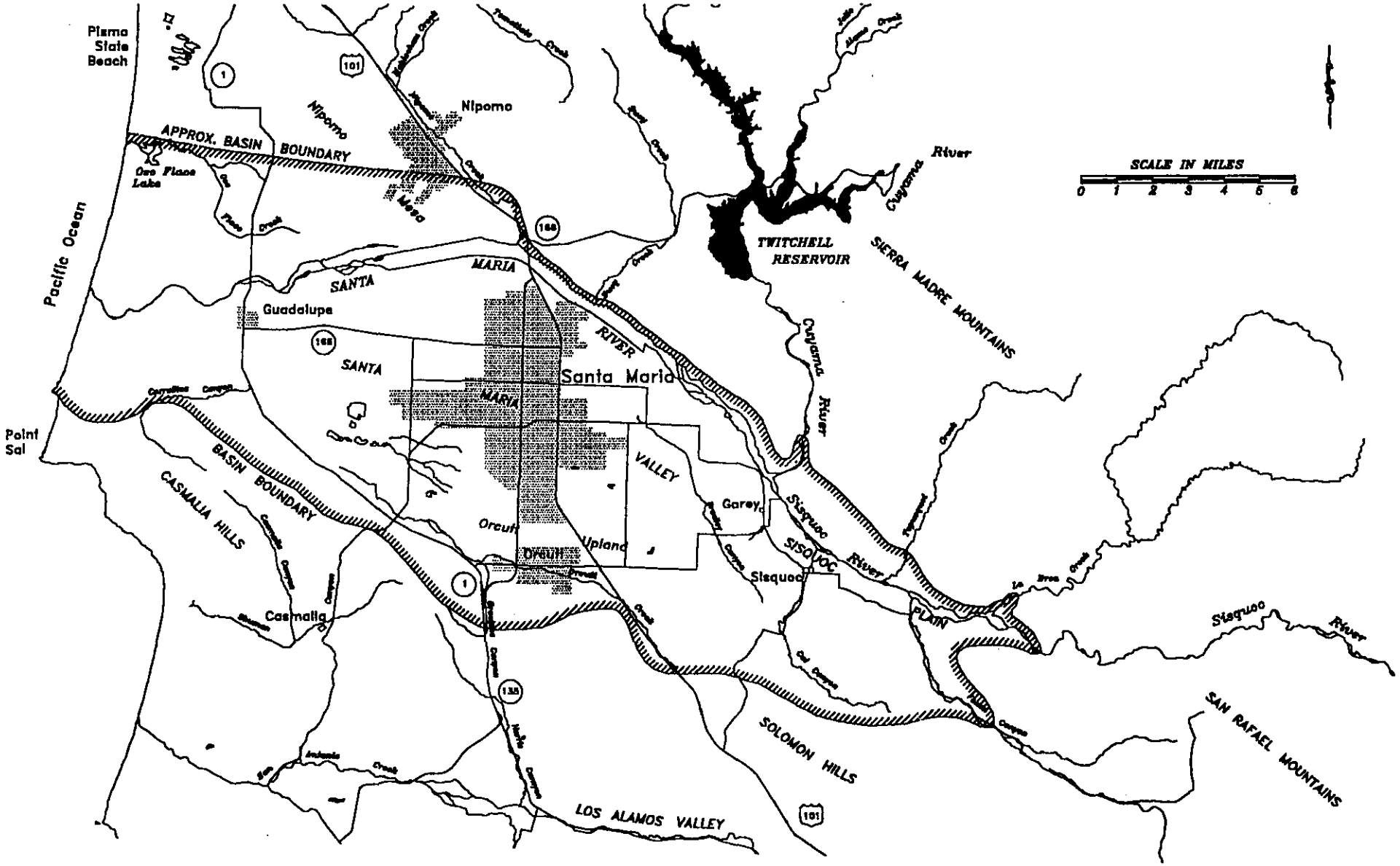

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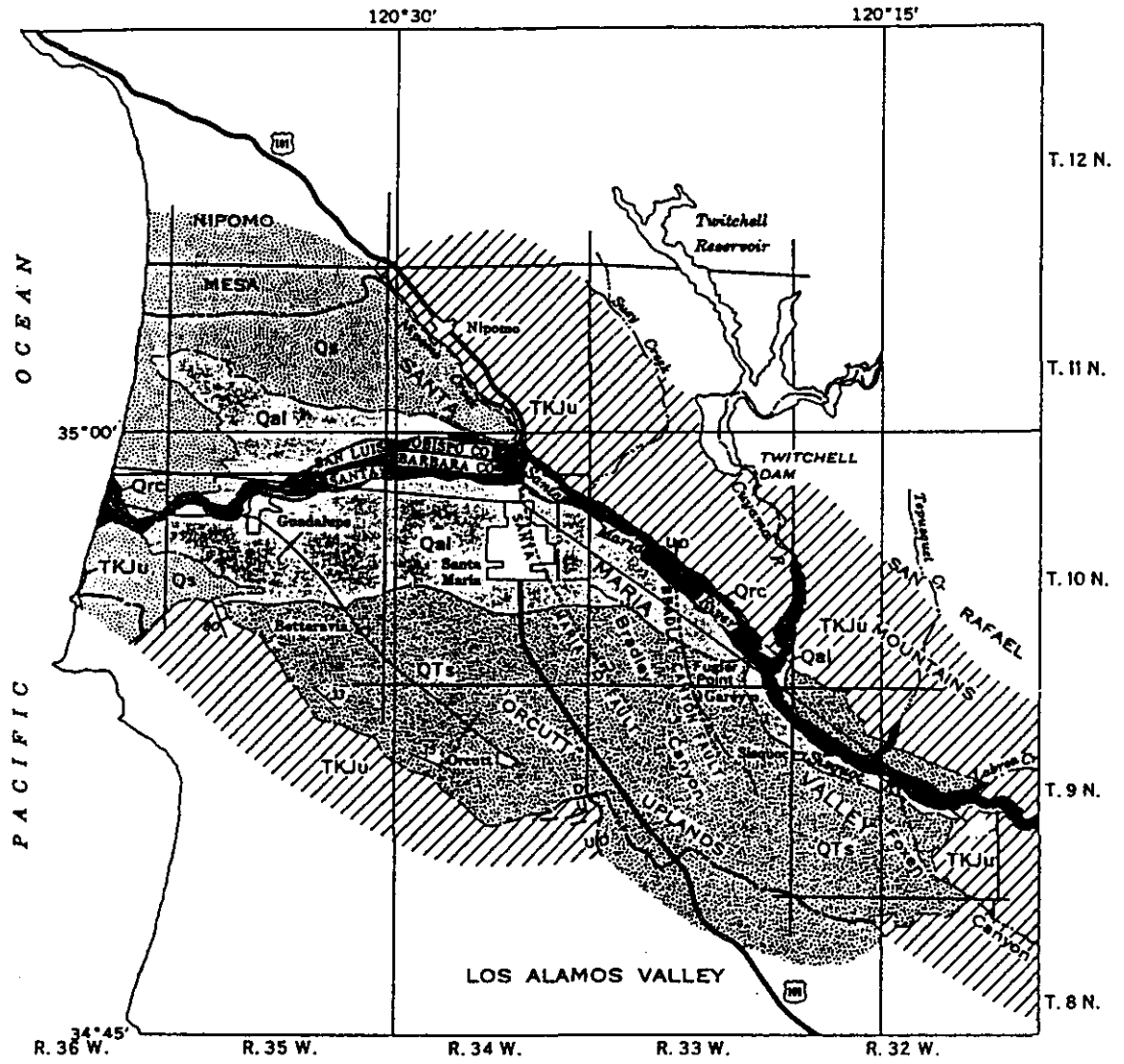
Figure 1
Santa Maria Valley Area
Santa Barbara and San Luis Obispo Counties



Geology modified from Worts (1951)

From USGS, 1966

EXPLANATION

Qs

Dune sand

Unconsolidated sand, in part actively drifting; mostly above water table; lower part saturated near coast; not tapped by wells

Qrc

River-channel deposits

Unconsolidated boulders, gravel, sand, silt, and some clay; chiefly in major stream channels; above water table for most part, but highly permeable and transmit seepage loss from streams to underlying aquifers

Qal

Alluvium

Unconsolidated boulders, gravel, sand, silt, and some clay; upper part is fine grained near coast and confines water in coarser, more permeable lower part; yields water readily to wells; most utilized aquifer in area

Recent — QUATERNARY

QTs

Older sediments

Undifferentiated Careaga Sand of Pliocene age, Paso Robles Formation of Pliocene and Pleistocene (?) age, Orcutt Sand of Pleistocene age, and locally include terrace deposits along major streams, and windblown sand and alluvium; consists chiefly of gravel, sand, and finer material; saturated over most of the area, and contain the major part of stored ground water in the basin, most of it below sea level, tapped by a few wells; generally not as permeable as the alluvium

Pliocene and Pleistocene — TERTIARY AND QUATERNARY

TKJu

Consolidated rocks

Undifferentiated Franciscan and Knoxville (?) Formations of Jurassic and Cretaceous age, and Foxen Mudstone, Sisquoc Formation, and Monterey Shale of Tertiary age; consist chiefly of sandstone, shale, siltstone, mudstone, some basic intrusive rocks, and other igneous and metamorphic rocks; generally of low permeability; tapped by few wells. Locally, ground water from these rocks is of poor quality

JURASSIC, CRETACEOUS AND TERTIARY

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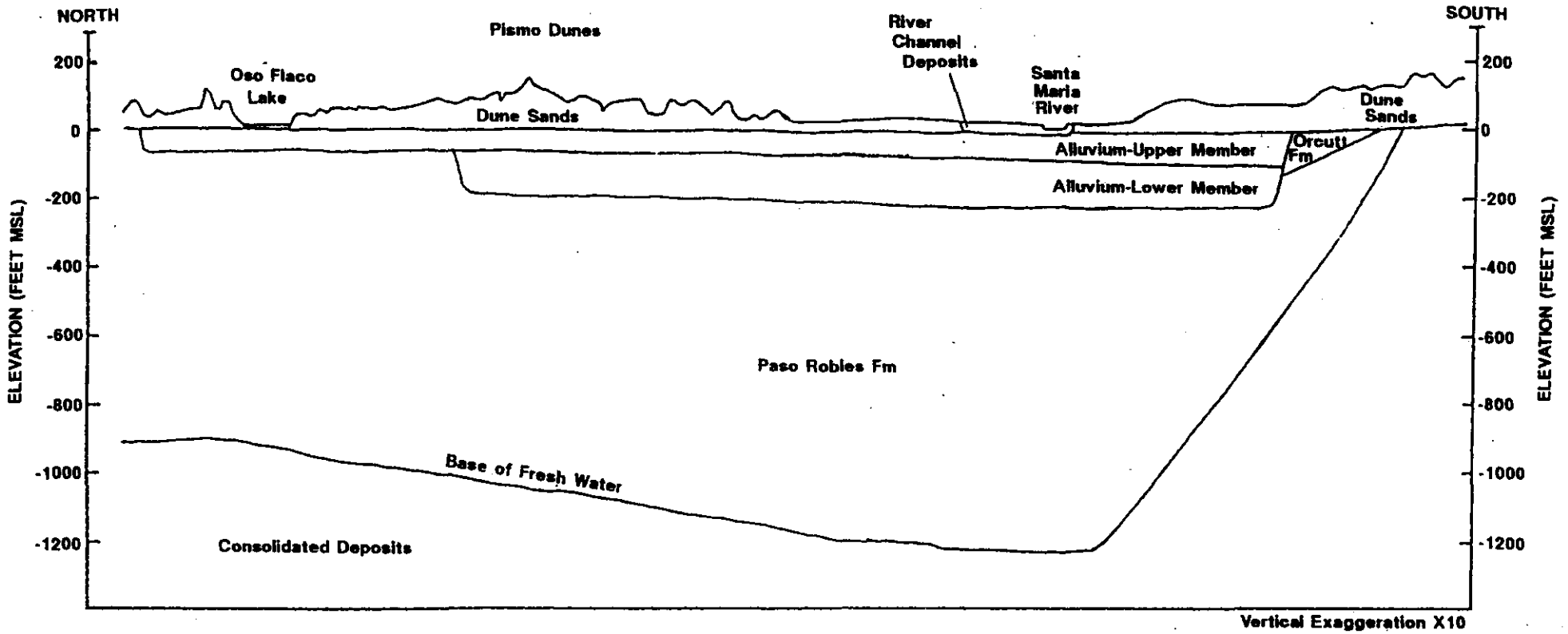
Figure 2
Generalized Geologic Map
Santa Maria Valley



Adapted From California DWR, 1970

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Figure 3
Generalized Geologic Cross Section
Santa Maria Valley

Basin Hydrologic Conditions

Ground-water levels within the entire basin have fluctuated greatly since the 1920's when historical water level measurements began, and certain water level trends are visible throughout the basin. A substantial decline in ground-water levels, from historical high to historical low levels, occurred between 1945 and the late 1960's with a progressively greater decline further inland from the coast. The decline ranged from approximately 20 to 40 feet near the coast to as much as 120 feet inland in the Garey area. This decline was apparently due to an increasing agricultural demand on the ground-water basin and to slightly drier than normal climatic conditions during this period.

Since then, a long-term stability has been present as ground-water levels fluctuated between the historical low and near-historical high levels over five- to 15-year periods. Hydrographs of ground-water elevations beneath the coastal and inland portions of the valley illustrate a similar trend, but also illustrate different ranges of ground-water level fluctuations observed over the historical period of record (approximately the last 65 years) (Figures 4, 5, and 6). The hydrographs show that ground-water levels have repeatedly recovered to near-historical high levels, including as recently as 1995.

In addition, coastal ground-water elevations appear to have remained **above** sea level throughout the historical period, apparently precluding any salt water intrusion along the coast. Periodic fluctuations in ground-water levels since the late 1960's, despite long-term stability, have apparently been due to intermittent wet and dry climatic conditions, with natural recharge during wet periods complemented by supplemental recharge from the Twitchell Reservoir project. As discussed below, the amount of recharge from the Santa Maria River to the basin has apparently increased considerably since the mid- to late-1960's when the Twitchell Reservoir project became fully operational. In addition, the long-term stability may have been partially due to a "leveling-off" of the agricultural demand on the basin.

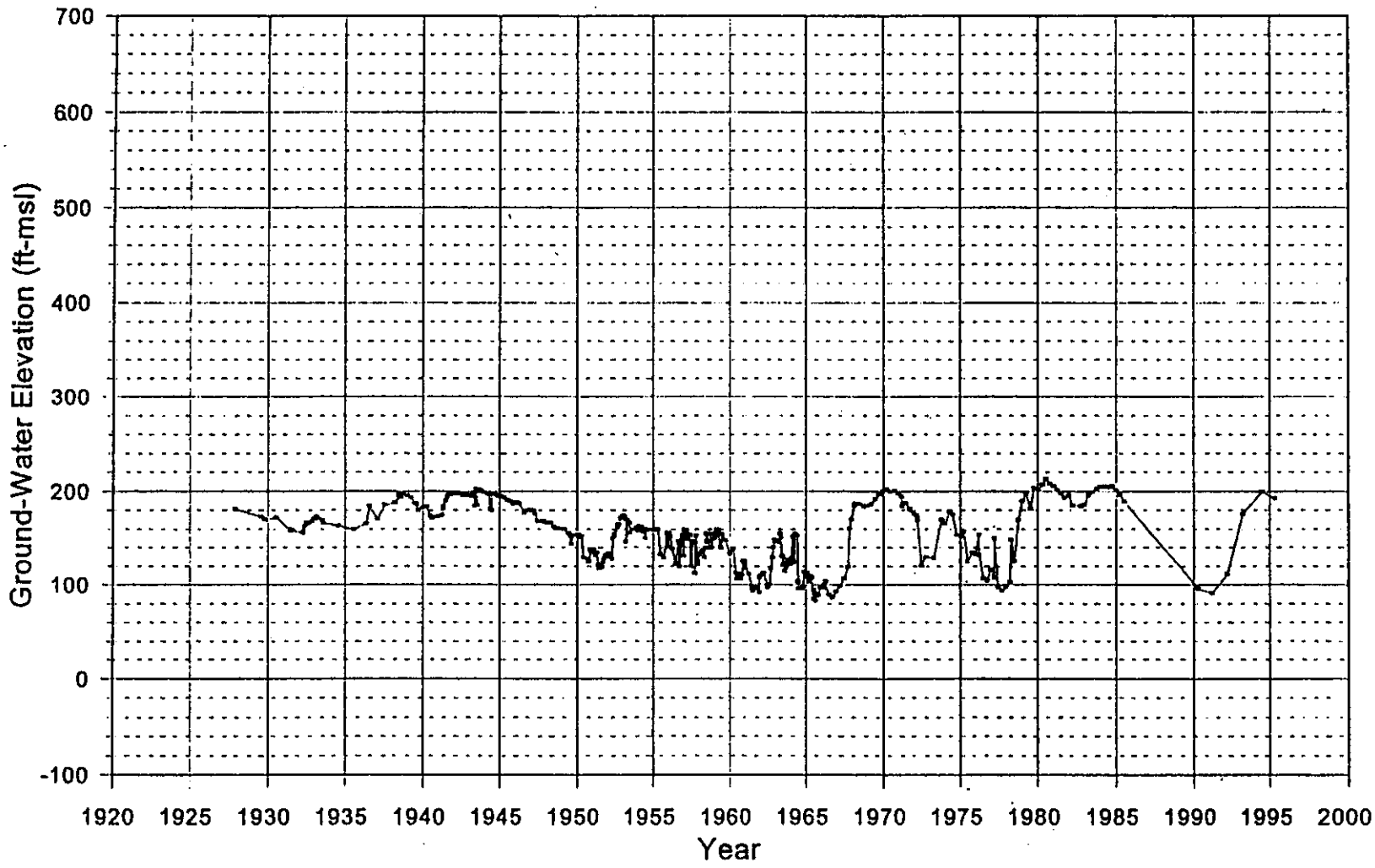

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Figure 4
Hydrograph of Ground-Water Elevation
Santa Maria Valley

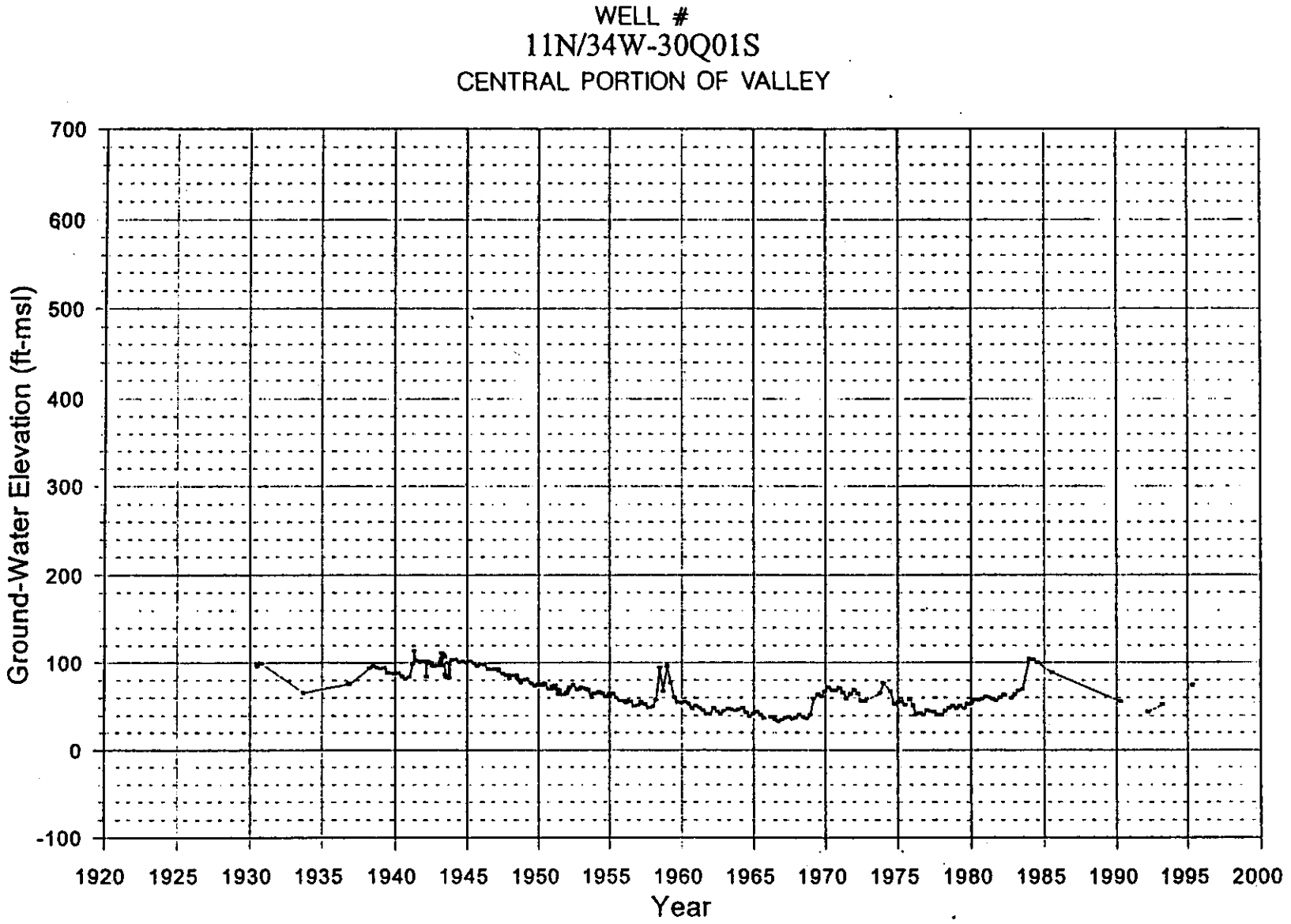

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Figure 5
Hydrograph of Ground-Water Elevation
Santa Maria Valley

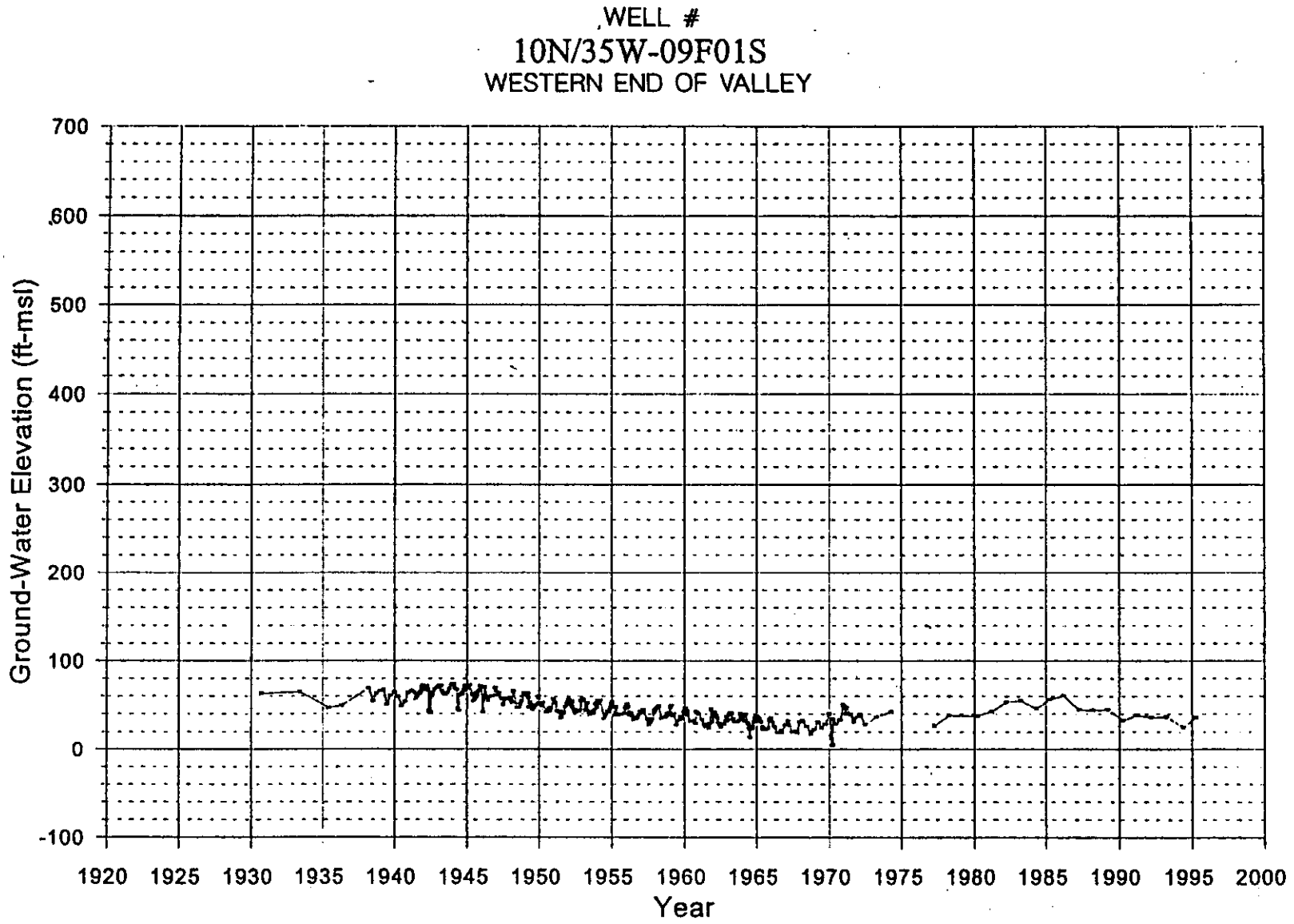

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Figure 6
Hydrograph of Ground-Water Elevation
Santa Maria Valley

Ground-water beneath the valley has historically flowed to the west-northwest from the Sisquoc area toward the Ocean, including some amount of flow beneath the Nipomo Mesa, at times as far to the northwest as the Oso Flaco Lake area. As noted above, ground-water levels have fluctuated between near-historical high and historical low levels since the early 1940's, and this is illustrated further in ground-water level contour maps for the following periods: 1943 (high), 1967 (low), and 1995 (high) (Figures 7, 8, and 9). Several points of interest in regard to the hydrologic conditions are that, first, a "flattening" of the water table beneath the central and western portions of the basins occurred between 1943 and 1967 as ground-water levels declined. The slope ("gradient") of the water table in these areas declined to less than one-half of the gradient observed during 1943, which would have the effect of slowing (but not stopping or reversing) the movement of ground-water through and out of the basin. This flattening has periodically fluctuated since 1967 as ground-water levels have alternately recovered and declined; some recovery is evident by 1995.

A second point is that the Twitchell Reservoir project appears to have provided supplemental recharge from the Santa Maria River to the ground-water basin sufficient to maintain and enhance the recovery of ground-water levels in the basin. The recharge is visible in the ground-water level contour maps for 1967 and 1995 (Figures 8 and 9) where the contours are parallel to the Santa Maria River from Garey to the entrance of Suey Creek. This is also the case for several periods since 1967 when ground water was at near-historical high or historical low levels. The recharge is also notable in ground-water quality as discussed below. As a result of the supplemental (Twitchell) recharge, even though ground-water levels beneath the eastern portion of the basin have fluctuated along with the rest of the basin, the water table gradient has decreased only slightly since 1943.

A "bar chart" of the historical net loss of streamflow between the Garey area and Guadalupe (Figure 10) also provides an indication that the amount of in-stream recharge to the basin has increased as a result of Twitchell operations since 1967. An estimate of the supplemental basin recharge is 34,100 acre-feet/year, assuming any streamflow losses due to processes other than recharge, as well as any streamflow gains, were consistent pre- and post-project. This estimate is

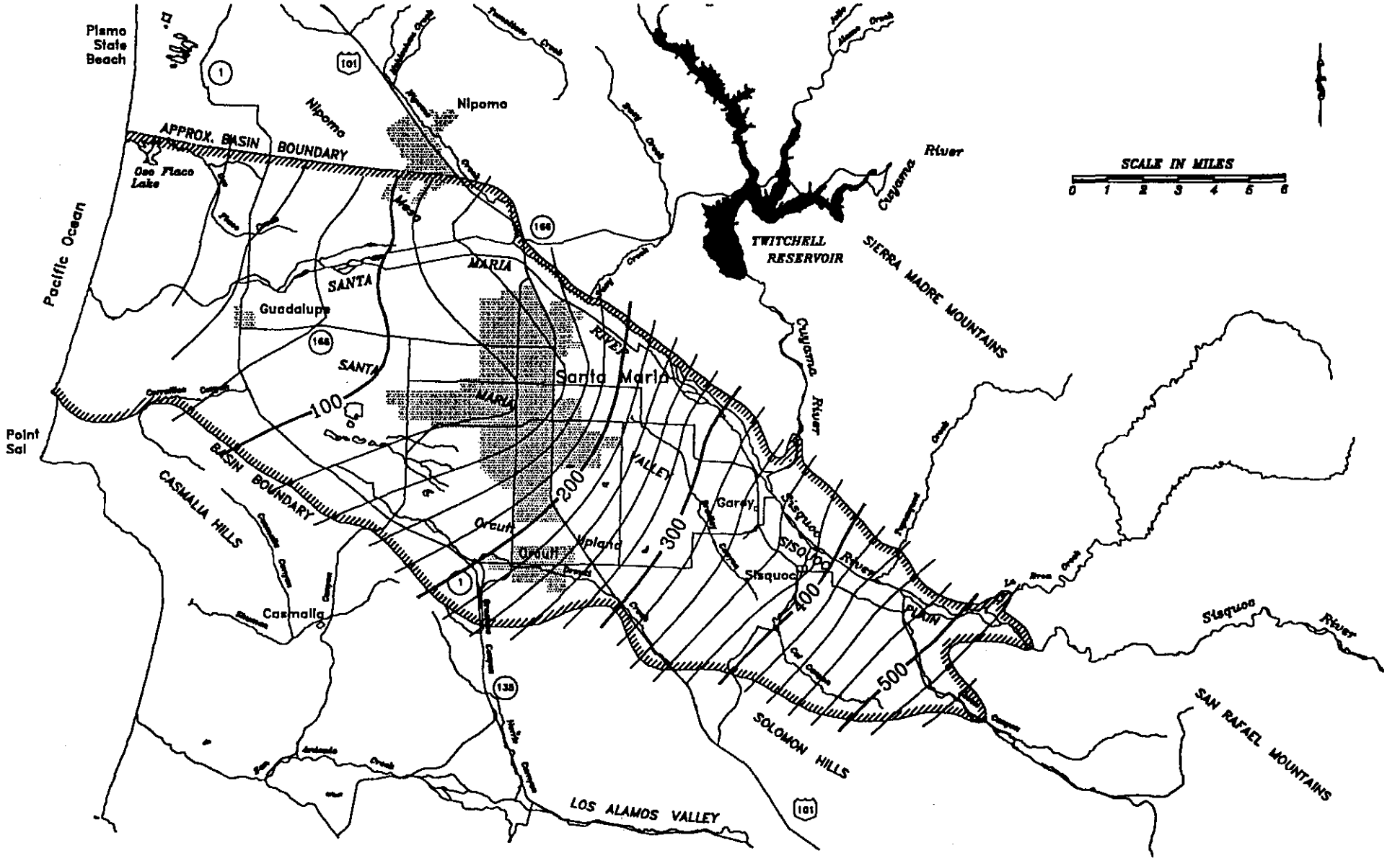

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Figure 7
Contours of Equal Ground-Water Elevation, Spring 1943
Santa Maria Valley

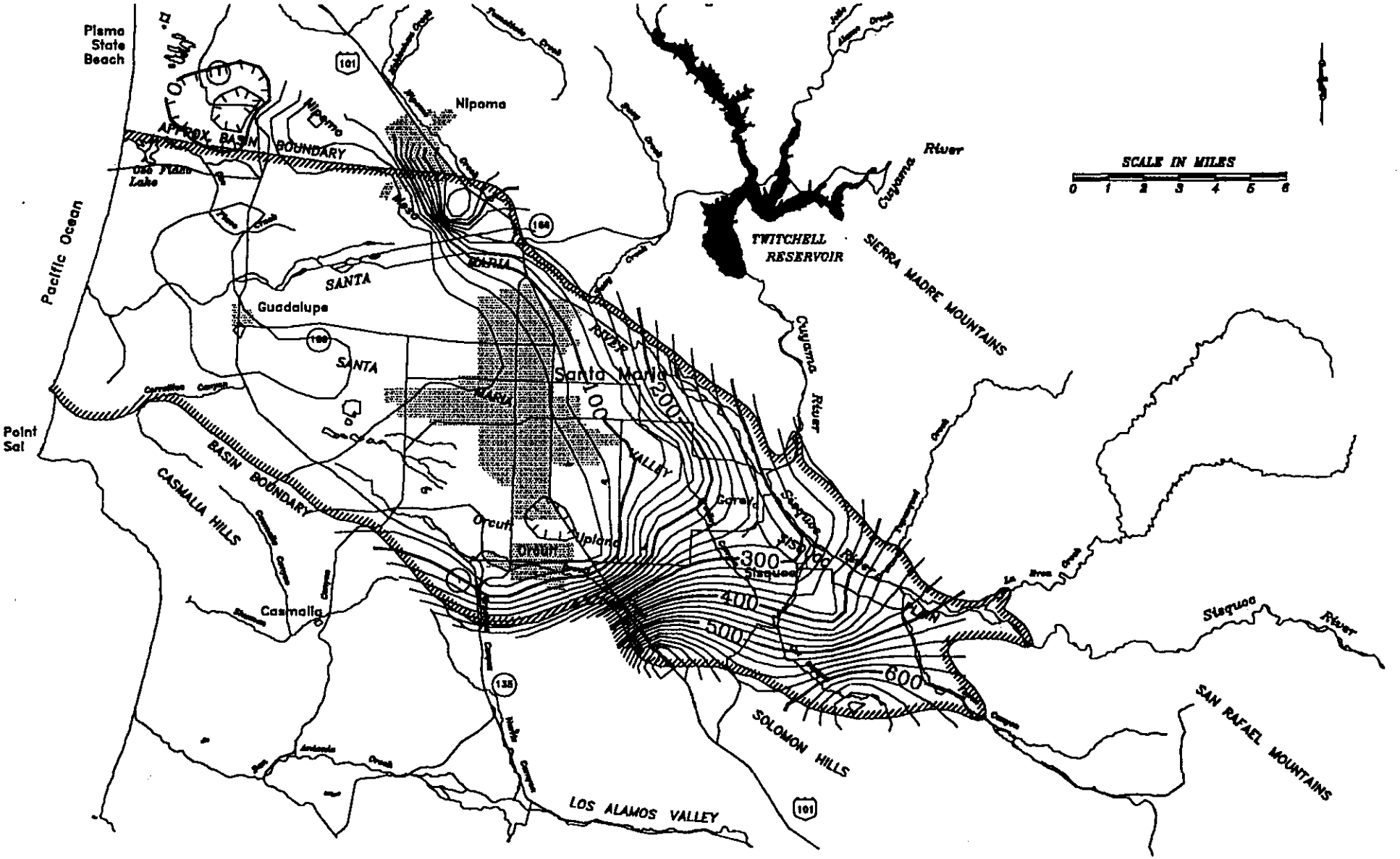

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Figure 8
Contours of Equal Ground-Water Elevation, Spring 1967
Santa Maria Valley

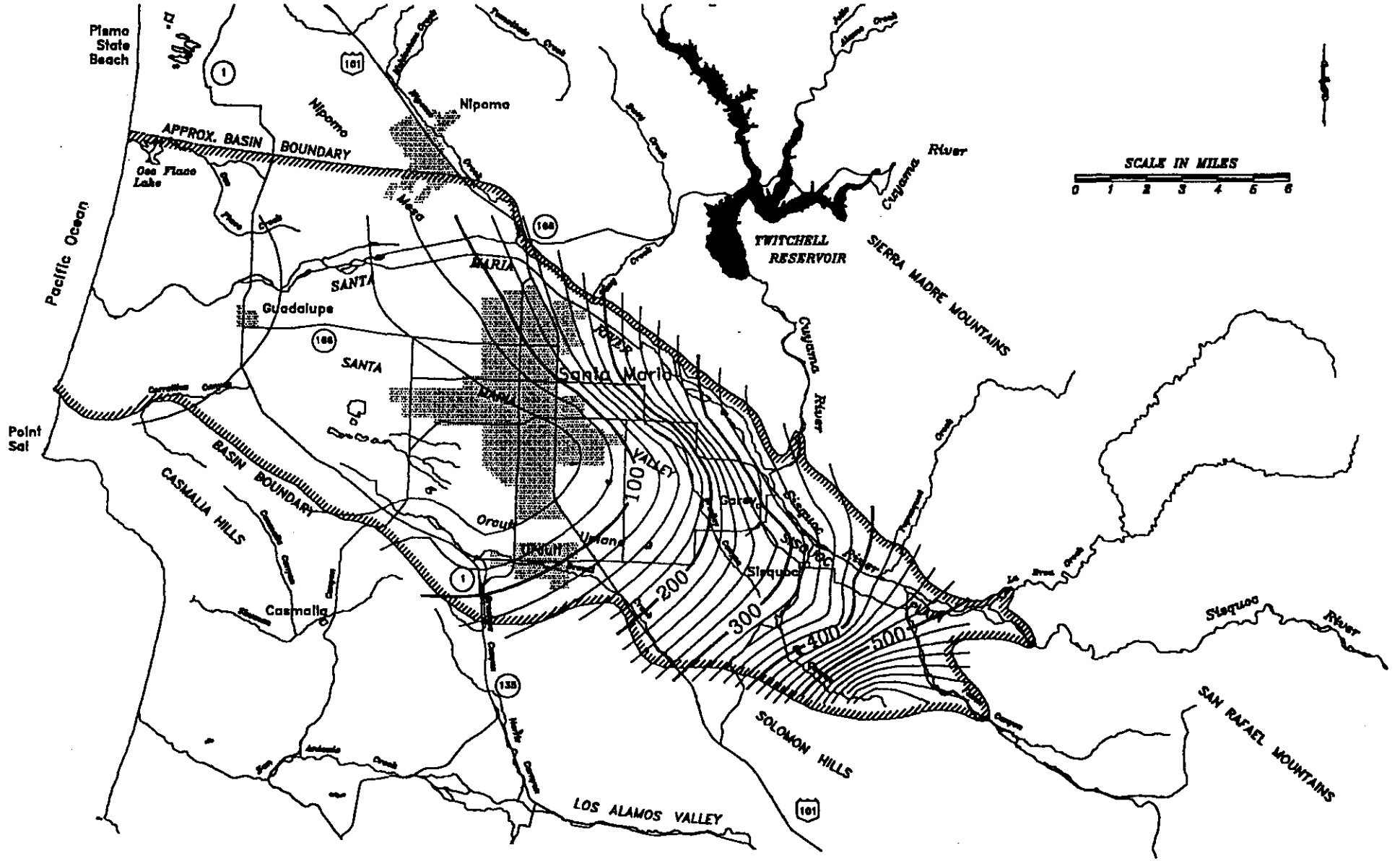

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Figure 9
Contours of Equal Ground-Water Elevation, Spring 1995
Santa Maria Valley

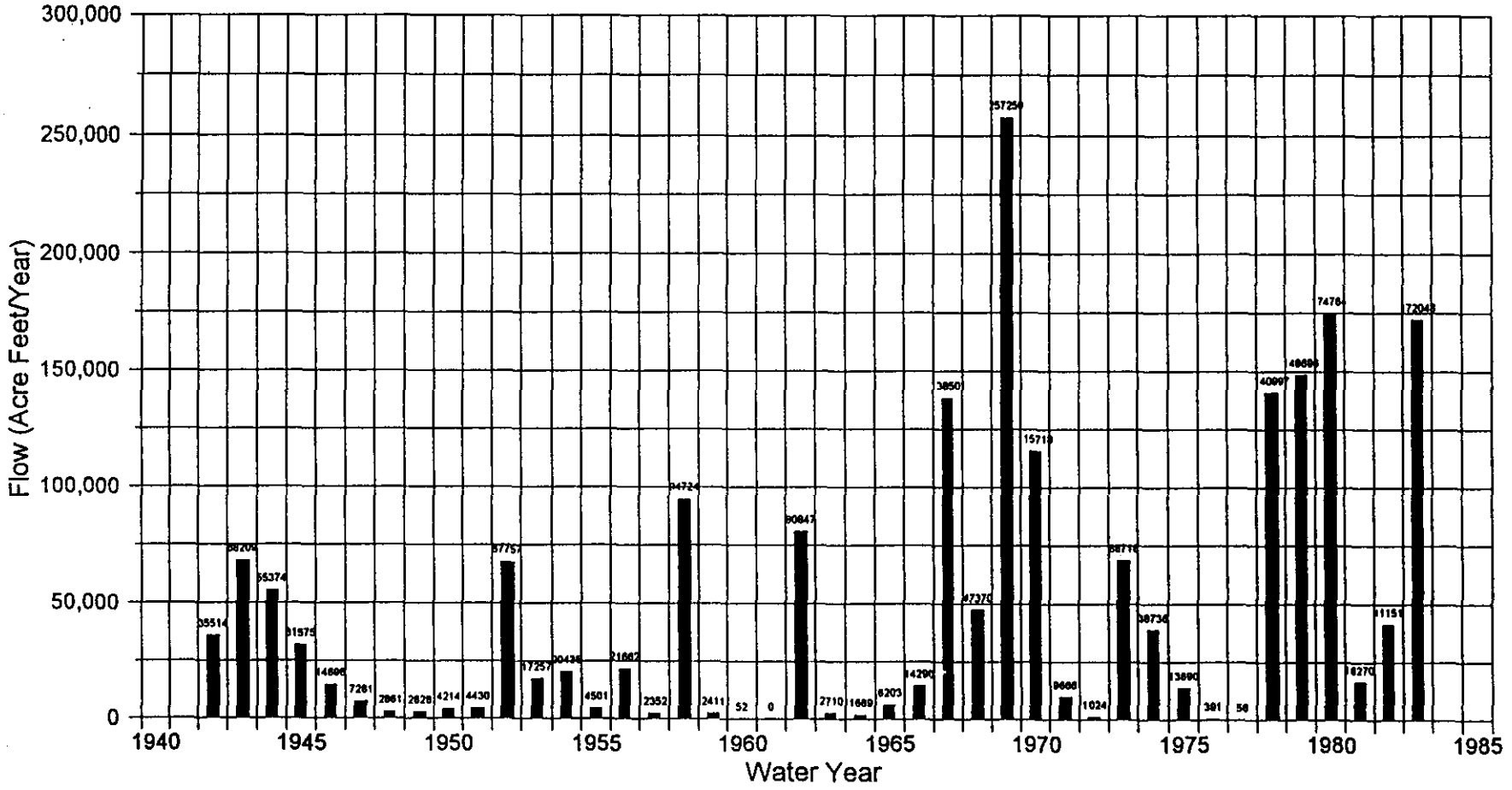

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Figure 10
Streamflow Loss, Santa Maria River
Santa Maria Valley

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based on streamflow data currently available (through 1983 for the Cuyama River and 1973 for the Sisquoc River tributaries). A schematic map illustrates the estimated increase in the magnitude of historical streamflow losses (recharge) within the basin (Figure 11).

A third point in regard to the hydrologic conditions illustrated by the ground-water level contour maps is that it appears that coastal ground-water levels have historically remained above sea level and that outflow of ground-water from the basin has been maintained. While the amount of outflow has varied with ground-water level fluctuations, the maintenance of positive water levels above sea level, which results in ground-water outflow, has likely precluded salt water intrusion of the basin. A localized area northeast of Oso Flaco Lake beneath the Nipomo Mesa experienced ground-water levels depressed below sea level during 1967 (see Figure 8); similar conditions have occurred during other periods since then when ground-water levels approached historical lows. This area is at the northern edge of the basin, and the depression (when present) appears to reduce the amount of outflow from the aquifer(s) beneath the Nipomo Mesa to the ocean; it may also induce ground-water flow from the basin northward toward the depression.

A review of historical ground-water conditions as described above indicates that the basin has achieved a long-term stability in ground-water levels. Recent reports of the ground-water conditions in the basin, however, have concluded that, at the current level of demand on the basin, it is in overdraft by approximately 20,000 acre-feet/year (Santa Barbara County Water Agency, 1994 and 1996). Hydrographs of historical ground-water levels throughout the basin (such as Figures 4, 5, and 6) do not support the occurrence of perennial overdraft; rather, they indicate that the initial decline of ground-water levels between 1943 and 1967 was followed by a period of recovery, which has then been successively followed by alternating periods of decline and recover between historical low and near-historical high ground-water levels through 1996.

The nature of ground-water level fluctuations does not support the existence of an "average annual" or continuous overdraft; instead, they indicate that basin ground-water storage has repeatedly fluctuated between several years of decline followed by several years of gain. The repeated recovery of ground-water levels to near-historical high levels in most of the basin,

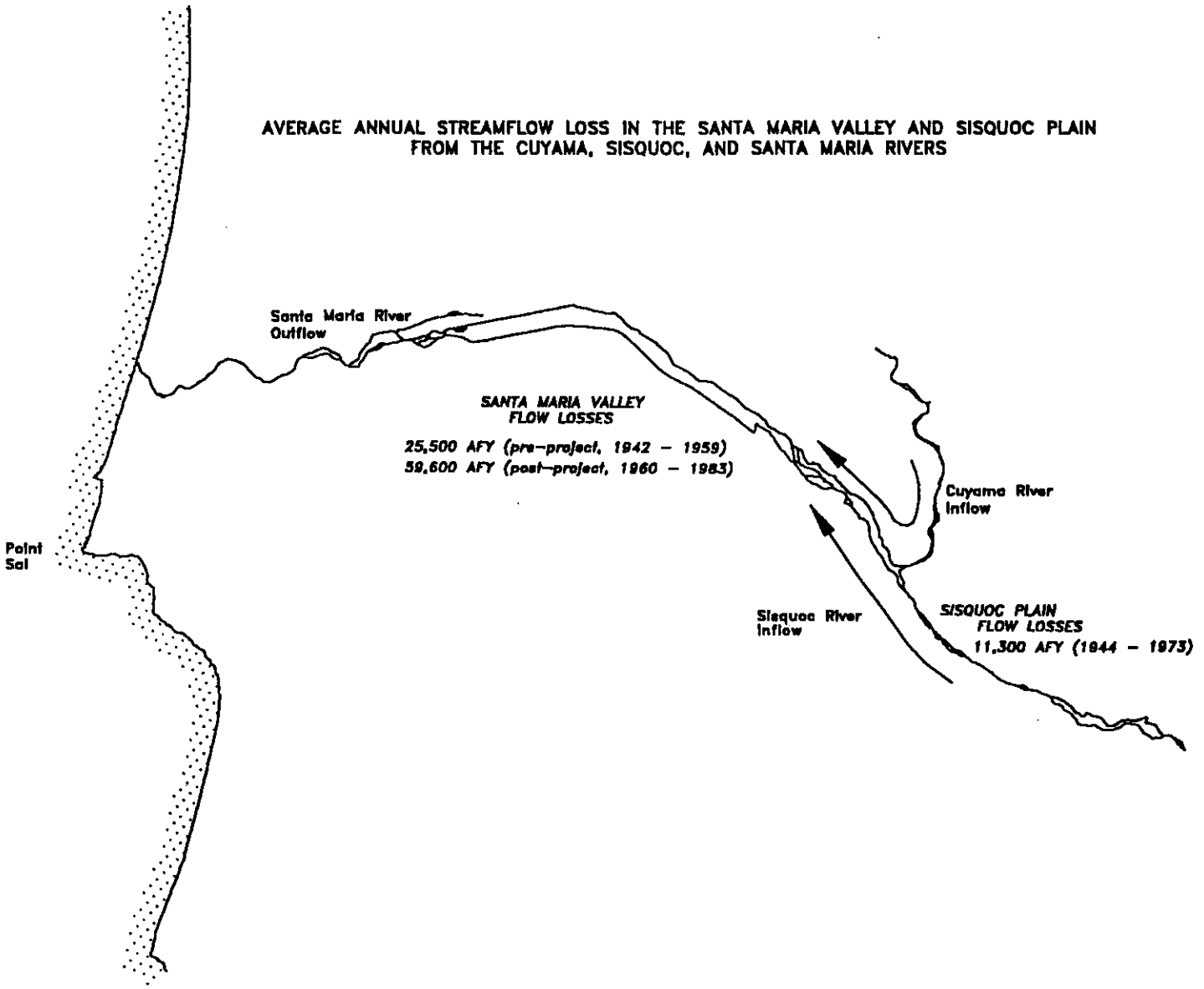

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Figure 11
Average Annual Streamflow Loss
Santa Maria Valley

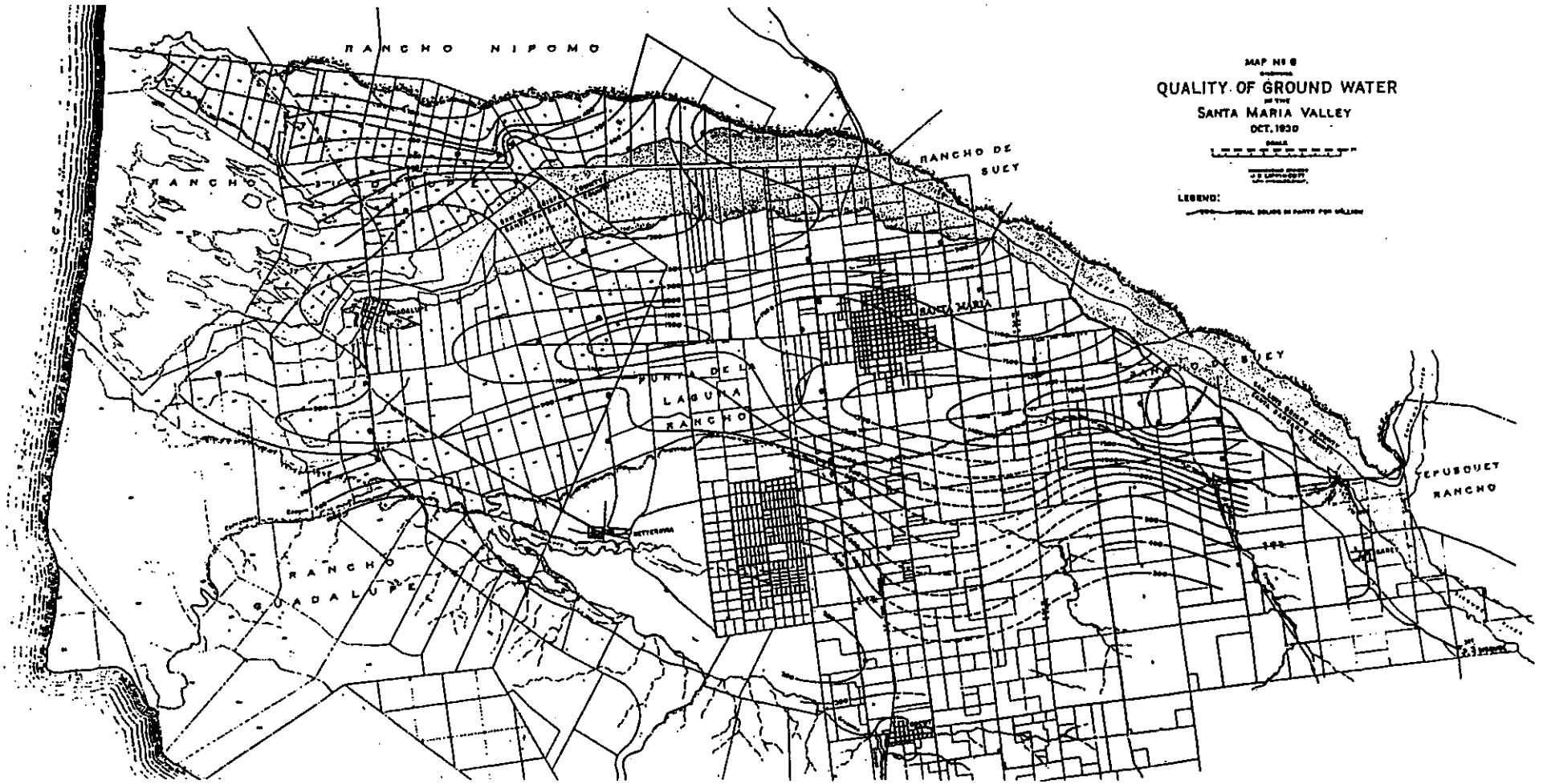
including during the most recent recovery between 1991 and 1996, does not support the conclusion that the basin is and has been in overdraft; instead, it indicates a long-term stability comprised of periodic ground-water level declines and recoveries.

Contour maps of ground-water elevations for periods of historical high and low levels (such as Figures 7, 8, and 9) indicate that a seaward gradient and, thus, outflow from the basin to the ocean, has been maintained historically. This would indicate that the hydrologic conditions in the basin have not induced salt water intrusion and, thus, overdraft conditions due to salt water intrusion do not appear to have existed historically. An expanded analysis of ground-water quality conditions, as discussed in the following subsection, appears to confirm that this is the case.

Ground-Water Quality

Water-quality conditions in most of the Santa Maria ground-water basin have changed during the historical period for which water-quality data are available, with improvement in some portions of the basin and degradation in other portions. Generally, the ground-water quality has improved in the area of highest recharge along the Santa Maria River and the eastern portion of the basin; it has degraded beneath the western portion of the basin, from the eastern edge of the confined area to Guadalupe; and it has remained fairly stable beneath the Orcutt upland and Sisquoc plain. Little is known about historical ground-water quality conditions beneath the western coastal portion of the basin and the Nipomo Mesa, due to a lack of water-quality data from these areas.

Concentrations of total dissolved solids (TDS) during the period of early basin development (early 1930s) were highest in the eastern portion of the basin (Lippincott, 1931) (Figure 12). The TDS values were as high as 1,600 mg/l in the basin's eastern end, approximately 900 mg/l near Guadalupe, 200 to 300 mg/l near Orcutt, and 200 to 800 mg/l beneath the Nipomo Mesa. It has been reported that the higher TDS values and their distribution were due to recharge of the streamflow from Cuyama Valley (which contained high concentrations of sulfate) to the basin



From Lippincott, 1931

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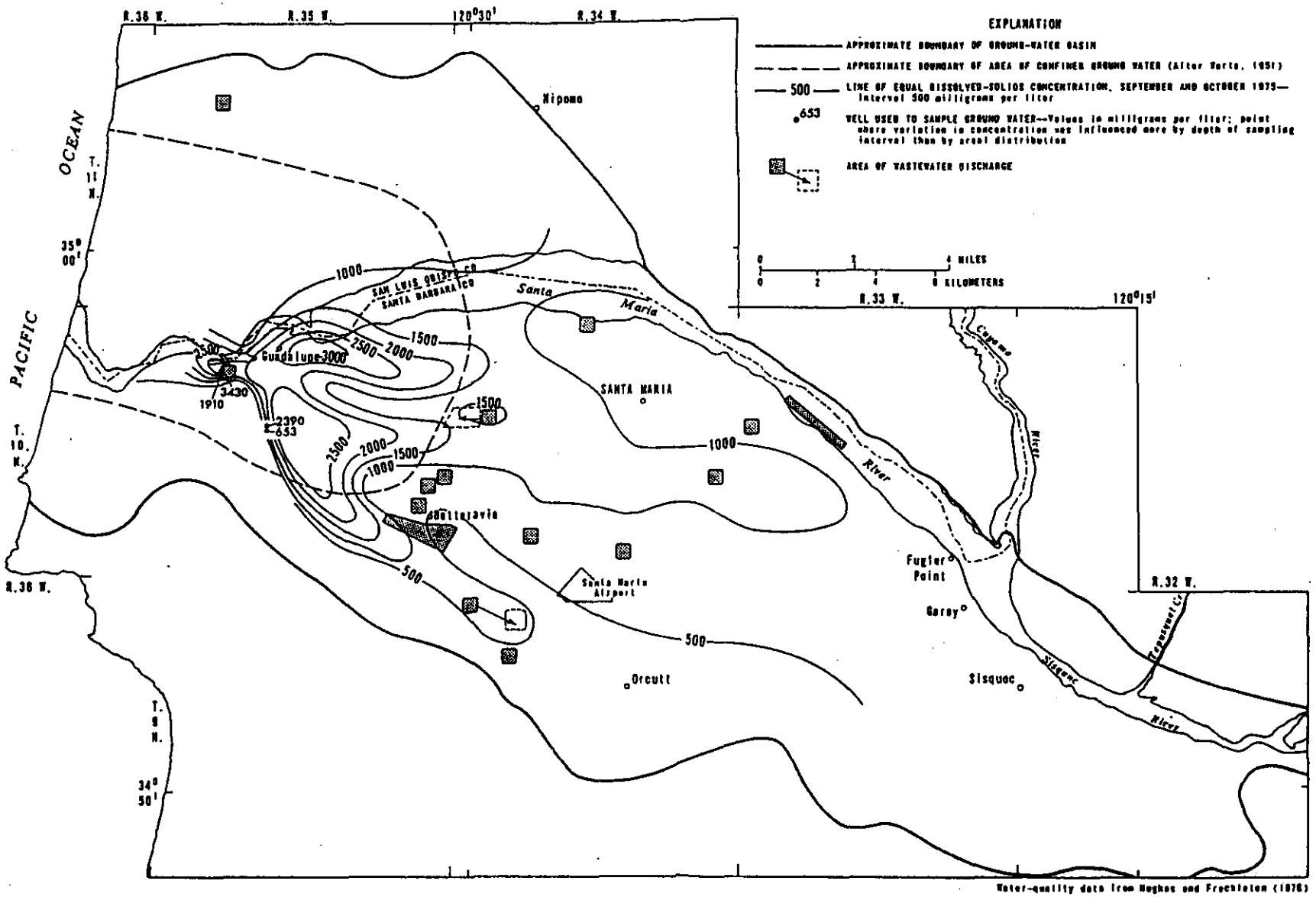
Figure 12
Contours of Equal Total Dissolved Solids Concentration
In Ground Water, 1930

along the upper-most portion of the Santa Maria River (USGS, 1977). Little historical data exists about individual general mineral constituent and nitrate concentrations during this early period.

By 1975, when the first comprehensive study of ground-water quality conditions in the Santa Maria Valley was conducted (USGS, 1977), TDS concentrations had improved in the eastern portion of the basin to less than 1,000 mg/l but had degraded toward the western end of the basin to generally 2,000 mg/l and as high as 3,400 mg/l near Guadalupe (Figure 13). Also by this period, chloride, sulfate, and nitrate concentrations in ground-water in the latter area had become elevated compared to the remainder of the basin; in particular, nitrate concentrations were as high as four times the drinking water standard for nitrate. Ground-water sampling completed since 1976 indicates that these constituent concentrations have increased further in the western end of the basin.

The ground-water quality improvement in the eastern end of the basin appears to be due to the conservation and efficient recharge of high streamflows, which generally are of better quality than low streamflows, along the uppermost portion of the Santa Maria River due to operation of the Twitchell Reservoir project. Sampling of the River water quality pre- and post-project indicates that the quality improved once the project was operational (USGS, 1977); and, as discussed in the previous subsection, recharge from the River to the basin has notably increased post-project in the area along the River. The ground-water quality improvement would then be due to the better quality water gradually "replacing" the poorer quality water over time.

The degradation of ground-water quality in the western end of the basin appears to be partially related to agricultural "recycling" of ground-water that has occurred throughout the basin; i.e. the repeated pumpage and application of ground-water, followed by evapotranspiration of water from crops and deep percolation of some applied water with added salts that tend to increase salt concentrations in ground water with each cycle. Historical discharges of treated and untreated waste water from various points throughout the basin, such as the treated water from the Cities of Santa Maria and Guadalupe waste water treatment plants, have apparently also contributed to the



Water-quality data from Hughes and Frechleton (1976)

From Hughes, 1977

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Figure 13
Contours of Equal Total Dissolved Solids Concentration
In Ground Water, 1975

ground-water quality degradation. Localized areas of nitrate degradation, apparently due to local nitrate applications, are also present in the western portion of the basin.

Ground-water quality degradation would then appear to be partially due to the recycled (agricultural, municipal, etc.) ground-water from the central portion of the basin gradually moving downgradient toward the confined area. As described above, although ground-water levels have remained above sea level, the ground-water gradient has flattened in the central and western portions of the basin and, thus, the movement of the degraded ground-water in this area (and the associated outflow to the ocean) has been reduced. It is possible that the reduced outflow of ground-water has been responsible for the localized degradation of ground-water quality; and it has been suggested that this is the case, based on the observation that the pattern of ground-water quality distribution in the basin is compatible with the ground-water flow directions (USGS, 1977).

Proposed Workplan - 1997 to 2007

To address the questions relating to potential ground-water overdraft and the increasing salinization of ground-water, the Conservation District has embarked on a program to manage ground-water within the Santa Maria basin under the general authority granted by AB 3030 by the adoption of a ground-water management plan. A copy of that plan is included with this report as Appendix A.

Since the Conservation District adopted its ground-water management plan in 1995, the Cities of Santa Maria and Guadalupe and the Town of Sisquoc have also begun to develop ground-water management plans. As suggested by AB 3030, the Conservation District intends to coordinate its ground-water management plan with those being developed by the municipalities. Because each of these municipalities are located within the Conservation District and because the Conservation District's Board of Directors believes that it would be unfair to require the landowners within the municipalities to pay twice for ground-water management, the Conservation District decided to exclude the landowners in the Cities of Santa Maria and Guadalupe and the Town of Sisquoc from its ground-water management plan. For this reason, the Conservation District has established a subsidiary district - Special Improvement District No. 1 (the "Improvement District") - that will actually levy the assessments needed to fund ground-water management. The Improvement District includes all lands within the Conservation District except lands within the Cities of Santa Maria and Guadalupe and the Town of Sisquoc.

Managing water in the Santa Maria basin required that there be a clear understanding of the hydrogeology of the basin, the movement of ground water, the quantities (and quality) of water

being applied to crops, and many other factors. At present, however, while the basic hydrogeology of the basin is reasonably well defined, there is a need to better understand various water level and water quality conditions throughout the basin. Notably, there continues to be debate over whether ground-water extractions exceed "safe" yield. Further, the occurrence of degraded ground-water quality to the west warrants further investigations, particularly in light of improved quality to the east and the continued occurrence of ground-water outflow to the ocean. Accordingly, much of the effort that the Conservation District intends to propose during the early years of its ground-water management program will be directed towards achieving a better understanding of the hydrogeologic conditions of the basin, together with the other information needed for sound management of the basin.

The District's primary hydrogeologic needs that will require continued or expanded investigation can be summarized as follows: 1) a consensus on definition of the basin and notably that portion of the basin, if less than the entire basin (e.g. the Santa Maria Valley as contrasted to the Nipomo Mesa), which will be most actively managed; 2) an expanded understanding of pumpage and return flows, complemented by quantification of imported water once deliveries begin, to better interpret the relationship among pumpage, return flows, and basin yield; 3) an expanded understanding of ground-water quality throughout the basin, with focus on the degraded area in the western part of the basin, in order to identify and control source(s) of degraded quality, and to develop appropriate management action to correct the problem and restore ground-water quality for desired beneficial uses (agricultural irrigation and municipal and industrial supply); and 4) an updated determination of perennial yield of the basin.

Priority objectives for the next decade in management of ground-water in the basin can be grouped into six categories, each of which is discussed below: 1) maintenance of existing management actions, notably ground-water recharge via releases from Twitchell Reservoir; 2) salt management, notably correction of the large historical salt increase in the westerly portion of the basin; 3) integration of imported State Water Project water into the overall quantity and quality of ground-water in the basin; 4) continuation of historical monitoring, and expansion of monitoring in particular problem areas; 5) long-term planning for augmented artificial ground-water recharge

via reclamation of sand and gravel mining operations on the Santa Maria and Sisquoc Rivers, including possible implementation of some additional recharge in completed mining areas; and 6) ground-water modeling to analyze water level and quality response to various management actions.

Maintenance of Existing Management - Perhaps the most beneficial management action in the history of the basin has been the construction and operation of Twitchell Dam and Reservoir. Its conservation of runoff and subsequent regulated release to maintain streamflow recharge to the vicinity of Highway 101 has resulted in increased average ground-water recharge on the order of 30,000 acre-feet per year since the mid- to late-1960's; that recharge has been a key factor in achieving long-term, relatively stable (i.e. no long-term decline) ground-water storage conditions since that time. The recharge from the river has also had a notable beneficial effect on ground-water quality beneath and down-gradient from the river because the conserved flows are the higher quality part of runoff that would otherwise discharge to the ocean. However, the conservation of runoff from the Cuyama River has also resulted in significant silt accumulation in Twitchell Reservoir, and a corresponding decrease in storage capacity. That reduced capacity, particularly as exacerbated by future silt accumulation, will ultimately limit the effectiveness of the reservoir for streamflow regulation and downstream ground-water recharge. As a result, one of the highest priority management actions for the District in the next ten years is to investigate and implement appropriate action to restore and maintain the storage capacity of Twitchell Reservoir, and to continue its operation to effect the historical level of in-stream artificial ground-water recharge downstream of the dam.

Salt Management - The historical large increase in salt concentration in the western part of the District represents a major potential impact on the use of the ground-water basin for ongoing agricultural, as well as municipal, water supply. Clearer understanding of the salt loading mechanism, and whether individual or multiple aquifers are affected, is necessary before developing a solution. That understanding can be accomplished by focused monitoring as discussed below. Ultimately, however, it is recognized that some form of management of ground-water flow to move salt toward the ocean, probably by purposeful ground-water recharge

such as has historically been successful in improving ground-water quality downgradient of the river, will likely be required to accomplish improvement of the degraded ground-water quality. Both the monitoring and the implementation of salt management are primary objectives for the next decade.

Importation of State Water Project Water - The importation of treated water from the State Water Project is now expected to commence in mid-1997. At full contract amounts, this represents as much as 17, 250 acre-feet per year to Santa Maria, Guadalupe, and the Orcutt area (plus a 10 percent "drought buffer"); and the quality of the imported water is notably better than local ground-water, particularly for municipal supply. A major task for the District in the next decade, will be addressing how the imported water affects both the quantitative and qualitative balance of the basin. Included in those tasks will be the resolution of the controversy over "return flows" which result from discharge of treated waste water, if the municipalities directly use the imported water, or resolution of the controversy over recharge impacts if the municipalities choose to recharge the imported water for recapture by their existing or new wells. In any case, the importation of State water represents another management challenge relative to ground-water storage, flow and quality in the basin.

Ground-Water Monitoring - Historical ground-water level monitoring has been, and continues to be essential to understanding ground-water basin conditions relative to storage, and fluctuations during wet and dry periods. It needs to be continued, with regular interpretation and reporting of basin conditions. Ground-water quality monitoring, on the other hand, has been more sporadic and less formal, resulting in less frequent interpretation of conditions and, possibly, less response to problems such as has occurred in the western part of the basin. As a result, both for long-term understanding, and for short-term investigation of such problems as the local salt accumulation in the western portion of the basin, a priority of the District is to formalize its ground-water quality monitoring efforts by: selecting wells for monitoring based on location and completion in selected aquifers; establishing a frequency for regular sampling and analyses; and interpreting results to better define sources and movement of salt, as well as the nature of salt accumulation such as has occurred. In addition, given the hydraulic connection of the basin to the ocean and

the general lack of irrigation or other supply wells near the coast, it may be appropriate for the District to expand its "monitoring" well network (which now consists of water supply wells) by installing one or more wells near the coast to allow monitoring of both water levels and water quality to detect the potential for or occurrence of seawater intrusion, if such conditions occur.

Recharge in Reclaimed Sand and Gravel Mining Excavations - Some current or completed sand and gravel mining along the Santa Maria and Sisquoc Rivers creates opportunities for the completed excavations to be used for seasonal and/or longer-term artificial recharge spreading basins. Similarly, new applications for long-term mining are currently in environmental review; at least one of those is ideally configured for potential future spreading basins, assuming an entity like the District is willing to operate it as such and, of course, manage surface water to fill the spreading basins for recharge. While the current or completed mining operations might be pursued for recharge, the District needs to interact with the mining companies to plan, as appropriate, for reclamation to recharge if one or more of the current applications is to be reclaimed to that purpose. Since the planned mining life of some of the current applications is on the order of ten years, the District needs to begin to pursue planning now to determine the need and method whereby it might introduce water for recharge in those locations and, as appropriate, begin interaction with the mining companies to facilitate reclamation to recharge.

Ground-Water Modeling - Both short- and long-term management of the basin will require an understanding of the impacts on ground-water levels and quality which result from any of the management actions which might be considered or implemented. For example, the importation of water from the State Water Project and the associated changes in M&I pumping, most notably by the City of Santa Maria, can be expected to have appreciable effects on ground-water levels (by substantially reducing locally concentrated pumpage) and on ground-water quality (due to higher quality return flows from treated wastewater discharge). In order to evaluate the various impacts of different management actions, the District will need to develop a calibrated numerical ground-water flow model of the basin which can be coupled with an appropriate water quality component to examine both the water levels which would be expected to result from one or more management actions, and the water quality changes which would also be expected to result. Such

a modeling effort would be comprehensive in the basin, and would build on previous geologic and hydrologic analyses, as well as more recent monitoring which would be incorporated in the basin-wide monitoring effort described above.

The Proposed Assessment

As described in the previous section, the Conservation District anticipates that the annual cost of implementing the ground-water management plan could range from as little as $100,000 in 1997 (largely because of the time required to begin to implement the ground-water management plan) to as much as $1 million in the early years (largely because of the high costs of the basin investigations) and as much as $600,000 during the latter years of the ground-water management plan (as the Conservation District finishes the basin investigations and begins the more routine task of managing ground-water in the basin).

The Improvement District will assess all lands at an equal rate per acre because all lands benefit equally from the type of ground-water management program being proposed by the Conservation District. The benefits provided to each parcel are thus based on the total capital cost required for ground-water management and the total operations and maintenance cost associated with the proposed facilities (e.g. ground-water quality monitoring).

The maximum annual assessment could be set by the Improvement District at a rate of $25/acre. In order to establish an assessment rate for a give year, the Conservation District will prepare a budget for the work to be accomplished during the following year. Based on that budget, the Improvement District will determine an assessment rate that will produce sufficient funds to carry out the proposed work. For instance, if the Conservation District budgets $100,000 for the first year of the ground-water management plan, the Improvement District would only levy an assessment of about $2.50/acre. If, by contrast, the Conservation District's budget calls for the expenditure of $500,000 during a given year, the Improvement District will levy an assessment of

$12.50/acre. Only if the Conservation District determines that it requires a budget of $1 million during a specified year would the Improvement District levy an assessment of $25/acre.

Conclusions and Findings

Based on the above discussion, the Conservation District's plan for ground-water management will provide special benefits to lands within the Improvement District. In particular, the implementation of the ground-water management plan and assessment workplan will, over time, reduce the salinization of lands within the Improvement District and reduce the extent to which (if any) the Santa Maria basin is in overdraft. Further, as described in the letter report (Appendix B) from Mr. Mike Malone, an appraiser familiar with lands in the Improvement District, the proposed maximum assessment rate of $25/acre (or a maximum of $250/acre over the 10-year maximum life of the assessment) is less than the value of the special benefits that the implementation of the ground-water management plan will confer on lands within the Improvement District. Finally, because the District operates on a non-profit basis, the proposed assessment rate does not exceed the reasonable cost of providing the special benefits of implementing the ground-water management plan for lands within the Improvement District.

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Appendix A

AB 3030
Ground-Water Management

RESOLUTION OF THE BOARD OF DIRECTORS
OF THE SANTA MARIA VALLEY WATER CONSERVATION DISTRICT

WHEREAS, the directors of this district, on September 23, 1993, after publication of notice as required by law, held the hearing required by §10753.2 of the California Water Code on whether or not to adopt a resolution of intention to draft a groundwater management plan pursuant to the Groundwater Management Law (Government Code §§10750, et seq.); and

WHEREAS, on September 23, 1993, at the conclusion of the said public hearing, the directors of this district drafted and adopted a resolution of intention to adopt a groundwater management plan for the purposes of implementing the plan and establishing a groundwater management program; and

WHEREAS, the said resolution of intention was thereafter published as required by law; and

WHEREAS, the directors of this district then held and participated in a number of workshops and formal and informal meetings with members of the public and representatives of water purveyors, both within and without the district boundaries, serving areas of the Santa Maria groundwater basin located in northern Santa Barbara and southern San Luis Obispo Counties, with the view of adopting either a joint groundwater management plan or compatible individual plan; and

WHEREAS, the directors of this district thereafter prepared a groundwater management plan; and

WHEREAS, the directors of this district thereafter, after publication of notice as required by law, held a public hearing on June 15, 1995 and on July 11, 1995 to determine whether to adopt such plan; and

WHEREAS, at said public hearings, the directors considered the protests to the adoption of the plan that were filed and considered the

comments for and against adoption of the plan; and

WHEREAS, the directors have and hereby do determine that the protests filed and not withdrawn prior to the conclusion of said public hearings do not represent more than fifty percent of the assessed valuation of land within this district;

NOW, THEREFORE, be it resolved and ordered that the board of directors of the Santa Maria Valley Water Conservation District, pursuant to the provisions of the Groundwater Management Law (California Water Code §10750, et seq.), do hereby adopt the following groundwater management plan for the Santa Maria Valley groundwater basin:

Preamble and Basic Mission Statement

It has been, and will continue to be, the mission of the Santa Maria Valley Water Conservation District (District) in developing, adopting and implementing a groundwater management plan to preserve and protect the quality and quantity of groundwater in the District and to maximize the usable supply of groundwater for the benefit of all users in the basin.

It is the intention of the District's Board (Board) to:

1. Continue and expand these activities by adopting a groundwater management plan (Plan) under the authority conferred by the Legislature in AB3030.

2. Create a basin wide Plan for managing the water of the basin. The Plan will include storage and water quality related matters. The District intends to undertake planning and execution of yield enhancement and conservation programs. These activities are to be for the benefit of all groundwater users in the basin.

3. Create a Plan under the authority of Water Code §10753(b). The Plan will encompass all of the Santa Maria groundwater basin, the exact limits of which will be fixed during the course of the Plan. The Plan consists of those activities described in the Plan under the section entitled "Activities of the Plan". Funding will be as allowed by law.

4. Adopt a program, or programs, to implement the Plan as contemplated in Water Code §10752(e) at an appropriate future time.

Recitals and Findings

The District is an entity empowered to adopt and implement a groundwater management plan under Water Code §10750 and following. The District is a "local public agency" "providing flood control" and "groundwater replenishment" within the meaning of these terms in Water Code §10750 and following. The District is not a "local agency" as defined in Water Code §10752(g).

By adopting this Plan, the District intends to enable itself to exercise all powers over groundwater management granted by Water Code §10750 and following and by other provisions of law.

The Plan is to be basin wide in the sense that it will consider all technical facts throughout the basin. Groundwater management, enforcement of regulations and assessment for costs under the Plan will be limited by the statutory constraints of Water Code §10753(b)(1) to areas not served by a "local agency" as defined at Water Code §10752(g) unless those entities agree to become part of the Plan.

Prior to the adoption of this Plan, the District conducted informal workshops and formal noticed hearings. On the basis of the testimony, the Board finds the following:

1. That by maximizing the yield of the basin as a whole and by enhancing water

quality, the public and private interest within the District will be served.

2. That the boundaries of the basin, the yield, storage and demand on the basin are difficult to ascertain. Uncertainty and differences of both common and expert opinion remain as to these facts. The question of whether the basin is in a state of overdraft is open.

3. Broad consensus exists that projects could be undertaken which could benefit the water users of the basin. Such projects may include, but are not limited to, the following: Inflatable dams, stream bed grading, spreading basins, below ground dams, injection wells, watershed burn projects and conservation measures.

Activities of the Plan

While not intending to be limited to the activities and topics discussed below, the Board intends the following actions, which actions are the Board's Plan, as contemplated by Water Code §10752(d). Modification of the Plan shall be accomplished by the Board as needed.

1. Boundaries of the basin. Conduct investigations to determine the natural hydraulic boundaries of that groundwater basin which is recharged principally by the Santa Maria River and its tributaries and plan for the entire basin.

2. State of the basin. Determine whether the basin is in overdraft or not. The term "overdraft" will be as defined by the law of California. The study of the basin will be consistent with and will explain observed water level data as has been historically collected by the District. If an overdraft is found to exist, the District will pursue appropriate policies to address the overdraft and its implications.

3. Project development. Evaluate projects which will further the goals of the Plan considering costs and benefits, effects on people

and their economic activities and environmental impacts as required by law.

4. Project execution. Carry out projects, with the District acting alone or in cooperation with other private and public entities, as might be agreed with such other entities and as allowed by law.

5. Regulatory activities. Review the regulatory activities of other agencies concerned with water. If the regulatory activities of other agencies are found by the District to be inadequate to protect the groundwater of the basin, the District may act to the full extent of its powers to protect the groundwater.

6. Groundwater banking. Use the storage capacity of the basin to the maximum feasible and lawful extent in accordance with the following principles:

a. Plan and administer, in a coordinated and orderly fashion, for the storage of out-of-basin water, if feasible.

b. Cooperate with other entities, public and private, to store water for use in the basin.

c. Determine, prior to any action taking place, whether storage capacity is available and, if available, how much storage capacity exists and where.

d. If storage space is found to exist, the use of this space for water derived from within the basin is to be given priority over storage of out-of-basin water both now and in the future.

e. Act, alone or with others, to assure that all banking and storage throughout the basin will be conducted in harmony with the District's groundwater management plan.

7. Education. Develop means to inform the general public of the activities of the Board and the reasons for those activities.

8. Land use planning. Make available the Board's technical findings to those who are involved in land use planning. Act affirmatively to inform land use decision makers of pending land use actions which affect the Plan.

9. Benefits of the Plan. Manage the water and water storage of the basin for the benefit of users of basin water. To achieve this goal, the District will take all necessary steps to protect the resources in its groundwater basin.

10. Coordination with other agencies. Attempt to harmonize the Plan and activities carried out under the Plan with actions by others within those areas of the basin exempt from the District's Plan. To carry out this goal, the Board may enter into joint powers agreements, memoranda of understanding and other agreements as appropriate with other entities when beneficial and feasible. Meetings to harmonize and coordinate planning will be held as required by law or more often.

Passed and adopted by the board of directors of the Santa Maria Valley Water Conservation District this 11th day of July, 1995 by the following vote:

AYES _____

NAYS _____

ABSENT _____

_____
President
Board of Directors
Santa Maria Valley Water
Conservation District

ATTEST:

_____
Maurice F. Twitchell
Secretary of the District

Appendix B

Appraiser's Report

MALONE/ANDERSON & ASSOCIATES
CALIFORNIA CERTIFIED
REAL ESTATE APPRAISERS & CONSULTANTS

MICHAEL L. MALONE, SRA, CRA
GAIL ANDERSON, MAI
LINDA D. McNEIL
RICHARD MERCIER

June 30, 1997

Mr. Stewart Johnston
Santa Maria Valley Water Conservation District
Post Office Box 364
Santa Maria, California 93456

Re: Impacts of Proposed Assessment for Groundwater Management

Dear Mr. Johnston:

The Santa Maria Valley Water Conservation District (the 'District') is proposing to levy an assessment of up to $25 per acre for a maximum of ten years. The purpose of the assessment is to promote groundwater management. The proposed program is described in an engineer's report that has been prepared by Luhdorff & Scalmanini, Consulting Engineers. Our firm has been requested to evaluate the impact of the proposed plan of action on land values within the Santa Maria Valley.

Our firm currently estimates the average value of agricultural land within the Santa Maria Valley at $12,000 per acre, with a range of $5,000 per acre to $16,000 per acre. As described in the engineer's report, there is controversy over whether the Santa Maria Valley groundwater basin is in overdraft and there are problems with water quality in various places in the Santa Maria Valley. If the proposed plan of action were implemented, and the effects of it resolve the controversy of the quality and quantity of the groundwater basin, we estimate that the average increase in value of agricultural land within the Santa Maria Valley due to this program would far exceed the cost of the proposed assessment over the next ten year period. However, if the proposed plan is not implemented, and degradation of the groundwater basin quality continues such that the water supply is diminished, we would expect the average value of the agricultural land to decline significantly.

Please feel free to contact me if you have any questions regarding this analysis.

Very truly yours,

MALONE/ANDERSON & ASSOCIATES

Michael Malone, SRA
CA Certified General Real Estate Appraiser AG001651

MM;b

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