STATE OF CALIFORNIA
The Resources Agency

# Department of Water Resources

## BULLETIN No. 181-71

# WATERMASTER SERVICE

IN THE

## UPPER LOS ANGELES RIVER AREA

## LOS ANGELES COUNTY

FOR PERIOD

OCTOBER 1, 1970 THROUGH SEPTEMBER 30, 1971

MARCH 1972



NORMAN B. LIVERMORE, JR.
*Secretary for Resources*
The Resources Agency

RONALD REAGAN
Governor
State of California

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ABSTRACT

The 1970-71 water year was a slightly below-average rainfall year. Rainfall in the valley increased by 5.07 inches above the prior year and was about 0.88 inches below the LACFCD 85 year mean precipitation. As a result, spreading operations by the LACFCD increased by 19% of the prior year's spreading. The control of ground water extractions imposed by the restricted pumping resulted in 7.19 percent less than the total allowed Restricted Pumping and an increase in imports of 22 percent over the prior year.

Nine parties overextracted a total of 2,019.60 acre-feet in the 1970-71 water year. Five of the nine parties are in violation of the Judgment either as a result of having a zero water right or having exceeded their allowable extraction by 10 percent of their Restricted Pumping.

During 1970-71 the Watermaster processed thirteen water right sale and assignment agreements. Several parties were warned about violations of the Judgment.


| Item | Water Year 1969-70 | Water Year 1970-71 |
|---|---|---|
| Parties | 28 | 28 |
| Active pumpers | 24 | 23 |
| Active nonparties (within valley fill) | 2 | 2 |
| Restricted Pumping, in acre-feet | 104,040 | 104,040 |
| Watermaster expenses (fiscal year) | $ 24,709.04 | $ 21,647.37 |
| Watermaster expenses per acre-foot pumped | $ 0.23 | 0.22 |
| Valley rainfall, in inches | 10.5 | 15.57 |
| Spreading Operations, in acre-feet | | |
| LACFCD | 14,228 | 16,940 |
| Los Angeles, City of | 13,401 | 7,203 |
| Extractions, in acre-feet | 109,618 | 96,555.64 |
| Imports, in acre-feet | | |
| Colorado River water | 36,890 | 33,607 |
| Owens River water | 390,255 | 486,996 |
| Delivered to hill and mountain areas, in acre-feet | 43,995 | 41,778 |
| Exports, in acre-feet | | |
| Owens River water | 166,638 | 271,359 |
| Sewage | 108,527 | 107,358 |


State of California
The Resources Agency
DEPARTMENT OF WATER RESOURCES

Ronald Reagan, Governor
Norman B. Livermore, Jr., Secretary for Resources
William R. Gianelli, Director, Department of Water Resources
John R. Teerink, Deputy Director

SOUTHERN DISTRICT

James J. Doody . . . . . District Engineer and Watermaster

Mitchell L. Gould . . . . . Chief, Operations Branch and Deputy Watermaster

Watermaster service in this area was conducted and report prepared under the direction of

Clyde B. Arnold . . . . . Chief, Contracts Administration Section

by

Carlos Madrid . . . . . Deputy Watermaster

assisted by

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Henry B. Whitney . . . . . Water Resources Technician I
Allan M. McDonagh . . . . . Water Resources Technician I
John A. Stanley . . . . . Water Resources Technician I
Larry S. Brudner . . . . . Clerk II

## FOREWORD

The Department of Water Resources, as Watermaster for the Upper Los Angeles River Area, submits this annual report as a comprehensive review of water supply conditions in the Basin during the 1970-71 water year. The report was prepared for the Superior Court in the County of Los Angeles, and for the parties to the Upper Los Angeles River Area Judgment, whose provisions authorize its publication.

The Upper Los Angeles River Area is administered by the Department as a watermaster service area in accordance with Part 4, Division 2, of the California Water Code. The Basin has been operating for several years under a well-defined management plan that limits and monitors ground water extractions.

This report contains information on ground water extractions, use of imported water, recharge operations, a financial report on watermaster service during the 1970-71 water year, and the tentative budget of the Watermaster for the 1972-73 water year.

James J. Doody
District Engineer
Southern District
and Watermaster
Reg. C. E. No. 6500

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# I. THE UPPER LOS ANGELES RIVER AREA

The Upper Los Angeles River Area (ULARA) encompasses all of the watershed of the Los Angeles River and its tributaries above a point in said river designated as Los Angeles County Flood Control District Gaging Station F-57C, northwesterly of the junction of the surface channels of the Los Angeles River and the Arroyo Seco as shown on Plate 1.

The entire area consists of approximately 329,000 acres, comprising 123,000 acres of valley fill area, referred to as the ground water basins, and 206,000 acres of hill and mountain areas. ULARA is bounded on the north by the Santa Susana Mountains and on the west by the Simi Hills. To the south, the Santa Monica Mountains separate it from the Los Angeles Basin and to the east the San Gabriel Mountains separate it from the San Gabriel Basin.

ULARA, as defined in the Judgment, has four distinct hydrologic ground water basins. The water supplies of these basins are separate and independent and are replenished by deep percolation from rainfall and from a portion of the water that is delivered for use within these basins and which returns to the ground water body. The four ground water basins in ULARA are the San Fernando Basin, the Sylmar Basin, the Verdugo Basin, and the Eagle Rock Basin. See Plate 1.

The San Fernando Basin is the largest of the four basins in ULARA. It consists of approximately 112,047 acres and comprises 90.8 percent of the total valley fill. It is bounded on the east and northeast by the San Rafael Hills and Verdugo Mountains; on the northwest and west by the Santa Susana Mountains and Simi Hills; and on the south by the Santa Monica Mountains.

The Sylmar Basin is located in the northerly part of ULARA. It consists of approximately 5,565 acres and comprises 4.5 percent of the total valley fill. It is bounded on the north and east by the San Gabriel Mountains; the topographic divide in the valley fill, lying between the Mission Hills and San Gabriel Mountains, divide it on the west; and to the south it is divided by the eroded limb of the Little Tujunga syncline.

The Verdugo Basin is located to the north and east of the Verdugo Mountains in ULARA. It consists of approximately 4,400 acres and comprises 3.8 percent of the total valley fill. It is bounded on the north by the San Gabriel Mountains; on the south and southwest by Verdugo Mountains; on the southeast by the San Rafael Mountains; and on the east by the ground water divide between the Monk Hill Subarea of the Raymond Basin and the Verdugo Basin.

The Eagle Rock Basin is the smallest of the four basins and is located in the extreme southeast corner of ULARA. It comprises approximately 807 acres and consists of 0.6 percent of the total valley fill.

## History of Adjudication

ULARA was established by the JUDGMENT AFTER TRIAL BY COURT in Superior Court Case No. 650,079, entitled "The City of Los Angeles, A Municipal Corporation, Plaintiff, vs. City of San Fernando, et al., Defendants" signed March 14, 1968 by the Honorable Edmund M. Moor, Judge of the Superior Court. Prior to the Judgment, numerous pretrials were held, subsequent to the filing of the action by the City of Los Angeles in 1955 and before the trial commenced on March 1, 1966.




PLATE 1


UPPER LOS ANGELES RIVER AREA

On March 19, 1958, an Interim Order of Reference was entered by the Court directing the State Water Rights Board (now known as the Water Resources Control Board) to study the availability of all public and private records, documents, reports, and data relating to a proposed order of reference in the case. The Court subsequently entered an order on June 11, 1958, entitled "Order of Reference to State Water Rights Board to Investigate and Report Upon the Physical Facts (Section 2001, Water Code)".

A final Report of Referee was approved on July 27, 1962 and filed with the Court. The Report of Reference made a complete study of the geology, insofar as it affects the occurrence and movement of ground water, and the surface and ground water hydrology of the area. In addition, the Board investigated the surface location of the beds and banks and of the channels of the Los Angeles River and its tributaries; the areas, limits, and directions of flow of all ground water within the area; the quality of the ground water in the basins; all sources of water, whether it be diverted, extracted, or imported, etc. This was the basis for the Judgment.

The City of Los Angeles has since filed an appeal with the Court of Appeals. The City of Los Angeles' brief is on file and The Metropolitan Water District of Southern California (MWD) has filed a brief amicus curiae on behalf of appellant. MWD is now planning to file a motion for leave to withdraw the brief amicus curiae since the City of San Fernando has joined its District.

Originally, the defendant's briefs were due March 24, 1970, and the appellant's closing brief due on July 13, 1970. However, the respondent's brief was filed as of September 6, 1971, and the appellant's closing brief is scheduled to be filed on March 9, 1972. It thus appears that the appeal in this matter will not be ready for hearing until in or about the middle of 1973.

## Watermaster Service

Watermaster Service is administered by the California Department of Water Resources in accordance with Division 2, Part 4, of the California Water Code. Under Section 4025 of the Water Code, the Department is authorized to divide the State into watermaster service areas. Pursuant to Section 4026, such service areas are created from time to time as rights to water are ascertained and determined. Particularly where ground water is concerned, such rights are usually ascertained or determined by court decree.

The first watermaster service area was formed in September 1929 and the latest (ULARA) was formed on April 19, 1968. Currently there are 19 such areas controlling surface water diversions in Northern California and four in Southern California controlling ground water use.

Under the Judgment, the Court appointed the Department of Water Resources as Watermaster to assist the Court in the administration and enforcement of the provisions of the Judgment, and to keep the Court fully advised in the premises.

A major task of the Watermaster in ULARA is that of monitoring ground water extractions. In accordance with the "General Information Policies and Procedures" dated January 4, 1971, and adopted by the Advisory Board, every ground water pumper reports its ground water extractions on a monthly basis on preprinted forms prepared and supplied by the Watermaster. This makes possible the updating of the water right accounts (Watermaster Water Production Summary) by computing the amount pumped during the previous

month, the total amount pumped to date, and the amount that can be legally pumped during the remainder of the water year. A copy of the updated account is then mailed to the pumper each month.

The watermaster field staff performs water meter tests to verify ground water production reported by the parties, when requested by any party to the Judgment or at the discretion of the Watermaster.

Defective or inaccurate water measuring devices must be repaired within 30 days after receiving written notice of the results of the test from the Watermaster. A number of ground water production tests were performed during 1970-71.

The Watermaster keeps the Court apprised of hydrologic conditions within ULARA by means of this annual report and on special occasions by correspondence directed to the Court, both of which are reviewed by an advisory board before submittal. In preparing the annual report, the Watermaster collects and reports all information affecting and relating to the water supply and disposal within ULARA. Such information includes the following items:

1. Water Supply
   a. Precipitation
   b. Imported water

2. Water Use and Disposal
   a. Extractions
      (1) Used in valley fill area
      (2) Exported from each basin
   b. Water Outflow
      (1) Surface
      (2) Subsurface
      (3) Sewers

3. Water Levels

4. Transfers of Water Rights

5. Watermaster Administrative Budgets and Costs

6. Compliance and Violation by any Party in Terms of the Judgment.

7. Ownership and Locations of New Wells.

In addition to the above duties, the Watermaster also makes recommendations as it deems appropriate in connection with the proper utilization of the water supply in the underground storage capacities of ULARA.

## Advisory Board

Section X, Paragraph 5 of the ULARA Judgment established an Advisory Board for the purpose of advising the Watermaster in the administration of its duties. The duly appointed members of the Board, as of September 30, 1971, are:

City of Los Angeles
Gerard A. Wyss (Vice Chairman)
Melvin L. Blevins (Secretary)
Paul H. Lane (Alternate)

City of Glendale
William H. Fell
Arnold W. Jagow (Alternate)

City of Burbank
Alan A. Capon
Martindale Kile, Jr. (Alternate)

City of San Fernando
Robert James (Chairman)
Stuart E. Bergman (Alternate)

Crescenta Valley County Water District
Robert E. Blomquist
Robert Argenio (Alternate)

The Advisory Board may be convened by the Watermaster at any time in order to seek its advice. In addition, the Advisory Board is also responsible for

reviewing with the Watermaster the proposed annual budget and annual report.

During the 1970-71 water year, the Advisory Board was convened three times, once on October 6, 1970, once on February 3, 1971, and once on February 25, 1971. The October 6 meeting was called for the purpose of discussing the following items:

1. Election of new advisory board chairman and vice chairman.

2. Annual report for 1969-70.

3. Gasoline contamination of ground water in the vicinity of Forest Lawn, Glendale.

4. Review Watermaster's "Policies and Procedures".

As a result of this meeting, the policies and procedures were revised and new procedures dated January 4, 1971 were filed with the Court and parties.

The February 3 meeting was convened to review the draft of the 1969-70 annual report, the 1971-72 budget, and the final print of the policies and procedures for watermaster service.

On February 9, 1971, a major earthquake occurred in the vicinity of Sylmar Basin. As a result, a state of emergency was created for the Cities of San Fernando and Los Angeles with regard to their water and sewer system. The Watermaster made a field inspection of the damaged area and subsequently called a special meeting of the Advisory Board on February 25. The purpose of the meeting was to report the extent of damages sustained by the parties as a result of the earthquake. This meeting set the stage for approval of a special stipulated agreement which would assist the City of Los Angeles during the emergency. These items and earthquake effects on watermaster service are discussed in subsequent chapters of this report.

## II. WATER SUPPLY CONDITIONS

The Upper Los Angeles River Area depends upon many sources of water to meet demands brought on by a fast growth in industry and a continuing population increase. At present, the water supply to ULARA consists of: precipitation on the watershed which includes portions of the San Gabriel, Santa Monica, Verdugo, and Santa Susana Mountains; ground water that is in storage within the four basins; imports from the Mono Basin-Owens River system; and imports from the Colorado River. Soon water from Northern California will be made available through the facilities of the State Water Project.

### Precipitation

The Upper Los Angeles River Area has the climate of an interior coastal valley and is hotter in the summer and wetter in the winter than the coastal areas which have a Mediterranean type climate.

Precipitation varies considerably throughout ULARA, depending on the topography and the elevation. Mean seasonal precipitation varies from about 14 inches at the western end of the San Fernando Valley to 35 inches in the San Gabriel Mountains. On the average, approximately 80 percent of the annual rainfall occurs in the four winter months of December through March.

Quantities of precipitation on the valley floor and on the hill and mountain areas are evaluated separately. The valley floor is made up of the four ground water basins, whereas the hill and mountain areas comprise the remaining areas in ULARA. Precipitation on the hill and mountain areas is evaluated to relate the runoff from the watersheds of Big Tujunga, Pacoima Creek, and Sycamore Canyon, with the runoff records which are included in this report and also to evaluate the ground water recharge. See Plate 2 for location of precipitation stations.

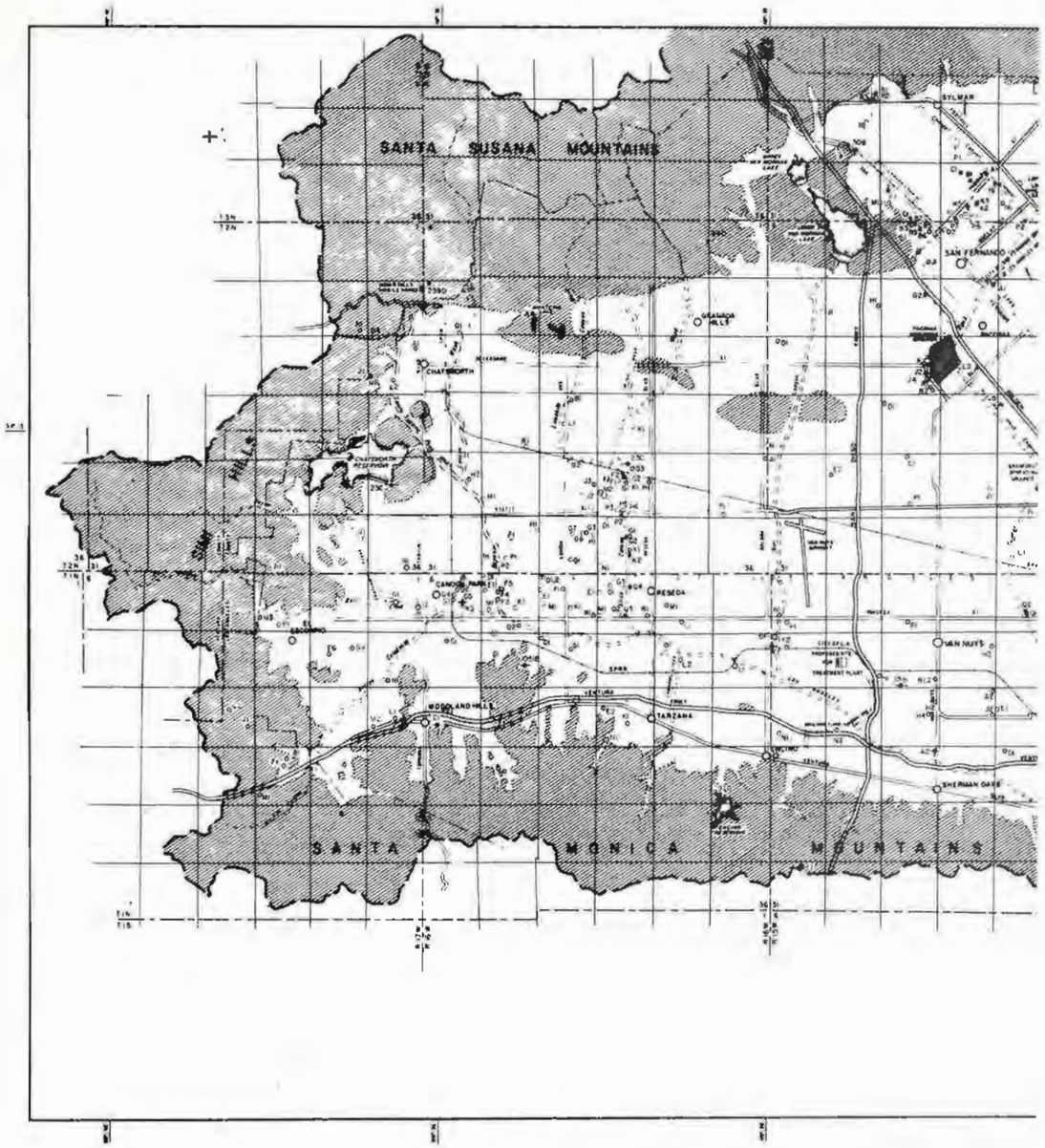
The 1970-71 water year experienced a slightly below average rainfall. In the San Gabriel Mountains, some stations received as little as 75 percent of normal. On the average, about 15.57 inches of rain fell on the valley floor, whereas the mountain areas received approximately 19.33 inches of rainfall. The 29-year (1929-1957) average precipitation for the valley floor and mountain areas are 16.82 and 21.50 inches, respectively.

Table 1 presents a record of rainfall at 22 key precipitation stations which were used to develop the 29-year average rainfall and are described in the Report of Referee.

TABLE 1. PRECIPITATION [a]
In inches

| Station | | 85-year mean | 1969-70 precipitation | 1970-71 | |
|---|---|---|---|---|---|
| LACFCD District Number | Name | | | Precipitation | Percent of 85 year mean |
| 12 | Franklin Canyon | 18.71 | 10.52 | 15.16 | 81 |
| 13B | North Hollywood [b] | 16.90 | 9.40 | 15.55 | 92 |
| 14C | Roscoe-Merrill [b] | 14.61 | 8.70 | 15.39 | 105 |
| 15A | Van Nuys [b] | 15.20 | 10.72 | 14.97 | 98 |
| 17 | Sepulveda Canyon | 19.22 | 9.79 | 19.35 | 101 |
| 23E | Chatsworth Reservoir [b] | 14.12 | 10.59 | 15.43 | 109 |
| 25C | Northridge-Andrews [b] | 14.59 | 10.81 | 14.58 | 100 |
| 29D | Granada Pump Plant | 17.10 | 12.96 | 16.36 | 96 |
| 30B | Sylmar [b] | 16.70 | 12.30 | 17.32 | 104 |
| 33A | Pacoima Dam | 18.94 | 14.59 | 19.55 | 103 |
| 47D | Clear Creek City School | 32.41 | 17.69 | 27.09 | 84 |
| 53D | Colby's Ranch | 30.13 | 16.84 | 22.58 | 75 |
| 54C | Loomis Ranch-Alder Creek | 20.96 | 13.13 | 15.04 | 72 |
| 210B | Brand Park | 19.15 | 11.32 | 16.94 | 88 |
| 251C | La Crescenta [b] | 23.64 | 12.43 | 19.97 | 84 |
| 259D | Chatsworth Patrol | 17.77 | 12.21 | 16.68 | 94 |
| 295G | Glendale [b] | 17.93 | 9.72 | 13.75 | 77 |
| 361 | Haines Canyon-Lower | 24.36 | 16.26 | 24.02 | 102 |
| 476 | Tujunga-Mill Creek | 17.63 | 11.40 | 12.99 | 74 |
| 705 | Paradise Ranch-Alder Creek | 26.70 | 11.02 | 18.30 | 68 |
| 1051B | Canoga Park [b] | 14.38 | 11.69 | 17.80 | 124 |
| 1074 | Little Gleason [c] | 24.48 | 23.74 | 20.03 | 82 |

a/ Data furnished by Los Angeles County Flood Control District.
b/ Valley Station.
c/ Substituted for Santa Clara Ridge Station No. 419.


SANTA SUSANA MOUNTAINS
SANTA MONICA MOUNTAINS
SYLMAR
SAN FERNANDO
CHATSWORTH
CANOGA PARK
CRESCOA
VAN NUYS
WOODLAND HILLS
TARZANA
SHERMAN OAKS



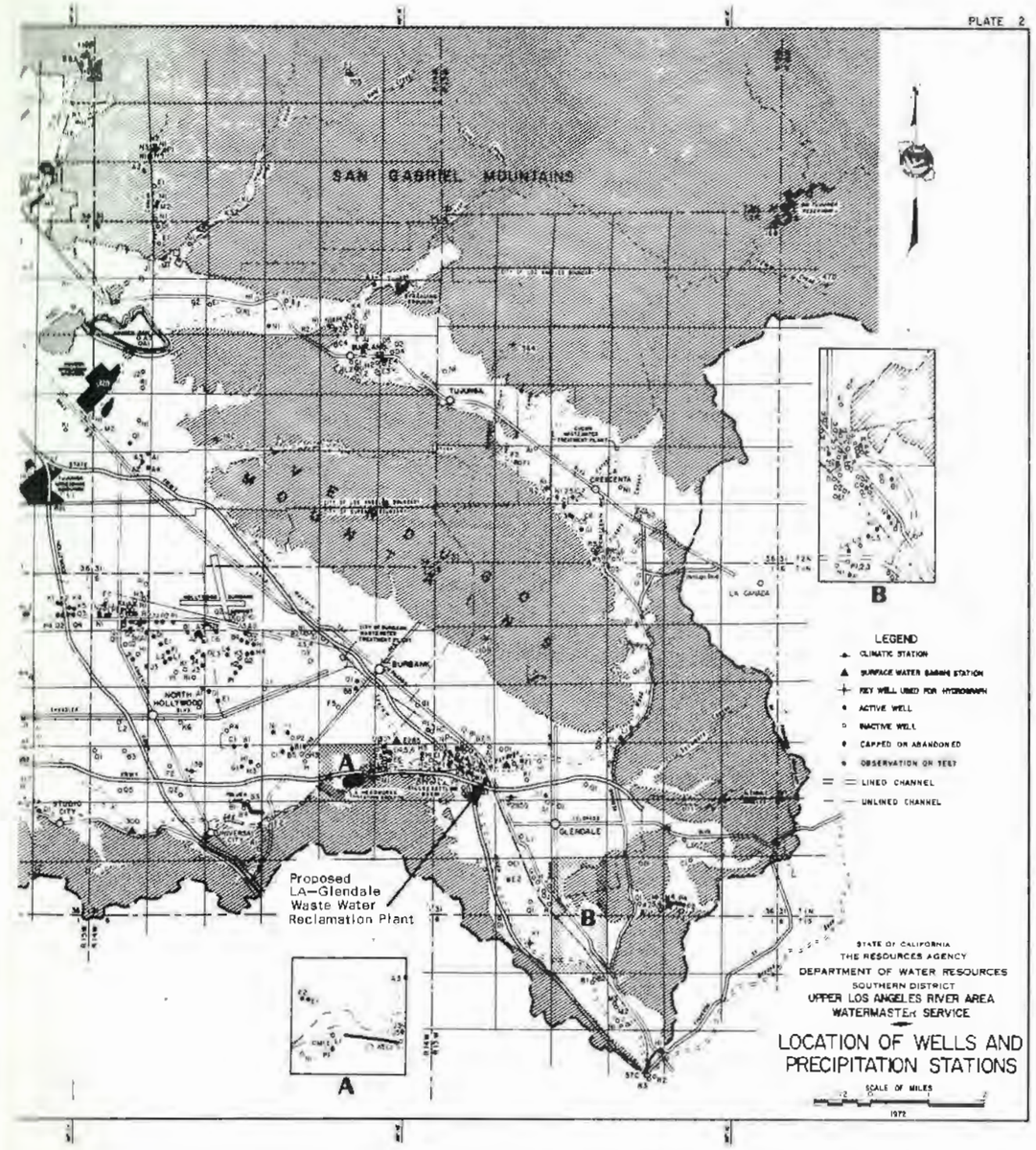


PLATE 2
SAN GABRIEL MOUNTAINS
TUJUNGA
CRESCENTA
LA CANADA
BURBANK
NORTH HOLLYWOOD
GLENDALE
STUDIO CITY
A
B
Proposed
LA–Glendale
Waste Water
Reclamation Plant
LEGEND
CLIMATIC STATION
SURFACE WATER GAGING STATION
KEY WELL USED FOR HYDROGRAPH
ACTIVE WELL
INACTIVE WELL
CAPPED OR ABANDONED
OBSERVATION ON TEST
LINED CHANNEL
UNLINED CHANNEL
STATE OF CALIFORNIA
THE RESOURCES AGENCY
DEPARTMENT OF WATER RESOURCES
SOUTHERN DISTRICT
UPPER LOS ANGELES RIVER AREA
WATERMASTER SERVICE
LOCATION OF WELLS AND
PRECIPITATION STATIONS
SCALE OF MILES
1972

## Runoff and Outflow from ULARA

The drainage area of ULARA contains 329,137 acres of which 205,709 acres are hill and mountain areas. The drainage system in turn is made up of the Los Angeles River and its tributaries. The surface flow in the spring originates as: storm runoff from the hill and mountain areas; storm runoff from the impervious areas of the valley floor; operational spills of imported water; industrial and sanitary waste discharge; and rising water.

Urbanization of the area has rapidly increased the flow discharge rates in much of ULARA and as such it is important to keep abreast of these changes to nature and its effect on the ground water basins.

A number of stream gaging stations are maintained throughout ULARA either by the LACFCD or the USGS. The Watermaster has selected six key gaging stations which in effect record major runoff from the hydrologic areas within ULARA.

The records presented herein will keep the parties informed as to the magnitude of runoff from these various areas. The stations selected for this purpose are:

Station 57C; registers all surface outflow from ULARA.

Station 118B; registers all releases from Pacoima Dam which originate in Pacoima Canyon. Runoff below this point flows to the Lopez and Pacoima Spreading Grounds and on down to the Los Angeles River.

Station 168; registers all releases from Big Tujunga Dam which collects runoff from Tujunga Canyon northeasterly of the dam. Runoff below this point flows to Hansen Dam.

Station 252; registers flow from Verdugo Canyon plus flows from Haines, Dunsmuir, and Pickens Canyons.

Station E-285; registers flow from the westerly slopes of Verdugo Mountains and some flow east of Lankershim Boulevard. It also records any releases of reclaimed waste water discharged by the City of Burbank.

Station 300; registers all flow west of Lankershim Boulevard plus outflow from Hansen Dam that is not spread. These records also include releases from Sepulveda Dam, which may include extractions from Reseda wells.

The location of these key gaging stations are shown on Plate 2. The mean daily discharge rates for these six gaging stations during 1970-71 are summarized in Appendix C. In addition, Table 2 summarizes the monthly flows for each of the gaging stations and compares the 1970-71 water year with the 1969-70 water year which was a very dry year as evidenced by the runoff quantities.

The February 9 earthquake made its mark on runoff and outflow from ULARA. Following the earthquake, an assessment of the damages to the upper and lower Van Norman Dams prompted the City of Los Angeles to take immediate steps to increase normal outflow from both reservoirs. Water was spilled at a variety of places into flood control channels, the Los Angeles River and the Tujunga Spreading Grounds. In addition, water was transferred to other storage locations in the vicinity of the San Fernando Valley.

TABLE 2. MONTHLY RUNOFF AT SELECTED GAGING STATIONS[a]
In acre-feet

| Station | Water Year | Month | | | | | | | | | | | | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Oct. | Nov. | Dec. | Jan. | Feb. | March | Apr. | May | June | July | Aug. | Sept. | |
| 57C-R | 1969-70 | 993 | 6280 | 1020 | 6010 | 14790 | 13090 | 1060 | 824 | 1000 | 750 | 1070 | 635 | 47520 |
| (Los Angeles River) | 1970-71 | 1090 | 35060 | 26420 | 3160 | 6110 | 7070 | 3290 | 2660 | 1860 | 4080 | 1380 | 1130 | 93310 |
| F252-R | 1969-70 | 300 | 339 | 196 | 486 | 1400 | 1360 | 231 | 264 | 407 | 501 | 427 | 180 | 6090 |
| (Verdugo Channel) | 1970-71 | 276 | 2800 | 1980 | 450 | 171 | 462 | 274 | 232 | 243 | 302 | 259 | 237 | 7690 |
| 285-R | 1969-70 | 438 | 696 | 455 | 682 | 981 | 1130 | 399 | 441 | 471 | 479 | 457 | 456 | 7080 |
| (Burbank Storm Drain) | 1970-71 | 406 | 2410 | 1730 | 769 | 748 | 648 | 569 | 464 | 379 | 277 | 365 | 432 | 9200 |
| 300-R | 1969-70 | 771 | 6850 | 970 | 4230 | 11240 | 10160 | 928 | 1160 | 1020 | 964 | 918 | 869 | 40080 |
| (L. A. River at Tujunga Ave.) | 1970-71 | 639 | 24340 | 20350 | 2500 | 5750 | 6580 | 2600 | 1520 | 1260 | 1020 | 1340 | 1190 | 69090 |
| 168-R | 1969-70 | 624 | 918 | 844 | 920 | 1030 | 4490 | 1340 | 685 | 388 | 165 | 112 | 103 | 11620 |
| (Big Tujunga Dam) | 1970-71 | 188 | 790 | 3574 | 1978 | 1302 | 1257 | 215 | 431 | 435 | 467 | 628 | 492 | 11760 |
| 118B-R | 1969-70 | 9 | 3 | 12 | 20 | 165 | 379 | 201 | 213 | 222 | 998 | 47 | 41 | 2310 |
| (Pacoima Dam) | 1970-71 | 32 | 27 | 1230 | 123 | 1200 | 932 | 429 | 309 | 529 | 61 | 61 | 60 | 4990 |

a/ Figures shown are rounded off; for details see Appendix C

The U.S. Corps of Engineers provided 11 pumps which pumped directly from lower Van Norman Reservoir to Bull Creek flood control channel. Additional water was spilled into Bull Creek by four 12-inch emergency taps from the 78-inch outlet line. Water from the upper Van Norman Reservoir was released into Bull Creek by means of two 24-inch holes which were cut in the 99-inch bypass pipeline.

Water released to the flood control channels were recorded at Station F-300. A major portion of the water released in the months of February, March, and April was recorded as outflow at Station F-57C.

In addition to releases from the Van Norman complex, the Los Angeles County Flood Control District likewise initiated steps to lower the water surface behind Pacoima Dam as well as Hansen Dam. Except for the water that was spread at Pacoima and Hansen Dams, the water that bypassed these areas was recorded at Station F-300 and in some instances, at Station F-57C as outflow.

At the request of the Advisory Board, the Watermaster has attempted to separate the surface flow of the Los Angeles River at gaging station F-57C as to the sources, i.e., storm runoff from precipitation, Owens River water, rising water, and industrial and reclaimed waste water discharges. The Watermaster utilized the procedures outlined in the Report of Referee for estimating the approximate flow rates and sources of water passing gaging station F-57C. Table 3 is a summary of that study.

Table 3. SEPARATION OF SURFACE FLOW AT STATION F-57C
In acre-feet

| Period | Base low flow | | Surface runoff | | Total measured outflow |
|---|---|---|---|---|---|
| | Rising Water | Waste Discharge | Owens River | Net Storm | |
| 1969-70 | 4,180 | 6,565 | 0 | 36,775 | 47,520 |
| 1970-71 | 2,556[a] | 8,856 | 12,978 | 68,920 | 93,310 |
| 29-year average 1929-57 | 6,810 | 770 | 1,580 | 30,790 | 39,940 |

a/ Rising water from Verdugo to San Fernando Basin amounted to 2,881 acre-feet.

## Ground Water Recharge

Local precipitation can have a marked influence on the ground water supply and water in storage. However, there is a wide variation in the annual amount of runoff as a result of changes in both precipitation and retentive characteristics of the watershed.

The accelerated urban development in ULARA has resulted in much of the rainfall being collected and routed into paved channels which discharge into the Los Angeles River and subsequently is carried out of the basin. Plate 2 depicts the lined channels within ULARA.

To somewhat overcome the rapid outflow due to urbanization, Pacoima Dam and Hansen Dam, originally built for flood protection, are currently being utilized to regulate storm flows for the purpose of recapturing the flow in spreading basins operated by the Los Angeles County Flood Control District (LACFCD) as well as the City of Los Angeles.

The LACFCD operates four spreading basins: Branford, Hansen, Lopez, and Pacoima Spreading Grounds. The City of Los Angeles, in turn, operates the Tujunga and Headworks Spreading Grounds. Plate 2 shows the location of these spreading basins. The spreading grounds operated by the LACFCD are utilized for spreading native water, whereas the spreading grounds operated by the City of Los Angeles are utilized to spread Owens River and native water, spillage from the Chatsworth Reservoir, ground water effluent, and the discharge from the Reseda wells. Table 4 summarizes the spreading operations for the 1970-71 water year.

There was a sharp increase in the amount spread following the earthquake of February 9. Wherever possible, water released from the various dams was spread. The Watermaster inspected and evaluated the City of Los Angeles' spreading operation of Owens River water. The evaluation is covered in Chapter IV of this report.

TABLE 4. SPREADING OPERATIONS

In acre-feet

| Month | Native water spread by Los Angeles County Flood Control District | | | | Water spread by City of Los Angeles | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | Tujunga Spreading Grounds | | Headworks Spreading Grounds | | |
| | Spreading Basins | | | | | | | | |
| | Branford | Hansen | Lopez | Pacoima | Native water | Owens River water | Releases from Van Norman Reservoir | Reseda Wells | Ground water effluent in L. A. River a/ |
| Oct. 1970 | 6 | 0 | 0 | 0 | 0 | 0 | 0 | 108 | 292 |
| Nov. | 229 | 0 | 0 | 400 | 0 | 0 | 0 | 90 | 243 |
| Dec. | 87 | 6413 | 0 | 1448 | 0 | 0 | 0 | 0 | 332 |
| Jan. 1971 | 45 | 1477 | 0 | 106 | 0 | 0 | 0 | 2 | 822 |
| Feb. | 43 | 1067 | 23 | 1076 | 0 | 399 | 0 | 0 | 400 |
| Mar. | 35 | 2273 | 304 | 673 | 0 | 0 | 570 | 1 | 917 |
| Apr. | 23 | 0 | 274 | 56 | 0 | 0 | 108 | 0 | 570 |
| May | 22 | 0 | 126 | 18 | 0 | 0 | 0 | 3 | 77 |
| June | 4 | 427 | 0 | 272 | 0 | 0 | 0 | 0 | 298 |
| July | 9 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 12 |
| Aug. | 4 | 0 | 0 | 0 | 0 | 0 | 0 | 177 | 788 |
| Sept. | + | 0 | 0 | 0 | 0 | 0 | 0 | 188 | 806 |
| Totals | 507 | 11657 | 727 | 4049 | 0 | 399 b/ | 678 b/ | 569 | 5,557 |

a/ Includes industrial discharge, ground water effluent, and surface runoff diverted from Los Angeles River to Headworks Spreading Grounds.

b/ Credited to the City of Los Angeles in accordance with the provisions of the "Stipulation for Emergency Spreading and Extraction."

## Ground Water Table Elevations

During the 1970-71 water year, the Watermaster collected and processed data to determine prevailing ground water conditions in ULARA. The Watermaster collected ground water level contour maps from the Los Angeles County Flood Control District and the City of Los Angeles in order to present the ground water table elevations for the spring and fall of 1971 and the change between the fall of 1970 and fall of 1971.

Ground water conditions during the spring and fall of 1971 are depicted by Plates 3 and 4, respectively. Data for lines of equal ground water elevation for Sylmar, Chatsworth, and Santa Monica Foothills were obtained from the City of Los Angeles. Data for the remaining area was obtained from the LACFCD.

Change in ground water elevation from fall of 1970 to fall of 1971 as presented in Plate 5 indicates the effects of spreading and ground water extractions. The areas around Hansen and Tujunga spreading basins show a drop of water levels as expected. A curtailment of ground water extractions is shown as a rise in water levels in and around the City of Los Angeles' Pollock wells which in recent years have dropped in production by 5,000 acre-feet; the City's Headworks and North Hollywood wells which dropped by 3,600 and 9,000 acre-feet, respectively; the City's Reseda wells which dropped by 1,100 acre-feet; and finally, the City's Mission wells which decreased slightly and the City of San Fernando wells which decreased by 2,000 acre-feet due to inoperative water systems and wells following the February 9 earthquake.

In addition to the plates, Figures 1 and 2 depict the water levels at key wells located within ULARA. Plate 2 shows the location of key wells.

## Waste Water Reclamation

The reclamation of waste water can provide a relatively economical source of water for irrigation, industrial, recreational, and ultimately, domestic use. Four waste water treatment plants are in operation in ULARA, and two are in the beginning stages of construction. See Plate 2 for locations. A tabulation of the operating waste water reclamation plants is shown in Table 5.

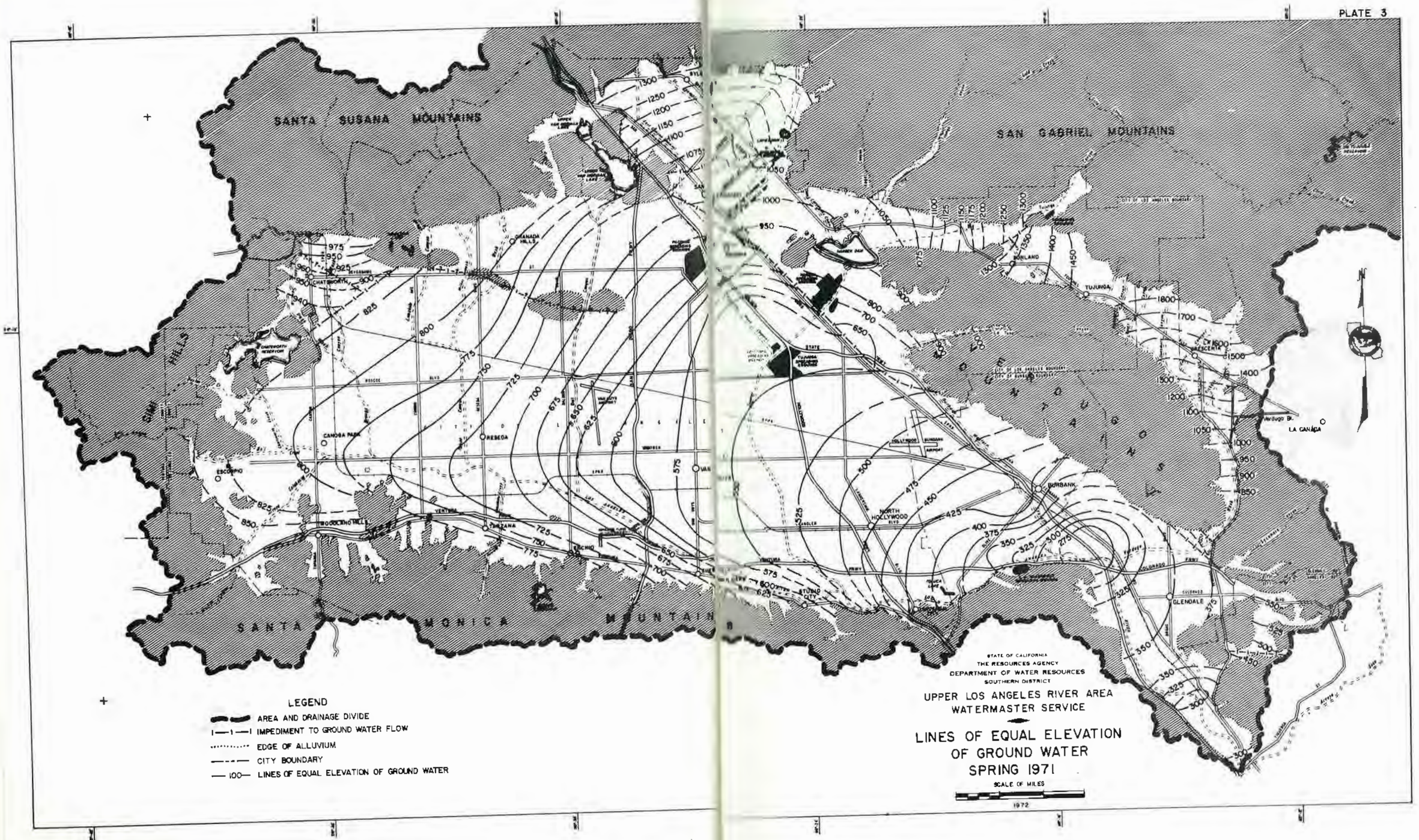
The Los Angeles-Glendale Waste Water Reclamation Plant project is scheduled for bid opening on or about February 1, 1972; a start of construction date of April 15, 1972; and an on-line date of spring of 1974 at which time it will provide 12.5 mgd of treated effluent to Griffith Park for irrigation and 2.5 mgd to the City of Glendale for cooling water for its steam plant.

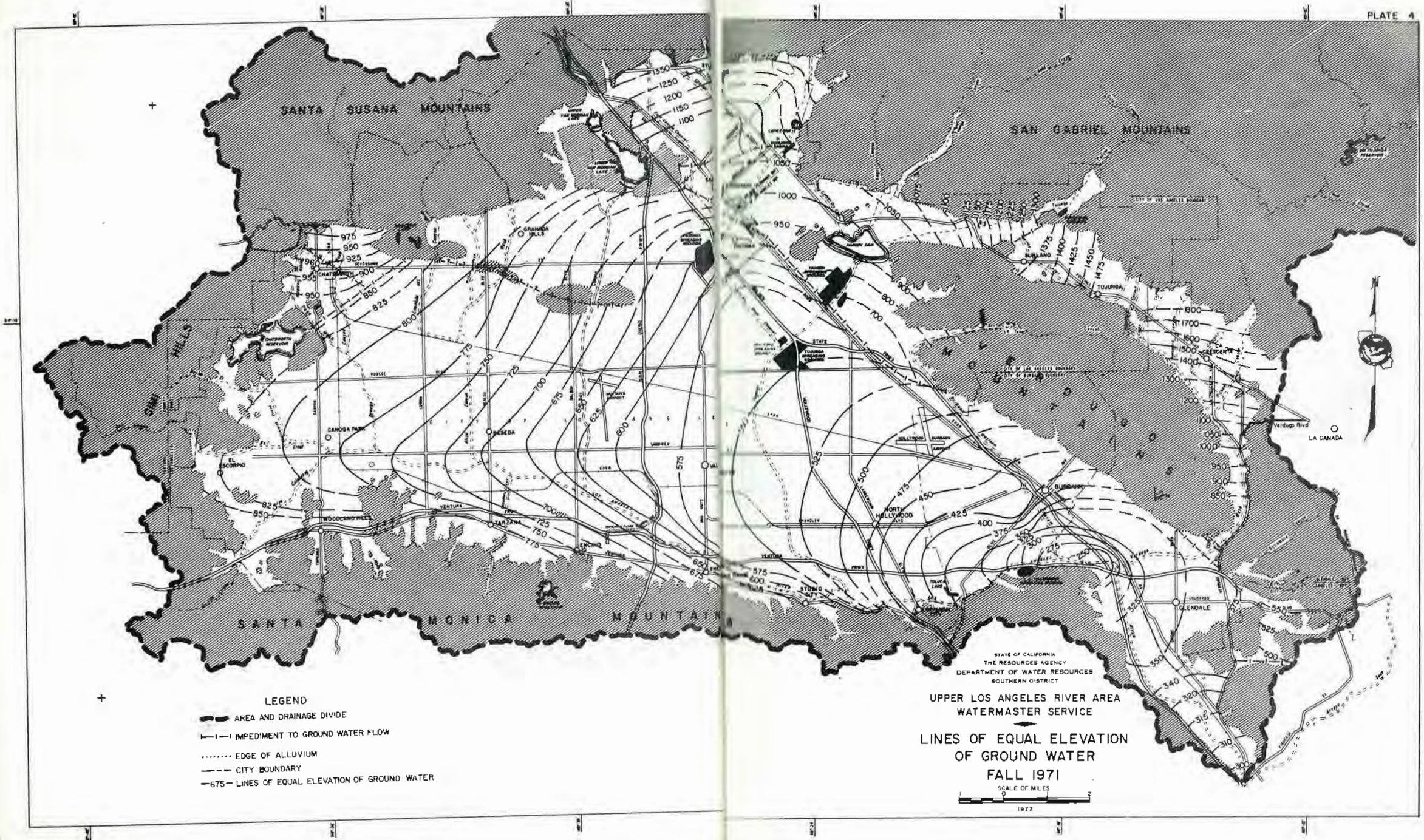
The Sepulveda Basin Water Reclamation Plant is currently under contract with preliminary grading completed January 11, 1972. The portion being constructed is the first of five modules of 40 mgd each and is scheduled to go on-line May 1974. At that time, it will provide treated effluent to the Sepulveda Basin Recreation Area for Irrigation.

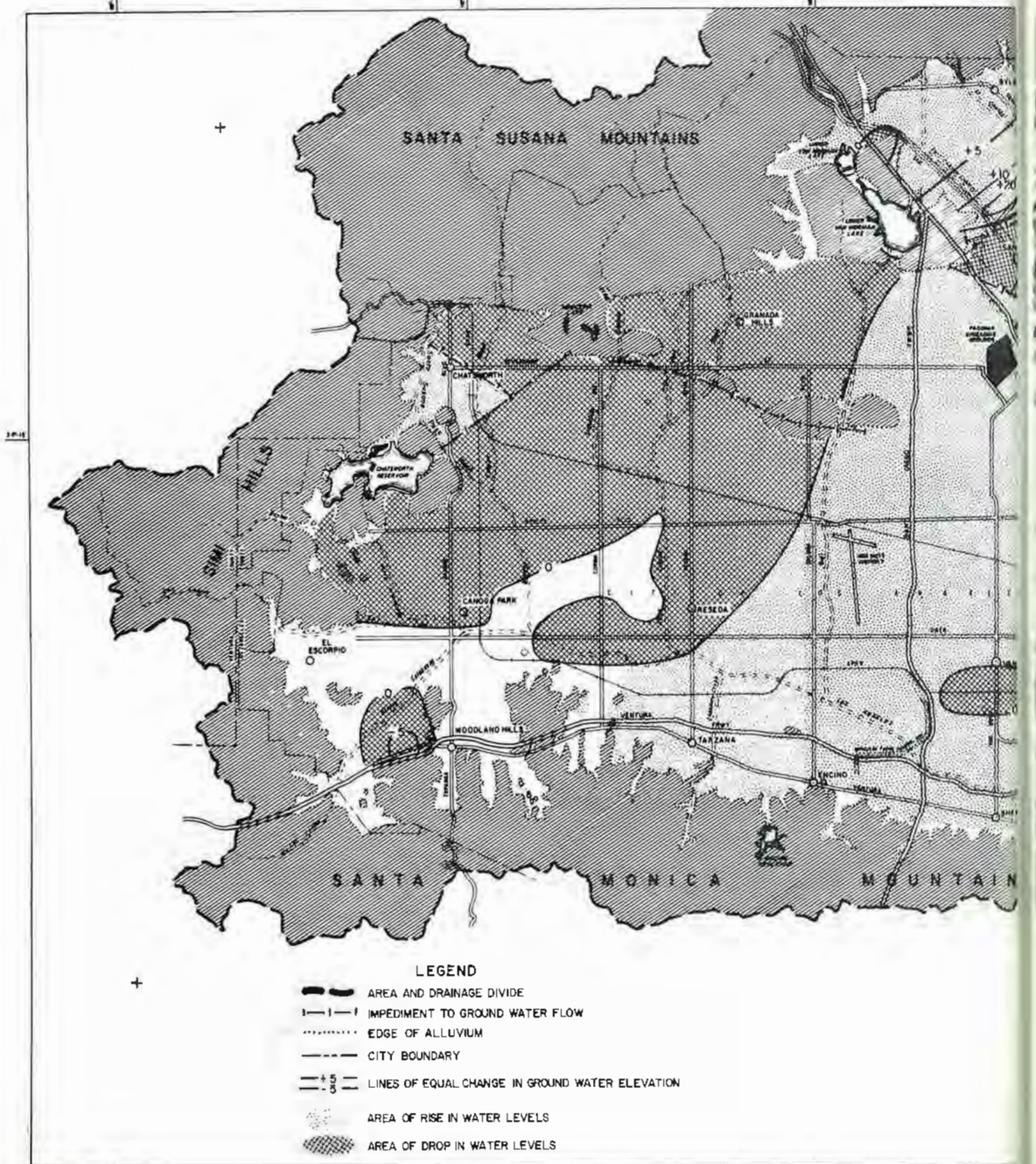
TABLE 5. WASTE WATER RECLAMATION PLANTS

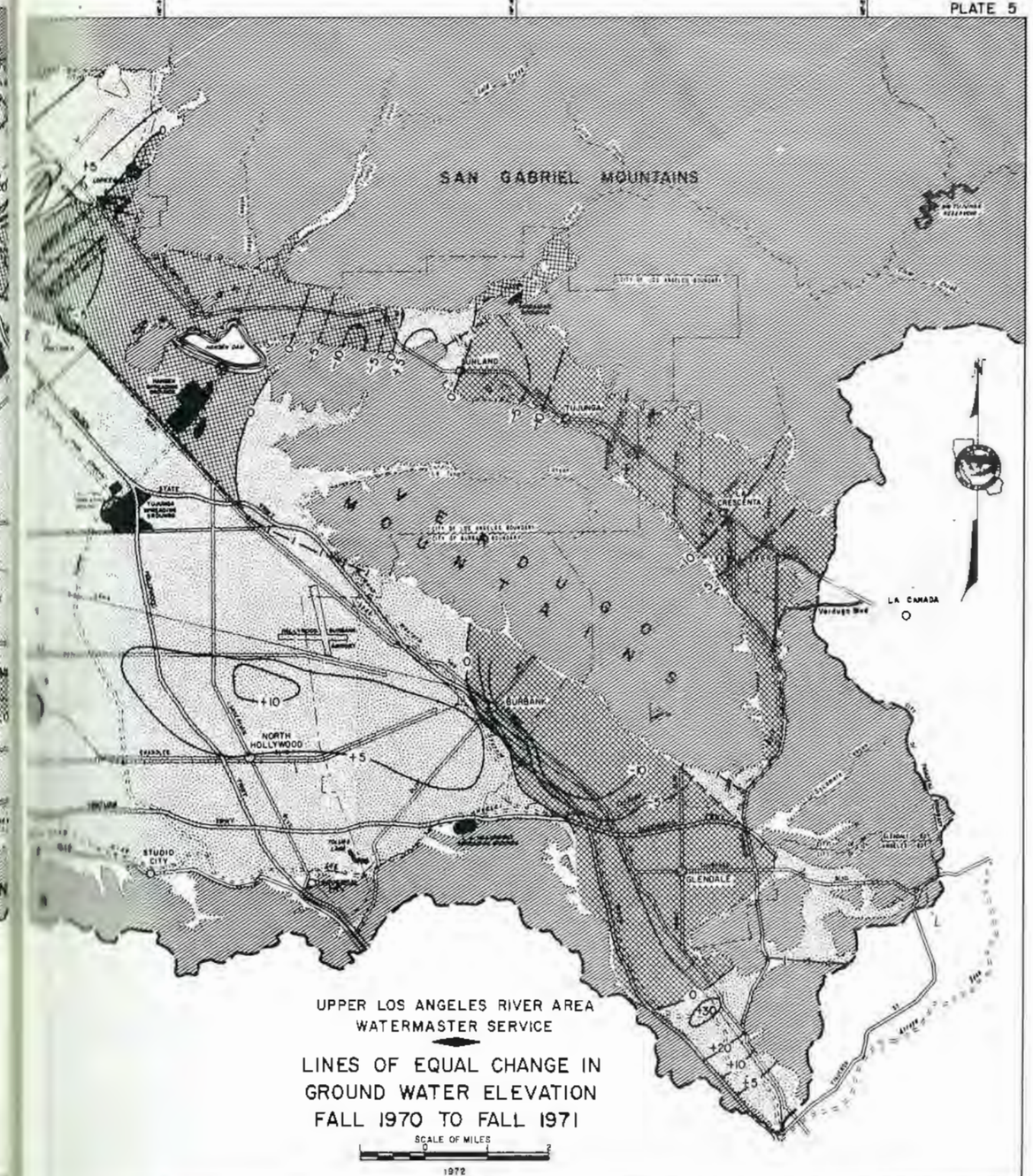
| Plant | Quantity treated, in acre-feet |
|---|---|
| San Fernando Basin | |
| City of Burbank | 5540 a/ |
| City of Los Angeles | |
| Valley Settling Basins | 525 b/ |
| Indian Hills Mobile Homes | 15 c/ |
| Verdugo Basin | |
| Crescenta Valley County Water District | 107 c/ |

a/ Cooling towers used 2,092 acre-feet, balance to Los Angeles River.
b/ Applied 12 acre-feet to irrigation, balance to city sewer.
c/ Used for land irrigation.


SANTA SUSANA MOUNTAINS
SAN GABRIEL MOUNTAINS
SANTA MONICA MOUNTAINS
SIMI HILLS
CHATSWORTH
CHATSWORTH RESERVOIR
GRANADA HILLS
CANOGA PARK
RESEDA
ESCONDIDO
WOODCLIFF HILL
VENTURA
TARZANA
ENCINO
VAN NUYS
STUDIO CITY
NORTH HOLLYWOOD
BURBANK
BURBANK AIRPORT
TUJUNGA
SUNLAND
MONTROSE
LA CAÑADA
GLENDALE
STATE
LEGEND
AREA AND DRAINAGE DIVIDE
IMPEDIMENT TO GROUND WATER FLOW
EDGE OF ALLUVIUM
CITY BOUNDARY
100 LINES OF EQUAL ELEVATION OF GROUND WATER
STATE OF CALIFORNIA
THE RESOURCES AGENCY
DEPARTMENT OF WATER RESOURCES
SOUTHERN DISTRICT
UPPER LOS ANGELES RIVER AREA
WATERMASTER SERVICE
LINES OF EQUAL ELEVATION
OF GROUND WATER
SPRING 1971
SCALE OF MILES
1972


SANTA SUSANA MOUNTAINS
SAN GABRIEL MOUNTAINS
SANTA MONICA MOUNTAINS
CHIMI HILLS
GRANADA HILLS
CHATSWORTH
CHATSWORTH RESERVOIR
CANOGA PARK
ENCINO
SHERMAN OAKS
STUDIO CITY
NORTH HOLLYWOOD
BURBANK
BURBANK AIRPORT
BURBANK STATE
TUJUNGA
SUNLAND
CRESCENTA
LA CANADA
GLENDALE
EL SCORPIO
WOODCRNO HILLS
VENTURA
Verdugo Blvd
LEGEND
AREA AND DRAINAGE DIVIDE
IMPEDIMENT TO GROUND WATER FLOW
EDGE OF ALLUVIUM
CITY BOUNDARY
675 LINES OF EQUAL ELEVATION OF GROUND WATER
STATE OF CALIFORNIA
THE RESOURCES AGENCY
DEPARTMENT OF WATER RESOURCES
SOUTHERN DISTRICT
UPPER LOS ANGELES RIVER AREA
WATERMASTER SERVICE
LINES OF EQUAL ELEVATION
OF GROUND WATER
FALL 1971
SCALE OF MILES
1972


SANTA SUSANA MOUNTAINS
SIMI HILLS
GRANADA HILLS
CHATSWORTH
CHATSWORTH RESERVOIR
CANOGA PARK
RESEDA
EL ESCORPIO
WOODLAND HILLS
TARZANA
ENCINO
SANTA MONICA MOUNTAIN
LEGEND
AREA AND DRAINAGE DIVIDE
IMPEDIMENT TO GROUND WATER FLOW
EDGE OF ALLUVIUM
CITY BOUNDARY
LINES OF EQUAL CHANGE IN GROUND WATER ELEVATION
AREA OF RISE IN WATER LEVELS
AREA OF DROP IN WATER LEVELS


SAN GABRIEL MOUNTAINS
MONTE NOS
SUNLAND
TUJUNGA
LA CRESCENTA
LA CANADA
Verdugo Wsd
BURBANK
NORTH HOLLYWOOD
STUDIO CITY
GLENDALE
UPPER LOS ANGELES RIVER AREA
WATERMASTER SERVICE
LINES OF EQUAL CHANGE IN
GROUND WATER ELEVATION
FALL 1970 TO FALL 1971
SCALE OF MILES
1972

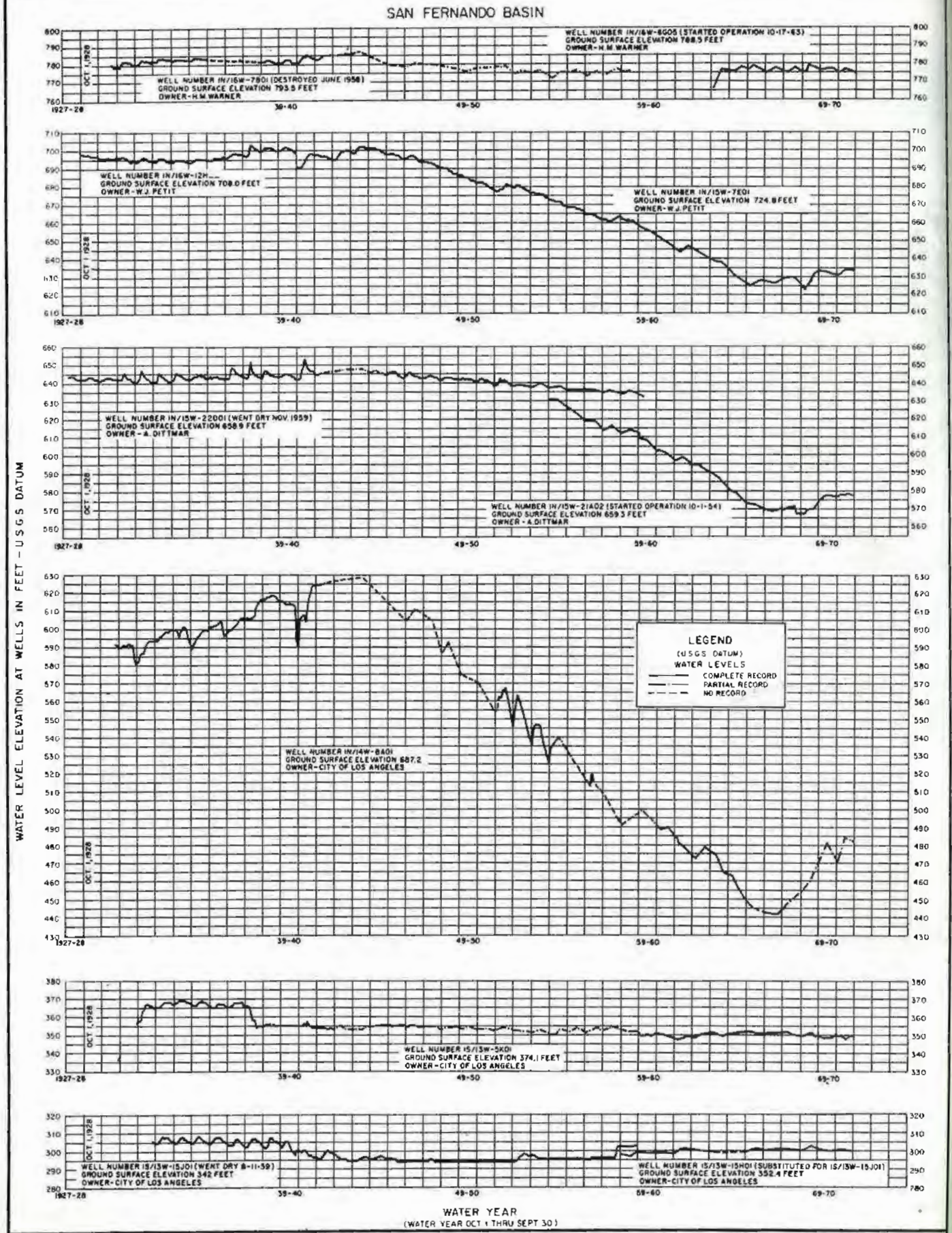



Figure 1.– FLUCTUATION OF WATER LEVEL ELEVATION AT WELLS IN THE SAN FERNANDO BASIN

DEPARTMENT OF WATER RESOURCES, SOUTHERN DISTRICT, 1972

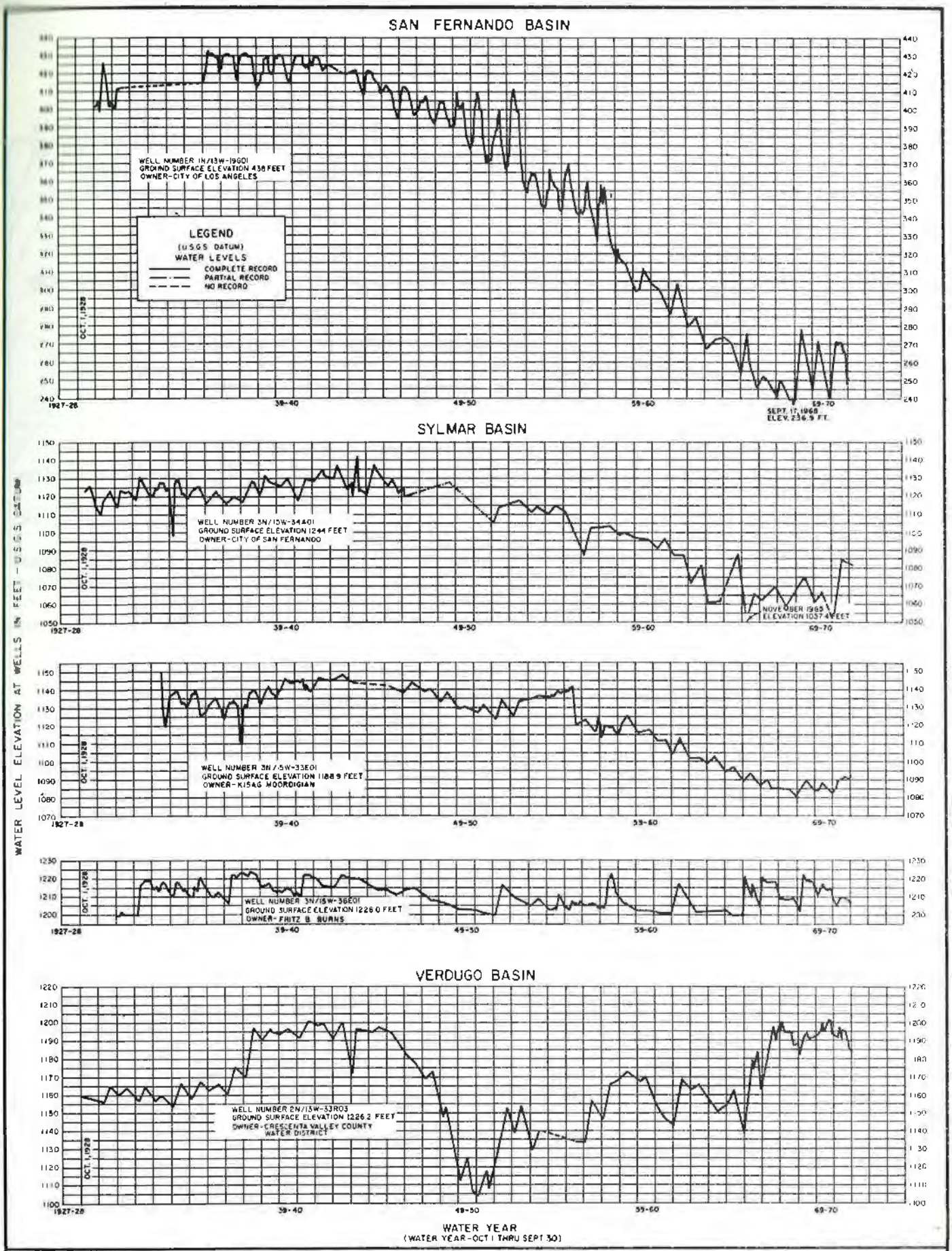



Figure 2.– FLUCTUATION OF WATER LEVEL ELEVATION AT WELLS IN THE SAN FERNANDO, SYLMAR AND VERDUGO BASINS

DEPARTMENT OF WATER RESOURCES, SOUTHERN DISTRICT, 1972

## Water Quality

During the 1970-71 water year, progress was made toward abating gasoline pollution near Forest Lawn Cemetery. The history of this major water quality problem was described in the 1968-69 and 1969-70 Watermaster reports.

The Western Oil and Gas Association (WOGA) has continued its efforts to abate the pollution. The California Regional Water Quality Control Board, Los Angeles Region, and the State Water Resources Control Board are exercising leading roles to insure effective and expeditious abatement. The Department of Water Resources has advised the Boards regarding the technical aspects of abatement. The City of Los Angeles Department of Water and Power (LADWP) and WOGA have maintained an effective monitoring program in the area of gasoline pollution.

As of November 1, 1971, WOGA has: (1) improved on monitoring of the areal extent and depth of free gasoline, and of the presence of taste and odor in ground water; (2) continued pumping of water from several sink wells to prevent the spread of free gasoline; (3) continued removal of gasoline from skimmer-pump wells; and (4) will attempt to remove all traces of residual gasoline taste and odor in the ground water basin.

Traces of free floating gasoline (less than 1.0 inch) are still evident at Wells W-26, W-50, and W-63 in the San Fernando field, at Wells W-52 and W-53 in the Rosslyn field, and at W-3 and W-4 in the Cox field. Free gasoline has seldom been detected at the Newman field during the past year. Gasoline odors are still present in the Newman, Cox, and Rosslyn fields; at Wells F-2, 3, 4, and 6; and at W-42, 45, and 54 along San Fernando Road (Figure 3.)[1/]

Because of the decline in water levels in the gasoline-polluted area, pumping rates at the Cox, Rosslyn, and San Fernando fields have been reduced to the following levels, as of late September 1971:[1/]

| Field | Well No. | Rate, in gpm |
|---|---|---|
| Cox | W-3 . . . . | 35.0 |
| | W-4 . . . . | 14.3 |
| | W-47 . . . . | 11.5 |
| Rosslyn | W-52 . . . . | 60.0 |
| San Fernando | W-50 . . . . | 13.8 |
| | W-63 . . . . | 44.0 |

Wells W-37 and W-58 are pumped occasionally at about 53 and 106 gpm, respectively, to keep them on a standby basis.

Gasoline recovery has decreased considerably since October 1970. Free gasoline removed from November 1970 through October 1971 was 1,291 gallons. Including an additional 70% to account for dissolved gasoline, and losses by evaporation or aeration, total removal of gasoline would be about 2,200 gallons.

According to WOGA, the total removal of free and dissolved gasoline since the start of the cleanup program has been about 44,000 gallons through October 25, 1971.

WOGA reports that almost all removable free gasoline has been removed, and pellicular gasoline retained by the sediments is being biodegraded by Pseudomonas and Arthrobacter bacteria.[1/] WOGA is monitoring bacterial densities as cleanup progresses.

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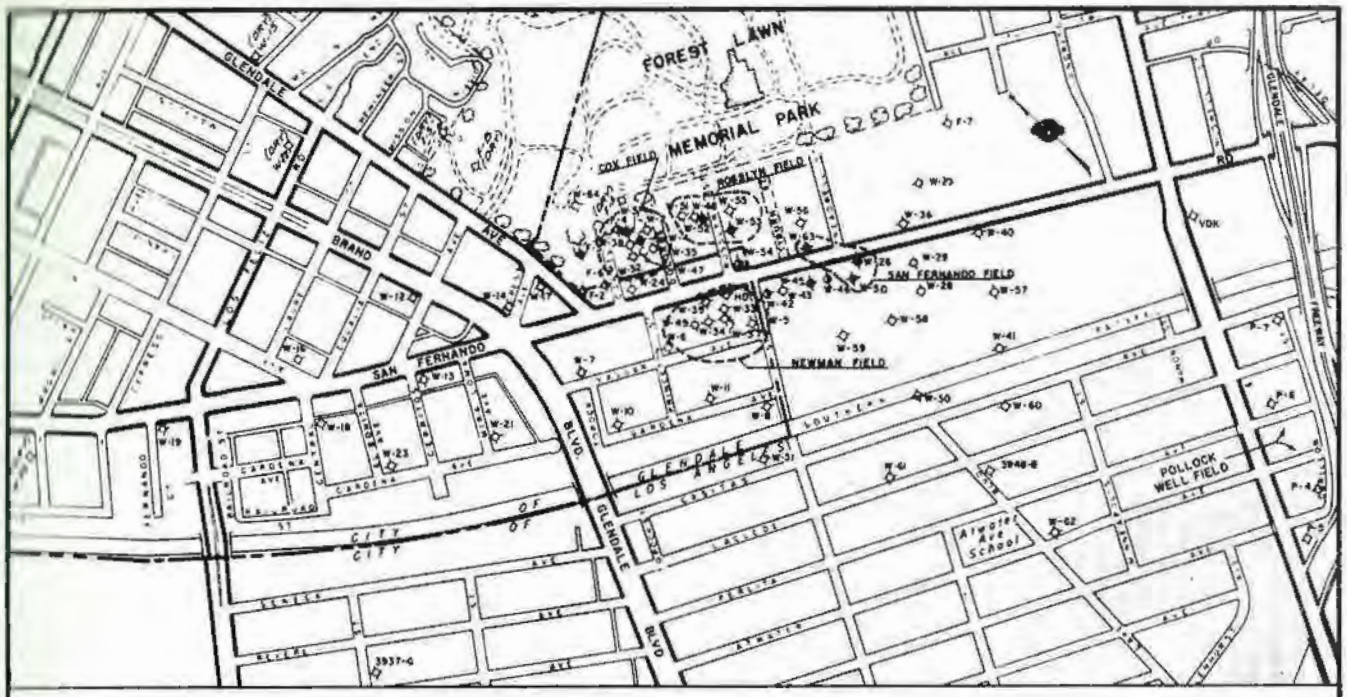
1/ Western Oil and Gas Association, Los Angeles, California. "Progress Report to Los Angeles Regional Water Quality Control Board on Amelioration of Ground Water Contamination by Gasoline near San Fernando Road in Glendale and Los Angeles". Unpublished Report. November 1971.




LEGEND

OWNERSHIP

- W-12 WOGA WELLS
- F-3 FOREST LAWN WELLS
- P-7 L.A.D.W.P. POLLOCK WELLS
- HD HEALY-DEBURRING WELL
- VDK VAN DE KAMP WELL
- 3948B L.A.D.W.P. OBSERVATION WELL

CONDITION OR STATUS[1]

- FREE GASOLINE
- GASOLINE ODOR
- NO GASOLINE

[1] SOURCE OF INFORMATION -- W.D.G.A. REPORT, DATED, NOVEMBER 1971.

Figure 3- GASOLINE POLLUTION-FOREST LAWN, GLENDALE, LOS ANGELES

DEPARTMENT OF WATER RESOURCES, SOUTHERN DISTRICT, 1972

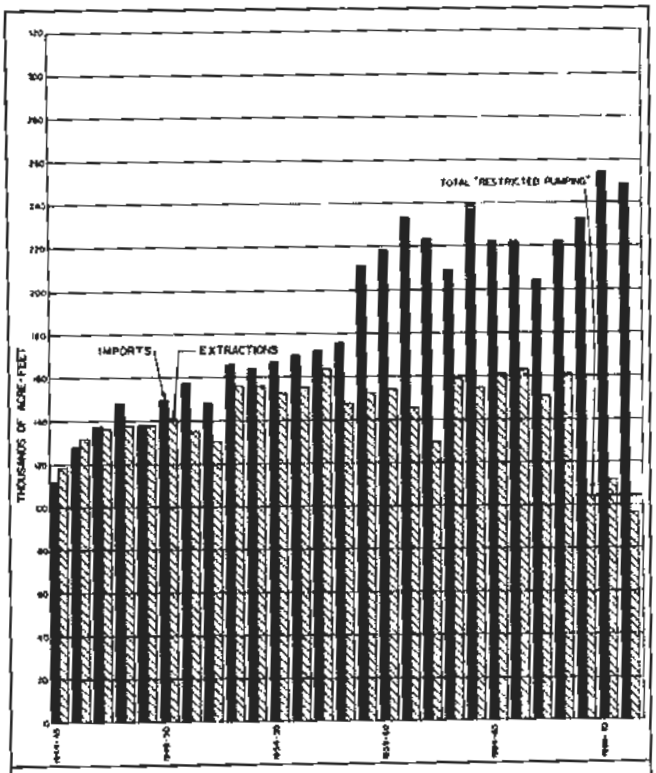



Figure 4 - GROUND WATER EXTRACTIONS AND USE OF IMPORTED WATER IN UPPER LOS ANGELES RIVER AREA

DEPARTMENT OF WATER RESOURCES, SOUTHERN DISTRICT 1972

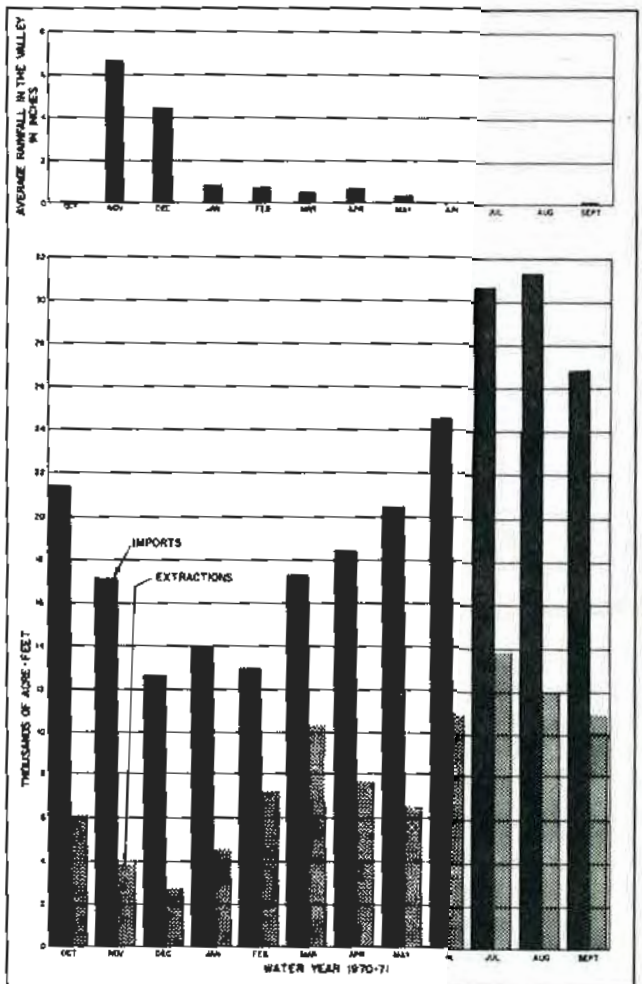



Figure 5 - MONTHLY WATER DEMAND AND AVERAGE RAINFALL IN UPPER LOS ANGELES RIVER AREA

DEPARTMENT OF WATER RESOURCES, SOUTHERN DISTRICT 1972

## III. WATER USE AND DISPOSAL

Water delivered for use in ULARA is either imported water, local ground water, local surface diversions, or a mixture, depending on the area and water system operation. During the 1970-71 water year, water purveyors in ULARA served approximately 345,800 acre-feet of water to their customers. Of this total approximately 96,600 acre-feet were extracted and the remaining 249,200 acre-feet were imported. The basin contains 579 wells of which 180 are active, and 399 are inactive. During 1970-71, 13 were drilled and 10 were destroyed.

The adjudication of ground water rights in ULARA restricted all ground water extractions effective October 1, 1968. On that date, ground water extractions were restricted to approximately 104,000 acre-feet per water year. This amounted to a reduction of approximately 50,000 acre-feet below the previous 6 years average.

Under the Judgment no determination was made regarding overdraft or surplus in the Eagle Rock Basin. Therefore, no restrictions on ground water extractions are imposed on the Eagle Rock Basin.

Except for Sparkletts Drinking Water Corporation and Deep Rock Artesian Water Company, there are no parties to the Judgment that extract water from Eagle Rock Basin. The safe yield of the basin, under 1964-65 conditions, was set at 70 acre-feet.

The restriction on ground water extractions together with the slightly below average rainfall and the deactivated San Fernando wells damaged by the earthquake, has resulted in a record (second to last year's) importation of water to ULARA.

Figure 4 graphically illustrates the annual ground water extractions and total water imported to ULARA beginning with 1944-45 water year. Note the change during years 1968-69 through 1970-71.

It can also be noted that for the 10 years before "Restricted Pumping", imports exceeded extractions by 50,000 to 60,000 acre-feet per year and that for the three water years 1968-69-1970-71, the difference jumped to between 120,000 to 142,000 acre-feet. Due to restricted pumping in ULARA, any substantial increase in water demand in the future will show in an increase of imports only.

Figure 5 provides another graphical analysis of the monthly relationship between rainfall, ground water extractions, and imported supply. This graph is representative of the entire ULARA and not a specific ground water basin within ULARA. The precipitation values were obtained from those stations that are located on the valley floor. (See Table 1.)

### Ground Water Extractions

By letter dated April 26, 1968, the Watermaster informed all parties that were known to be active, that ground water extractions within ULARA would be reduced and controlled by the Watermaster in accordance with the Judgment. The ULARA Judgment limits the amount of ground water each party can extract annually from each of the separate basins to an amount referred to as "Restricted Pumping".

Table 6 presents a balance sheet which summarizes each party's water account by listing its "Restricted Pumping" (see Appendix A for any changes); allowable carryover from 1969-70; any additional allowable pumping as

TABLE 6. RESTRICTED PUMPING AND QUANTITIES EXTRACTED AND ASSIGNED
in acre-feet

| Party | (1) Restricted Pumping | (2) Allowable carryover from 1969-70 | (3) Assignments in Restricted Pumping[a] | (4) Allowable extraction 1970-71 (1)±(2)±(3)=4 | (5) Amount Extracted | (6) Balance (4)-(5)=(6) | (7) Allowable carryover into 1971-72 |
|---|---|---|---|---|---|---|---|
| SAN FERNANDO BASIN | | | | | | | |
| Bartholomaus, William O. | 15.00 | 0.00 | - 15.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Burbank, City of | 13,649.00 | + 2.67 | + 181.00[b] | 13,832.67 | 13,820.62 | 12.05 | 12.05 |
| California Materials Company | 0.00 | 0.00 | + 350.00[b] | 350.00 | 273.66 | 76.34[c] | 0.00 |
| Consolidated Rock Products Company | 0.00 | 0.00 | +1600.00 | 1,600.00 | 1,396.10 | 203.90[c] | 0.00 |
| Forest Lawn Memorial Park Assoc. | 814.00 | + 16.24 | - 182.00 | 648.24 | 588.18 | 60.06 | 60.06 |
| Glendale, City of | 12,405.00 | + 385.26 | 0.00 | 12,790.26 | 12,601.41 | 188.85 | 188.85 |
| Harper, Cecilia DeMille | 0.00 | - 6.69 | + 45.00[b] | 38.31 | 12.16 | 26.15 | 4.50 |
| Livingston-Graham, Inc. | 0.00 | 0.00 | + 550.00[b] | 550.00 | 669.37 | - 119.37[c] | 0.00 |
| Lockheed Aircraft Corporation | 239.00 | 0.00 | - 239.00[b] | 0.00 | 0.00 | 0.00 | 0.00 |
| Los Angeles, City of | 63,257.00 | -6,581.37 | -4800.00[b] | 51,875.63 | 51,875.63[d] | 0.00 | 226.60[e] |
| *(Pursuant to "Stipulation for Emergency Spreading and Extraction")* | | | | 1,077.00[f] | 2,055.92 | - 978.92 | - 978.92[g] |
| McCabe, Celeste Louise | 1.00 | + 0.10 | 0.00 | 1.10 | 0.00 | 1.10 | 0.10 |
| Mena, John and Barbara | 0.00 | - 1.92 | 0.00 | - 1.92 | 0.96 | - 2.88 | - 2.88 |
| Monteria Lake Association | 0.00 | - 13.46 | 0.00 | - 13.46 | 0.00 | - 13.46 | - 13.46 |
| Riverwood Ranch Mutual Water Co. | 0.00 | - 5.87 | + 32.00[b] | 26.13 | 14.33 | 11.80 | 3.20 |
| Sears, Roebuck and Company | 0.00 | 0.00 | + 400.00[b] | 400.00 | 259.60 | 140.40[c] | 0.00 |
| Southern Service Company, Ltd. | 0.00 | - 44.37[h] | + 130.00 | 85.63 | 85.93 | - 0.30 | - 0.30 |
| Sportsmen's Lodge, Inc. | 0.00 | - 30.83[h] | + 38.00 | 7.17 | 19.16 | - 11.99 | - 11.99 |
| Toluca Lake Property Owners' Association | 23.00 | - 6.90 | + 15.00 | 31.10 | 30.28 | 0.82 | 0.82 |
| U.S. Mortgage | 0.00 | + 1.68 | 0.00 | 1.68 | 0.03 | 1.65 | 0.00 |
| Valhalla Memorial Park | 184.00 | + 17.83 | + 20.00 | 221.83 | 218.94 | 2.89 | 2.89 |
| Van de Kamp's Holland Dutch Bakers, Inc. | 93.00 | + 6.50 | - 25.00 | 74.50 | 38.83 | 35.67 | 6.80 |
| Walt Disney Productions | 0.00 | 0.00 | +1900.00[b] | 1,900.00 | 1,974.67 | - 74.67[c] | 0.00 |
| Subtotals | 90,680.00 | -6,261.13 | 0.00 | 85,495.87 | -85,935.78 | - 439.91 | - 501.68 |
| SYLMAR BASIN | | | | | | | |
| Brown, Charles T. | 0.00 | - 12.30 | + 20.00 | 7.70 | 12.12 | - 4.42 | - 4.42 |
| Church of Jesus Christ of the Latter Day Saints | 0.00 | - 591.71 | 0.00 | - 591.71 | 212.81 | - 804.52 | - 804.52 |
| Fidelity Federal Savings and Loan Association | 609.00 | + 60.90 | - 20.00 | 649.90 | 22.05 | 627.85 | 58.90 |
| Los Angeles, City of | 2,818.00 | - 181.72[j] | 0.00 | 2,636.28 | 2,645.35 | - 9.07 | - 9.07 |
| Moordigian, Kisag | 46.00 | + 0.60 | - 40.00 | 6.60 | 0.00 | 6.60 | 0.60 |
| San Fernando, City of | 2,737.00 | 0.00[j] | + 40.00 | 2,777.00 | 1,250.94 | 1526.06 | 1,526.06[k] |
| Subtotals | 6,210.00 | - 724.23 | 0.00 | 5,485.77 | -4,143.27 | 1342.50 | 767.55 |
| VERDUGO BASIN | | | | | | | |
| Crescenta Valley County Water District | 3,294.00 | - 39.11 | 0.00 | 3,254.89 | 3,027.44 | 227.45 | 227.45 |
| Glendale, City of | 3,856.00 | + 385.60 | 0.00 | 4,241.60 | 3,449.15 | 792.45 | 385.60 |
| Subtotals | 7,150.00 | + 346.49 | 0.00 | 7,496.49 | -6,476.59 | 1019.90 | 613.05 |
| ULARA TOTALS | 104,040.00 | -6,638.87 | 0.00 | 98,478.13[d] | -96,555.64 | 1,922.49 | 878.92 |

a/ Refer to Table 10 and Appendix A for information concerning assignments of "Restricted Pumping" or prior ownership.
b/ Reduction in City of Los Angeles extraction pursuant to separate Stipulated Judgment.
c/ Reverts to City of Los Angeles as a carryover.
d/ Excludes extractions from Reseda Wells which totaled 569.16 acre-feet and overextractions totaling 2,055.92 acre-feet.
e/ Includes year-end balance of parties to Stipulated Judgments.
f/ Credit for spreading imported water pursuant to "Stipulation for Emergency Spreading and Extraction".
g/ Amount to be returned to basin by spreading imported water or foregoing right to extract water or by combination of both.
h/ Last year's carryover was corrected to reflect revisions of ground water extractions in 1968-69 (28.61 acre-feet) and 1969-70 (26.22 acre-feet).
j/ Last year's carryover was corrected to reflect separate accounting of Physical Solution - Sylmar Basin.
k/ Allowable carryover by special Watermaster authorization. Amount to be extracted in following three years. See Chapter IV of this report for details.

the results of a water right assignment; amount of ground water extracted during the 1970-71 water year; and the amount that can be carried forward to the succeeding water year.

In order to provide flexibility in the control of ground water extractions, the Judgment contains various provisions which allow parties to carry over into the succeeding water year a portion of their unused water right and, in some cases, to overextract. This flexibility clause was provided to assist the parties in meeting unforseen emergencies in water demands. One provision allows parties to carry over from one water year to another any unused "Restricted Pumping" up to an amount not to exceed 10 percent of their "Restricted Pumping".

The flexibility clause also allows parties to overextract up to an amount equal to 10 percent of their "Restricted Pumping". However, any overextraction will be deducted from the "Restricted Pumping" in the succeeding water year. Chapter IV contains additional information on this provision.

In addition to the flexibility clause, the City of San Fernando is allowed, by the Judgment, to exceed its assigned "Restricted Pumping" in Sylmar Basin. The additional allowance for the City of San Fernando is described in the Judgment as "Physical Solution-Sylmar Basin". This provision allows the City of San Fernando to extract up to 850 acre-feet of water per year in addition to the amount that it has received under its "Restricted Pumping". If the City of San Fernando takes, diverts, or extracts water in addition to its "Restricted Pumping", it must immediately notify the City of Los Angeles and the Watermaster in writing, and the City of Los Angeles must reduce its extractions in an amount equal to the amount that the City of San Fernando has exceeded its rights. Chapter IV describes the 1970-71 operation.

The Judgment, in Section IV, also allows various parties to divert and extract water from the San Fernando Basin in accordance with the terms and conditions of the stipulated Judgments between the City of Los Angeles and said parties (Case No. 650,079). The City of Los Angeles, in turn, shall deduct from its "Restricted Pumping" for each year, the aggregate amount of water extracted pursuant to the separate stipulated Judgments.

At the commencement of each water year, the City of Los Angeles advises the Watermaster of the estimated amount of water each party to the stipulated Judgments will pump during the water year (see Appendix A). The City then reduces its extractions in the San Fernando Basin in an amount equal to the estimates. For each subsequent year, the City of Los Angeles will reduce its extractions by the amount of water that said stipulated parties' extractions exceeded the estimates for the preceding year. Should the stipulated parties' extractions be less than the estimate for that year, the City of Los Angeles may increase its extractions by that amount in the next succeeding year.

**The February 9th Earthquake resulted in such heavy damage to the City of San Fernando's water facilities and the City of Los Angeles' terminal storage complex at Van Norman Reservoir, that changes in allowable ground water extractions for these two parties were required. As a result, the City of Los Angeles will be allowed to exceed its "Restricted Pumping" in the San Fernando Basin pursuant to the "Stipulation for Emergency Spreading and Extraction" which is reproduced in Appendix A. Table 6 shows a separate accounting of this item. The City of San Fernando, in turn, will be allowed to extract the unused 1970-71 water right balance of 1,526.06 acre-feet in the ensuing three water years.**

A further explanation of this authorization is discussed in Chapter IV.

The metered ground water production from each active well is listed by basin and by party in Appendix B, Table B-1. This tabulation presents the total ground water production as reported by each party. Plates 6 and 7 depict the service area wherein each party delivers its water supply.

## Extractions by Nonparties

In order to keep the parties and the Court apprised of all the ground water extractions within ULARA, the Watermaster has attempted to seek and collect information on nonparty ground water extractions. A nonparty is an entity which was not named in the ULARA water right suit. These nonparties and parties which were dismissed by the court do not come under the jurisdiction of the Watermaster.

To the best of the Watermaster's knowledge, and information on hand, the Western Oil and Gas Association and The Metropolitan Water District of Southern California are the only nonparties extracting ground water within ULARA. The Watermaster has approved these operations which are necessary for the control of gasoline pollution at Forest Lawn and the construction of the San Fernando Tunnel of the MWD Foothill Feeder.

No report on ground water extractions is made as to the parties dismissed from the action: Glenhaven Memorial Park, Incorporated; Los Angeles County Waterworks District No. 21, etc., which are still active pumpers in the hill and mountain areas of ULARA.

Ground water extracted by The Metropolitan Water District of Southern California (MWD) and Western Oil and Gas Association is shown in Table 7.

TABLE 7. EXTRACTIONS BY NONPARTIES

In acre-feet

| Month | Metropolitan Water District | Western Oil and Gas Association | | | | |
|---|---|---|---|---|---|---|
| | | Cox | Newman | Spec-6 | BP-4 | Total |
| October 1970 | 4.51 | 17.63 | 1.06 | 16.59 | 0.00 | 35.28 |
| November | 4.76 | 5.73 | 0.28 | 6.03 | 13.60 | 25.64 |
| December | 5.43 | 0.15 | 0.03 | 0.00 | 20.50 | 20.68 |
| January 1971 | 8.93 | 3.96 | 0.00 | 0.00 | 23.04 | 27.00 |
| February | 55.68 | 6.33 | 1.92 | 0.00 | 19.30 | 27.55 |
| March | 177.46 | 13.65 | 0.12 | 0.60 | 22.50 | 36.87 |
| April | 105.93 | 11.19 | 17.58 | 0.42 | 5.15 | 34.34 |
| May | 81.79 | 16.33 | 15.34 | 1.20 | 7.84 | 40.71 |
| June | 72.25 | 9.96 | 14.23 | 0.24 | 4.50 | 28.93 |
| July | 65.07 | 15.15 | 1.01 | 0.00 | 1.79 | 17.95 |
| August | 60.48 | 17.56 | 0.97 | 0.00 | 0.00 | 18.53 |
| September | 49.98 | 14.27 | 1.02 | 1.67 | 0.49 | 17.45 |
| Totals | 692.27 | 131.91 | 53.56 | 26.75 | 118.71 | 330.93 |

## Water Wells in ULARA

The Report of Referee described the wells in ULARA according to a number-location identification system devised by the Los Angeles County Flood Control District. However, the Watermaster has redesignated the wells in accordance with its recording system. Each water well in ULARA was assigned a state well number in order to simplify the administration of the Judgment and the monitoring of ground water extractions. A cross-index between State well numbers and County numbers should be completed by March 1972. At that time, it will be made available to all interested parties.

A state well numbering system was adopted by the State several years ago which utilizes the United States Public Land Survey System. A graphical illustration and description of the coding system in ULARA is shown in Figure 6.

Plate 2 on page 9 records all wells (party and nonparty) in ULARA in accordance with the above procedure. Wells drilled or destroyed in 1970-71 are listed in Appendix D.

As a matter of course, the Watermaster locates all new wells by survey and assigns a new state well number. The parties that submit detailed information as to the location of the well will preclude the Watermaster's

requirement for a survey. If the well is suspected of being abandoned or destroyed, the Watermaster will attempt to tag the well, requesting that the owner inform the Watermaster of his intentions. In this manner, the owner may be informed of the proper methods of destroying the well. Each party is required to notify the Watermaster whenever a new well is drilled.

**The City of San Fernando suffered extensive damage to its water system due to the February 9 earthquake. Of their seven wells one was completely destroyed, two had to be capped, and four are still operating. The destroyed well, (well No. 7) has since been replaced by well No. 7A which was drilled by the U.S. Corps of Engineers under Public Law 91-606.**

State well numbers that identify each water well in ULARA are derived from a system based on the U.S. Public Land Survey. Each number consists of township and range designation, a section number, a letter representing the 40-acre tract in which the well is situated, a sequence number indicating the chronological order in which the well number was assigned, and a letter representing the base and meridian. The last letter is frequently omitted from well numbers in a single area because all wells there share a single base and meridian. Well numbers are assigned by the Watermaster.

The components of well No. 1N/14W-12C03S, for example, are identified in the following breakdown:

| Township | Range | Section | Tract | Sequence number | Base and meridian |
|---|---|---|---|---|---|
| 1N | 14W | 12 | C | 03 | S |

The derivation of the components is illustrated below:

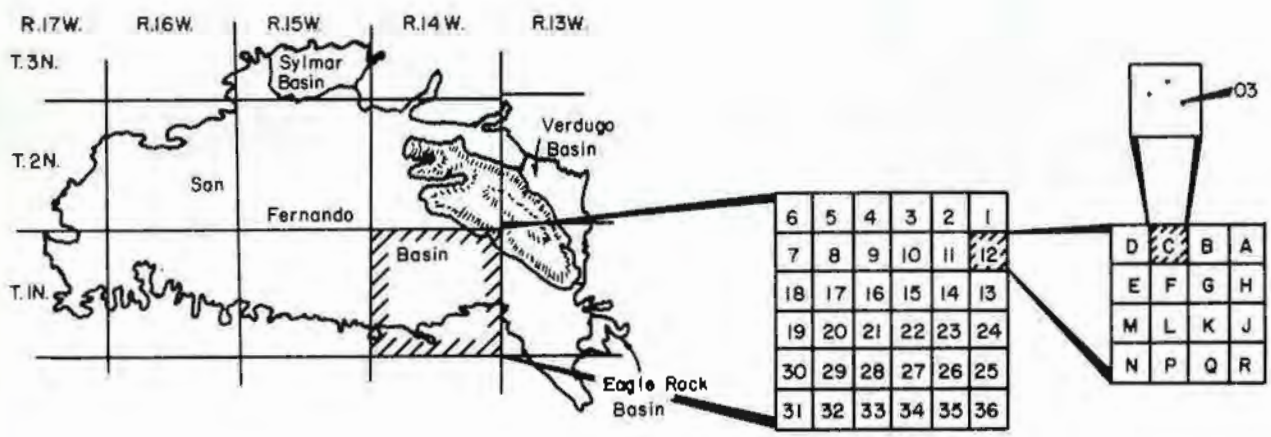
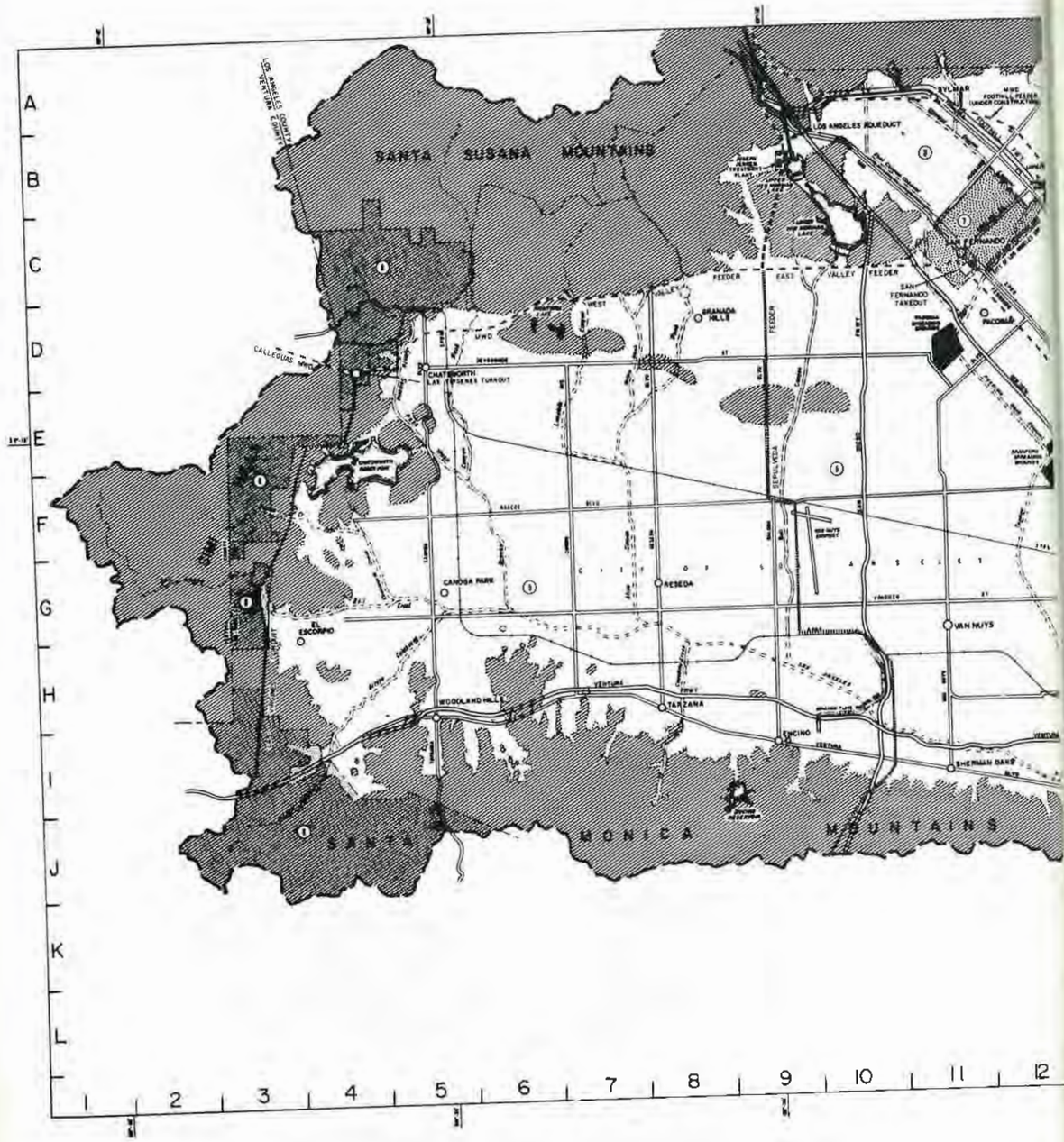
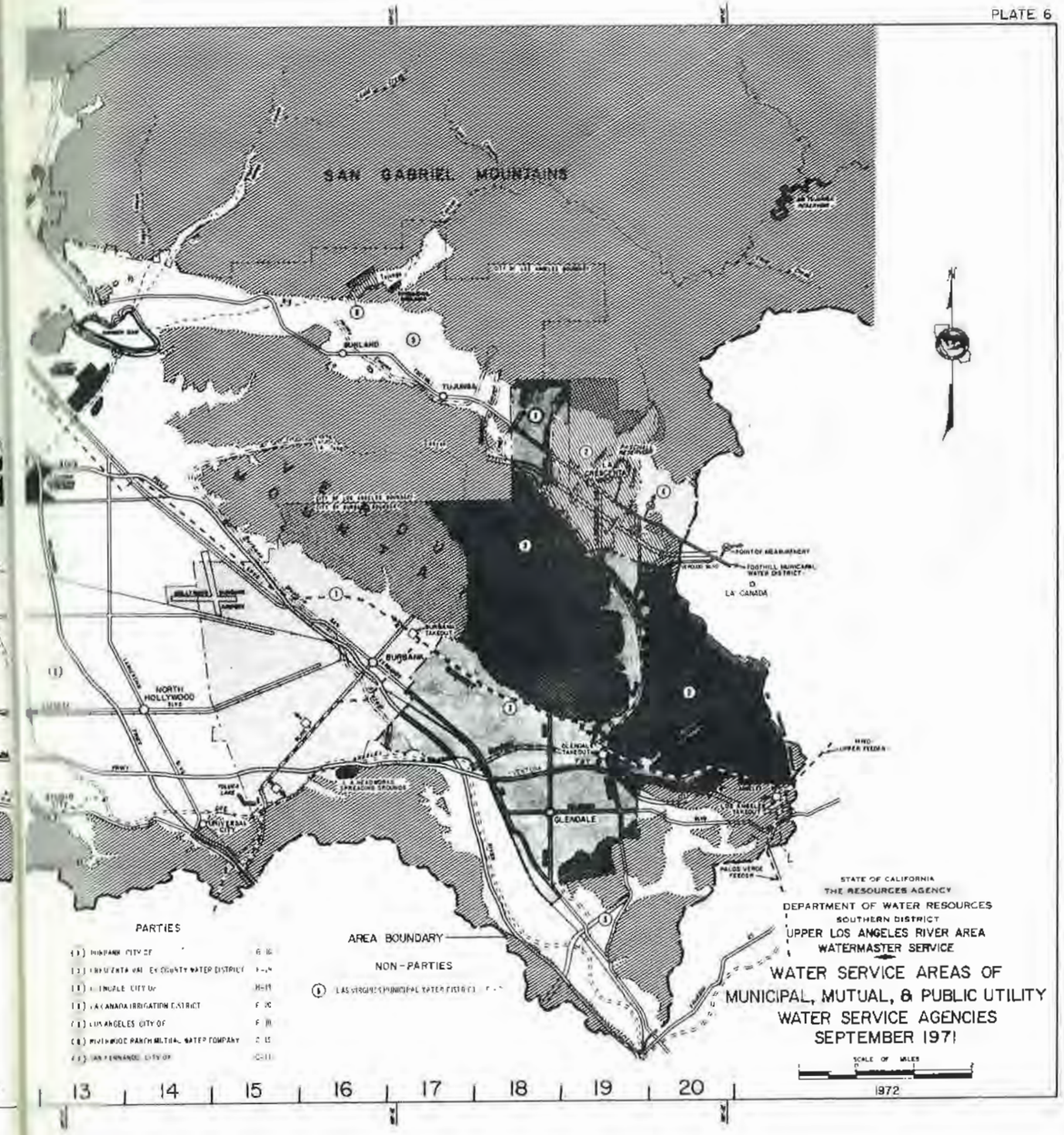
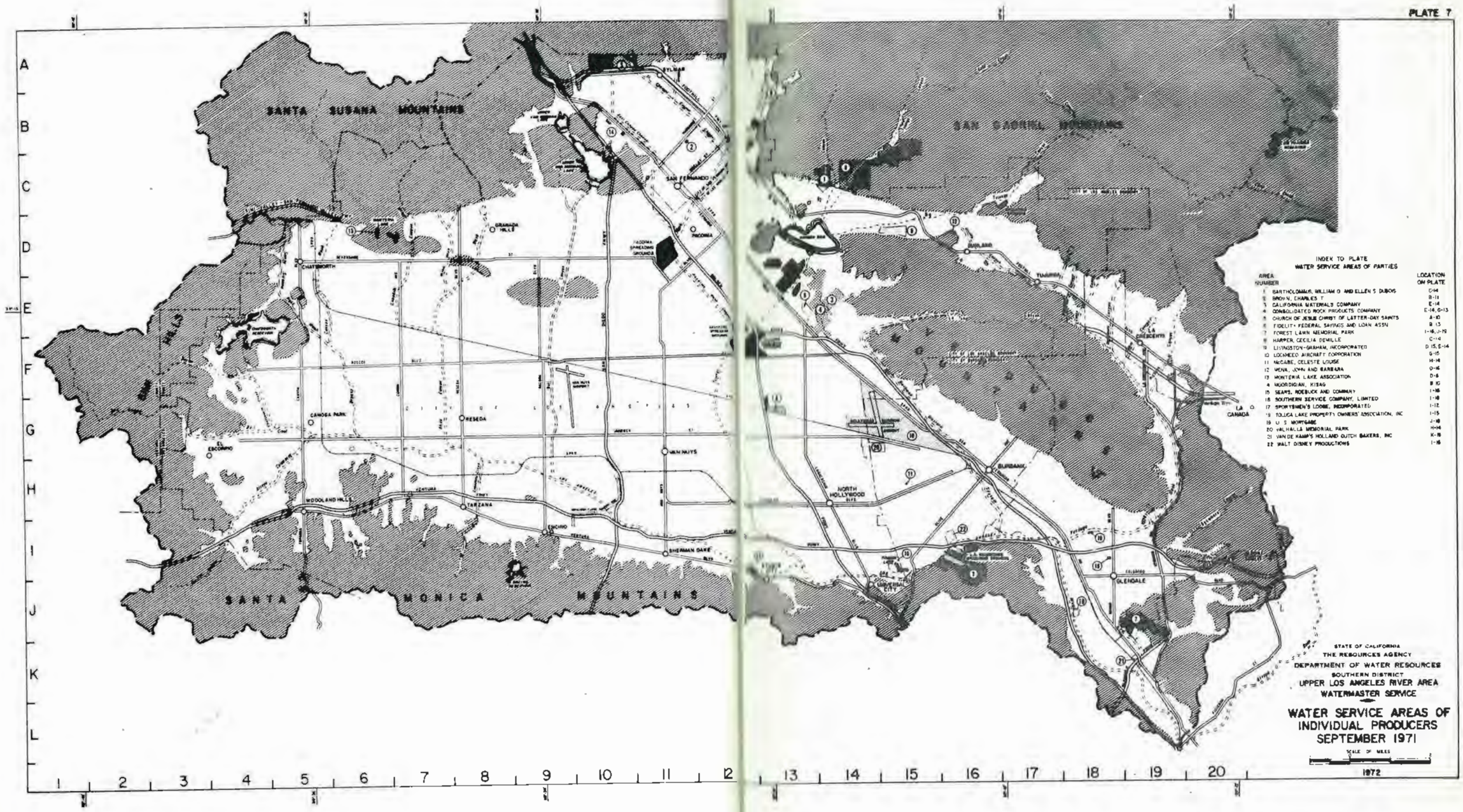



Figure 6. **SYSTEM FOR WATER WELL IDENTIFICATION**


SANTA SUSANA MOUNTAINS
SANTA MONICA MOUNTAINS
LOS ANGELES AQUEDUCT
SYLMAR
LOS FERNANDO
SAN FERNANDO TAKEOUT
PACOIMA
GRANADA HILLS
CHATSWORTH
CALLEGUAS
CANOGA PARK
RESEDA
VAN NUYS
EL ESCORPIO
WOODLAND HILLS
TARZANA
ENCINO
SHERMAN OAKS
FEEDER
EAST
VALLEY
WEST
VENTURA
LOS ANGELES COUNTY
VENTURA COUNTY
A
B
C
D
E
F
G
H
I
J
K
L
1
2
3
4
5
6
7
8
9
10
11
12


SAN GABRIEL MOUNTAINS
BURLAND
TUJUNGA
FOOTHILL MUNICIPAL WATER DISTRICT
LA CANADA
BURBANK
NORTH HOLLYWOOD
GLENDALE
UNIVERSAL CITY
PALOS VERDE FEEDER
PARTIES
NON-PARTIES
AREA BOUNDARY
STATE OF CALIFORNIA
THE RESOURCES AGENCY
DEPARTMENT OF WATER RESOURCES
SOUTHERN DISTRICT
UPPER LOS ANGELES RIVER AREA
WATERMASTER SERVICE
WATER SERVICE AREAS OF
MUNICIPAL, MUTUAL, & PUBLIC UTILITY
WATER SERVICE AGENCIES
SEPTEMBER 1971
SCALE OF MILES
1972
13
14
15
16
17
18
19
20


SANTA SUSANA MOUNTAINS
SAN GABRIEL MOUNTAINS
SANTA MONICA MOUNTAINS
SAN FERNANDO
PACOIMA
GRANADA HILLS
CHATSWORTH
CANOGA PARK
RESEDA
EL ESCORPIO
WOODLAND HILLS
TARZANA
ENCINO
VAN NUYS
SHERMAN OAKS
BURBANK
NORTH HOLLYWOOD
GLENDALE
LA CRESCENTA
LA CANADA
INDEX TO PLATE
WATER SERVICE AREAS OF PARTIES
AREA NUMBER
LOCATION ON PLATE
1 BARTHOLOMAUS, WILLIAM O. AND ELLEN S. DUBOIS C-14
2 BROWN, CHARLES T. B-11
3 CALIFORNIA MATERIALS COMPANY E-14
4 CONSOLIDATED ROCK PRODUCTS COMPANY E-14, G-13
5 CHURCH OF JESUS CHRIST OF LATTER-DAY SAINTS A-10
6 FIDELITY FEDERAL SAVINGS AND LOAN ASSN. B-13
7 FOREST LAWN MEMORIAL PARK I-16, J-15
8 HARPER, CECILIA DEMILLE C-14
9 LIVINGSTON-GRAHAM, INCORPORATED D-15, E-14
10 LOCKHEED AIRCRAFT CORPORATION G-15
11 McCABE, CELESTE LOUISE H-14
12 MENA, JOHN AND BARBARA G-16
13 MONTERIA LAKE ASSOCIATION D-6
14 MOORDIGIAN, KISAG B-10
15 SEARS, ROEBUCK AND COMPANY I-16
16 SOUTHERN SERVICE COMPANY, LIMITED I-18
17 SPORTSMEN'S LODGE, INCORPORATED I-12
18 TOLUCA LAKE PROPERTY OWNERS' ASSOCIATION, INC. I-15
19 U. S. MORTGAGE J-18
20 VALHALLA MEMORIAL PARK H-14
21 VAN DE KAMP'S HOLLAND DUTCH BAKERS, INC. K-18
22 WALT DISNEY PRODUCTIONS I-16
STATE OF CALIFORNIA
THE RESOURCES AGENCY
DEPARTMENT OF WATER RESOURCES
SOUTHERN DISTRICT
UPPER LOS ANGELES RIVER AREA
WATERMASTER SERVICE
WATER SERVICE AREAS OF
INDIVIDUAL PRODUCERS
SEPTEMBER 1971
SCALE OF MILES
1972

## Imports and Exports of Water

Residential, commercial, and industrial expansion within the ULARA requires the importation of additional water supplies to supplement that which is provided by the ground water basins. The City of Los Angeles and the Metropolitan Water District of Southern California (MWD) have kept abreast of this demand by continuing to expand their facilities for the importation of water.

**The City of Los Angeles now has a second aqueduct capable of bringing in an additional supply of Owens River and Mono Basin water at the rate of more than 130 million gallons a day.**

In addition to the City's aqueducts, the Colorado River aqueduct constructed by MWD, delivers water to the Cities of Burbank, Glendale, and Los Angeles. Also, during the 1970-71 water year, MWD delivered Colorado River water to the City of San Fernando on an emergency basis, due to the damage sustained by San Fernando's water system and wells during the February 9, 1971, earthquake. On November 9, 1971, by unanimous approval of a resolution by the Board of Directors of MWD, the City of San Fernando became a member agency of MWD. Thus, San Fernando can now obtain supplemental water on a permanent basis from MWD supplies and participate in all programs for future development and distribution of such water.

The Crescenta Valley County Water District and La Canada Irrigation District also import Colorado River water through the facilities of the Foothill Municipal Water District, which is a member agency of MWD.

State Water Project water from northern California will be delivered to MWD at Castaic Reservoir through the MWD Foothill Feeder to the Joseph Jensen Water Filtration Plant in ULARA on or about April 1, 1972.

The date for initial delivery was set back because of the damage sustained by the nearly completed Filtration Plant during the February earthquake.

Exports from ULARA, exclusive of sewage, are limited to the City of Los Angeles, which exports water consisting of imported water and ground water. Table 8 summarizes the nontributary imports and exports from ULARA. Ground water imports and exports within and out of ULARA are listed in Table 9.

Facilities for importing nontributary water are depicted on Plate 6, page 31.

## Physical Data by Basins

In order to comply with the Court's directive, the Watermaster has collected and summarized data on Table 9 which show the water supply and disposal in each of the basins.

The information for Table 9 was submitted by the parties. In instances where estimates were made, such as water delivered to hill and mountain areas, sewage exported, etc., estimates were made by the parties and based upon methods consistent with previous estimates computed by the State Water Resources Control Board (SWRCB) for the San Fernando Valley Reference. The Watermaster likewise made computations of subsurface outflows based on similar computations made by the SWRCB.

Some of the figures submitted for Table 9 are partially estimated due to the lack of information at the time of submittal. However, the actual figures based on measured values are subsequently submitted to the Watermaster for its permanent record file. The revised data is available at your request from the Watermaster.

Table 8. ULARA IMPORTS AND EXPORTS

| Source and Agency | Quantity, in acre-feet | | | |
|---|---|---|---|---|
| | 1969-70 | | 1970-71 | |
| IMPORTS | | | | |
| Colorado River Water | | | | |
| Burbank, City of | 13,223 | | 12,293 | |
| Crescenta Valley County Water District | 1,243 | | 1,409 | |
| Glendale, City of | 10,640 | | 10,075 | |
| Los Angeles, City of | 10,190 | | 7,922 | |
| La Canada Irrigation District | 859 | | 737 | |
| Las Virgenes Municipal Water District (nonparty) | 735 | | 687 | |
| San Fernando, City of | 0 | | 484 | |
| | | 36,890 | | 33,607 |
| Owens River Water | | | | |
| Los Angeles, City of | | 390,255[a] | | 486,996[b] |
| Total | | 427,145 | | 520,603 |
| EXPORTS | | | | |
| Owens River Water | | | | |
| Los Angeles, City of | | -166,638[a] | | -271,359 |
| Net Import | | 260,507 | | 249,244 |

a/ Last year's figure was updated.
b/ This value represents the summation of the gross amount of water delivered to and exported from ULARA. It does not include operational releases, reservoir evaporation, and water spread during the year.

## TABLE 9. SUMMARY OF WATER SUPPLY AND DISPOSAL BY BASINS
In acre-feet

### SAN FERNANDO BASIN

| Water source and use | City of Burbank | City of Glendale | City of Los Angeles | City of San Fernando | All others | Total |
|---|---|---|---|---|---|---|
| **Extractions** | | | | | | |
| Total quantity | 13,821 | 12,601 | 53,932[a] | 0 | 5,913 | 86,267 |
| Used in Valley Fill | 13,214 | 7,131 | 8,120 | 0 | 5,582[b] | 34,051 |
| **Imports** | | | | | | |
| Colorado River Water | 12,293 | 6,535 | 4,867 | 484 | 687 | 24,866 |
| Owens River Water | -- | -- | 478,531 | -- | -- | 478,535 |
| Ground water from Sylmar Basin | -- | -- | 2,645 | 1,138 | 0 | 3,783 |
| **Exports** | | | | | | |
| Ground water: | | | | | | |
| to Verdugo Basin | -- | 4,672 | 0 | -- | 0 | 4,672 |
| Out of ULARA | -- | -- | 48,457 | -- | 0 | 48,517 |
| Owens River Water: | | | | | | |
| Out of ULARA | -- | -- | 271,355 | -- | -- | 271,359 |
| to Eagle Rock Basin | -- | -- | 1,037 | -- | 0 | 1,037 |
| Colorado River: | | | | | | |
| to Verdugo Basin | -- | 3,540 | 0 | -- | 0 | 3,540 |
| **Water delivered to hill and mountain areas** | | | | | | |
| Ground water | 607 | 798 | 0 | 0 | 0 | 1,405 |
| Owens River Water | -- | -- | 31,752 | -- | -- | 31,752 |
| Colorado River Water | 540 | 776 | 2,316 | -- | 687 | 4,319 |
| **Water outflow** | | | | | | |
| Surface | | | | | | 93,310[c] |
| Subsurface | | | | | | 248 |
| Sewers | 11,777[d] | 17,256 | 73,110 | 1,138 | 0 | 103,281 |

### SYLMAR BASIN

| Water source and use | City of Los Angeles | City of San Fernando | All others | Total |
|---|---|---|---|---|
| **Extractions** | | | | |
| Total quantity | 2,645 | 1,251 | 940 | 4,836 |
| Used in Valley Fill | 0 | 113 | 247[e] | 360 |
| **Imports** | | | | |
| Owens River Water | 6,473 | -- | -- | 6,473 |
| **Exports** | | | | |
| Ground water: to San Fernando Basin | 2,645 | 1,138 | 0 | 3,783 |
| **Water delivered to hill and mountain areas** | | | | |
| Owens River Water | 378 | -- | -- | 378 |
| **Water outflow** | | | | |
| Surface | | | | 5,000[f] |
| Subsurface: to San Fernando Basin | | | | 517 |
| Sewers | 730 | 112 | 0 | 842 |

## TABLE 9. SUMMARY OF WATER SUPPLY AND DISPOSAL BY BASINS
In acre-feet
(Continued)

### VERDUGO BASIN

| Water source and use | Crescenta Valley County Water District | City of Glendale | La Canada Irrigation District | City of Los Angeles | Total |
|---|---|---|---|---|---|
| Extractions | | | | | |
| Total quantity | 3,027 | 3,449 | 0 | 0 | 6,476 |
| Used in Valley Fill | 2,931 | 3,449 | 0 | 0 | 6,380 |
| Imports | | | | | |
| Colorado River Water | 1,409 | 3,540 | 737 | 0 | 5,686 |
| Owens River Water | -- | -- | -- | 951 | 951 |
| Ground water from San Fernando Basin | -- | 4,672 | 0 | 0 | 4,672 |
| Exports | 0 | 0 | 0 | 0 | 0 |
| Water delivered to hill and mountain areas | | | | | |
| Colorado River Water | 44 | 398 | 0 | 0 | 442 |
| Owens River Water | -- | -- | -- | 303 | 303 |
| Ground water | 96 | 911 | 0 | 0 | 1,007 |
| Water outflow | | | | | |
| Surface | | | | | 7,690 g/ |
| Subsurface: | | | | | |
| to Monk Hill Basin | | | | | 300 h/ |
| to San Fernando Basin | | | | | 72 |
| Sewage | 0 | 1,195 | 0 | 0 | 1,195 |

### EAGLE ROCK BASIN

| Water source and use | City of Los Angeles | Deep Rock Water Company | Sparkletts Drinking Water Corporation | Total |
|---|---|---|---|---|
| Extractions | | | | |
| Total quantity | 0 | 8 | 207 | 215 |
| Used in Valley Fill | 0 | 0 | 0 | 0 |
| Imports | | | | |
| Owens River | 1,037 | --- | --- | 1,037 |
| Colorado River | 3,055 | --- | --- | 3,055 |
| Ground water | 0 | 0 | 0 | 0 |
| Exports | | | | |
| Ground water | 0 | 8 | 207 | 215 |
| Water delivered to hill and mountain areas | | | | |
| Colorado River Water | 1,659 | --- | --- | 1,659 |
| Owens River Water | 513 | --- | --- | 513 |
| Water outflow | | | | |
| Surface | | | | --- j/ |
| Subsurface | | | | 50 k/ |
| Sewers | 2 ,040 | 0 | 0 | 2,040 |

a/ Excludes production from Reseda wells.
b/ Excludes production by Western Oil and Gas Association (nonparty)
c/ Measured at Station F-57C where the 29-year mean (1929-57) base low flow is 7,580 acre-feet.
d/ Includes reclaimed waste water which infiltrates into the ground water basin after being discharged in L. A. River and while on route to gaging station F-57C.
e/ Excludes water from San Fernando Tunnel which is being built by MWD.
f/ Surface outflow is not measured. Calculated average surface outflow by Laverty - SF Exhibit 57.
g/ Information obtained from Station F-252R.
h/ Based on 29-year average (1929-57).
j/ Information not available.
k/ Estimated in Supplemental No. 2 to Report of Referee for dry year 1960-61. Currently, data not available for direct evaluation.

## IV. ADMINISTRATION OF THE JUDGMENT

The Department of Water Resources as Watermaster in the Upper Los Angeles River Area, administers the Judgment and keeps the Court fully advised and apprised of any violations or changes in administration.

### Assignments of Restricted Pumping

In accordance with the provisions of the Judgment, the Watermaster records all changes of ownership, transfer, or assignment of Restricted Pumping rights. Table 10 lists all assignments, parties, and amounts involved. Appendix "A" records the documents used to assign Restricted Pumping rights by each of the parties as of September 30, 1971. During the 1970-71 water year, the City of Los Angeles submitted estimates on the amounts to be extracted by those parties having separate stipulated Judgments with the City of Los Angeles. The clause, which allows the parties with stipulated Judgments to extract ground water under the City of Los Angeles' Restricted Pumping right, is covered by Section V, Paragraph 2 of the Judgment. The City of San Fernando did not exercise its right to purchase water from the City of Los Angeles

TABLE 10. ASSIGNMENTS OF RESTRICTED PUMPING

| Party | Assignment and amount, in acre-feet | | | Party |
|---|---|---|---|---|
| | | San Fernando Basin | | |
| Pursuant to Stipulated Judgments | | | | |
| California Materials Company | Stipulated | 350.00 a/ | from | Los Angeles, City of |
| Consolidated Rock Products Co. | Stipulated | 1,600.00 a/ | from | Los Angeles, City of |
| Livingston-Graham, Incorporated | Stipulated | 550.00 a/ | from | Los Angeles, City of |
| Sears, Roebuck and Company | Stipulated | 400.00 a/ | from | Los Angeles, City of |
| Walt Disney Productions | Stipulated | 1,900.00 a/ | from | Los Angeles, City of |
| Pursuant to License | | | | |
| Burbank, City of | Licensed | 181.00 | from | Lockheed Aircraft Corporation |
| Harper, Cecelia DeMille | Licensed | 45.00 | from | Forest Lawn Memorial Park Association |
| Riverwood Ranch Mutual Water Co. | Licensed | 32.00 | from | Lockheed Aircraft Corporation |
| Southern Service Company, Ltd. | Licensed | 130.00 | from | Forest Lawn Memorial Park Association |
| Sportsmen's Lodge, Incorporated | Licensed | 7.00 | from | Forest Lawn Memorial Park Association |
| Sportsmen's Lodge, Incorporated | Licensed | 6.00 | from | Lockheed Aircraft Corporation |
| Sportsmen's Lodge, Incorporated | Licensed | 25.00 | from | Van de Kamp's Holland Dutch Bakers, Inc. |
| Toluca Lake Property Owner's Association | Licensed | 15.00 | from | Bartholomeus, William O. and Dubois, Ellen S. |
| U. S. Mortgage | Granted | 0.00 | from | Wright, Marion J. and Alice M. |
| Valhalla Memorial Park | Licensed | 20.00 | from | Lockheed Aircraft Corporation |
| | | Sylmar Basin | | |
| Pursuant to License | | | | |
| Brown, Charles T. | Licensed | 20.00 | from | Boise Cascade Building Company |
| Fidelity Federal Savings and Loan Association | Assigned | 609.00 | from | Boise Cascade Building Company |
| San Fernando, City of | Licensed | 40.00 | from | Moordigian, Kisag |

a/ Estimate submitted by City of Los Angeles, see Appendix A.

pursuant to the "Physical Solution-Sylmar Basin", which is described in Section VII, Paragraph 2 of the Judgment.

In addition to the Cities of Los Angeles and San Fernando, a number of parties availed themselves of the opportunity to license water rights to meet their water demands.

In order that a water right license or sale agreement be in force during the water year, it will be the Watermaster's policy that it be signed before or during the water year in question. Failure to submit a license or sale document with the Watermaster by August 31 of the water year in question may be considered as evidence that such an agreement was never consummated during such water year.

## Overextractions

In restricting ground water extractions in ULARA, it was foreseen that there would be unavoidable fluctuations in water usage occurring from year to year. Therefore, the flexibility clause was included in the Judgment which allowed each party to vary its extractions within reasonable limits so that it could pump more or less than its "Restricted Pumping", with equivalent debits or credits being applied to its extractions in the subsequent water year.

The provisions described in Section VIII of the Judgment, allows each party a flexibility of 10 percent of its Restricted Pumping right. In other words, a party may underpump or overpump by ten percent of its Restricted Pumping and in the succeeding water year increase or decrease (whichever is applicable) its pumping by the same amount. Table 11 summarizes all overextractions and violations of the Judgment.

Of the 9 parties that exceeded their allowable extraction for 1970-71, five were in violation of the Judgment.

TABLE 11. OVEREXTRACTIONS

In acre-feet

| Party | (1) Restricted Pumping a/ | (2) Allowable carryover from 1969-70 | (3) Allowable extraction 1970-71 (1)±(2)=(3) | (4) Amount extracted | Overextractions (5) Amount (3)-(4)=(5) | (6) Allowable b/ | (7) In percent [(5)÷(1)]100=(7) |
|---|---|---|---|---|---|---|---|
| **San Fernando Basin** | | | | | | | |
| Livingston-Graham, Inc. | 550.00 | 0.00 | 550.00 | 669.37 | - 119.37 | --- c/ | |
| Los Angeles, City of | 59,534.00 d/ | - 6,581.37 | 52,952.63 | 53,931.55 | - 978.92 e/ | 6,325.70 f/ | 1.55 f/ |
| Mena, John and Barbara | 0.00 | - 1.92 | - 1.92 | 0.96 | - 2.88 | 0.00 | -- g/ |
| Monteria Lake Association | 0.00 | - 13.46 | - 13.46 | 0.00 | - 13.46 | 0.00 | -- g/ |
| Southern Service Company, Ltd. | 130.00 | - 44.37 | 85.63 | 85.93 | - 0.30 | 13.00 | 0.23 |
| Sportsmen's Lodge, Inc. | 38.00 | - 30.83 | 7.17 | 19.16 | - 11.99 | 3.80 | 31.55 g/ |
| Walt Disney Productions | 1,900.00 | 0.00 | 1,900.00 | 1,974.67 | - 74.67 | --- c/ | |
| Subtotals | 62,152.00 | - 6,671.95 | 55,480.05 | 56,681.64 | - 1,201.59 | | |
| **Sylmar Basin** | | | | | | | |
| Brown, Charles T. | 20.00 | - 12.30 | 7.70 | 12.12 | - 4.42 | 2.00 | 22.10 g/ |
| Church of Jesus Christ of the Latter Day Saints | 0.00 | - 591.71 | - 591.71 | 212.81 | - 804.52 | 0.00 | -- g/ |
| Los Angeles, City of | 2,818.00 | - 181.72 | 2,636.28 | 2,645.35 | - 9.07 | 281.80 | 0.32 |
| Subtotals | 2,838.00 | - 785.73 | 2,052.27 | 2,870.28 | - 818.01 | | |
| Totals | 64,990.00 | - 7,457.68 | 57,532.32 | 59,551.92 | - 2,019.60 | | |

a/ Refer to Column (1)+(3), Table 6.
b/ Computed as 10 percent of Column (1) unless otherwise noted.
c/ Party entitled to extract ground water per stipulated Judgment with City of Los Angeles. The City will, in succeeding water year, decrease its extractions by the amount of the overextraction shown under Column (5).
d/ Includes 1077 acre-feet of spreading credit pursuant to "Stipulation for Emergency Spreading and Extraction".
e/ Not to be considered an overextraction per se, as the "Stipulation for Emergency Spreading and Extraction" permits the City of Los Angeles to overextract.
f/ For City of Los Angeles, the allowable overextraction is 10 percent of its "Restricted Pumping" shown in Column (1) of Table 6.
g/ Party in violation of the Judgment either as a result of having a zero water right or having exceeded its allowable extraction by 10 percent of its "Restricted Pumping" shown in Column (1).

The parties in violation are subject to court action. Recommendations are discussed under "Findings, Determinations and Recommendations by the Watermaster.

Table 11 also lists two parties that are subject to the Stipulated Judgment with the City of Los Angeles. These parties' extractions, in excess of the estimates submitted by the City of Los Angeles, will be adjusted against the City's Restricted Pumping right during the 1971-72 water year. As such, the parties in question are not considered to be in violation of the Judgment.

## Findings, Determinations and Recommendations by the Watermaster

The Watermaster finds five parties in violation of the Judgment as a result of overextractions during the 1970-71 water year and recommends action by the Court be brought only against the Church of Jesus Christ of the Latter Day Saints.

This party was also in violation of the Judgment for the 1968-69 and 1969-70 water years. On or about March 2, 1971, the Watermaster advised them by letter that they were in violation of the Judgment. To date, the Church has made no apparent effort to obtain Restricted Pumping rights to cover its ground water extractions during the 1968-69, 1969-70, and 1970-71 water years. Monteria Lake Association, Inc. did not extract any ground water during the 1970-71 year; however, their account continues to show an overextraction as a carryover from 1968-69. On March 5, 1971, they were advised, by letter from the Watermaster, that should they not eliminate the deficit from their account by September 30, 1971, the Watermaster would recommend to the Court that action be taken against them. Therefore, the Watermaster does hereby recommend that the Court take the necessary action against Monteria Lake Association, Inc.

Charles T. Brown Company and Sportsmen's Lodge, Inc. were also in violation of the Judgment due to an overextraction during the 1969-70 water year. However, no action is recommended by the Watermaster inasmuch as these two parties have leased water rights in an attempt to offset their overextraction. In addition, the Watermaster has on file correspondence from these two parties which shows that they are making a great effort to obtain additional Restricted Pumping rights to cover their overextractions.

As to the one remaining party who overextracted in violation of the Judgment, the Watermaster also does not recommend action be taken. John and Barbara Mena extract less than 1 acre-foot a year for domestic purposes.

The City of Los Angeles, as a result of the February 9, 1971 earthquake damage sustained by its water system and reservoirs, mainly, the Van Norman complex, requested permission for the removal of the 10% flexibility restriction on ground water extractions, as it applies to the City of Los Angeles. The matter was considered and approved by the ULARA Advisory Board on February 25, 1971. A Stipulation for Emergency Spreading and Extraction and Order Thereon, (see Appendix A) was filed along with the Watermaster's recommendation with the Court on June 16, 1971, and ordered by the Honorable Charles A. Loring, Judge of the Superior Court, on June 16, 1971.

Said stipulation provides that the City of Los Angeles may spread excess Owens River water into its spreading grounds in the San Fernando Basin but not to exceed 22,000 acre-feet in any water year. It further provides that the City of Los Angeles may extract from the San Fernando Basin in addition

to extractions and diversions permitted by the Judgment, an amount of water equal to the amount spread plus "the amount heretofore spread on an emergency basis following the earthquake of February 9, 1971."

Following the earthquake, which occurred at 6:01 a.m. on February 9, 1971, the City of Los Angeles took immediate steps to empty Van Norman Reservoir. Water was spilled at numerous places into flood control channels which subsequently drain to the Los Angeles River.

By 8:35 a.m., spreading had commenced at the Tujunga Spreading Grounds. Spreading of imported water from Van Norman Reservoir continued through February 12, by which time 399 acre-feet of water had been spread. The Watermaster made a study of the data which was submitted by the City in substantiating the amount spread. The Watermaster has credited the City with 399 acre-feet of Owens River water spread during the month of February.

In addition to spreading at the Tujunga Spreading Grounds, the City also spread Owens River water diverted from the Los Angeles River at its Headworks Spreading Grounds. During March 1971 the City spread 1,488 acre-feet of water in its Headworks Spreading Grounds. It was estimated, based on historical records of the normal flow in the river during this period, that 570 acre-feet of the quantity spread resulted from the releases of Owens River water from Van Norman Reservoir into the Los Angeles River system. The City subsequently spread 678 acre-feet of water during the month of April of which 108 acre-feet was considered as Owens River water. The City submitted data relating to the amount of water spread during March and April. The Watermaster in turn reviewed, analyzed, and credited the City with 570 acre-feet of water during the month of March and 108 acre-feet during the month of April. As a result of 1970-71 spreading of imported water pursuant to the "Stipulation for Emergency Spreading and Extraction", the City of Los Angeles was credited with 1,077 acre-feet of water which was applied toward the City's extractions during the same water year.

The City of San Fernando, through no fault of its own, was deprived the use of its water system and ability to extract its full entitlement of water right during the 1970-71 water year because of the earthquake.

During the February 4, 1972, ULARA Advisory Board meeting, a motion was made and approved that the City of San Fernando be allowed to extract its unused water right in the subsequent 3 water years. The Watermaster concurs with the Advisory Board's recommendations and deems it appropriate and equitable that the City of San Fernando be allowed to carry over its unused "Restricted Pumping" because of the emergency conditions that prevailed subsequent to the earthquake and which prevented it from pumping its proportionate share of ground water from the Sylmar Basin.

In view of the earthquake damage sustained by the City of San Fernando, and its inability to extract is water rights, the Watermaster hereby approves, subject to continuing jurisdiction of the Court, that San Fernando be allowed to carry over for extraction in the three subsequent water years a total of 1,526.06 acre-feet of water which it was unable to utilize during the 1970-71 period.

Excerpts from reports describing water system damages sustained by the Cities of San Fernando and Los Angeles are presented in Appendix E. The City of Los Angeles' report entitled "Earthquake Emergency Report, Water Systems" February 1971 and the City of San Fernando's report entitled "Report on the City of San Fernando's Water Supply System" November 1971 are filed in the Watermaster's office.

## V. ADMINISTRATIVE COSTS

The Upper Los Angeles River Area was established as a "Watermaster Service Area" in accordance with Part 4, Division 2, of the Water Code of the State of California. Pursuant to the provisions of Section 4201 thereof, the cost of watermaster service is payable one-half by the State and one-half by the parties. Thus, the parties are assisted by the State in their endeavor to distribute the waters of ULARA in the most economical way.

The Judgment, on the other hand, describes the procedures for apportioning the costs among the parties and how it should be collected. It requires that each year, the Watermaster prepare a proposed budget covering the forthcoming July 1 to June 30 fiscal year. Please keep in mind that watermaster service and the annual report are on a water year basis, i.e., October 1 through September 30.

The Judgment also provides that the parties' share of the budget be borne by each party in the proportion that its "Mutual Prescriptive Right" bears to the total "Mutual Prescriptive Right" of all parties in ULARA. However, no party having 50 acre-feet or less of "Mutual Prescriptive Right" shall be assessed any charges.

The Watermaster is required to include the proposed budget and its apportionment in the annual report, so that they may be reviewed and approved by the Advisory Board on or about February 1 of each year. The proposed budget is subsequently mailed to the parties as part of the annual report on or before March 1 of each year. If there are any objections to the proposed budget, they must be presented in writing to the Court and to the Watermaster within 30 days (on or before March 31) after the mailing of the annual report. If no objections are received, the proposed budget becomes final.

Invoices are mailed on or about April 1 and all payments must be received, whether objections are filed or not, within 60 days (on or before May 1) after mailing of the annual report.

### APPROVED BUDGET FOR 1970-71

In accordance with the Judgment, the Watermaster submitted the proposed budget for the fiscal year July 1, 1970 through June 30, 1971 as part of its 1968-69 annual report. The tentative budget and annual report were reviewed and approved by the Advisory Board on February 2, 1970.

The parties had 30 days after the mailing of the annual report to submit their objections to the proposed budget. No objections were received by March 31, 1970 and the proposed budget became final. Table 12 presents the 1970-71 budget as approved by the Advisory Board and parties.

TABLE 12. APPROVED BUDGET FOR 1970-71

| | | | |
|---|---|---|---|
| Salaries and wages | $16,532 | | |
| Operating expenses | 8,644 | | |
| TOTAL BUDGET | | $25,176 | |
| One-half payable by State | | | $12,588 |
| One-half payable by parties to Judgment | | | $12,588 |
| Less estimated funds on hand July 1, 1970 | | | - 3,000 |
| Amount to be billed | | | $ 9,588 |

State of California
The Resources Agency
DEPARTMENT OF WATER RESOURCES
Southern District

Approved: Date: 2/2/70

UPPER LOS ANGELES RIVER AREA
ADVISORY BOARD

By L. H. Trayer
Chairman

James J. Doody
District Engineer
Southern District
and Watermaster

Invoices for each party's proportionate share of the budget were mailed on or about April 1 and all payments were received prior to the deadline of May 1, 1970. Each party's proportionate share of the 1970-71 budget is shown on Table 13. A recapitulation for the Cities of Glendale and Los Angeles is made since they are billed in two separate basins.

During the third year of watermaster service the work load leveled off and decreased somewhat. As a result, the expenditures in 1970-71 were slightly lower when compared with the 1969-70 fiscal year.

Income and expenditures for watermaster service during the 1970-71 fiscal year are shown in Table 14 In accordance with the California Water Code, any credit or debit balance remaining at the end of the fiscal year is carried forward into the succeeding fiscal year. The parties' share of the carryover into the 1971-72 fiscal year totaled $3,254.75.

TABLE 13. APPORTIONMENT OF PARTIES' SHARE OF 1970-71 BUDGET

| Party | Mutually Prescriptive Right, in acre-feet | Apportionment to be paid |
|---|---|---|
| **San Fernando Basin** | | |
| Burbank, City of | 17,760 | $ 1,335 |
| Forest Lawn Memorial Park Assoc. | 1,060 | 80 |
| Glendale, City of | 16,141 | 1,213 |
| Lockheed Aircraft Corporation | 310 | 23 |
| Los Angeles, City of | 82,310 | 6,185 |
| Valhalla Memorial Park | 240 | 18 |
| Van de Kamp's Holland Dutch Bakers, Inc. | 120 | 9 |
| **Verdugo Basin** | | |
| Crescenta Valley County Water District | 1,988 | 149 |
| Glendale, City of | 2,327 | 175 |
| **Sylmar Basin** | | |
| Boise Cascade Building Company | 527 | 40 |
| Los Angeles, City of | 2,440 | 183 |
| San Fernando, City of | 2,370 | 178 |
| TOTALS | 127,593 | $ 9,588 |
| **Recapitulation for:** | | |
| Glendale, City of | 18,468 | $ 1,388 |
| Los Angeles, City of | 84,750 | $ 6,368 |

TABLE 14. STATEMENT OF JULY 1, 1970 – JUNE 30, 1971
INCOME AND EXPENDITURES

| Item | Parties | | State | | Parties and State | |
|---|---|---|---|---|---|---|
| **Income** | | | | | | |
| From 1970-71 budget | $9,588.00 | | $12,588.00 | | $22,176.00 | |
| Balance from 1969-70 | 4,490.43 | | | | 4,490.43 | |
| TOTAL INCOME | | $14,078.43 | | $12,588.00 | | $26,666.43 |
| **Expenditures** | | | | | | |
| Salaries and wages | $7,552.28 | | $ 7,552.28 | | $15,104.56 | |
| Operating expenses | | | | | | |
| Miscellaneous indirect cost[a] | 1,907.94 | | 1,907.95 | | 3,815.89 | |
| Travel in State | 9.25 | | 9.25 | | 18.50 | |
| Printing annual report | 97.79 | | 97.79 | | 195.58 | |
| Electronic machine computing | 892.09 | | 892.09 | | 1,784.18 | |
| Other[b] | 364.33 | | 364.33 | | 728.66 | |
| TOTAL EXPENDITURES | | $10,823.68 | | $10,823.69 | | $21,647.37 |
| BALANCE | | $ 3,254.75[c] | | $ 1,764.31 | | $ 5,019.06 |

a/ Rent, utilities, auto rental, communications, retirement, employee's health plan, and workmen's compensation insurance.
b/ Equipment rental, mobile equipment operation, engineering contracts.
c/ Total credit to parties in 1971-72 fiscal year, subject to delayed charges.

## APPROVED BUDGET FOR 1971-72

The tentative budget for the fiscal year July 1, 1971, through June 30, 1972, was submitted by the Watermaster for review and approval by the Advisory Board on February 3, 1971. The parties had 30 days after the mailing of the annual report for submitting their objections to the proposed budget which was made a part thereof.

No objections were received by March 31, 1971, and the budget became final. Invoices for each party's proportionate share of the budget were mailed on April 1 and all payments were made before May 1, 1971. Table 15 presents the 1971-72 budget as approved by the Advisory Board on February 3, 1971. Each party's share of the 1971-72 budget is shown in Table 16.

## TENTATIVE BUDGET FOR 1972-73

In accordance with the Judgment, the Watermaster hereby submits a proposed budget for the fiscal year July 1, 1972, through June 30, 1973. The tentative budget submitted herewith was reviewed and approved by the Advisory Board on February 4, 1972. The parties will have 30 days after the mailing of the annual report for submitting their objections to the proposed budget.

If no objections are received by March 31, 1972, the budget will become final. Invoices for each party's proportionate share of the budget will be mailed on or about April 1 and payments will be due on or before May 1, 1972. Table 17 presents the 1972-73 budget as approved by the Advisory Board. Each party's share of the 1972-73 budget is shown in Table 18.

TABLE 15. APPROVED BUDGET FOR THE FISCAL YEAR JULY 1, 1971 THROUGH JUNE 30, 1972

| | | |
|---|---|---|
| Salaries and wages | $18,307 | |
| Operating expenses | 8,352 | |
| TOTAL BUDGET | | $26,659 |
| One-half payable by State | | $13,330 |
| One-half payable by parties to Judgment | | $13,329 |
| Less estimated funds on hand July 1, 1971 | | - 1,500 |
| Amount to be billed | | $11,829 |

APPROVED:

UPPER LOS ANGELES RIVER AREA ADVISORY BOARD

By Robert E James
Robert James
Chairman

Date Feb. 3, 1971

STATE OF CALIFORNIA
The Resources Agency
DEPARTMENT OF WATER RESOURCES
Southern District

By J J Doody
James J. Doody
District Engineer
Southern District
and Watermaster

Date JAN 28 1971

TABLE 16. APPORTIONMENT OF PARTIES' SHARE OF 1971–72 BUDGET

| Party | Mutually Prescriptive Right, in acre-feet | Apportionment to be paid |
|---|---|---|
| San Fernando Basin | | |
| Burbank, City of | 17,760 | $ 1,646.51 |
| Forest Lawn Memorial Park Association | 1,060 | 98.27 |
| Glendale, City of | 16,141 | 1,496.42 |
| Lockheed Aircraft Corporation | 310 | 28.74 |
| Los Angeles, City of | 82,310 | 7,630.88 |
| Valhalla Memorial Park | 240 | 22.25 |
| Van de Kamp's Holland Dutch Bakers, Inc. | 120 | 11.12 |
| Verdugo Basin | | |
| Crescenta Valley County Water District | 1,988 | 184.30 |
| Glendale, City of | 2,327 | 215.73 |
| Sylmar Basin | | |
| Boise Cascade Building Company | 527 | 48.85 |
| Los Angeles, City of | 2,440 | 226.21 |
| San Fernando, City of | 2,370 | 219.72 |
| TOTALS | 127,593 | $ 11,829.00 |
| Recapitulation for: | | |
| Glendale, City of | 18,468 | $ 1,712.15 |
| Los Angeles, City of | 84,750 | $ 7,857.09 |

Table 17. TENTATIVE BUDGET FOR THE FISCAL YEAR
JULY 1, 1972 THROUGH JUNE 30, 1973

ULARA Watermaster Service Area

| | | |
|---|---|---|
| Salaries and wages | $15,630 | |
| Operating expenses | 8,594 | |
| TOTAL BUDGET | | $24,224 |
| One-half payable by State | | $12,112 |
| One-half payable by parties to Judgment | | $12,112 |
| Less estimated funds on hand July 1, 1972 | | - 0 |
| Amount to be billed | | $12,112 |

APPROVED:

UPPER LOS ANGELES RIVER
AREA ADVISORY BOARD

By Robert James
Robert James
Chairman

Date Feb. 4, 1972

STATE OF CALIFORNIA
The Resources Agency
DEPARTMENT OF WATER RESOURCES
Southern District

By J. J. Doody
James J. Doody
District Engineer
Southern District
and Watermaster

Date JAN 31 1972

TABLE 18. APPORTIONMENT OF PARTIES' SHARE OF 1972–73 BUDGET

| Party | Mutually Prescriptive Right, in acre-feet | Apportionment to be paid |
|---|---|---|
| San Fernando Basin | | |
| Burbank, City of | 17,760 | $ 1,685.90 |
| Forest Lawn Memorial Park Association | 1,060 | 100.62 |
| Glendale, City of | 16,141 | 1,532.21 |
| Lockheed Aircraft Corporation | 310 | 29.43 |
| Los Angeles, City of | 82,310 | 7,813.43 |
| Valhalla Memorial Park | 240 | 22.78 |
| Van de Kamp's Holland Dutch Bakers, Inc. | 120 | 11.39 |
| Verdugo Basin | | |
| Crescenta Valley County Water District | 1,988 | 188.71 |
| Glendale, City of | 2,327 | 220.90 |
| Sylmar Basin | | |
| Fidelity Federal Savings and Loan Association | 527 | 50.03 |
| Los Angeles, City of | 2,440 | 231.62 |
| San Fernando, City of | 2,370 | 224.98 |
| TOTALS | 127,593 | $ 12,112.00 |
| Recapitulation for: | | |
| Glendale, City of | 18,468 | $ 1,753.11 |
| Los Angeles, City of | 84,750 | $ 8,045.05 |

# APPENDIX A

## RESTRICTED PUMPING OF
## UPPER LOS ANGELES RIVER AREA PARTIES
## SEPTEMBER 1971

## AND

## COPIES OF LEGAL DOCUMENTS

## Appendix A
## TABLE OF CONTENTS

## RESTRICTED PUMPING OF UPPER LOS ANGELES RIVER AREA PARTIES SEPTEMBER 1971

| Party [a] | Restricted Pumping, in acre-feet per year | |
|---|---|---|
| **SAN FERNANDO BASIN** | | |
| Bartholomaus, William O. and Ellen S. Dubois | 15.00 | |
| Burbank, City of | 13,649.00 | |
| California Materials Company | 0.00 [b] | |
| Consolidated Rock Products Company | 0.00 [b] | |
| Forest Lawn Memorial Park Association<br>Includes: American Security and Fidelty Company<br>Forest Lawn Cemetery Association<br>Forest Lawn Company | 814.00 | |
| Glendale, City of | 12,405.00 | |
| Harper, Cecilia DeMille<br>Successor of Estate of Cecil B. DeMille | 0.00 | |
| Livingston–Graham, Incorporated<br>Successor of Livingston Rock and Gravel Company | 0.00 [b] | |
| Lockheed Aircraft Corporation | 239.00 | |
| Los Angeles, City of | 63,257.00 | |
| McCabe, Celeste Louise | 1.00 | |
| Mena, John and Barbara<br>Successor of Neva Bartlett Holmgrin | 0.00 | |
| Monteria Lake Association | 0.00 | |
| Riverwood Ranch Mutual Water Company | 0.00 | |
| Sears, Roebuck & Company | 0.00 [b] | |
| Southern Service Company, Limited | 0.00 | |
| Sportsmen's Lodge, Incorporated<br>Formerly known as Sportsmen's Lodge Banquet Corporation | 0.00 | |
| Toluca Lake Property Owners' Association | 23.00 | |
| U. S. Mortgage<br>Successor of Wright, Marion J. and Alice M. | 00.00 | |
| Valhalla Memorial Park<br>Includes: Valhalla Mausoleum Park<br>Valhalla Properties | 184.00 | |
| Van de Kamp's Holland Dutch Bakers, Incorporated | 93.00 | |
| Walt Disney Productions | 00.00 [b] | |
| SUBTOTALS (SAN FERNANDO BASIN) | | 90,680.00 |

## RESTRICTED PUMPING OF UPPER LOS ANGELES RIVER AREA PARTIES SEPTEMBER 1971

(Continued)

| Party [a] | Restricted Pumping, in acre-feet per year | |
|---|---|---|
| **SYLMAR BASIN** | | |
| Brown, Charles T.<br>Successor of Stella M. Brown | 0.00 | |
| Church of Jesus Christ of the Latter Day Saints<br>Successor of Henry G. Stetson | 0.00 | |
| Fidelity Federal Savings and Loan Association<br>Successor of Boise Cascade Building Company<br>Successor of The Wellesley Company<br>Successor of Maxine Duckworth and John E. Mullin | 609.00 | |
| Los Angeles, City of | 2,818.00 | |
| Moordigian, Kisag | 46.00 | |
| San Fernando, City of | 2,737.00 | |
| SUBTOTALS (SYLMAR BASIN) | | 6,210.00 |
| **VERDUGO BASIN** | | |
| Crescenta Valley County Water District | 3,294.00 | |
| Glendale, City of | 3,856.00 | |
| SUBTOTALS (VERDUGO BASIN) | | 7,150.00 |
| TOTAL (ULARA) | | 104,040.00 |

[a] Parties that are not listed on this table have zero "Restricted Pumping."

[b] Party is allowed to extract ground water pursuant to Stipulated Judgment with City of Los Angeles.

OFFICE COPY

STATE OF CALIFORNIA—RESOURCES AGENCY

RONALD REAGAN, Governor

DEPARTMENT OF WATER RESOURCES

P. O. BOX 6570
LOS ANGELES 90053

JUN 16 1971

ORIGINAL FILED
JUN 16 1971
COUNTY CLERK

Presiding Judge
Superior Court for Los Angeles
County
P. O. Box 151
Main Post Office
Los Angeles, California 90053

Subject: Stipulation for Emergency
Spreading and Extraction - ULARA

Dear Sir:

This is to inform the Court that the Watermaster, appointed by the Court in the Superior Court Case No. 650,079, supports the above-mentioned Stipulation and Order which was signed on May 26, 1971.

The precarious condition of the City of Los Angeles' water supply system that exists following the February 9, 1971 earthquake was described to the ULARA Advisory Board on February 25, 1971, and inspected by the Watermaster on March 8, 1971. The consensus of the Advisory Board was that Los Angeles should be allowed to exceed its "Restricted Pumping" right and that it be allowed to make restitution by spreading imported water or by curtailing its groundwater extractions after the emergency has passed.

The Watermaster has kept abreast of the events leading up to the signing of the "Stipulation" by all interested parties and feels that the "Stipulation" can be administered without difficulty.

Should the Court desire additional information, this office will be happy to supply it.

Sincerely yours,

for James J. Doody
District Engineer
Southern District
and Watermaster

ROGER ARNEBERGH, City Attorney
EDWARD C. FARRELL, Chief Assistant
City Attorney for Water and Power
ROBT. E. MOORE, JR.,
Assistant City Attorney
RALPH GUY WESSON,
Assistant City Attorney
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Los Angeles, California 90054
(213) 681-6352 or 681-4211

GEORGE G. GROVER, Special Counsel
601 South Main Street
Corona, California
(714) 737-1910

ORIGINAL FILED
JUN 16 1971
COUNTY CLERK

SUPERIOR COURT OF CALIFORNIA, COUNTY OF LOS ANGELES

| | |
|---|---|
| THE CITY OF LOS ANGELES, a Municipal corporation, Plaintiff, vs. CITY OF SAN FERNANDO, a Municipal corporation, et al. Defendants. | No. 650079 STIPULATION FOR EMERGENCY SPREADING AND EXTRACTION and ORDER THEREON |

RECITALS

This stipulation is based upon the following facts:

A. On February 9, 1971, a major earthquake occurred in the Upper Los Angeles River Area (ULARA), causing heavy damage to plaintiff's water system in the San Fernando Valley, including damage to both Van Norman Reservoirs. As a result, plaintiff has lost the vital terminal storage capability of those reservoirs, and plaintiff will have no surface substitute for such storage until October 1, 1973, or later.

B. On a temporary basis, the San Fernando Basin of the ULARA can be used as a partial substitute for terminal storage formerly provided by the Van Norman Reservoirs. Said basin also constitutes a source of emergency water in the event such earthquake damage should make it impossible for plaintiff to meet its water service demands from time to time. Those demands presently include emergency service to the City of San Fernando, whose water system has been even more extensively damaged by the earthquake.

C. Subparagraph 2(c) of Section X of the "Judgment After Trial by Court" which was rendered in this case on March 14, 1968, authorizes the watermaster, subject to review by the court, to permit changes in the Restricted Pumping of the parties because of "emergency requirements".

D. Section IX of the judgment enjoins the parties from spreading, in the ULARA, any water imported from other areas, including water imported by plaintiff by means of the Los Angeles Aqueduct. The judgment contains no provision authorizing the watermaster to modify that limitation, but Section IX and Subparagraph 2 of Section XI provide for applications to the court for authorization of artificial recharge by such spreading. Subparagraph 6 of Section XI also provides for court modification of the judgment's flexibility and Restricted Pumping provisions, on the basis of "emergency requirements".

E. The earthquake of February 9, 1971, has resulted in an emergency of the type contemplated by the foregoing provisions of the judgment.

F. At times inflow of water from the Los Angeles Aqueduct exceeds the ability of plaintiff to utilize such water in its



water system without the Van Norman Reservoirs. Part or all of this water could be placed in spreading grounds owned by plaintiff whereby it would percolate into the San Fernando ground water basin.

G. The parties desire to ameliorate the damage and loss which have resulted, or may result, from the earthquake of February 9, 1971. To that end, they desire to consent to certain terms and conditions whereby plaintiff may engage in artificial recharge by spreading water imported by the Los Angeles Aqueduct without prejudice to the rights of any party in the judgment or in the pending appeal from the judgment. It is in the public interest that the following stipulation be given effect.

STIPULATION

NOW, THEREFORE, it is hereby stipulated and agreed that:

1. The foregoing recitals are true.

2. The conditions existing by reason of the aforesaid earthquake constitute an emergency as contemplated by Section XI(6) of the judgment. Pursuant to Subparagraph 2(c) of Section X of the judgment, the watermaster may authorize plaintiff, or any party, to exceed its Restricted Pumping rights (as modified by Section VIII) to the extent necessary to meet its water service demands. Such permission may be given in the first instance without prior notice to the parties or the court, but records shall be kept of all authorizations. During the calendar month following any such authorization, the watermaster shall notify the other parties of the action permitted. Summaries of actions taken and authorized shall be included in the respective annual reports required by

Section X of the judgment.

3. As promptly as practicable, any party exceeding its pumping rights pursuant to authorization from the watermaster shall return an amount of water equivalent to such excess, by spreading imported water into the basin from which it is pumped or by foregoing its right to pump from said basin or by both such spreading and reduced pumping.

4. Until the terminal storage capability of the Van Norman Reservoirs is replaced or until further order of court herein, plaintiff may engage in artificial recharge by spreading into its spreading grounds in the San Fernando Basin any water which it imports by means of the Los Angeles Aqueduct and which cannot be delivered into the water system or be stored in surface reservoirs of plaintiff. Provided, however, that no more than 22,000 acre feet shall be so spread in any water year.

5. Plaintiff may extract from the San Fernando Basin, at a future time, in addition to extractions and diversions permitted by the judgment, an amount of water equal to the amount spread pursuant to Paragraph 4 hereof, plus the amount heretofore spread on an emergency basis following the earthquake of February 9, 1971, less any amount extracted in accordance with Paragraph 2 hereof in excess of its pumping rights, and less any amount of such spread water which is determined to have been lost by evaporation or transpiration, and less any rising water outflow caused by such spreading.

6. Plaintiff shall report to the watermaster each month the amount of any water spread in the preceding month. Prior to extracting any water pursuant to Paragraph 5 hereof, plaintiff



shall secure the consent of the watermaster, who shall ascertain that the procedures contemplated are in accordance with said paragraph. No party shall be responsible for any legal damages caused by the spreading of water by any other party.

7. This stipulation shall be effective upon submission to and approval by the court and shall be subject to further order of the court herein.

Dated: May 24, 1971.

ROGER ARNEBERGH, City Attorney
EDWARD C. FAURELL, Chief Assistant City Attorney for Water and Power
ROBT. E. MOORE, JR., Assistant City Attorney
RALPH GUY WESSON, Assistant City Attorney
GILBERT W. [illegible], Deputy City Attorney
GEORGE G. GROVER, Special Counsel

By [signature]

Attorneys for Plaintiff.

NEVILLE R. LEWIS, City Attorney
LEWIS, WAGNI & GHIRARDELLI, Special Counsel

By [signature]

Attorneys for Defendant City of San Fernando, a municipal corporation.



JOSEPH W. RAINVILLE, City Attorney
City of Glendale
SAMUEL GORLICK, City Attorney
City of Burbank
HIGGS, JENNINGS, FLETCHER & MACK, Special Counsel

By [signature]

Attorneys for Defendants City of Glendale, a municipal corporation; City of Burbank, a municipal corporation; Joseph E. Amador; Gledys J. Amador; Bank of America National Trust & Savings Association; Laura J. LeGuay; Thelma M. Meeker; Carl H. Meeker.

WELBY & ANDERSON

By [signature]

Attorneys for Defendant Crescenta Valley County Water District.

NICHOLAS, KOLLINER, VAN TASSEL & MYERS

By [signature]

Attorneys for Defendants William O. Bartholomaus, Ellen S. DuBois, American Security & Fidelity Corporation, Forest Lawn Cemetery Association, Forest Lawn Company, Forest Lawn Memorial-Park Association, Lockheed Aircraft Corporation, Celeste Louise McCabe, Margaret E. Arine, Dean Peter Moordigian, Kisag Moordigian, Toluca Lake Property Owners Association, Valhalla Properties, Valhalla Memorial Park, Valhalla Mausoleum Park, Van de Kamp's Holland Dutch Bakers, Inc., and The Wellesley Company.



ORDER

Pursuant to the foregoing stipulation and for good cause thus shown,

IT IS SO ORDERED, subject to the retained jurisdiction of the court to modify the same.

Dated: JUN 16 1971, 1971.

CHARLES A. LORING
Judge of the Superior Court

DEPARTMENT OF
WATER AND POWER
THE CITY OF LOS ANGELES

December 16, 1970

Mr. James J. Doody
District Engineer and Watermaster
State of California
Department of Water Resources
P. O. Box 6598
Los Angeles, California 90055

Dear Mr. Doody:

Estimated Ground-Water Production
for Stipulated Judgment Parties
for the Water Year 1970-71

In accordance with Section IV of the "Policies and Procedures" for the Watermaster Service in the Upper Los Angeles River Area, following is a table showing the City of Los Angeles' estimate of the amount of ground water each Stipulating Party will pump during the water year 1970-71. The data enclosed will serve to document the verbal reply made to your office near the beginning of the water year (November 17, 1970).

Water Year 1970-71

| Stipulating Party | Estimated Ground Water Extraction Ac-ft |
|---|---|
| California Materials Company | 350 |
| Consolidated Rock Products Company | 1,600 |
| Livingston-Graham, Inc. | 550 |
| Sears Roebuck & Company | 400 |
| Walt Disney Productions | 1,900 |
| Total Estimated Production | 4,800 |

The estimated values above were based on the amount of ground-water extractions during the previous year (1969-70) by the Stipulating Parties. If additional information is required, please contact Byron Weinstein on 481-3180.

Very truly yours,

PAUL H. LANE
Engineer
Los Angeles Aqueduct

WATER FOR LIFE POWER FOR PROGRESS

WATER LICENSE AGREEMENT

FOREST LAWN COMPANY (Licensor) grants to SOUTHERN SERVICE COMPANY, LTD. (Licensee): a license to extract 75 acre-feet of Licensor's Restricted Pumping allocated to Licensor (or predecessors in interest) under and pursuant to Judgment dated March 14, 1968, and entered in Los Angeles Superior Court Case No. 650,079 entitled "The City of Los Angeles, Plaintiff vs. City of San Fernando, et al., Defendants", during the period commencing August 30, 1971, and continuing to and including September 30, 1971.

Said License is granted, subject to the following conditions:

(1) Licensee shall exercise said right and extract the same on behalf of Forest Lawn Company during the period above specified and put the same to beneficial use and Licensee shall not by the exercise hereunder of said right acquire any right to extract water independent of the rights of Licensor.

(2) Licensee shall notify the Watermaster that said pumping was done pursuant to this License and provide the Watermaster with a copy of the document.

(3) Licensee shall note, in any recording of water production for the period of agreement, that said pumping was done pursuant to this License.

FOREST LAWN COMPANY warrants that it has 75 acre-feet of Restricted Pumping and that it has not pumped and will not pump or permit or license any other person to pump any part of said 75 acre-feet during period of August 30, 1971 through September 30, 1971.

DATED: September 3, 1971

FOREST LAWN COMPANY

By _____

Title _____

SOUTHERN SERVICE COMPANY, LTD.

By _____

Title President

WATER LICENSE AGREEMENT

FOREST LAWN COMPANY (Licensor) grants to CECILIA DE MILLE HARPER, (Licensee): a license to extract 45 acre-feet of Licensor's Restricted Pumping allocated to Licensor (or predecessors in interest) under and pursuant to Judgment dated March 14, 1968, and entered in Los Angeles Superior Court Case No. 650,079 entitled "The City of Los Angeles, Plaintiff vs. City of San Fernando, et al., Defendants", during the period commencing October 1, 1970, and continuing to and including September 30, 1971.

Said License is granted, subject to the following conditions:

(1) Licensee shall exercise said right and extract the same on behalf of Forest Lawn Company during the period above specified and put the same to beneficial use and Licensee shall not by the exercise hereunder of said right acquire any right to extract water independent of the rights of Licensor.

(2) Licensee shall notify the Watermaster that said pumping was done pursuant to this License and provide the Watermaster with a copy of the document.

(3) Licensee shall note, in any recording of water production for the period of agreement, that said pumping was done pursuant to this License.

FOREST LAWN COMPANY warrants that it has 45 acre-feet of Restricted Pumping and that it has not pumped and will not pump or permit or license any other person to pump any part of said 45 acre-feet during period of October 1, 1970 through September 30, 1971.

DATED: April 1, 1972

FOREST LAWN COMPANY

CECILIA DE MILLE HARPER

By: _____

Title: Vice President

By: _____

Title: Owner

WATER LICENSE AGREEMENT

FOREST LAWN COMPANY (Licensor) grants to SOUTHERN SERVICE COMPANY, LTD. (Licensee): a license to extract 55 acre-feet of Licensor's Restricted Pumping allocated to Licensor (or predecessors in interest) under and pursuant to Judgment dated March 14, 1968, and entered in Los Angeles Superior Court Case No. 650,079 entitled "The City of Los Angeles, Plaintiff vs. City of San Fernando, et al., Defendants", during the period commencing October 1, 1970, and continuing to and including September 30, 1971.

Said License is granted, subject to the following conditions:

(1) Licensee shall exercise said right and extract the same on behalf of Forest Lawn Company during the period above specified and put the same to beneficial use and Licensee shall not by the exercise hereunder of said right acquire any right to extract water independent of the rights of Licensor.

(2) Licensee shall notify the Watermaster that said pumping was done pursuant to this License and provide the Watermaster with a copy of the document.

(3) Licensee shall note, in any recording of water production for the period of agreement, that said pumping was done pursuant to this License.

FOREST LAWN COMPANY warrants that it has 55 acre-feet of Restricted Pumping and that it has not pumped and will not pump or permit or license any other person to pump any part of said 55 acre-feet during period of October 1, 1970 through September 30, 1971.

DATED: April 14, 1971.

FOREST LAWN COMPANY

By: _____

Title: Vice President

SOUTHERN SERVICE COMPANY, LTD.

By: _____

Title: President

## WATER LICENSE AGREEMENT

FOREST LAWN COMPANY (Licensor) grants to SPORTSMEN'S LODGE, INC. (Licensee): a license to extract 7 acre-feet of Licensor's Restricted Pumping allocated to Licensor (or predecessors in interest) under and pursuant to Judgment dated March 14, 1968, and entered in Los Angeles Superior Court Case No. 650,079 entitled "The City of Los Angeles, Plaintiff vs. City of San Fernando, et al., Defendants", during the period commencing October 1, 1970, and continuing to and including September 30, 1971.

Said License is granted, subject to the following conditions:

(1) Licensee shall exercise said right and extract the same on behalf of Forest Lawn Company during the period above specified and put the same to beneficial use and Licensee shall not by the exercise hereunder of said right acquire any right to extract water independent of the rights of Licensor.

(2) Licensee shall notify the Watermaster that said pumping was done pursuant to this License and provide the Watermaster with a copy of the document.

(3) Licensee shall note, in any recording of water production for the period of agreement, that said pumping was done pursuant to this License.

FOREST LAWN COMPANY warrants that it has 15 acre-feet of Restricted Pumping and that it has not pumped and will not pump or permit or license any other person to pump any part of said 15 acre-feet during period of October 1, 1970 through September 30, 1971.

DATED: 6/17/70

FOREST LAWN COMPANY

By [signature]

Title Vice President

SPORTSMEN'S LODGE, INC.

By [signature]

Title President

## WATER USE LICENSE AGREEMENT

ELLEN S. DuBOIS and WM. O. BARTHOLOMAUS (hereinafter referred to as "Licensors") hereby grant to TOLUCA LAKE PROPERTY OWNERS ASSOCIATION, a non profit corporation, (hereinafter referred to as "Licensee") a license to extract 15 acre-feet of water of Licensors' Restricted Pumping allocated to Licensors under and pursuant to Judgment dated March 14, 1968, and entered in Los Angeles Superior Court, Case Number 650,079, entitled "The City of Los Angeles, plaintiff, vs. City of San Fernando, et al., defendants", during the period commencing October 1, 1970, and continuing to and including September 30, 1971.

Said License is granted subject to the following conditions:

1) Licensee shall exercise said rights and extract the same on behalf of Licensors during the period above specified and put the same to beneficial use, and Licensee shall not by the exercise hereunder of said right acquire any right to extract water independent of the rights of Licensors.

2) Licensee shall notify the watermaster that said pumping was done pursuant to this License and provide the watermaster with a copy of this License.

3) Licensee shall note, in any recording of water production for the period of this License, that said pumping was done pursuant to this License.

4) Licensee shall be entitled to the rights and subject to the obligations and liabilities contained in a Supplemental License Agreement dated Sept 22nd, 1970, between Licensors and Licensee.

5) Licensors warrant that they have ~~fifteen (15)~~ E.S.D. acre feet of Restricted Pumping and that they have not pumped and will not pump or permit or license any other person to pump any part of the E.S.D. ~~fifteen~~ (15) acre-feet granted by this License during the period of October 1, 1970 through September 30, 1971.

This License is entered into as of the 22nd day of September, 1970.

Ellen S. DuBois

Ellen S. DuBois

Wm. O. Bartholomaus

"Licensors"

TOLUCA LAKE PROPERTY OWNERS ASSOCIATION

By: [signature]

"Licensee"

Park Finnick President

## VAN DE KAMP'S WATER USE LICENSE AGREEMENT

Van de Kamp's hereby grants to Sportsmen's Lodge a license to extract 25 acre-feet of licensor's Restricted Pumping allocated to licensor (or predecessors in interest) under and pursuant to Judgment dated March 14, 1968, and entered in Los Angeles Superior Court Case No. 650,079 entitled "The City of Los Angeles, Plaintiff vs. City of San Fernando, et al., Defendants," during the period commencing October 1, 1970 and continuing to and including September 30, 1971.

Said License is granted, subject to the following conditions:

(1) Licensee shall exercise said right and extract the same on behalf of Van de Kamp's during the period above specified and put the same to beneficial use and licensee shall not by the exercise hereunder of said right acquire any right to extract water independent of the rights of licensor.

(2) Licensee shall notify the Watermaster that said pumping was done pursuant to this license and provide the Watermaster with a copy of the document.

(3) Licensee shall note, in any recording of water production for the period of agreement, that said pumping was done pursuant to this license.

Van de Kamp's warrants that it has 25 acre-feet of Restricted Pumping and that it has not pumped and will not pump or permit or license any other person to pump any part of said 25 acre-feet during period of October 1, 1970 through September 30, 1971.

DATED: September 30, 1971

Dated 10/2/71

VAN DE KAMP'S

By [signature]
James G. Lorraine

Title: Vice President, Finance

SPORTSMEN'S LODGE

By [signature]

Title: President

[illegible]
1640 Ninth Avenue
P.O. Box 12198
San Diego, Calif. 92112
Attorn[illegible]

SPACE ABOVE THIS LINE FOR RECORDER'S USE

Name As Above

# Grant Deed

FOR A VALUABLE CONSIDERATION, receipt of which is hereby acknowledged,

ALICE M. WRIGHT, as Executrix of the Will of J. Marion Wright, dec'd.,

hereby GRANT(S) to

U. S. MORTGAGE, a California corporation, all the right, title and interest of the decedent and his estate in

the following described real property in the City of Los Angeles
County of Los Angeles, State of California:

That portion of the Rancho Santa Eulalia, in the City of Los Angeles, County of Los Angeles, State of California, as per final decree in partition of the Rancho San Rafael in District Court Case No. 1621, and more particularly described on the description attached hereto and made a part hereof, marked Exhibit "A", comprising of 2 pages.

SUBJECT TO: Easements, rights-of-way, reservations, covenants, conditions, and restrictions of record.

This Deed is executed pursuant to the Order of the Probate Court for the County of Los Angeles, State of California, made on December 8, 1970, in the Estate of J. Marion Wright, deceased, Case No. P-542,485.

Dated December 9, 1970

Alice M. Wright
ALICE M. WRIGHT, as Executrix
of the Will of
J. Marion Wright, deceased

STATE OF CALIFORNIA
COUNTY OF LOS ANGELES
On December 16, 1970 before me, the undersigned, a Notary Public in and for said County and State, personally appeared
ALICE M. WRIGHT
known to me to be the person whose name is subscribed to the within instrument and acknowledged that she executed the same.
WITNESS my hand and official seal.

J. Bennent
Notary Public in and for said County and State

J. BENNENT
NOTARY PUBLIC-CALIFORNIA
PRINCIPAL OFFICE IN
LOS ANGELES COUNTY

J. Bennent
Name (Typed or Printed)

My Commission Expires

MAIL TAX STATEMENTS AS DIRECTED ABOVE

EXHIBIT "A" - Page 1

PARCEL NO. 1:

That portion of the Rancho Santa Eulalia, in the city of Los Angeles, county of Los Angeles, state of California, as per final decree in partition of the Rancho San Rafael in District Court Case No. 1621, described as follows:

Beginning at the west extremity of the center line of Figali Avenue, as shown on map of Tract No. 5358, as per map recorded in book 58 pages 63 and 64 of Maps; thence southwesterly along the prolongation of said center line to the dividing line between the Rancho Santa Eulalia and the Rancho Los Feliz, as established in Case No. 5274, Superior Court of said County; thence northerly in a direct line to the most easterly corner of Tract No. 10584, as per map recorded in book 184 page 24 of Maps; thence northerly along the easterly line of said tract and the northerly prolongation thereof to the common boundary line established by deeds recorded on December 3, 1941 as Document Nos. 1108 and 1109, in book 14958 page 57 and book 14921 page 108 of Official Records, in the office of the County Recorder of said County, said common boundary line being a straight line that extends from the most easterly corner of lot 33 and passes through the southwesterly corner of lot 6, both in Tract No. 9837 as per map recorded in book 143 pages 89 and 90 of Maps in said office of the county recorder thence easterly along said common boundary line to the northwesterly prolongation of the southwesterly line of the land described in the deed to George D. La Haren and wife, recorded on July 17, 1946 as Document No. 3187 in book 23930 page 333 of said Official Records; thence southeasterly along said prolongation and said southwesterly line a distance of 276.81 feet, more or less, to the most southerly corner of said land; thence southwesterly 19.83 feet to the most northerly corner of the land described in the deed to Abe Rabinovitz, recorded in book 5800 page 352, Official Records; thence southwesterly and southeasterly along the northwesterly and southwesterly boundary of said land to the most westerly corner of lot 7, in block "G" of said Tract 5358; thence southerly along the westerly line of said block "G" to the most northerly corner of the land described in the deed to Lela White recorded on October 31, 1955 as Document No. 3521 in book 54560 page 193 of said Official Records; thence southwesterly along the northwesterly line of said land and along the northwesterly line of the land described in the deed to Louis H. Brisebar and wife recorded on October 7, 1954 as Document No. 3339 in book 45785 page 114 of said Official Records, a distance of 124.41 feet to the most westerly corner of said last mentioned land; thence southeasterly along the southwesterly line and prolongation thereof, of said last mentioned land, a distance of 71.67 feet to the northwest line of said Figali Avenue; thence southwesterly along said northwest line to the westerly extremity of said Avenue; thence southeasterly to the point of beginning.

PARCEL NO. 2:

That portion of the Rancho Santa Eulalia, in the city of Los Angeles county of Los Angeles, state of California, as per final decree of partition of the Rancho San Rafael, in the District Court Case No. 1621, bounded as follows:

EXHIBIT "A" - Page 2

Description continued.....

On the south by the north line of Tract No. 10584, as per map recorded in book 184 page 24 of Maps, in the office of the county recorder of said county; on the east by the north prolongation of the east line of said Tract; on the north by the north line of said Rancho Santa Eulalia, and on the west by the east line of the channel of the Los Angeles River, as described in deed recorded in book 7014 page 27, Official Records of said county.

EXCEPT therefrom that portion described as follows:

Beginning at a point on the north line of the Rancho Santa Eulalia; where the northerly prolongation of the east line of Tract 10584, as per map recorded in book 184 page 24 of Maps, meets said north line; thence southerly along said northerly prolongation 58.15 feet; thence westerly parallel to the north line of Tract 10584, to the east line of the channel of the Los Angeles River, as per map recorded in book 7014 page 27, Official Records; thence northerly along said east line to the northerly line of said Rancho Santa Eulalia; thence easterly along said north line to the point of beginning, as granted to R.L. Carmack, in deed recorded March 24, 1947 as Instrument No. 68 in book 24188 page 194, Official Records.

PARCEL NO. 3:

Lot 7 in Block "G" of Tract 5358, in the city of Los Angeles, county of Los Angeles, state of California, as per map recorded in book 58 pages 63 and 64 of Maps, in the office of the county recorder of said county.

PARCEL NO. 4:

That part of the Rancho Santa Eulalia, as per final decree of partition of the Rancho San Rafael in District Court Case No. 1621, described as follows:

Beginning at the northeast corner of lot 7 in block "G" of Tract 5358, as per map recorded in book 58, pages 63 and 64 of Maps, in the office of the county recorder of said county; thence south 69° 44' West along the northerly line of said lot 7, a distance of 109 feet; thence north 20° 18' west 40 feet; thence north 69° 44' east 109 feet to the westerly line of Edenhurst Avenue; thence south 20° 18' east along said westerly line of Edenhurst Avenue 40 feet to the point of beginning.

WATER USE LICENSE AGREEMENT

Boise Cascade hereby grants to Charles T. Brown: a licensee to extract 80 acre-feet of licensor's Restricted Pumping allocated to licensor (or predecessors in interest) under and pursuant to Judgment dated March 14, 1968, and entered in Los Angeles Superior Court Case No. 650,079 entitled "The City of Los Angeles, Plaintiff vs. City of San Fernando, et al., Defendants", during the period commencing October 1, 1970 and continuing to and including September 30, 1971.

(1) Licensee shall exercise said right and extract the same on behalf of Boise Cascade during the period above specified and put same to beneficial use and licensee shall not by the exercise hereunder of said right acquire any right to extract water independent of rights of licensor.

(2) Licensee shall notify the Watermaster that said pumping done pursuant to this license and provide the Watermaster with a copy of the document.

(3) Licensee shall note, in any recording of water production for the period of agreement, that said pumping was done pursuant to this license.

Boise Cascade warrants that it has 80 acre-feet of Restricted Pumping and that it has not pumped and will not pump or permit or license any other person to pump any part of said 80 acre-feet during period of October 1, 1970 through September 30, 1971.

DATED: 6/8/71

BOISE CASCADE
By [signature]
Title operator

CHARLES T. BROWN
By [signature]
Title

WHEN RECORDED RETURN TO:

Davidson, Baker & Davidson
444 South Garfield Avenue
P. O. Box 718
Alhambra, California 91802

SPACE ABOVE THIS LINE FOR RECORDER'S USE

ASSIGNMENT OF RIGHT TO TAKE, DIVERT AND EXTRACT WATER FROM THE SYLMAR BASIN

FOR A VALUABLE CONSIDERATION, receipt of which is hereby acknowledged, BOISE CASCADE BUILDING CO., a Delaware corporation, successor to The Wellesley Company, does hereby grant, convey, assign and set over to FIDELITY FEDERAL SAVINGS AND LOAN ASSOCIATION, an United States corporation, all of its ownership interest in and to the right to take, divert and extract water from the Sylmar basin as set forth in that certain Judgment After Trial By Court dated March 14, 1968 in the matter of the City of Los Angeles vs. City of San Fernando, et al., being case number 650,079, filed in the Superior Court of the State of California, for the County of Los Angeles; said ownership interest being conveyed to The Wellesley Company by Maxine Duckworth and John E. Mullin, said company and said persons being hereinafter referred to as "predecessors", and subsequently conveyed and assigned by predecessors to Boise Cascade Building Co., a Delaware corporation.

IN WITNESS WHEREOF, said corporation has caused its corporate name and seal to be affixed hereto and this instrument to be executed by its _____ President and Asst. Secretary, hereunto duly authorized.

DATED: This 28th day of September, 1971.

BOISE CASCADE BUILDING CO.,
a Delaware corporation

By [signature]
Philip J. Ausbrooch - Asst. Sec.

By [signature]
Alan Borstein - President

STATE OF CALIFORNIA
COUNTY OF LOS ANGELES } ss.

On the 28th day of September, 1971, before me, the undersigned, a Notary Public in and for said County and State, personally appeared Alan Borstein known to me to be the President, and Philip J. Ausbrooch, known to me to be the Asst. Secretary of the corporation that executed the within instrument on behalf of the corporation therein named, and acknowledged to me that such corporation executed the within instrument pursuant to its by-laws or a resolution of its board of directors.

WITNESS my hand and official seal.

[signature]

OFFICIAL SEAL
BETTE J. LIVESAY
NOTARY PUBLIC-CALIFORNIA
LOS ANGELES COUNTY
My Commission Expires July 16, 1971

## SUGGESTED SAMPLES OF DOCUMENTS FOR TRANSFERRING WATER RIGHTS

### YEARLY ASSIGNMENTS

WATER USE LICENSE AGREEMENT

JOHN DOE hereby grants to BILL SMITH: a license to extract _____ acre-feet of licensor's Restricted Pumping allocated to licensor (or predecessors in interest) under and pursuant to Judgment dated March 14, 1968, and entered in Los Angeles Superior Court Case No. 650,079 entitled "The City of Los Angeles, Plaintiff vs. City of San Fernando, et al., Defendants", during the period commencing October 1, 19__ and continuing to and including September 30, 19__.

Said License is granted, subject to the following conditions:

(1) Licensee shall exercise said right and extract the same on behalf of JOHN DOE during the period above specified and put the same to beneficial use and licensee shall not by the exercise hereunder of said right acquire any right to extract water independent of the rights of licensor.

(2) Licensee shall notify the Watermaster that said pumping was done pursuant to this license and provide the Watermaster with a copy of the document.

(3) Licensee shall note, in any recording of water production for the period of agreement, that said pumping was done pursuant to this license.

JOHN DOE warrants that he has _____ acre-feet of Restricted Pumping and that he has not pumped and will not pump or permit or license any other person to pump any part of said _____ acre-feet during period of October 1, 19__ through September 30, 19__.

DATED: _____

JOHN DOE

By _____

Title _____

(NOTARY)

BILL SMITH

By _____

Title _____

### PERMANENT TRANSFERS

DEED OF WATER RIGHTS

For a valuable consideration, BILL SMITH hereby sells and transfers to the JOHN DOE COMPANY:

The Right to extract _____ acre-feet of grantor's Mutually Prescriptive Right (_____ acre-feet of Restricted Pumping) allocated to grantor (or predecessors in interest) under and pursuant to Judgment dated March 14, 1968, and entered in Los Angeles Superior Court Case No. 650,079 entitled "The City of Los Angeles, Plaintiff vs. City of San Fernando, et al., Defendants".

DATED: _____

JOHN DOE COMPANY

By _____

Title _____

(NOTARY)

BILL SMITH

By _____

Title _____

# APPENDIX B

## GROUND WATER EXTRACTIONS

TABLE 8-1

GROUND WATER EXTRACTIONS
IN ACRE-FEET

| STATE WELL NUMBER | OWNERS DESIGNATION | PRODUCTION 1970 OCT | NOV | DEC | 1971 JAN | FEB | MAR | APR | MAY | JUNE | JULY | AUG | SEPT | TOTAL |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **SAN FERNANDO BASIN** | | | | | | | | | | | | | | |
| BURBANK, CITY OF | | | | | | | | | | | | | | |
| 1N/14W-09P01S | 6A | 61.71 | 72.89 | 3.19 | 322.82 | 214.14 | 232.02 | 285.42 | 202.02 | 39.44 | 292.06 | 285.24 | 261.78 | 2272.73 |
| 1N/14W-11Q01S | 7 | 125.14* | 117.11* | 119.95* | 123.72* | 107.84* | 116.50* | 97.82* | 117.51* | 116.30* | 115.53* | 110.34* | 102.16* | 1369.92 |
| 1N/14W-09G03S | 9 | 0 | 12.66 | 31.14 | 0 | 26.96 | 46.42 | 28.22 | 0 | 0 | 98.92 | 31.30 | 115.65 | 391.27 |
| 1N/14W-09H01S | 10 | 77.29 | 77.42 | 73.22 | 67.09 | 0 | 32.01 | 96.99 | 123.62 | 90.33 | 88.25 | 102.05 | 173.66 | 1001.93 |
| 1N/14W-09H04S | 11A | 0 | 0 | 235.26 | 0 | 0 | 33.12 | 124.38 | 205.95 | 157.53 | 86.09 | 139.56 | 221.06 | 1202.95 |
| 1N/14W-09G02S | 12 | 189.40 | 17.06 | 0 | 0 | 51.33 | 104.95 | 67.10 | 120.71 | 107.31 | 145.32 | 241.32 | 168.80 | 1213.30 |
| 1N/14W-09K02S | 13A | 152.67 | 0 | 0 | 0 | 0 | 117.79 | 197.87 | 119.61 | 19.26 | 256.69 | 238.95 | 233.09 | 1335.93 |
| 1N/14W-09A03S | 14A | 328.93 | 263.91 | 0 | 0 | 0 | 19.55 | 0 | 0 | 181.14 | 143.97 | 0 | 0 | 937.50 |
| 1N/14W-14H08S | 15 | 119.62 | 111.30 | 112.85 | 115.75 | 100.81 | 106.48 | 88.88 | 105.34 | 103.19 | 102.97 | 99.55 | 92.89 | 1259.63 |
| 1N/14W-09H04S | 17 | 197.31 | 126.93 | 4.32 | 136.64 | 77.73 | 19.84 | 87.00 | 75.20 | 192.82 | 199.42 | 198.67 | 142.16 | 1458.04 |
| 1N/14W-09L04S | 18 | 224.23 | 34.21 | 0 | 3.55 | 127.43 | 35.39 | 22.79 | 168.29 | 195.88 | 129.22 | 222.11 | 214.32 | 1377.42 |
| TOTALS | | 1476.30 | 833.49 | 579.93 | 769.57 | 706.24 | 864.07 | 1096.47 | 1238.25 | 1203.20 | 1658.44 | 1669.09 | 1725.57 | 13820.62 |
| CALIFORNIA MATERIALS COMPANY | | | | | | | | | | | | | | |
| 2N/14W-30A01S | 4926- | 23.23 | 18.85 | 18.41 | 25.76 | 22.05 | 27.45 | 24.58 | 20.00 | 21.17 | 24.28 | 23.21 | 24.67 | 273.66 |
| CONSOLIDATED ROCK PRODUCTS COMPANY | | | | | | | | | | | | | | |
| 2N/14W-30A03S | 2 | 65.36 | 50.54 | 45.83 | 63.62 | 52.15 | 74.37 | 59.13 | 62.80 | 94.86 | 91.99 | 88.86 | 81.44 | 830.95 |
| 2N/14W-30A04S | 3 | 57.83 | 44.13 | 42.06 | 56.64 | 45.46 | 67.33 | 51.68 | 53.77 | 3.28 | 29.72 | 55.86 | 57.39 | 565.15 |
| TOTALS | | 123.19 | 94.67 | 87.89 | 120.26 | 97.61 | 141.70 | 110.81 | 116.57 | 98.14 | 121.71 | 144.72 | 138.83 | 1396.10 |
| FOREST LAWN CEMETERY ASSN ET AL | | | | | | | | | | | | | | |
| 1N/13W-33N03S | 4 | 37.47 | 21.53 | 3.72 | 7.05 | 14.36 | 27.64 | 32.77 | 39.49 | 42.80 | 45.22 | 45.24 | 40.15 | 357.44 |
| 1N/13W-33P01S | 6 | 9.42 | 6.03 | 1.45 | 1.82 | 3.99 | 7.23 | 7.73 | 8.66 | 10.46 | 11.69 | 12.24 | 10.43 | 91.15 |
| 1N/13W-04B01S | 7 | 14.21 | 9.00 | 5.23 | 5.08 | 9.20 | 13.06 | 13.70 | 11.81 | 14.23 | 14.57 | 16.10 | 13.40 | 139.59 |
| TOTALS | | 61.10 | 36.56 | 10.40 | 13.95 | 27.55 | 47.93 | 54.20 | 59.96 | 67.49 | 71.48 | 73.58 | 63.98 | 588.18 |
| GLENDALE, CITY OF | | | | | | | | | | | | | | |
| 1N/13W-19J01S | STPT1 | 8.53 | .79 | 11.85 | 6.68 | 50.03 | 47.37 | 56.13 | 40.91 | 21.11 | 3.76 | 24.51 | 29.80 | 301.47 |
| 1N/13W-19J04S | STPT2 | 139.13 | 104.34 | 86.26 | 85.80 | 6.88 | 22.37 | 12.27 | 51.92 | 79.36 | 124.46 | 105.35 | 75.68 | 893.82 |
| | GVENT | 1106.64 | 630.04 | 602.12 | 726.10 | 630.96 | 751.57 | 638.94 | 831.36 | 1108.48 | 1666.71 | 1599.50 | 1113.70 | 11406.12 |
| TOTALS | | 1254.30 | 735.17 | 700.23 | 818.58 | 687.87 | 821.31 | 707.34 | 924.19 | 1208.95 | 1794.93 | 1729.36 | 1219.18 | 12601.41 |
| HARPER, CECILIA DE MILLE | | | | | | | | | | | | | | |
| 2N/14W-05A02S | CEREG | .28* | .40* | .13* | .08* | .37* | .08* | .11* | .75* | .53* | .75* | 1.79* | 1.23* | 6.50 |
| 2N/14W-05L01S | WYCKF | 4.43* | 1.23* | 0* | 0 | 0* | 0* | 0* | 0* | 0* | 0* | 0 | 0 | 5.66 |
| TOTALS | | 4.71 | 1.63 | .13 | .08 | .37 | .08 | .11 | .75 | .53 | .75 | 1.79 | 1.23 | 12.16 |
| LIVINGSTON-GRAHAM, INC. | | | | | | | | | | | | | | |
| 2N/14W-10N01S | SNLND | 19.53 | 17.21 | 9.84 | 15.93 | 14.92 | 16.07 | 17.81 | 17.14 | 18.12 | 20.24 | 21.67 | 20.75 | 211.23 |
| 2N/14W-19Q01S | SNVAL | 25.87 | 30.71 | 31.04 | 35.45 | 38.46 | 40.95 | 45.95 | 37.50 | 41.56 | 46.93 | 44.02 | 39.70 | 458.14 |
| TOTALS | | 45.40 | 47.92 | 40.88 | 51.38 | 53.38 | 59.02 | 63.76 | 54.64 | 59.68 | 67.17 | 65.69 | 60.45 | 669.37 |
| LOS ANGELES, CITY OF | | | | | | | | | | | | | | |
| 1N/13W-19K03S | CS-51 | 0 | 0 | 0 | .30 | .08 | 0 | 0 | 0 | .02 | 0 | .02 | 0 | .42 |
| 1N/14W-24H03S | CS-52 | 121.34* | 56.55* | 31.18* | .18* | 37.86* | 101.24 | 174.47* | 118.09* | 193.81* | 179.52* | 184.82* | 176.92* | 1375.98 |
| 2N/14W-13E02S | BWNHD | 0 | 0 | 0 | 0 | 2.94 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2.94 |
| 1N/14W-08J04S | F-1 | 0 | 0 | .30 | 16.37 | 127.02 | 256.29 | 85.51 | 38.11 | 147.98 | 262.19 | 135.15 | 144.42 | 1213.34 |
| 1N/14W-08J03S | F-3 | 0 | 0 | .16 | 0 | 60.08 | 166.25 | 0 | 70.62 | 132.42 | 142.65 | 146.33 | 96.01 | 814.52 |
| 1N/14W-08L02S | F-4 | 0 | 0 | .16 | 16.57 | 128.60 | 231.38 | 0 | 63.36 | 279.13 | 266.35 | 138.54 | 200.25 | 1324.34 |
| 1N/14W-08J01S | F-5 | 0 | 0 | .16 | 19.17 | 148.97 | 100.76 | 96.85 | 71.40 | 266.67 | 298.81 | 41.46 | 217.49 | 1261.74 |
| 1N/14W-07J03S | F-6 | 0 | 0 | .16 | 13.91 | 122.13 | 121.83 | 0 | 0 | 62.17 | 220.98 | 139.53 | 98.42 | 779.13 |
| 1N/14W-07J01S | F-10 | 90.31 | 0 | .11 | 0 | 88.22 | 76.49 | 66.87 | 52.32 | 0 | 146.05 | 225.99 | 100.41 | 846.77 |
| 2N/14W-14A01S | FNWK1 | 0 | 0 | 0 | 0 | 13.02 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 13.02 |
| 2N/14W-13E04S | FTHL2 | 0 | 0 | 0 | 0 | 20.25 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 20.25 |
| 1N/14W-24D04S | H-27 | 109.41 | 48.78 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 158.19 |
| 2N/14W-13D05S | LNGMR | 0 | 0 | 0 | 0 | 30.88 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 30.88 |
| 1N/14W-06N01S | NH-2 | 0 | .21 | 0 | 0 | 0 | 143.34 | 10.67 | 0 | 61.62 | 188.48 | 0 | 0 | 404.32 |
| 1N/15W-02R01S | NH-4 | 0 | .23 | 0 | 0 | 0 | 35.31 | 0 | 0 | 56.29 | 117.36 | 0 | 90.70 | 299.89 |
| 1N/14W-06P01S | NH-5 | 0 | .05 | 0 | 0 | 0 | 36.00 | 0 | 0 | 0 | 29.25 | 31.59 | 0 | 96.89 |
| 1N/15W-02Q01S | NH-7 | 0 | 0 | 0 | 0 | 0 | 48.69 | 0 | 0 | 49.43 | 0 | 0 | 75.83 | 173.95 |
| 1N/14W-06K01S | NH-11 | 0 | .14 | 0 | 0 | 0 | 9.44 | 62.05 | 0 | 57.48 | 24.15 | 64.14 | 7.32 | 224.72 |
| 1N/14W-06Q01S | NH-13 | 0 | .16 | 0 | 0 | 0 | 2.16 | 0 | 0 | 15.75 | 0 | 5.74 | 39.07 | 62.88 |
| 1N/14W-06Q03S | NH-14 | 0 | .28 | 0 | 0 | 0 | 50.80 | 83.91 | 0 | 73.16 | 0 | 8.08 | 54.71 | 270.94 |
| 1N/15W-01K01S | NH-15 | 0 | .11 | 0 | 0 | 0 | 42.42 | 3.12 | 0 | 23.37 | 1.17 | 0 | 0 | 70.19 |
| 1N/14W-05N01S | NH-16 | 0 | .21 | 0 | 0 | 0 | 18.20 | 41.71 | 0 | 77.30 | 0 | 0 | 140.31 | 277.73 |
| 1N/14W-05P02S | NH-17 | 0 | .21 | 0 | 0 | 0 | 18.30 | 78.26 | .71 | 0 | 0 | 78.67 | 0 | 176.15 |
| 1N/14W-05P01S | NH-18 | 0 | .32 | 0 | 0 | 0 | 19.79 | 84.48 | .73 | 0 | 0 | 85.12 | 143.11 | 333.55 |
| 1N/14W-08R01S | NH-19 | 0 | .23 | 0 | 0 | 0 | 16.32 | 81.01 | .83 | 0 | 45.25 | 94.26 | 0 | 237.90 |
| 1N/14W-08A02S | NH-20 | 0 | .16 | 0 | 0 | 0 | 14.49 | 62.37 | .64 | 0 | 34.37 | 71.74 | 0 | 183.77 |
| 1N/14W-08A01S | NH-21 | 0 | .16 | 0 | 0 | 0 | 15.45 | 65.29 | .69 | 0 | 152.34 | 0 | 0 | 233.93 |

TABLE B-1

GROUND WATER EXTRACTIONS
(CONTINUED)
IN ACRE-FEET

| STATE WELL NUMBER | OWNERS DESIGNATION | PRODUCTION 1970 OCT | NOV | DEC | 1971 JAN | FEB | MAR | APR | MAY | JUNE | JULY | AUG | SEPT | TOTAL |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| LOS ANGELES, CITY OF (CONTINUED) | | | | | | | | | | | | | | |
| 1N/15W-01Q02S | NH-22 | 0 | .25 | 0 | 0 | 0 | 145.32 | 54.04 | 0 | 44.19 | 0 | 0 | 0 | 243.80 |
| 1N/15W-01Q03S | NH-23 | 0 | .23 | 0 | 0 | 0 | 105.12 | 59.89 | 0 | 22.31 | 14.35 | 160.15 | 0 | 362.05 |
| 1N/14W-06L01S | NH-24 | 0 | .18 | 0 | 0 | 0 | 55.95 | 0 | 0 | 17.52 | 17.52 | 124.63 | 0 | 215.80 |
| 2N/14W-12C01S | TGPLT | 8.36 | 9.23 | 30.56 | 30.46 | 28.47 | 38.09 | 101.42 | 223.42 | 218.18 | 168.89 | 165.82 | 154.94 | 1177.84 |
| 1N/14W-22C01S | V-1 | 0 | 0 | .23 | 137.03 | 171.79 | 209.99 | 103.19 | 89.23 | 199.75 | 199.08 | 199.70 | 180.56 | 1490.55 |
| 1N/14W-15N01S | V-2 | 0 | 0 | .25 | 179.22 | 224.84 | 276.74 | 136.75 | 115.96 | 259.04 | 261.36 | 252.00 | 228.31 | 1934.47 |
| 1N/14W-15P01S | V-4 | 0 | 0 | .14 | 8.33 | 0 | 0 | 0 | 86.98 | 236.87 | 238.77 | 203.26 | 224.82 | 999.17 |
| 1N/14W-22B01S | V-11 | 0 | 0 | 7.25 | 179.02 | 222.06 | 261.36 | 129.75 | 81.63 | 260.81 | 256.50 | 248.07 | 237.01 | 1883.46 |
| 1N/14W-21B01S | V-13 | 40.08 | 0 | .02 | 0 | 39.23 | 69.33 | 34.04 | 21.17 | 67.22 | 64.10 | 61.25 | 57.16 | 453.60 |
| 1N/14W-21C01S | V-16 | 80.65 | 0 | .11 | 101.65 | 158.33 | 178.54 | 88.68 | 79.80 | 173.05 | 163.77 | 152.92 | 141.62 | 1319.12 |
| 1N/14W-21H01S | V-22 | 0 | 0 | .23 | 43.55 | 117.73 | 129.38 | 51.49 | 60.38 | 130.53 | 130.10 | 124.22 | 116.21 | 903.82 |
| 1N/14W-21G01S | V-24 | 0 | 0 | .09 | 13.25 | 182.44 | 216.32 | 109.48 | 95.34 | 211.82 | 214.26 | 212.17 | 205.21 | 1460.38 |
| 1N/14W-07A01S | W-1 | 245.75 | .21 | 0 | 0 | 138.93 | 133.98 | 92.17 | 46.90 | 180.95 | 334.30 | 167.63 | 152.02 | 1492.84 |
| 1N/14W-08D01S | W-2 | 0 | .28 | 0 | 0 | 45.73 | 131.52 | 93.62 | 46.79 | 183.52 | 350.99 | 178.83 | 168.85 | 1200.13 |
| 1N/14W-08E01S | W-3 | 0 | .18 | 0 | 0 | 77.62 | 129.87 | 77.89 | 39.23 | 152.32 | 290.01 | 269.88 | 137.70 | 1174.70 |
| 1N/14W-08F01S | W-4 | 0 | 0 | .16 | 0 | 60.22 | 123.03 | 0 | 0 | 258.22 | 137.01 | 310.42 | 158.01 | 1047.07 |
| 1N/14W-08L01S | W-5 | 0 | .30 | 0 | 0 | 113.75 | 132.48 | 0 | 0 | 278.90 | 146.10 | 214.49 | 169.21 | 1055.23 |
| 1N/14W-17A01S | W-8 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 11.41 | 0 | 190.36 | 201.77 |
| 1N/14W-16D01S | W-9 | 0 | 0 | .14 | 0 | 76.68 | 99.56 | 0 | 0 | 109.94 | 135.81 | 122.68 | 63.96 | 608.77 |
| 1N/14W-16E01S | W-10 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 101.58 | 145.91 | 131.43 | 68.60 | 447.52 |
| 1N/14W-24F06S | H-25 | 57.05 | 0 | 0 | 0 | 0 | 75.99 | 258.15 | 266.87 | 254.59 | 251.38 | 229.22 | 217.98 | 1611.23 |
| 1N/14W-24D03S | H-26 | 145.20 | 32.71 | 92.86 | 216.14 | 242.88 | 202.48 | 0 | 119.61 | 279.96 | 277.09 | 251.38 | 237.14 | 2097.45 |
| 1S/13W-04L04S | P-5 | 0 | 0 | 0 | 0 | 47.75 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 47.75 |
| 1S/13W-04L03S | P-6 | 0 | 0 | 0 | 0 | 43.39 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 43.39 |
| 1S/13W-04K01S | P-7 | 0 | 0 | 0 | 0 | 27.20 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 27.20 |
| 1N/15W-01P04S | NH-25 | 0 | .28 | 0 | 0 | 0 | 180.17 | 65.70 | 0 | 28.47 | 198.92 | 0 | 157.74 | 631.28 |
| 1N/15W-01Q04S | NH-26 | 0 | .16 | 0 | 0 | 0 | 165.08 | 60.74 | 0 | 49.20 | 0 | 0 | 0 | 275.18 |
| 1N/14W-06R05S | NH-27 | 0 | .11 | 0 | 0 | 0 | 15.82 | 0 | 0 | 48.30 | 0 | 66.76 | 118.48 | 249.47 |
| 1N/14W-06R07S | NH-28 | 0 | .16 | 0 | 0 | 0 | 14.60 | 178.95 | 0 | 128.54 | 3.88 | 0 | 0 | 326.13 |
| 1N/14W-06Q05S | NH-29 | 0 | .28 | 0 | 0 | 0 | 13.82 | 0 | 0 | 24.49 | 0 | 91.90 | 62.03 | 192.52 |
| 1N/14W-06P02S | NH-31 | 0 | .30 | 0 | 0 | 0 | 15.27 | 0 | 0 | 0 | 327.53 | 0 | 0 | 343.10 |
| 1N/14W-06N02S | NH-30 | 0 | .21 | 0 | 0 | 0 | 75.76 | 11.73 | 0 | 67.93 | 0 | 0 | 0 | 155.63 |
| 1N/15W-02G02S | NH-32 | 0 | .21 | 0 | 0 | 0 | 45.18 | 0 | 0 | 70.80 | 155.90 | 0 | 105.85 | 377.94 |
| 1N/15W-02R02S | NH-33 | 0 | .14 | 0 | 0 | 0 | 42.49 | 0 | 0 | 21.81 | 140.96 | 0 | 109.71 | 315.11 |
| 1N/15W-01K02S | NH-34 | 0 | .18 | 0 | 0 | 0 | 77.94 | 12.12 | 0 | 64.88 | 3.54 | 0 | 0 | 158.66 |
| 1N/14W-24D05S | H-28 | 227.16 | 94.12 | 0 | 330.81 | 371.56 | 426.77 | 414.14 | 414.72 | 427.57 | 429.98 | 407.94 | 393.48 | 3938.25 |
| 1N/14W-08A03S | NH-35 | 0 | .11 | 0 | 0 | 0 | 10.97 | 28.12 | 0 | 48.88 | 116.69 | 0 | 0 | 204.77 |
| 1N/15W-01K04S | NH-36 | 0 | .30 | 0 | 0 | 88.15 | 34.94 | 0 | 0 | 2.02 | 283.08 | 0 | 0 | 408.49 |
| 1N/15W-01K05S | NH-37 | 0 | .25 | 0 | 0 | 92.19 | 29.09 | 0 | 0 | 2.07 | 115.40 | 0 | 0 | 239.00 |
| 1N/14W-24D06S | H-29 | 303.42 | 356.13 | 157.83 | 346.99 | 389.69 | 444.79 | 430.67 | 324.04 | 0 | 155.76 | 445.25 | 429.87 | 3784.44 |
| 1N/13W-19 S | CS-CM | 35.58 | 50.05 | 105.60 | 180.21 | 408.63 | 563.59 | 493.57 | 464.88 | 435.26 | 423.78 | 382.92 | 355.37 | 3899.44 |
| 1N/14W-23 S | DG3-4 | 56.70* | 27.78* | 1.03* | 80.46* | 48.21* | 298.21* | 126.61* | 0* | 87.24* | 0* | 29.27* | 0* | 755.51 |
| 1N/14W-06Q07S | NH-38 | 0 | 0 | 2.39 | 1.12 | 0 | 0 | 0 | 0 | 0 | 4.50 | 0 | 0 | 8.01 |
| 1N/14W-06K01S | NH-39 | 193.20 | 0 | 0 | 0 | 256.75 | 276.26 | 0 | .92 | 0 | 308.26 | 0 | 2.34 | 1037.73 |
| 1N/14W-06K02S | NH-40 | 298.78 | 449.36 | 0 | 0 | 253.58 | 203.97 | 0 | 0 | 303.12 | 160.49 | 115.68 | 28.44 | 1813.42 |
| 1N/14-W06K03 | NH-41 | 0 | 0 | 0 | 0 | 0 | 0 | 216.18 | 0 | 0 | 0 | 0 | 205.42 | 421.60 |
| 1N/14W-06K04S | NH-42 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 8.43 | 8.43 |
| TOTALS | | 2012.99 | 1131.50 | 431.12 | 1914.74 | 4707.85 | 7174.72 | 4425.66 | 2995.37 | 6948.45 | 8746.30 | 6771.05 | 6671.80 | 53931.55 |
| LOS ANGELES, CITY OF (RESEDA)** | | | | | | | | | | | | | | |
| 2N/16W-34K02S | R-5 | 12.17 | 11.29 | 0 | .07 | 0 | 0 | 0 | 0 | 0 | 0 | 27.73 | 27.96 | 79.22 |
| 2N/16W-27P02S | R-6 | 9.53 | 8.36 | 0 | .02 | 0 | 0 | 0 | .02 | .02 | 0 | 22.98 | 25.02 | 65.95 |
| 1N/16W-03Q03S | R-2 | 32.71 | 28.93 | 0 | .05 | 0 | 0 | 0 | .02 | 0 | 0 | 55.60 | 66.57 | 183.88 |
| 2N/16W-27F02S | R-8 | 27.59 | 24.01 | 0 | .02 | .05 | 0 | 0 | 0 | .02 | 0 | 44.77 | 45.13 | 141.59 |
| 2N/16W-34G02S | R-9 | 19.88 | 17.86 | 0 | 1.95 | .39 | .71 | 0 | 2.80 | 0 | 0 | 25.55 | 23.55 | 92.69 |
| 1N/16W-03G04S | R-10 | 5.83 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 5.83 |
| TOTALS | | 107.71 | 90.45 | 0 | 2.11 | .44 | .71 | 0 | 2.84 | .04 | 0 | 176.63 | 188.23 | 569.16 |
| MENA, JOHN AND BARBARA | | | | | | | | | | | | | | |
| 2N/14W-11N01S | 4973J | .08* | .08* | .08* | .08* | .08* | .08* | .08* | .08* | .08* | .08* | .08* | .08* | .96 |
| RIVERWOOD RANCH MUTUAL WATER COMPANY | | | | | | | | | | | | | | |
| 2N/14W-11A01S | 4982- | 2.36 | .11 | .25 | 1.20 | .88 | 1.26 | 1.62 | 1.48 | 1.68 | .90 | 1.18 | 1.41 | 14.33 |
| SEARS ROEBUCK AND COMPANY | | | | | | | | | | | | | | |
| 1N/13W-20R01S | 3945- | 26.91 | 21.36 | 7.67 | 10.96 | 9.61 | 17.77 | 26.39 | 20.90 | 25.69 | 37.84 | 21.48 | 33.02 | 259.60 |
| SOUTHERN SERVICE COMPANY | | | | | | | | | | | | | | |
| 1N/13W-20F01S | METR1 | 2.53 | 1.92 | 2.17 | 2.18 | 2.10 | 2.54 | 2.34 | 2.43 | 2.61 | 2.11 | 2.54 | 2.19 | 27.66 |
| 1N/13W-20F01S | METR2 | 2.72 | 2.12 | 2.19 | 2.12 | 2.10 | 2.46 | 2.45 | 2.15 | 2.71 | 2.27 | 2.31 | 2.21 | 27.81 |
| 1N/13W-20F01S | METR3 | 2.54 | 2.47 | 2.35 | 2.33 | 2.18 | 2.56 | 2.48 | 2.48 | 2.84 | 2.70 | 2.84 | 2.69 | 30.46 |
| TOTALS | | 7.79 | 6.51 | 6.71 | 6.63 | 6.38 | 7.56 | 7.27 | 7.06 | 8.16 | 7.08 | 7.69 | 7.09 | 85.93 |
| SPORTSMENS LODGE, INCORPORATED | | | | | | | | | | | | | | |
| 1N/15W-25D01S | 1 | 1.65 | 1.24 | .77 | 1.81 | 1.24 | 2.44 | 2.01 | .97 | .82 | 1.10 | 2.81 | 2.30 | 19.16 |

TABLE B-1

GROUND WATER EXTRACTIONS
(CONTINUED)
IN ACRE-FEET

| STATE WELL NUMBER | OWNERS DESIGNATION | PRODUCTION 1970 OCT | NOV | DEC | 1971 JAN | FEB | MAR | APR | MAY | JUNE | JULY | AUG | SEPT | TOTAL |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **TOLUCA LAKE PROPERTY OWNERS ASSN** | | | | | | | | | | | | | | |
| 1N/14W-28R01S | 3845F | .61 | .99 | .70 | 1.45 | 1.85 | 2.80 | 3.98 | 2.73 | 4.82 | 4.98 | 3.40 | 1.97 | 30.28 |
| **VALHALLA MEMORIAL PARK** | | | | | | | | | | | | | | |
| 1N/14W-04N03S | 4 | 14.47 | 3.21 | 0 | 0 | .06 | 17.58 | 23.53 | 24.21 | 34.97 | 36.61 | 39.60 | 19.95 | 214.19 |
| 1N/14W-09D06S | 2 | 0 | 0 | 0 | 1.02 | .40 | .13 | 1.62 | .63 | 0 | .95 | 0 | 0 | 4.75 |
| TOTALS | | 14.47 | 3.21 | 0 | 1.02 | .46 | 17.71 | 25.15 | 24.84 | 34.97 | 37.56 | 39.60 | 19.95 | 218.94 |
| **VAN DE KAMPS HOLLAND DUTCH BAKERS, INC** | | | | | | | | | | | | | | |
| 1S/13W-04G01S | 1 | .36* | .36* | .36* | .36 | 6.02 | 7.42 | 7.45 | 8.18 | 6.20 | 2.07 | .02 | .03 | 38.83 |
| **WALT DISNEY PRODUCTIONS** | | | | | | | | | | | | | | |
| 1N/14W-23E01S | EAST | 31.15 | 59.19 | 32.50 | 87.07 | 112.74 | 38.32 | 38.76 | 32.22 | 105.39 | 119.51 | 111.08 | 148.14 | 916.07 |
| 1N/14W-23E02S | WEST | 113.79 | 109.75 | 93.29 | 56.17 | 22.15 | 90.23 | 131.23 | 58.72 | 67.14 | 86.59 | 118.33 | 111.21 | 1058.60 |
| TOTALS | | 144.94 | 168.94 | 125.79 | 143.24 | 134.89 | 128.55 | 169.99 | 90.94 | 172.53 | 206.10 | 229.41 | 259.35 | 1974.67 |
| **WESTERN OIL AND GAS ASSOCIATION (NONPARTY)** | | | | | | | | | | | | | | |
| | COX | 17.63 | 5.73 | .15 | 3.96 | 6.33 | 13.65 | 11.19 | 16.33 | 9.96 | 15.15 | 17.56 | 14.27 | 131.91 |
| | NWMAN | 1.06 | .28 | .03 | 0 | 1.92 | .12 | 17.58 | 15.34 | 14.23 | 1.01 | .97 | 1.02 | 53.56 |
| | SPACE | 16.59 | 6.03 | 0 | 0 | 0 | .60 | .42 | 1.20 | .24 | 0 | 0 | 1.67 | 26.75 |
| | SF4 | 0 | 13.60 | 20.50 | 23.04 | 19.30 | 22.50 | 5.15 | 7.84 | 4.50 | 1.79 | 0 | .49 | 118.71 |
| TOTALS | | 35.28 | 25.64 | 20.68 | 27.00 | 27.55 | 36.87 | 34.34 | 40.71 | 28.93 | 17.95 | 18.53 | 17.45 | 330.93 |
| **WRIGHT, J MARION, ESTATE OF** | | | | | | | | | | | | | | |
| 1N/13W-32E02S | 3937F | .03* | 0* | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | .03 |
| SUBTOTALS | | 5343.41 | 2032.00 | | 6492.32 | | 6761.21 | | 9891.53 | | 10979.32 | | | |
| SAN FERNANDO BASIN | | | 3218.68 | 3910.18 | | 9359.45 | | 5610.46 | | 12800.72 | | 10436.59 | | 86835.87 |

## SYLMAR BASIN

| STATE WELL NUMBER | OWNERS DESIGNATION | PRODUCTION 1970 OCT | NOV | DEC | 1971 JAN | FEB | MAR | APR | MAY | JUNE | JULY | AUG | SEPT | TOTAL |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **BOISE CASCADE BUILDING COMPANY** | | | | | | | | | | | | | | |
| 3N/15W-25G01S | 3 | 1.80* | 1.49* | 1.48* | 0* | 2.37* | 2.72* | 2.85* | 1.80* | 2.12* | 2.61* | 0 | 0 | 19.24 |
| **BROWN, CHARLES T** | | | | | | | | | | | | | | |
| 3N/15W-34K03S | 1 | 1.50* | .65* | 0* | .52* | 1.10* | .69* | .22* | 1.11* | 1.45* | 2.17* | 1.99* | .72* | 12.12 |
| **CHURCH OF JESUS CHRIST OF L D SAINTS** | | | | | | | | | | | | | | |
| 3N/15W-20P01S | 1 | 27.31 | 16.62 | 2.88 | 0 | 0 | 22.09 | 6.67 | 16.78 | 31.30 | 27.20 | 38.68 | 23.28 | 212.81 |
| **FIDELITY FEDERAL SAVINGS + LOAN ASSN.** | | | | | | | | | | | | | | |
| 3N/15W-25G01S | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1.57* | 1.24 | 2.81 |
| **LOS ANGELES, CITY OF** | | | | | | | | | | | | | | |
| 2N/15W-04 | S MISSN | 0 | 0 | 0 | 0 | 262.08 | 425.90 | 409.80 | 409.25 | 387.19 | 373.05 | 378.08 | 0 | 2645.35 |
| **METROPOLITAN WATER DISTRICT OF SO CAL (NONPARTY)** | | | | | | | | | | | | | | |
| 3N/15W-36F | S TUNNL | 4.51 | 4.76 | 5.43 | 8.93 | 55.68* | 177.46* | 105.93* | 81.79* | 72.25* | 65.07* | 60.48* | 49.98* | 692.27 |
| **SAN FERNANDO, CITY OF** | | | | | | | | | | | | | | |
| 3N/15W-34P01S | 1 | 26.76 | 22.66 | 20.41 | 22.39 | 29.73 | 7.33 | 10.93 | 5.46 | 0 | 0 | 0 | 0 | 145.67 |
| 3N/15W-34R01S | 2 | 14.51 | 6.79 | 85.25 | 84.81 | 16.23 | 0 | 0 | 0 | 0 | 0 | .10 | 2.19 | 209.88 |
| 3N/15W-34C01S | 3 | 160.31 | 122.99 | .01 | 0 | 0 | 0 | 0 | 0 | 100.26 | 0 | 0 | 42.23 | 425.80 |
| 3N/15W-34A01S | 4 | 58.20 | 37.94 | 48.30 | 64.44 | 18.35 | 6.26 | 0 | 0 | 0 | 0 | 104.03 | 53.07 | 390.59 |
| 3N/15W-34H01S | 5 | .84 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | .84 |
| 3N/15W-34K04S | 7 | 22.97 | 16.70 | 11.06 | 14.10 | 13.33 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 78.16 |
| TOTALS | | 283.59 | 207.08 | 165.03 | 185.74 | 77.64 | 13.59 | 10.93 | 5.46 | 100.26 | 0 | 104.13 | 97.49 | 1250.94 |
| SUBTOTALS | | 318.71 | | 174.82 | | 398.87 | | 536.40 | | 594.57 | | 584.93 | | |
| SYLMAR BASIN | | | 230.60 | | 195.19 | | 642.45 | | 516.19 | | 470.10 | | 172.71 | 4835.54 |

TABLE B-1

GROUND WATER EXTRACTIONS
IN ACRE-FEET

| STATE WELL NUMBER | OWNERS DESIGNATION | PRODUCTION 1970 OCT | NOV | DEC | 1971 JAN | FEB | MAR | APR | MAY | JUNE | JULY | AUG | SEPT | TOTAL |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **VERDUGO BASIN** | | | | | | | | | | | | | | |
| CRESCENTA VALLEY COUNTY WATER DIST | | | | | | | | | | | | | | |
| 2N/13W-33C03S | 1 | 40.43 | 32.78 | 42.79 | 31.48 | 39.69 | 41.48 | 35.41 | 35.51 | 38.87 | 50.12 | 51.04 | 31.85 | 471.45 |
| 2N/13W-29F02S | 2 | .49 | 0 | .68 | 0 | .46 | 0 | 0 | 0 | .91 | 0 | .29 | .64 | 3.47 |
| 2N/13W-29R01S | 4 | 0 | 0 | 0 | 0 | 0 | .22 | 0 | 0 | 0 | 0 | 0 | 16.38 | 16.60 |
| 2N/13W-33C06S | 5 | 40.81 | 36.31 | 29.21 | 19.04 | 29.21 | 26.07 | 37.28 | 33.24 | 37.21 | 47.86 | 61.73 | 60.21 | 458.18 |
| 2N/13W-33R03S | 6 | 0 | 0 | 1.13 | .88 | 0 | .14 | 0 | 0 | .10 | .03 | 0 | .44 | 2.72 |
| 2N/13W-33C01S | 7 | 38.12 | 32.07 | 30.04 | 22.16 | 38.81 | 43.52 | 40.92 | 36.97 | 40.98 | 51.00 | 52.39 | 43.98 | 470.96 |
| 1N/13W-03D05S | 8 | 28.58 | 27.91 | 30.22 | 36.47 | 28.76 | 37.48 | 29.37 | 31.67 | 21.98 | 38.62 | 46.20 | 32.86 | 390.12 |
| 2N/13W-28N01S | 9 | 0 | .07 | 6.64 | 0 | 0 | 1.09 | 0 | 0 | 0 | .01 | 0 | 6.66 | 14.47 |
| 2N/13W-33R05S | 10 | 34.26 | 34.01 | 18.73 | 9.46 | 35.80 | 46.99 | 58.53 | 51.75 | 61.04 | 80.97 | 94.01 | 61.18 | 586.73 |
| 2N/13W-33G01S | 11 | 46.61 | 44.64 | 27.15 | 14.91 | 1.57 | 2.81 | 0 | 3.31 | 23.54 | 45.31 | 52.62 | 42.74 | 305.21 |
| 2N/13W-33R06S | 12 | 0 | 0 | 0 | 0 | 0 | .15 | 0 | 0 | .26 | .15 | 0 | 5.94 | 6.50 |
| 2N/13W-33R01S | 14 | 25.81 | 22.69 | 7.61 | .08 | 1.36 | 3.39 | 5.86 | 3.30 | 5.29 | 10.41 | 14.10 | 18.29 | 118.19 |
| 1V/FRS-ION | PICK | 15.70 | 14.99 | 14.88 | 15.42 | 10.20 | 10.21 | 9.01 | 8.13 | 7.13 | 6.97 | 13.97 | 16.21 | 142.82 |
| 1V/FRS-ION | DUNS | 5.32* | 5.50* | 0* | 2.10* | 3.32* | 4.37* | 3.94* | 2.64* | 3.45* | 3.29* | 2.96* | 3.13* | 40.02 |
| TOTALS | | 276.13 | 250.97 | 209.08 | 152.00 | 189.18 | 217.92 | 220.32 | 206.52 | 240.76 | 334.74 | 389.31 | 340.51 | 3027.44 |
| GLENDALE, CITY OF | | | | | | | | | | | | | | |
| 1N/13W-10F S | GL3-4 | 148.18 | 141.76 | 176.87 | 173.93 | 90.56 | 166.84 | 164.99 | 154.97 | 169.43 | 168.78 | 175.12 | 169.53 | 1900.96 |
| 1N/13W-15L01S | VPCKP | 132.20 | 128.54 | 134.85 | 135.14 | 121.56 | 139.05 | 117.68 | 131.82 | 127.02 | 131.55 | 129.34 | 119.44 | 1548.19 |
| TOTALS | | 280.38 | 270.30 | 311.72 | 309.07 | 212.12 | 305.89 | 282.67 | 286.79 | 296.45 | 300.33 | 304.46 | 288.97 | 3449.15 |
| SUBTOTALS VERDUGO BASIN | | 556.51 | 521.27 | 520.80 | 461.07 | 401.30 | 523.81 | 502.99 | 493.31 | 537.21 | 635.07 | 693.77 | 629.48 | 6476.59 |
| GRAND TOTALS ULARA | | 6218.63 | 3970.55 | 2727.62 | 4566.44 | 7292.49 | 10525.71 | 7800.60 | 6619.96 | 11023.31 | 13905.89 | 12258.02 | 11238.78 | 98148.00 *** |

* Estimated

** Extractions not chargeable against City of Los Angeles' Water Right Entitlement

*** Includes nonparty extractions and extractions from Reseda wells by City of Los Angeles

# APPENDIX C

## MEAN DAILY DISCHARGE
## AT
## KEY SURFACE RUNOFF
## GAGING STATIONS

MEAN DAILY DISCHARGE OF LOS ANGELES RIVER ABOVE ARROYO SECO
In second-feet

Station 570-A

| Day | October | November | December | January | February | March | April | May | June | July | August | September |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 15.0 | 22.0 | 106.0 | 20.0 | 13.0 | 130.0 | 23.0 | 37.0 | 27.0 | 39.0 | 32.0 | 24.0 |
| 2 | 15.0 | 21.0 | 527.0 | 20.0 | 11.8 | 150.0 | 22.0 | 28.0 | 33.0 | 41.0 | 28.0 | 23.0 |
| 3 | 16.5 | 33.0 | 20.0 | 20.0 | 11.8 | 150.0 | 18.4 | 28.0 | 31.0 | 42.0 | 30.0 | 20.0 |
| 4 | 42.0 | 25.0 | 20.0 | 20.0 | 11.8 | 130.0 | 16.5 | 35.0 | 27.0 | 41.0 | 27.0 | 16.5 |
| 5 | 26.0 | 71.0 | 20.0 | 20.0 | 12.4 | 119.0 | 26.0 | 34.0 | 11.1 | 42.0 | 27.0 | 15.6 |
| 6 | 11.8 | 20.0 | 20.0 | 20.0 | 14.3 | 138.0 | 43.0 | 142.0 | 7.8 | 61.0 | 30.0 | 124.0 |
| 7 | 7.4 | 20.0 | 20.0 | 20.0 | 11.8 | 138.0 | 20.0 | 82.0 | 11.8 | 74.0 | 43.0 | 45.0 |
| 8 | 7.4 | 20.0 | 20.0 | 20.0 | 15.6 | 150.0 | 18.4 | 35.0 | 14.3 | 89.0 | 13.7 | 17.4 |
| 9 | 8.3 | 20.0 | 400.0 | 20.0 | 150.0 | 157.0 | 18.4 | 20.0 | 15.0 | 96.0 | 18.4 | 13.0 |
| 10 | 8.3 | 20.0 | 20.0 | 20.0 | 487.0 | 157.0 | 15.6 | 25.0 | 20.0 | 96.0 | 23.0 | 15.6 |
| 11 | 16.5 | 20.0 | 20.0 | 20.0 | 293.0 | 163.0 | 15.6 | 32.0 | 15.6 | 91.0 | 18.4 | 13.7 |
| 12 | 12.4 | 20.0 | 20.0 | 674.0 | 200.0 | 169.0 | 14.3 | 34.0 | 15.6 | 88.0 | 23.0 | 11.8 |
| 13 | 13.7 | 20.0 | 20.0 | 317.0 | 157.0 | 844.0 | 46.0 | 37.0 | 14.3 | 86.0 | 43.0 | 11.8 |
| 14 | 13.7 | 20.0 | 201.0 | 84.0 | 35.0 | 150.0 | 751.0 | 38.0 | 11.1 | 58.0 | 31.0 | 13.7 |
| 15 | 13.0 | 20.0 | 20.0 | 43.0 | 59.0 | 138.0 | 50.0 | 49.0 | 49.0 | 61.0 | 9.8 | 15.0 |
| 16 | 15.0 | 20.0 | 171.0 | 25.0 | 485.0 | 108.0 | 43.0 | 37.0 | 58.0 | 74.0 | 13.7 | 15.6 |
| 17 | 37.0 | 20.0 | 385.0 | 21.0 | 649.0 | 50.0 | 41.0 | 31.0 | 50.0 | 50.0 | 18.4 | 13.7 |
| 18 | 16.5 | 20.0 | 3300.0 | 12.0 | 50.0 | 43.0 | 39.0 | 37.0 | 49.0 | 43.0 | 19.3 | 15.0 |
| 19 | 18.4 | 20.0 | 3650.0 | 13.0 | 45.0 | 22.0 | 26.0 | 41.0 | 41.0 | 58.0 | 34.0 | 11.1 |
| 20 | 21.0 | 20.0 | 20.0 | 12.0 | 33.0 | 15.6 | 43.0 | 46.0 | 35.0 | 65.0 | 20.0 | 15.0 |
| 21 | 19.3 | 20.0 | 4140.0 | 12.0 | 26.0 | 24.0 | 31.0 | 42.0 | 42.0 | 70.0 | 14.3 | 14.3 |
| 22 | 21.0 | 20.0 | 20.0 | 10.0 | 22.0 | 73.0 | 35.0 | 35.0 | 47.0 | 70.0 | 11.1 | 14.3 |
| 23 | 18.4 | 20.0 | 20.0 | 9.0 | 25.0 | 31.0 | 43.0 | 32.0 | 45.0 | 72.0 | 13.7 | 16.5 |
| 24 | 14.3 | 20.0 | 20.0 | 10.0 | 14.3 | 25.0 | 35.0 | 34.0 | 45.0 | 64.0 | 14.3 | 12.4 |
| 25 | 15.6 | 20.0 | 20.0 | 11.0 | 12.4 | 37.0 | 26.0 | 45.0 | 42.0 | 61.0 | 37.0 | 9.8 |
| 26 | 17.4 | 1070.0 | 20.0 | 19.0 | 9.2 | 37.0 | 46.0 | 39.0 | 35.0 | 77.0 | 13.7 | 10.5 |
| 27 | 19.3 | 26.0 | 20.0 | 19.0 | 68.0 | 82.0 | 51.0 | 35.0 | 31.0 | 74.0 | 20.0 | 11.8 |
| 28 | 22.0 | 2450.0 | 20.0 | 32.0 | 157.0 | 50.0 | 33.0 | 137.0 | 37.0 | 82.0 | 15.0 | 10.5 |
| 29 | 22.0 | 12870.0 | 20.0 | 20.0 | | 39.0 | 34.0 | 42.0 | 38.0 | 74.0 | 13.7 | 10.5 |
| 30 | 23.0 | 736.0 | 20.0 | 16.0 | | 27.0 | 34.0 | 28.0 | 41.0 | 70.0 | 18.4 | 10.5 |
| 31 | 23.0 | | 20.0 | 12.0 | | 18.4 | | 24.0 | | 46.0 | 21.0 | |
| Total | 550.2 | 17674.0 | 13320.0 | 1591.0 | 3079.4 | 3565.0 | 1658.2 | 1341.0 | 939.6 | 2055.0 | 694.9 | 571.6 |
| Mean Daily Discharge | 17.7 | 589.0 | 430.0 | 51.3 | 110.0 | 115.0 | 55.3 | 43.3 | 31.3 | 66.3 | 22.4 | 19.1 |
| Max. Mean Daily Discharge | 42.0 | 12870.0 | 4140.0 | 674.0 | 640.0 | 844.0 | 751.0 | 142.0 | 58.0 | 96.0 | 43.0 | 124.0 |
| Min. Mean Daily Discharge | 7.4 | 20.0 | 20.0 | 9.0 | 9.2 | 15.6 | 14.3 | 20.0 | 7.8 | 39.0 | 9.8 | 9.8 |
| Runoff in Acre-feet | 1090.0 | 35064.0 | 26420.0 | 3160.0 | 6110.0 | 7070.0 | 3290.0 | 2660.0 | 1860.0 | 4080.0 | 1380.0 | 1130.0 |

Maximum Stage 12.18 feet at 1148 on Nov. 29, 1970. Discharge 41,500 second-feet

Total Acre-feet 1970-71 (93310.0)

MEAN DAILY DISCHARGE OF BIG TUJUNGA CREEK BELOW BIG TUJUNGA DAM
In second-feet

Station 168-A

| Day | October | November | December | January | February | March | April | May | June | July | August | September |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 2.1 | 3.3 | 200.0 | 17.7 | 33.0 | 33.0 | 3.6 | 4.0 | 8.2 | 6.7 | 10.6 | 9.7 |
| 2 | 2.3 | 3.2 | 200.0 | 17.7 | 31.0 | 33.0 | 3.6 | 4.2 | 8.3 | 6.7 | 10.6 | 9.6 |
| 3 | 2.5 | 3.1 | 200.0 | 17.7 | 30.0 | 32.0 | 3.6 | 4.4 | 8.3 | 6.7 | 10.6 | 9.6 |
| 4 | 2.7 | 3.0 | 187.0 | 17.7 | 30.0 | 32.0 | 3.6 | 4.6 | 8.2 | 6.7 | 10.6 | 9.5 |
| 5 | 2.9 | 3.0 | 160.0 | 17.7 | 30.0 | 32.0 | 3.6 | 4.9 | 8.1 | 6.7 | 10.5 | 9.5 |
| 6 | 3.1 | 3.1 | 100.0 | 17.7 | 29.0 | 32.0 | 3.6 | 6.6 | 8.0 | 6.7 | 10.5 | 9.5 |
| 7 | 3.2 | 3.2 | 84.0 | 17.7 | 29.0 | 32.0 | 3.6 | 6.8 | 7.9 | 6.7 | 10.5 | 9.4 |
| 8 | 3.3 | 3.3 | 162.0 | 17.7 | 29.0 | 32.0 | 3.6 | 7.0 | 7.8 | 6.7 | 10.4 | 9.4 |
| 9 | 3.2 | 3.4 | 204.0 | 17.7 | 28.8 | 32.0 | 3.6 | 7.2 | 7.7 | 6.7 | 10.4 | 9.4 |
| 10 | 3.2 | 3.5 | 148.0 | 17.7 | 28.8 | 32.0 | 3.6 | 7.4 | 7.6 | 6.7 | 10.4 | 9.3 |
| 11 | 3.1 | 3.6 | 23.3 | 17.7 | 19.6 | 31.5 | 3.6 | 7.5 | 7.5 | 6.7 | 10.4 | 9.3 |
| 12 | 3.1 | 3.7 | 0.0 | 27.9 | 0.0 | 31.5 | 3.6 | 7.5 | 7.4 | 6.7 | 10.3 | 9.2 |
| 13 | 3.0 | 3.7 | 0.0 | 48.7 | 0.0 | 31.5 | 3.6 | 7.5 | 7.3 | 6.7 | 10.3 | 9.2 |
| 14 | 3.0 | 3.7 | 0.0 | 48.0 | 0.0 | 31.5 | 3.6 | 7.5 | 7.2 | 2.5 | 10.3 | 9.0 |
| 15 | 2.9 | 3.7 | 0.0 | 47.0 | 0.0 | 31.5 | 3.6 | 7.5 | 7.1 | 0.0 | 10.2 | 8.9 |
| 16 | 2.9 | 3.8 | 0.0 | 46.0 | 0.0 | 31.5 | 3.6 | 7.5 | 7.0 | 0.0 | 10.2 | 8.9 |
| 17 | 3.0 | 3.8 | 0.0 | 45.0 | 0.0 | 31.5 | 3.6 | 7.5 | 7.0 | 0.0 | 10.2 | 8.9 |
| 18 | 3.0 | 3.8 | 0.0 | 44.0 | 0.0 | 31.5 | 3.6 | 7.5 | 7.0 | 6.7 | 10.2 | 8.9 |
| 19 | 3.0 | 3.8 | 0.0 | 43.0 | 24.4 | 19.9 | 3.6 | 7.5 | 7.0 | 10.8 | 10.2 | 8.9 |
| 20 | 3.1 | 3.8 | 0.0 | 42.0 | 36.8 | 3.3 | 3.6 | 7.5 | 7.0 | 10.8 | 10.1 | 8.9 |
| 21 | 3.1 | 3.9 | 0.0 | 41.0 | 36.8 | 3.3 | 3.6 | 7.5 | 6.9 | 10.8 | 10.1 | 8.8 |
| 22 | 3.1 | 3.9 | 0.0 | 40.0 | 35.0 | 3.3 | 3.6 | 7.5 | 6.9 | 10.8 | 10.1 | 8.8 |
| 23 | 3.2 | 3.9 | 0.0 | 39.0 | 35.0 | 3.3 | 3.6 | 7.5 | 6.9 | 10.8 | 10.0 | 8.8 |
| 24 | 3.2 | 3.9 | 9.5 | 38.0 | 35.0 | 3.3 | 3.6 | 7.5 | 6.8 | 10.8 | 10.0 | 5.4 |
| 25 | 3.3 | 3.9 | 17.7 | 37.0 | 34.0 | 3.3 | 3.6 | 7.6 | 6.8 | 10.6 | 10.0 | 0.0 |
| 26 | 3.3 | 3.9 | 17.7 | 37.0 | 34.0 | 3.3 | 3.6 | 7.7 | 6.8 | 10.6 | 9.9 | 0.0 |
| 27 | 3.3 | 3.9 | 17.7 | 37.0 | 34.0 | 3.3 | 3.6 | 7.8 | 6.7 | 10.6 | 9.9 | 5.4 |
| 28 | 3.4 | 2.8 | 17.7 | 37.1 | 33.0 | 3.3 | 3.6 | 7.9 | 6.7 | 10.6 | 9.9 | 8.6 |
| 29 | 3.4 | 99.0 | 17.7 | 36.0 | | 3.3 | 3.6 | 8.0 | 6.7 | 10.6 | 9.8 | 8.6 |
| 30 | 3.4 | 200.0 | 17.7 | 35.0 | | 3.3 | 3.8 | 8.1 | 6.7 | 10.6 | 9.8 | 8.6 |
| 31 | 3.3 | | 17.7 | 34.0 | | 3.3 | | 8.2 | | 10.6 | 9.7 | |
| Total | 94.6 | 398.6 | 1801.7 | 997.4 | 656.2 | 633.5 | 108.2 | 217.4 | 219.5 | 235.3 | 316.7 | 248.0 |
| Mean Daily Discharge | 3.1 | 13.3 | 58.1 | 32.2 | 23.4 | 20.4 | 3.6 | 7.0 | 7.3 | 7.8 | 10.2 | 8.3 |
| Max. Mean Daily Discharge | 3.4 | 200.0 | 204.0 | 49.0 | 37.0 | 33.0 | 3.8 | 8.2 | 8.3 | 10.8 | 10.6 | 9.7 |
| Min. Mean Daily Discharge | 2.1 | 2.8 | 0.0 | 17.7 | 0.0 | 3.3 | 3.6 | 4.0 | 6.7 | 0.0 | 9.7 | 0.0 |
| Runoff in Acre-feet | 188.0 | 790.0 | 3574.0 | 1978.0 | 1302.0 | 1257.0 | 215.0 | 431.0 | 435.0 | 467.0 | 628.0 | 492.0 |

No instantaneous discharge. Flows were mostly dam releases.

Total Acre-feet 1970-71 (11,760.0)

MEAN DAILY DISCHARGE OF VERDUGO CHANNEL AT ESTELLE STREET
In second-feet

Station 252-R

| Day | October | November | December | January | February | March | April | May | June | July | August | September |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 3.9 | 9.5 | 5.0 | 7.3 | 2.5 | 2.8 | 2.8 | 2.3 | 2.8 | 2.8 | 3.9 | 3.9 |
| 2 | 3.9 | 9.5 | 48.0 | 8.4 | 2.3 | 2.8 | 2.8 | 2.5 | 2.8 | 3.9 | 3.9 | 2.8 |
| 3 | 7.8 | 10.6 | 2.3 | 2.8 | 2.3 | 2.8 | 2.8 | 2.8 | 2.8 | 3.9 | 3.9 | 2.8 |
| 4 | 2.8 | 11.3 | 2.3 | 2.3 | 2.0 | 2.8 | 2.8 | 3.9 | 2.8 | 3.9 | 3.9 | 2.8 |
| 5 | 2.5 | 12.9 | 3.9 | 2.3 | 2.0 | 2.8 | 2.8 | 3.9 | 2.8 | 5.0 | 5.0 | 2.8 |
| 6 | 3.4 | 52.0 | 2.8 | 5.0 | 2.0 | 2.8 | 2.8 | 17.1 | 2.8 | 3.9 | 5.0 | 2.8 |
| 7 | 2.8 | 7.3 | 2.8 | 5.0 | 2.0 | 2.5 | 2.8 | 7.2 | 2.8 | 3.9 | 6.2 | 2.8 |
| 8 | 2.8 | 6.2 | 3.9 | 3.9 | 3.9 | 2.5 | 3.9 | 2.5 | 2.8 | 3.9 | 6.2 | 2.8 |
| 9 | 2.8 | 7.3 | 22.0 | 2.3 | 2.8 | 2.5 | 3.9 | 2.3 | 2.8 | 3.9 | 6.2 | 2.8 |
| 10 | 2.8 | 6.2 | 5.0 | 2.0 | 2.8 | 2.5 | 5.0 | 2.3 | 5.0 | 3.9 | 6.2 | 2.8 |
| 11 | 2.8 | 6.2 | 2.5 | 2.0 | 2.8 | 2.5 | 5.0 | 2.0 | 6.2 | 3.9 | 5.0 | 2.8 |
| 12 | 2.8 | 5.0 | 2.5 | 110.0 | 2.8 | 109.0 | 5.0 | 2.0 | 7.3 | 3.9 | 3.9 | 2.8 |
| 13 | 3.9 | 2.8 | 2.5 | 12.9 | 2.8 | 5.0 | 5.0 | 2.0 | 5.0 | 3.9 | 3.9 | 2.8 |
| 14 | 3.9 | 2.8 | 8.4 | 8.4 | 2.8 | 5.0 | 39.0 | 2.3 | 2.5 | 5.0 | 3.9 | 2.8 |
| 15 | 3.9 | 2.8 | 2.8 | 3.9 | 2.8 | 5.0 | 2.3 | 2.5 | 2.8 | 5.0 | 3.9 | 3.9 |
| 16 | 3.9 | 2.8 | 25.0 | 2.8 | 2.8 | 5.0 | 2.5 | 2.5 | 3.9 | 3.9 | 2.8 | 5.0 |
| 17 | 3.9 | 2.8 | 59.0 | 2.8 | 2.8 | 6.2 | 10.5 | 2.3 | 5.0 | 3.9 | 2.8 | 5.0 |
| 18 | 2.8 | 3.9 | 258.0 | 2.8 | 2.8 | 5.0 | 2.8 | 2.3 | 5.0 | 3.9 | 2.8 | 5.0 |
| 19 | 2.8 | 5.0 | 145.0 | 2.8 | 2.8 | 6.2 | 2.5 | 2.3 | 3.9 | 5.0 | 2.8 | 5.0 |
| 20 | 2.8 | 6.2 | 10.6 | 2.8 | 5.0 | 6.2 | 2.3 | 2.3 | 3.9 | 8.4 | 2.8 | 3.9 |
| 21 | 3.9 | 5.0 | 325.0 | 2.8 | 5.0 | 6.2 | 2.8 | 2.5 | 3.9 | 3.4 | 2.8 | 5.0 |
| 22 | 3.9 | 5.0 | 6.2 | 2.8 | 5.0 | 6.2 | 6.2 | 2.5 | 3.9 | 6.2 | 2.8 | 8.2 |
| 23 | 5.0 | 5.0 | 1.8 | 2.8 | 3.9 | 5.0 | 3.9 | 2.8 | 5.0 | 6.2 | 2.8 | 5.0 |
| 24 | 6.2 | 5.0 | 6.2 | 2.8 | 3.9 | 5.0 | 2.8 | 2.8 | 5.0 | 6.2 | 3.9 | 2.8 |
| 25 | 6.2 | 17.0 | 3.9 | 2.8 | 3.9 | 5.0 | 2.3 | 2.8 | 5.0 | 7.3 | 3.9 | 2.8 |
| 26 | 6.2 | 16.2 | 3.9 | 3.9 | 3.9 | 5.0 | 2.0 | 2.8 | 5.0 | 7.3 | 5.0 | 3.9 |
| 27 | 6.2 | 3.9 | 5.0 | 3.9 | 2.8 | 3.9 | 2.0 | 2.8 | 5.0 | 5.0 | 5.0 | 2.8 |
| 28 | 6.2 | 233.0 | 7.3 | 3.9 | 2.8 | 3.9 | 2.3 | 16.9 | 5.0 | 5.0 | 5.0 | 5.0 |
| 29 | 7.3 | 931.0 | 9.5 | 3.9 | | 2.8 | 2.3 | 3.9 | 5.0 | 5.0 | 5.0 | 8.4 |
| 30 | 9.5 | 16.4 | 8.4 | 2.5 | | 5.0 | 2.3 | 5.0 | 3.9 | 5.0 | 3.9 | 7.3 |
| 31 | 9.5 | | 8.4 | 2.5 | | 2.8 | | 2.8 | | 5.0 | 3.9 | |
| Total | 139.1 | 1411.1 | 1000.4 | 227.1 | 86.0 | 232.7 | 137.9 | 130.9 | 122.4 | 152.4 | 130.8 | 119.5 |
| Mean Daily Discharge | 4.48 | 47.0 | 32.3 | 7.63 | 3.07 | 7.81 | 4.44 | 3.77 | 4.38 | 4.91 | 4.21 | 3.98 |
| Max. Mean Daily Discharge | 9.5 | 931.0 | 325.0 | 110.0 | 5.0 | 109.0 | 39.0 | 17.1 | 7.3 | 8.4 | 6.2 | 8.4 |
| Min. Mean Daily Discharge | 2.5 | 2.8 | 1.8 | 2.0 | 2.0 | 2.5 | 2.0 | 2.0 | 2.8 | 2.8 | 2.8 | 2.8 |
| Runoff in Acre-feet | 276.0 | 2800.0 | 1980.0 | 450.0 | 171.0 | 462.0 | 274.0 | 232.6 | 243.0 | 302. | 259.0 | 237.0 |

Maximum Stage 3.27 feet at 1148 on Nov. 29, 1970. Discharge 5330 second-feet.

Total Acre-feet 1970-71 (7896.0)

MEAN DAILY DISCHARGE OF LOS ANGELES RIVER AT TUJUNGA AVENUE
In second-feet

Station 300-R

| Day | October | November | December | January | February | March | April | May | June | July | August | September |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 13.0 | 8.9 | 83.0 | 14.5 | 15.1 | 168.0 | 25.0 | 18.0 | 16.4 | 20.0 | 13.7 | 15.4 |
| 2 | 13.7 | 9.5 | 411.0 | 15.6 | 14.1 | 150.0 | 24.0 | 17.6 | 15.9 | 19.0 | 13.9 | 14.9 |
| 3 | 20.0 | 8.7 | 15.6 | 14.9 | 13.1 | 155.0 | 25.0 | 17.6 | 17.2 | 18.0 | 14.2 | 13.7 |
| 4 | 26.0 | 8.7 | 15.6 | 14.9 | 12.1 | 157.0 | 22.0 | 17.6 | 18.0 | 17.5 | 16.4 | 14.9 |
| 5 | 14.2 | 8.9 | 19.4 | 14.9 | 13.2 | 154.0 | 24.0 | 17.6 | 15.9 | 17.5 | 16.2 | 14.9 |
| 6 | 13.7 | 113.0 | 14.7 | 14.9 | 15.2 | 148.0 | 27.0 | 17.6 | 16.2 | 17.5 | 14.7 | 156.0 |
| 7 | 10.2 | 13.9 | 11.1 | 14.9 | 15.2 | 149.0 | 28.0 | 17.6 | 16.7 | 17.5 | 17.2 | 16.8 |
| 8 | 10.2 | 10.6 | 11.1 | 14.9 | 17.7 | 142.0 | 24.0 | 17.6 | 18.5 | 17.5 | 17.5 | 13.0 |
| 9 | 10.2 | 9.5 | 225.0 | 14.9 | 164.0 | 149.0 | 27.0 | 17.6 | 18.0 | 17.5 | 17.5 | 15.4 |
| 10 | 10.9 | 8.9 | 11.1 | 14.9 | 436.0 | 148.0 | 27.0 | 17.6 | 17.2 | 17.5 | 16.4 | 15.2 |
| 11 | 10.6 | 8.2 | 8.0 | 14.9 | 400.0 | 146.0 | 24.0 | 17.6 | 14.9 | 17.5 | 15.9 | 15.7 |
| 12 | 11.1 | 8.0 | 7.8 | 526.0 | 259.0 | 151.0 | 26.0 | 17.6 | 13.7 | 17.5 | 19.1 | 15.9 |
| 13 | 10.4 | 7.6 | 10.9 | 247.0 | 187.0 | 553.0 | 28.0 | 17.6 | 15.9 | 17.5 | 22.0 | 18.3 |
| 14 | 9.7 | 7.0 | 150.0 | 66.0 | 35.0 | 148.0 | 584.0 | 18.0 | 15.4 | 17.5 | 19.7 | 18.8 |
| 15 | 9.5 | 7.4 | 11.3 | 13.9 | 44.0 | 126.0 | 38. | 18.5 | 44.0 | 17.0 | 16.9 | 16.7 |
| 16 | 10.2 | 8.9 | 114.0 | 13.9 | 355.0 | 104.0 | 32.0 | 19.0 | 30.0 | 16.5 | 16.7 | 16.7 |
| 17 | 8.2 | 9.1 | 184.0 | 13.9 | 411.0 | 44.0 | 38.4 | 19.5 | 31.0 | 16.2 | 16.4 | 15.4 |
| 18 | 8.0 | 9.5 | 2920.0 | 13.9 | 30.0 | 40.0 | 20.0 | 20.0 | 28.0 | 15.7 | 16.2 | 18.0 |
| 19 | 8.4 | 10.2 | 2480.0 | 13.9 | 29.0 | 36.0 | 20.0 | 20.0 | 27.0 | 17.2 | 196.0 | 17.2 |
| 20 | 7.6 | 12.2 | 257.0 | 13.9 | 25.0 | 30.0 | 20.0 | 21.0 | 26.0 | 16.9 | 15.4 | 16.7 |
| 21 | 8.7 | 13.4 | 3150.0 | 13.9 | 19.4 | 58.0 | 20.0 | 18.5 | 25.0 | 17.7 | 16.2 | 16.4 |
| 22 | 7.8 | 11.6 | 15.6 | 14.3 | 18.8 | 25.0 | 20.0 | 16.4 | 23.0 | 15.9 | 15.7 | 13.9 |
| 23 | 7.8 | 11.8 | 15.6 | 14.7 | 21.0 | 24.0 | 20.0 | 17.2 | 22.0 | 17.7 | 16.4 | 14.7 |
| 24 | 8.4 | 11.3 | 15.6 | 15.1 | 17.7 | 32.0 | 20.0 | 21.0 | 22.0 | 15.4 | 17.2 | 14.2 |
| 25 | 7.0 | 115.0 | 14.5 | 15.5 | 17.2 | 27.0 | 20.0 | 20.0 | 22.0 | 14.9 | 19.9 | 14.2 |
| 26 | 7.2 | 107.0 | 14.5 | 15.9 | 18.5 | 31.0 | 36.0 | 19.7 | 22.0 | 15.9 | 14.9 | 13.4 |
| 27 | 7.6 | 10.0 | 14.5 | 16.5 | 196.0 | 66.0 | 40.0 | 48.0 | 21.0 | 14.2 | 16.4 | 13.4 |
| 28 | 6.8 | 1900.0 | 14.5 | 16.5 | 109.0 | 69.0 | 19.8 | 192.0 | 21.0 | 14.9 | 17.2 | 14.7 |
| 29 | 7.4 | 9170.0 | 14.5 | 16.5 | | 26.0 | 19.8 | 16.9 | 21.0 | 13.7 | 14.2 | 13.9 |
| 30 | 8.9 | 574.0 | 14.5 | 16.5 | | 24.0 | 19.8 | 15.9 | 21.0 | 13.0 | 14.7 | 13.4 |
| 31 | 8.0 | | 14.5 | 16.5 | | 28.0 | | 13.7 | | 13.0 | 14.9 | |
| Total | 322.0 | 12777.8 | 10240.9 | 1258.5 | 2898.3 | 3317.0 | 1310.4 | 764.5 | 630.9 | 518.3 | 677.7 | 511.0 |
| Mean Daily Discharge | 10.4 | 409.0 | 331.0 | 40.6 | 104.0 | 107.0 | 43.7 | 24.7 | 21.2 | 16.7 | 21.9 | 20.1 |
| Max. Mean Daily Discharge | 26.0 | 9170.0 | 3150.0 | 526.0 | 436.0 | 553.0 | 584.0 | 192.0 | 44.0 | 20.0 | 196.0 | 156.0 |
| Min. Mean Daily Discharge | 7.2 | 7.0 | 7.8 | 13.9 | 12.1 | 24.0 | 19.8 | 13.7 | 13.7 | 13.0 | 13.7 | 13.4 |
| Runoff in Acre-feet | 639.0 | 24340.0 | 20350.0 | 2500.0 | 5750.0 | 6580.0 | 2600.0 | 1520.0 | 1250.0 | 1024.0 | 1344.0 | 1014.0 |

Maximum Stage 11.30 feet at 1124 on Nov. 29, 1970. Discharge 25,920 second-feet.

Total Acre-feet 1970-71 (40,090.0)

MEAN DAILY DISCHARGE OF PACOIMA CREEK FLUME BELOW PACOIMA DAM
In second-feet

Station 118 B-R

| Day | October | November | December | January | February | March | April | May | June | July | August | September |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 0.6 | 0.5 | + | 2.0 | 40.0 | 19.0 | 6.7 | 6.1 | 2.2 | 1.0 | 1.0 | 1.0 |
| 2 | 0.6 | 0.5 | + | 2.0 | 59.0 | 19.0 | 6.7 | 6.1 | 1.8 | 1.0 | 1.0 | 1.0 |
| 3 | 0.6 | 0.5 | + | 2.0 | 56.0 | 23.0 | 6.7 | 6.1 | 1.5 | 1.0 | 1.0 | 1.0 |
| 4 | 0.6 | 0.5 | + | 2.0 | 55.0 | 28.0 | 6.7 | 6.1 | 1.5 | 1.0 | 1.0 | 1.0 |
| 5 | 0.6 | 0.5 | + | 2.0 | 26.0 | 25.0 | 6.7 | 6.1 | 1.5 | 1.0 | 1.0 | 1.0 |
| 6 | 0.6 | 0.5 | + | 2.0 | 2.0 | 23.0 | 6.7 | 6.1 | 1.5 | 1.0 | 1.0 | 1.0 |
| 7 | 0.6 | 0.5 | + | 2.0 | 2.0 | 22.0 | 6.7 | 8.0 | 1.5 | 1.0 | 1.0 | 1.0 |
| 8 | 0.5 | 0.5 | + | 2.0 | 45.0 | 22.0 | 6.0 | 9.4 | 1.5 | 1.0 | 1.0 | 1.0 |
| 9 | 0.5 | 0.5 | + | 2.0 | 34.0 | 22.0 | 6.0 | 9.4 | 1.5 | 1.0 | 1.0 | 1.0 |
| 10 | 0.5 | 0.5 | + | 2.0 | 7.4 | 22.0 | 6.0 | 8.0 | 27.0 | 1.0 | 1.0 | 1.0 |
| 11 | 0.5 | 0.5 | + | 2.0 | 7.7 | 12.8 | 6.0 | 6.2 | 39.0 | 1.0 | 1.0 | 1.0 |
| 12 | 0.5 | 0.5 | + | 2.0 | 8.1 | 7.9 | 8.9 | 5.8 | 34.0 | 1.0 | 1.0 | 1.0 |
| 13 | 0.5 | 0.5 | + | 2.0 | 8.4 | 7.9 | 8.9 | 5.5 | 39.0 | 1.0 | 1.0 | 1.0 |
| 14 | 0.5 | 0.5 | + | 2.0 | 8.3 | 7.9 | 8.9 | 4.8 | 45.0 | 1.0 | 1.0 | 1.0 |
| 15 | 0.5 | 0.5 | 0.1 | 2.0 | 15.[illegible] | 7.9 | 8.9 | 4.8 | 53.0 | 1.0 | 1.0 | 1.0 |
| 16 | 0.5 | 0.5 | 3.8 | 2.0 | 23.0 | 7.9 | 8.9 | 4.8 | 1.0 | 1.0 | 1.0 | 1.0 |
| 17 | 0.5 | 0.5 | 2.7 | 2.0 | 22.0 | 8.9 | 8.9 | 4.8 | 1.0 | 1.0 | 1.0 | 1.0 |
| 18 | 0.5 | 0.6 | + | 2.0 | 22.0 | 10.9 | 8.9 | 4.8 | 1.0 | 1.0 | 1.0 | 1.0 |
| 19 | 0.5 | 0.6 | + | 2.0 | 22.0 | 22.0 | 8.9 | 4.8 | 1.0 | 1.0 | 1.0 | 1.0 |
| 20 | 0.5 | 0.6 | + | 2.0 | 22.0 | 34.0 | 8.9 | 4.8 | 1.0 | 1.0 | 1.0 | 1.0 |
| 21 | 0.5 | 0.6 | 9.9 | 2.0 | 22.0 | 33.0 | 8.9 | 4.8 | 1.0 | 1.0 | 1.0 | 1.0 |
| 22 | 0.5 | 0.6 | 62.0 | 2.0 | 22.0 | 19.1 | 7.6 | 4.1 | 1.0 | 1.0 | 1.0 | 1.0 |
| 23 | 0.5 | 0.5 | 61.0 | 2.0 | 22.0 | 8.8 | 6.1 | 3.4 | 1.0 | 1.0 | 1.0 | 1.0 |
| 24 | 0.5 | 0.5 | 58.0 | 2.0 | 22.0 | 7.4 | 6.1 | 3.4 | 1.0 | 1.0 | 1.0 | 1.0 |
| 25 | 0.6 | 0.5 | 60.0 | 2.0 | 22.0 | 7.4 | 6.1 | 4.5 | 1.0 | 1.0 | 1.0 | 1.0 |
| 26 | 0.5 | 0.5 | 55.0 | 2.0 | 10.6 | 7.4 | 6.1 | 2.2 | 1.0 | 1.0 | 1.0 | 1.0 |
| 27 | 0.5 | 0.2 | 51.0 | 2.0 | 0.6 | 6.7 | 6.1 | 2.2 | 1.0 | 1.0 | 1.0 | 1.0 |
| 28 | 0.5 | + | 64.0 | 2.0 | 0.6 | 6.7 | 6.1 | 2.2 | 1.0 | 1.0 | 1.0 | 1.0 |
| 29 | 0.5 | + | 79.0 | 2.0 | | 6.7 | 6.1 | 2.2 | 1.0 | 1.0 | 1.0 | 1.0 |
| 30 | 0.5 | + | 77.0 | 2.0 | | 6.7 | 6.1 | 2.2 | 1.0 | 1.0 | 1.0 | 1.0 |
| 31 | 0.5 | | 36.0 | 2.0 | | 6.9 | | 2.2 | | 1.0 | 1.0 | |
| Total | 16.3 | 13.7 | 619.5 | 62.0 | 606.3 | 469.9 | 216.3 | 155.9 | 266.5 | 31.0 | 31.0 | 30.0 |
| Mean Daily Discharge | 0.53 | 0.46 | 20.0 | 2.0 | 22.0 | 15.2 | 7.2 | 5.0 | 8.9 | 1.0 | 1.0 | 1.0 |
| Max. Mean Daily Discharge | 0.6 | 0.6 | 79.0 | 2.0 | 59.0 | 34.0 | 8.9 | 9.4 | 53.0 | 1.0 | 1.0 | 1.0 |
| Min. Mean Daily Discharge | 0.5 | + | + | 2.0 | 6.[illegible] | 6.7 | [illegible] | 2.2 | 1.0 | 1.0 | 1.0 | 1.0 |
| Runoff in Acre-feet | 32.0 | 27.0 | 1230.0 | 123.0 | 1200.0 | 932.0 | 429.0 | 309.0 | 529.0 | 61.0 | 61.0 | 60.0 |

No instantaneous discharge. Flows were mostly dam releases.
(+) Denotes insignificant flow.

Total Acre-feet 1970-71 (4990.10)

MEAN DAILY DISCHARGE OF BURBANK WESTERN STORM DRAIN AT RIVERSIDE DRIVE
In second-feet

Station E 285-R

| Day | October | November | December | January | February | March | April | May | June | July | August | September |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 7.1 | 8.6 | 8.6 | 8.6 | 10.2 | 5.6 | 8.6 | 4.5 | 5.6 | 5.6 | 2.2 | 7.1 |
| 2 | 5.6 | 11.7 | 49.0 | 8.6 | 8.6 | 5.0 | 8.6 | 4.5 | 5.6 | 4.5 | 2.2 | 7.1 |
| 3 | 8.6 | 10.2 | 8.6 | 8.6 | 10.2 | 5.6 | 7.1 | 7.1 | 5.6 | 3.9 | 2.8 | 7.1 |
| 4 | 8.6 | 8.6 | 8.6 | 8.6 | 10.2 | 13.2 | 7.1 | 7.1 | 5.6 | 3.9 | 2.2 | 5.6 |
| 5 | 10.2 | 5.6 | 8.6 | 8.6 | 10.2 | 11.7 | 10.2 | 5.6 | 5.6 | 4.5 | 2.2 | 5.6 |
| 6 | 11.7 | 36.0 | 8.6 | 8.6 | 10.2 | 5.6 | 10.2 | 21.0 | 5.6 | 5.0 | 5.0 | 10.2 |
| 7 | 8.6 | 2.8 | 8.6 | 8.6 | 10.2 | 5.6 | 8.6 | 16.2 | 7.1 | 5.0 | 5.0 | 5.6 |
| 8 | 7.1 | 2.8 | 8.6 | 16.2 | 13.2 | 5.6 | 7.1 | 8.6 | 7.1 | 5.0 | 5.0 | 5.6 |
| 9 | 5.0 | 3.4 | 8.6 | 14.7 | 17.8 | 5.6 | 5.6 | 5.6 | 7.1 | 5.0 | 5.0 | 5.6 |
| 10 | 5.0 | 2.8 | 8.6 | 14.7 | 19.3 | 5.6 | 5.6 | 5.6 | 8.6 | 5.0 | 5.0 | 5.6 |
| 11 | 5.0 | 2.8 | 8.6 | 13.2 | 10.2 | 5.6 | 5.0 | 5.6 | 13.2 | 4.5 | 5.0 | 5.6 |
| 12 | 7.1 | 3.4 | 8.6 | 99.0 | 8.6 | 5.6 | 8.6 | 5.6 | 13.2 | 4.5 | 8.6 | 5.6 |
| 13 | 7.1 | 3.4 | 8.6 | 11.7 | 5.6 | 36.0 | 10.2 | 8.6 | 8.6 | 4.5 | 8.6 | 5.6 |
| 14 | 7.1 | 2.8 | 8.6 | 8.6 | 5.6 | 16.2 | 110.0 | 8.6 | 8.6 | 4.5 | 8.6 | 5.6 |
| 15 | 7.1 | 2.8 | 8.6 | 8.6 | 7.1 | 16.2 | 5.6 | 7.1 | 5.6 | 5.6 | 7.1 | 7.1 |
| 16 | 5.0 | 2.8 | 8.6 | 8.6 | 75.0 | 16.2 | 4.5 | 5.6 | 5.6 | 4.5 | 5.6 | 7.1 |
| 17 | 4.5 | 2.8 | 8.6 | 8.6 | 28.0 | 16.2 | 4.5 | 5.0 | 5.6 | 3.9 | 5.6 | 7.1 |
| 18 | 3.9 | 3.4 | 281.0 | 8.6 | 14.7 | 16.2 | 4.5 | 5.6 | 5.6 | 2.8 | 5.6 | 7.1 |
| 19 | 5.6 | 3.4 | 105.0 | 8.6 | 14.7 | 16.2 | 7.1 | 5.0 | 5.6 | 3.9 | 7.1 | 7.1 |
| 20 | 5.6 | 3.4 | 8.6 | 8.6 | 14.7 | 16.2 | 5.0 | 5.6 | 5.6 | 3.9 | 5.6 | 8.6 |
| 21 | 5.6 | 3.4 | 206.0 | 8.6 | 11.7 | 10.2 | 4.5 | 8.6 | 5.6 | 4.5 | 5.6 | 8.6 |
| 22 | 4.5 | 3.4 | 8.6 | 8.6 | 10.2 | 8.6 | 5.0 | 8.6 | 5.6 | 5.0 | 8.6 | 8.6 |
| 23 | 5.0 | 3.4 | 8.6 | 8.6 | 10.2 | 8.6 | 3.4 | 7.1 | 5.6 | 5.6 | 10.2 | 8.6 |
| 24 | 5.6 | 3.4 | 8.6 | 8.6 | 10.2 | 8.6 | 4.5 | 8.6 | 5.6 | 5.6 | 8.6 | 8.6 |
| 25 | 5.6 | 22.0 | 8.6 | 8.6 | 11.7 | 8.6 | 4.5 | 7.1 | 5.0 | 5.0 | 7.1 | 8.6 |
| 26 | 5.6 | 21.0 | 8.6 | 8.6 | 8.6 | 8.6 | 4.5 | 7.1 | 4.5 | 7.1 | 10.2 | 8.6 |
| 27 | 7.1 | 7.1 | 8.6 | 10.2 | 5.0 | 8.6 | 4.5 | 7.1 | 3.9 | 5.6 | 5.6 | 8.6 |
| 28 | 5.6 | 248.0 | 8.6 | 10.2 | 5.0 | 8.6 | 4.5 | 14.7 | 4.5 | 2.8 | 5.6 | 8.6 |
| 29 | 7.1 | 771.0 | 8.6 | 8.6 | | 8.6 | 7.1 | 5.6 | 4.5 | 2.8 | 5.6 | 8.6 |
| 30 | 7.1 | 10.2 | 8.6 | 8.6 | | 8.6 | 5.6 | 5.6 | 5.6 | 2.8 | 5.6 | 8.6 |
| 31 | 10.2 | | 8.6 | 8.6 | | 10.2 | | 5.6 | | 2.8 | 7.1 | |
| Total | 204.5 | 1216.4 | 873.2 | 387.7 | 376.9 | 326.9 | 286.8 | 233.8 | 191.1 | 139.6 | 183.8 | 217.6 |
| Mean Daily Discharge | 6.6 | 40.5 | 28.2 | 12.5 | 13.5 | 10.5 | 9.56 | 7.54 | 6.37 | 4.50 | 5.93 | 7.25 |
| Max. Mean Daily Discharge | 11.7 | 771.0 | 281.0 | 99.0 | 28.0 | 36.0 | 110.0 | 21.0 | 13.2 | 7.1 | 10.2 | 10.2 |
| Min. Mean Daily Discharge | 3.9 | 2.8 | 8.6 | 8.6 | 5.0 | 5.0 | 3.4 | 4.5 | 3.9 | 2.8 | 2.2 | 5.6 |
| Runoff in Acre-feet | 406.0 | 2410.0 | 1730.0 | 769.0 | 748.0 | 648.0 | 569.0 | 464.0 | 379.0 | 277.0 | 365.0 | 432.0 |

Maximum Stage 3.45 feet at 1100 on Nov. 29, 1970. Discharge 4599 Second-feet

Total Acre-feet 1970-71 (9200.0)

# APPENDIX D

## WELLS DRILLED
## AND
## DESTROYED

## WELLS DRILLED 1970-71

| State Well No. | Owner |
|---|---|
| 1N/14W-06K3 | Los Angeles Department of Water & Power |
| 1N/14W-06K4 | " " " " |
| 1N/15W-07D1 | Los Angeles County Flood Control District |
| 1N/16W-12L1 | " " " " |
| 1N/16W-15N1 | " " " " |
| 1N/17W-01G1 | " " " " |
| 1N/17W-01J1 | " " " " |
| 2N/13W-34B2 | " " " " |
| 2N/14W-09K1 | " " " " |
| 2N/14W-14K1 | Metropolitan Water District of Southern California |
| 2N/17W-36R1 | Los Angeles County Flood Control District |
| 3N/15W-36F1 | Metropolitan Water District of Southern California |
| 1S/13W-04C2 | Western Oil and Gas Association |

## WELLS DESTROYED 1970-71

| | |
|---|---|
| 1N/13W-19B4 | City of Glendale |
| 1N/13W-19J2 | Roger Jessup Farms |
| 1N/15W-23L1 | Cecilia Vanonie |
| 2N/13W-34M1 | Metropolitan Water District of Southern California |
| 2N/14W-13K1 | Silvestre Hernandez |
| 2N/17W-13H2 | W. E. Silverwood |
| 2N/17W-19Q1 | Livingston-Graham, Inc. |
| 3N/15W-21P1 | Unknown |
| 3N/15W-26G1 | Mullin Investment Company |
| 3N/15W-34K4 | City of San Fernando |

# APPENDIX E

## EARTHQUAKE DAMAGE
## TO WATER SUPPLY SYSTEMS
Cities of
**LOS ANGELES AND SAN FERNANDO**

EXCERPT OF

# " EARTHQUAKE EMERGENCY REPORT – CITY OF LOS ANGELES "
# FEBRUARY 1971

## I INTRODUCTION

### The Earthquake

The Los Angeles area was jolted by a strong earthquake on Tuesday, February 9, 1971. The quake hit at 6:01 a.m. and had a magnitude of 6.6 on the Richter Scale. Its epicenter was in a sparsely settled area north of the City of Los Angeles, about 10 miles east of Newhall (see Exhibit 1).

Hardest hit by the earthquake were the Granada Hills, Sylmar and Olive View areas of the City of Los Angeles and adjoining areas of the City of San Fernando. In these areas, all lying within a three-mile radius in the north part of the San Fernando Valley, the U. S. Veterans Hospital, the Olive View Sanitarium, a major freeway interchange, the jointly owned Sylmar AC-DC Converter Station, the Metropolitan Water District's Joseph Jensen Filtration Plant and the DWP Water System's Van Norman Reservoir Complex and distribution system, as well as many other structures, sustained major damage. Private homes and businesses suffered severe damages. The earthquake caused at least 64 deaths. When the final assessment is made, the total loss may be as much as $1 billion.

This report describes the damages incurred and the actions taken, immediately after the earthquake and in the following days, by the Water System of the Los Angeles Department of Water and Power.

### The Van Norman Reservoir Complex

The Water System's Van Norman Reservoir Complex is the terminus of the two Los Angeles Aqueducts which deliver 80 percent of the total water supply to the City. The complex consists of two major reservoirs formed by the Upper and Lower San Fernando Dams, a smaller bypass reservoir, a complex of bypass pipelines, penstocks for power stations, bypass channels, chlorination stations and standby pumping stations. Fanning easterly, westerly and southerly from the Van Norman Complex are major water pipelines which distribute and transfer water to other areas of the City (see Exhibits 2 and 3).

The complex is so designed that normal water supply to the City can be maintained, at least for a time, even if one or more facilities are out of service. For example, if one reservoir was out of service, water could be diverted through bypass pipes and channels around the reservoir. If one aqueduct was out of service, water could be diverted through interconnections from the other aqueduct to provide service to the trunk lines which are normally supplied by the aqueduct out of service. If both aqueducts were out of service at the same time, service could be maintained by drawing upon the stored water in the two reservoirs, either by gravity or by operating standby pumping stations (see Exhibit 4).

The Upper and Lower Van Norman Reservoirs, both aqueducts and four major trunk lines delivering water westerly and easterly through earthquake ravaged areas were damaged, causing disruption of water service to approximately four percent of all services.

## Damages to Facilities (Noted on Tuesday, February 9, 1971)

### Lower Van Norman

The upstream face of the dam of Lower Van Norman Reservoir had suffered a major slide with a width of roughly 1,000 feet. The top of the remaining embankment was roughly six feet above the water surface and fractured but the buttress fill placed on the downstream face in 1940 contained no cracks (see Exhibit 5). The tower for Outlet No. 1, or the east outlet, disappeared under the water and was later found to have tilted northerly and sheared 20 feet above its base. The bridge to the tower for Outlet No. 2, or the west outlet, was badly twisted and buckled.

### Upper Van Norman Reservoir

At the Upper Van Norman Reservoir there was evidence that the downstream face and crest had moved downstream. The junction of the upper end of the spillway and the bypass channel was damaged and undermined by flowing water. The bridge to the tower for Outlet No. 1 was down. Two sides of the portal vault of Outlet No. 1 were pushed inward, and muddy-colored seepage was flowing from one corner. Downstream from the vault a flow of approximately 100 cubic feet per second was discharging from a broken pipe and flowing across the basin into Lower Van Norman Reservoir.

The lining of the tailrace channel of San Fernando Power House No. 3 was fractured and the banks were eroded by water flowing through and around the power house from the damaged penstock.

At the junction of the high-speed channel and the bypass channel, the stilling basin walls and gate structure were cracked. The concrete lining of the bypass channel was cracked and many sections were lifted and displaced.

First and Second Los Angeles Aqueducts

The damages to Aqueduct facilities were confined primarily to the First Los Angeles Aqueduct Penstock, the Cascades, the Saugus Pipeline of the Second Los Angeles Aqueduct on the north slope of Terminal Hill, the First Aqueduct in Magazine Canyon just north of Terminal Hill, and various tunnel and conduit sections of the First Aqueduct between the City limits and San Francisquito Canyon.

Inside the San Fernando Power Plant, cracked control valves and scroll cases on Units 1 and 2 left the plant inoperative. The resulting uncontrolled flow from the Penstock caused severe damage and erosion to the power plant foundation and tailrace channel. Throughout the entire Penstock from the power plant upstream to the head-gates at the Cascades there was evidence that rivets had been pulled out as a result of pier supports displacing the external stiffener rings. It appeared several piers had sunken one to two feet, the 3/8-inch steel plate had buckled at pier supports, and one of the expansion joints pulled apart nearly 20 inches.

Damage in the vicinity of the Aqueduct Cascades consisted of extensive cracking, with most of the damages confined to the First Los Angeles Aqueduct Cascades. The concrete channel lining was badly cracked in many areas and some sections were uplifted and displaced.

The Terminal Hill spillway structure of the Second Aqueduct was essentially undisturbed; some damage to the pad paving was evident as well as numerous slides along the access roadway. Some areas of the Terminal Hill pad were visibly sunken and portions of the 77- and 54-inch vault piping had separated.

Some of the most extensive Second Aqueduct facility damage occurred on the north slope of Terminal Hill where the 77-inch Saugus Pipeline is supported aboveground on concrete piers. The pipeline appeared to have suffered a compression failure due to the northward movement of part of the slope. Anchor blocks and piers apparently were heavily jostled on the upper half of the slope, with piers being dislocated six inches to a foot downhill with respect to the pipeline. The pipeline appeared to have accordioned on itself at mid-slope, resulting in a 6-inch collar on the pipe and spilling water from the collar causing severe erosion around piers and anchor blocks.

Damage to the First Aqueduct in the Magazine Canyon area, just north of Terminal Hill, consisted of extensive cracking in the box conduit at the junction of the Maclay High Line conduit causing numerous leaks and extensive erosion. It appeared that the Magazine Canyon area settled nearly a foot relative to the Aqueduct and High Line.

Along the First Aqueduct, between Magazine Canyon and San Francisquito Canyon, north of the town of Saugus, conduits and tunnels were badly cracked in numerous locations and air valves were damaged on many of the siphon sections.

## Water System Facilities West of the Van Norman Reservoirs

West of the Van Norman Reservoirs, approximately 14,000 services and 1,200 fire hydrants were without water.

The 54-inch Susana Trunk Line, which supplies water to the higher elevations of the Porter Ranch area, sustained three major breaks and one coupling separation. The 48-inch Granada Trunk Line, supplying the damaged Mission Hills and Granada Hills area, as well as other portions of the West Valley, was severely damaged, especially that portion located in the utility corridor just west of the San Fernando Power House.

The Sesnon Tank, with a capacity of 2 million gallons and located northwest of Porter Ranch, and the Granada High Tank, with a capacity of 590,000 gallons and located northeast of Porter Ranch, were seriously damaged and left without water supplies.

In all, some 300 breaks, shattered mains, or service leaks were found in the West Valley area.

South of the Lower Van Norman Reservoir, quantities of mud and sand were sucked into the trunk lines and distribution mains through the many breaks. In addition to mud and sand, rocks and chunks of broken concrete entered the water system through the tilted and sheared tower of Lower Van Norman Reservoir and were spread over a 25 square mile area.

## Water System Facilities East of the Van Norman Reservoirs

East of the Van Norman Complex, approximately 10,800 services and 850 fire hydrants were without water.

At the junction of the 54-inch Upper Van Norman Bypass and the 30-inch Olden Street Diversion Line, two large couplings had pulled apart. The tunnel and conduit sections of the Maclay High Line, a concrete box conduit built in 1917 which supplies water to the Sylmar and Olive View areas sustained heavy to moderate damage, but the extent of the damage was not known until full inspection was made on March 19, 1971. At the terminus of the Maclay High Line, the Maclay Reservoir, a concrete lined and covered reservoir, whose capacity is 5.3 million gallons, was dry; its timber roof and supports were collapsed and the concrete lining in two corners was cracked and displaced. The Maclay Reservoir outlet lines were pulled apart and broken in numerous places; one 1,800-foot long section of 22-inch riveted pipe averaged one leak every 50 feet; and another 1,400-foot long section of 24-inch pipe average one leak every 70 feet.

In all, 1,200 breaks, shattered mains, or service leaks were found in the East Valley areas, with the highest concentration in the Sylmar area.

## II INITIAL REACTIONS

### Lower Van Norman Reservoir

Robert E. Noel, reservoir keeper, was the first to view the damaged dam holding back 11,200 acre feet of water, or 3.6 billion gallons (design capacity was 20,518 acre feet), in the Lower Van Norman Reservoir. Mr. Noel, aroused from his sleep, drove from the reservoir keeper's house at the base of the Lower Dam up the road to the crest. Even though it was dark and the air was still dust-laden, Noel could see enough of an outline of damage which prompted him to retrace his steps to make the first of two calls, at 6:10 a.m., before telephone service failed.

Clyde W. Carney, also a reservoir keeper, who lives just minutes away from the Lower Dam, arrived and headed for the Upper Van Norman Reservoir. Fraser M. Crofts, engineer of the Water System's Inspection Section, arrived from his home in the Valley at about 6:18 a.m. and was followed by Robert Merrill, an engineer with the Division of Safety of Dams of the Department of Water Resources. Their messages were by radio at 6:24. Helmer F. Hanson and Oscar E. Hensgen, two Water System Design engineers, arrived together and were followed by Justin M. Wool, Engineer in Charge of the Water System's Dams, Geology and Materials Section, who arrived between 6:55 and 7:15 and subsequently took charge of emergency operations at the dam.

The principal concern was that major earthquake aftershocks would further damage the embankment of the Lower Dam. Of less concern were the considerations that wind-whipped waves would further erode the damaged embankment and allow the dam to be overtopped, or that the hanging scarp left by the slide would fall, or the upper dam would fail and create a wave which would also overtop the dam.

The dam was immediately inspected by the engineers for damage. Observation wells and drainage systems were checked. Pore pressures, as determined by the observation wells, increased for a short time but rapidly returned to normal. Seepage was found to be above normal with some turbidity, but very shortly returned to normal. Measurement and settlement surveys made later showed that the berm moved approximately two feet southerly and settled nearly half a foot.

Beginning at 6:30 a.m., February 9, steps were taken to increase the normal outflow from the lower reservoir. Water was spilled at a variety of places into flood control channels, the Los Angeles River, and the Tujunga Spreading Grounds. Water was transferred to other storage locations at Franklin, Stone Canyon, Hollywood and Santa Ynez Reservoirs (see Exhibit 3). Demand for Van Norman Reservoir water downstream was created by shutting off well systems at the Vanowen and River Supply Conduit Wells and by starting the Sheldon Pumping Station to pump low system water to higher deficient areas. The U. S. Corps of Engineers contracted with Stang Hydronic, Inc., to provide 11 pumps, which pumped directly from Lower Van Norman Reservoir into Bull Creek Flood Control Channel.

The maximum average rate of outflow from Lower Van Norman Reservoir for any one day was 660 cubic feet per second (cfs); the peak rate was 700 cfs. Pumping accounted for 30 to 60 cfs maximum (see Exhibit 6). Spilling operations were discontinued February 12 when the water surface dropped from elevation 1,109 to 1,092 feet and the volume had been reduced from 11,200 to 6,500 acre feet. Water was used in the system until February 19, when the turbidity sharply increased because of an underwater slide. The balance was drained into Bull Creek by four 12-inch emergency taps to the 78-inch outlet line.

Upper Van Norman Reservoir

The main concern for the Upper Van Norman Reservoir dam was that piping was occurring as evidenced by the muddy-colored seepage which appeared at one corner of the portal vault of Outlet No. 1. The tower gates and a gate downstream were closed to isolate the outlet line, and blowoffs were opened to relieve the pressure in the outlet line. Immediately, the flow at the corner of the vault decreased and the color slowly cleared up, indicating that the muddy-colored seepage was originating from leaks in the tower gates or foundation.

On February 9, at about 7 a.m., the outflow from Upper Van Norman Reservoir was increased by opening a 48-inch needle valve to discharge water into the Chatsworth High Line, and subsequently some of this discharge was spilled into the Los Angeles River (see Exhibit 6). In the afternoon, two 24-inch holes were cut in the 99-inch bypass pipeline downstream where it crosses Bull Creek to increase the outflow and supplement the existing 12-inch blowoff.

The next day, spilling was discontinued and the rate of outflow was reduced to that required to supply the Chatsworth High Line.

A new operating level for the reservoir was established at elevation 1,195 feet. When the water level dropped to this level February 12, the volume of water had been reduced from the full capacity of 1,848 acre feet, 602 million gallons to 625 acre feet.

Measurement and settlement checks indicated that the relative lateral movements of the west and east abutments were 0.4 and 1.7 feet northerly, respectively, and the dam embankment moved a maximum of 5.1 feet southerly at one location. The settlements of the east and west abutments were 0.1 and 0.5 feet, respectively, and the maximum settlement of the embankment was three feet at one location.

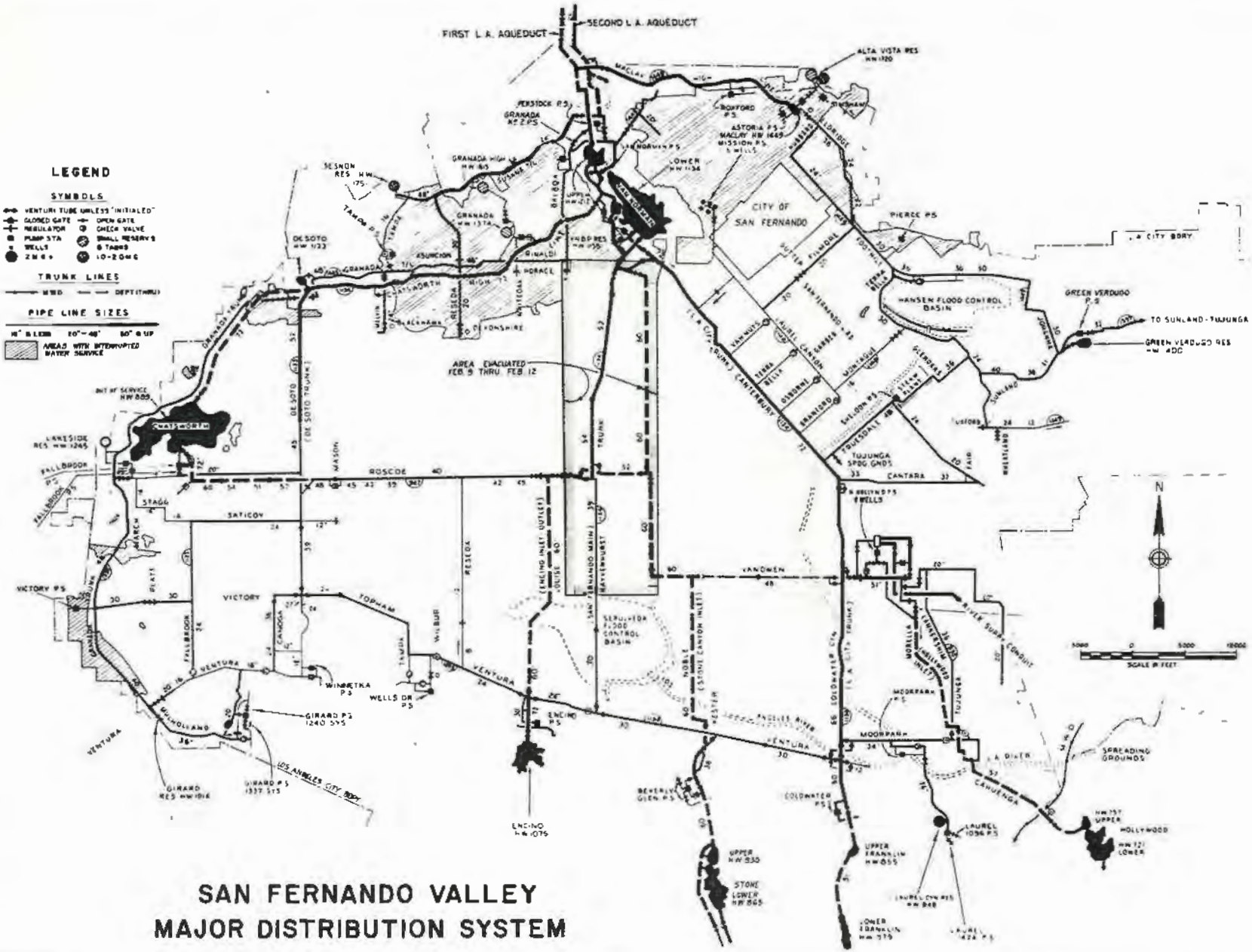
First and Second Los Angeles Aqueducts

After the initial shock and assessment of damages in the Sylmar-Van Norman Lakes area, the initial operations of the Aqueduct Division were to halt the flow of Aqueduct water into the badly damaged area.

Flow in the Saugus Pipeline of the Second Los Angeles Aqueduct was already being reduced at the time of the quake due to a planned three-day shutdown for repair work scheduled in advance to commence at 6 a.m. on February 9. This flow was being terminated at Drinkwater Reservoir, the northern terminus of the Saugus Pipeline and northeast of Saugus.

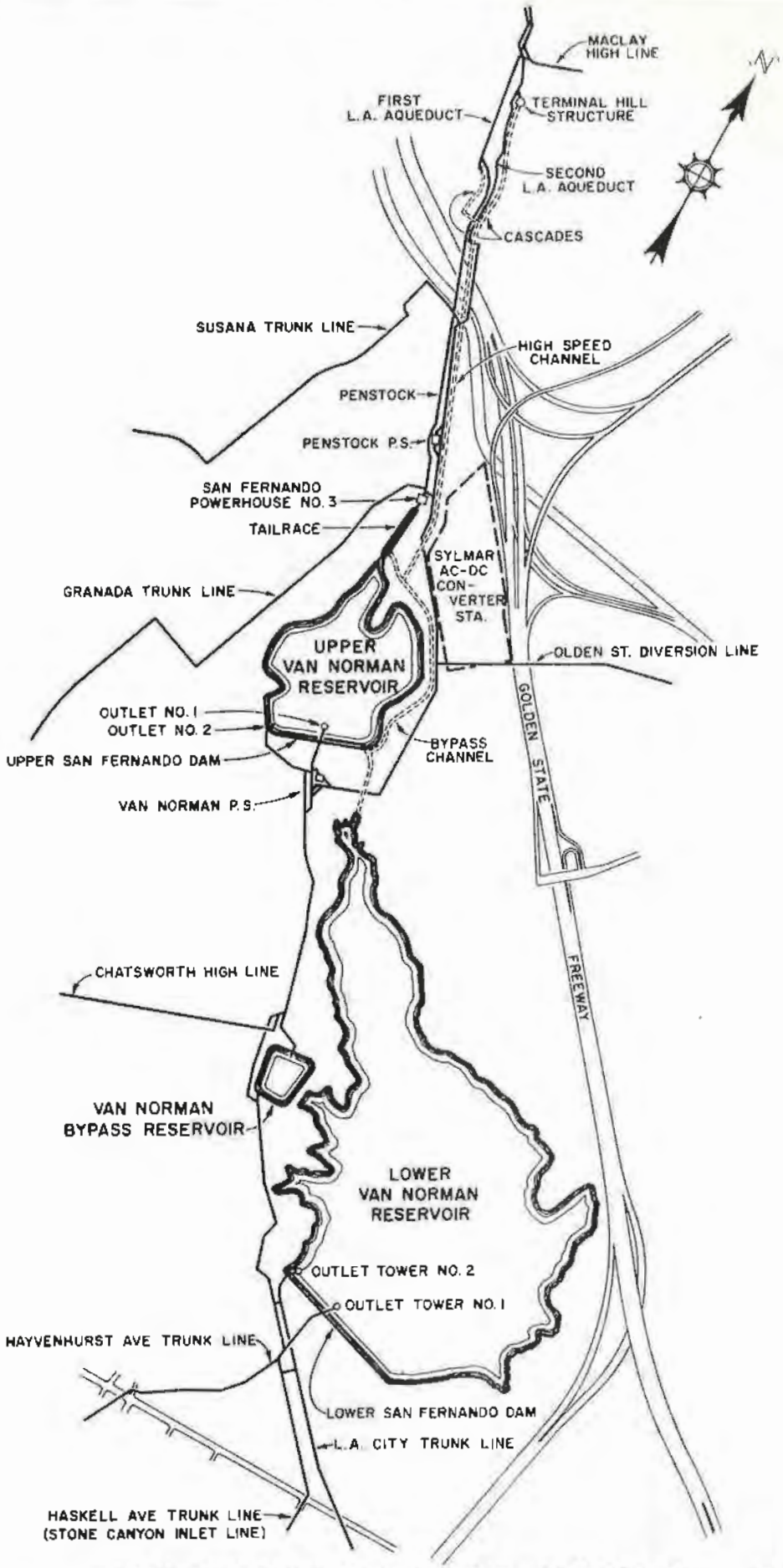
The flow in the First Aqueduct was ordered stopped at Fairmont Reservoir, west of Lancaster, at about 7 a.m. Aqueduct personnel stationed at Dry Canyon Reservoir to the south were instructed to trap the remaining Aqueduct flow in transit from Fairmont and discharge it through blowoff valves at Dry Canyon.

Access into the Cascades and Terminal Hill areas was extremely difficult due to road outages and numerous slides. By mid-day, Wells O. Abbott, Aqueduct Division Southern District Engineer, was able to get into the area and meet Glen B. Wallace, Southern District Superintendent, who had driven down from Aqueduct offices in Mojave to inspect damages near Terminal Hill, Magazine Canyon and various points north along the Aqueducts. After inspecting the damages, Messrs. Abbott and Wallace formulated plans for repair work activities for the following day.




# SAN FERNANDO VALLEY MAJOR DISTRIBUTION SYSTEM

EXHIBIT 3




**VAN NORMAN RESERVOIR COMPLEX** **EXHIBIT 4**

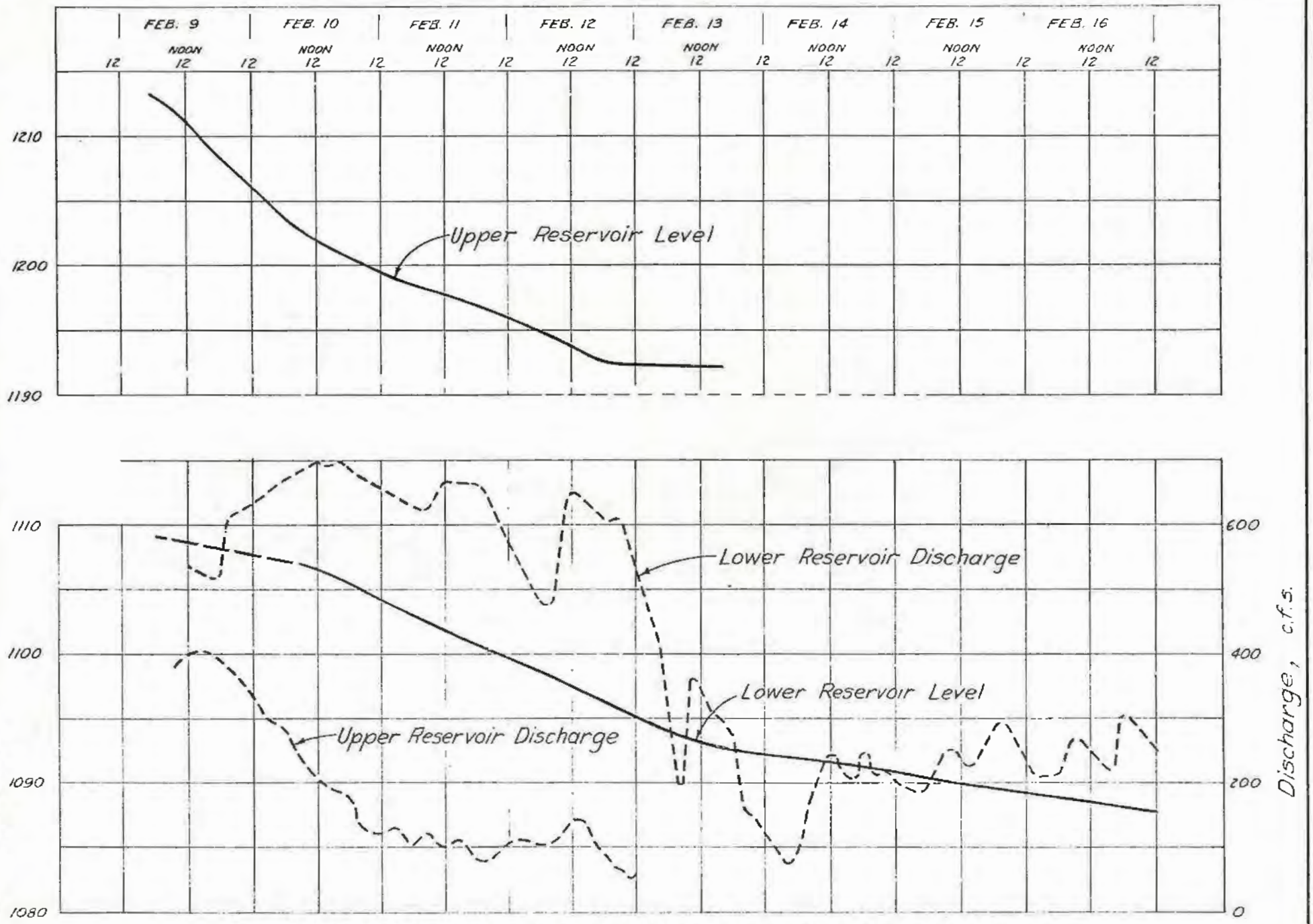



EXHIBIT 6

DRAWDOWN OF VAN NORMAN RESERVOIRS

EXCERPT FROM

**"REPORT ON THE CITY OF SAN FERNANDO WATER SUPPLY SYSTEM" – NOVEMBER 1971**

## III. WATER SUPPLY SYSTEM

### A. GENERAL

The water supply system consists essentially of seven wells, two booster pumping stations and five regulating storage reservoirs for serving the High, Middle, and Low Level Distribution Zones. The Middle Zone water supply is obtained from Wells No. 2, 3, 4, 5, and 7A, and the MWD Booster Pumping Station, and is stored in Reservoirs R-2 and R-5, which are interconnected and "floats" on the system. The High Zone water supply is obtained primarily from Reservoir R-2 which is lifted to Reservoirs R-3 and R-4 by the High Level booster pump(s). The Low Zone water supply is obtained from Wells No. 1 and 6, and is stored in Reservoir R-1. A tie with the Middle Zone distribution system provides supplemental water into Reservoir R-1 when required, through an automatic hydraulic-operated altitude valve at the reservoir.

### B. DESCRIPTION OF FACILITIES

1. Water Wells

a. Well No. 1. This well, drilled in 1901, is located northeast of Fourth and Hubbard Streets. It apparently was not damaged by the earthquake and did not require major modification. The pump is a Gould Model 10JMC, 4-stage, oil-lubricated line shaft deep-well turbine pump, with 8-inch diameter by 120-foot long column, set in a 15-inch diameter by 170-foot casing. The pump is driven by a 1760-rpm, 30-hp, General Electric Motor No. 12F5612S, operating on 220-volt, 3-phase, 60-Hertz power.

b. Well No. 2. This well, drilled in 1910, is located at the southeast corner of Borden Avenue and Sayre Street. It was damaged by the earthquake and required replacement of the pump and other modifications. The new

pump is a Worthington Model 10H, 7-stage, oil-lubricated, line-shaft deep well turbine pump. The pump is driven by a 1760-rpm, 50-hp, General Electric Motor No. 6328929, operating on 460-volt, 3-phase, 60-Hertz power.

c. Well No. 3. This well, drilled prior to 1920, is located at the southwest corner of Borden Avenue and Dyer Street. It was damaged by the earthquake and required replacement of the pumping unit and other modifications. The new pump is a Layne & Bowler Model 12RH, 5-stage, oil-lubricated line shaft deep well turbine pump with 10-inch diameter by 200-foot long column set in an 18-inch diameter by plus or minus 309-foot casing. The pump is driven by a new 1770-rpm, 125-hp, U.S. Corporation electric motor, operating on 460-volt, 3-phase, 60-Hertz power.

d. Well No. 4. This well, drilled in 1926, is located northwest of Eighth and Hubbard Streets. It was not seriously damaged by the earthquake. The pump column required cleaning and was repaired. A conductor casing is apparently needed for this well. The pump is a Peerless Model 10MA, 6-stage, water-lubricated line shaft deep well turbine pump with 6-inch diameter by 230-foot long column set in a 14-inch diameter by 481-foot casing. The pump is driven by a 50-hp, 1750-rpm, General Electric Motor No. FBJ615470, operating on 460-volt, 3-phase, 60-Hertz power.

e. Well No. 5. This well, drilled in 1950, is located southeast of Eighth and Hubbard Streets. The extent of damage, if any, caused by the earthquake has not been determined. The pump is a Johnston Model 10BC, 8-stage, oil-lubricated, line-shaft deep well turbine pump. The pump is driven by a 1760-rpm, 50-hp, U.S. Corporation Motor No. 874839, operating on 460-volt, 3-phase, 60-Hertz power.

f. Well No. 6. This well, drilled in 1955, is located northeast of Fourth and Hubbard Streets. The extent of damage, if any, caused by the earthquake has not been satisfactorily determined. The pump is a Winthroath Model 12-352, 4-stage, oil-lubricated, line-shaft deep well turbine pump with 8-inch diameter by

170-foot long column set in an 18-inch diameter by 301-foot casing. The pump is driven by a 1760-rpm, 40-hp, General Electric Motor No. UMJ627014, operating on 460-volt, 3-phase, 60-Hertz power.

g. Well No. 7. This well, drilled in 1960 and located on the south side of Glenoaks Boulevard easterly of Hubbard Street, was severely damaged by the earthquake. It contained the only submersible deep well pump owned by the City. Although design modifications were made for this well, it was later decided by the Corps of Engineers to abandon it, in accordance with Department of Water Resources Bulletin No. 74. As of this date, the equipment has been dismantled and the well properly filled with concrete.

h. Well No. 7A. This well was drilled after the earthquake to replace the water supply lost when Well No. 7 was abandoned. It is located at the northwest corner of Astoria and Dronfield Streets. The pump and motor previously installed at Well No. 3 was reinstalled at Well No. 7A. The pump is a Gould Model 14JHO, 6-stage, oil-lubricated line-shaft deep well turbine pump with 12-inch diameter by 300-foot long column set in an 18-inch diameter by 377-foot casing. The pump is driven by a 1170-rpm, 100-hp, U.S. Pump Company Motor No. 102115, operating on 480-volt, 3-phase, 60-Hertz power.

2. Booster Pumping Stations

a. High Level Booster Pumping Station. This booster pumping station, constructed in 1963, is located at the northwest corner of Hubbard and Dronfield Streets. There was no evidence of earthquake damage to this facility. Two identical pumping units are installed. Each pump is a Peerless Model 10MA, 2-stage, water-lubricated, vertical canned turbine pump. Each pump is driven by a 1760-rpm, 20-hp motor operating on 460-volt, 3-phase, 60-Hertz power.

b. MWD Booster Pumping Station. This booster pumping station constructed subsequent to the earthquake, is located at the northeast corner of Jessie and First Streets. Source of water supply for this facility is from the Metropolitan Water District's Calleguas Conduit. This facility was constructed to replace the

present water supply in case one or more wells, including new Well No. 7A, had to be abandoned. Two identical pumping units were initially installed with provisions for two additional identical pumps to be installed in the future. The fourth pump would be used strictly on a stand-by basis. Each pump is a Johnston Model 12ES, 4-stage, oil-lubricated, vertical canned turbine pump. Each motor is driven by an 1800-rpm, 150-hp, Westinghouse Motor operating on 460-volt, 3-phase, 60-Hertz power.

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3. Regulating Storage Reservoirs

a. Reservoir R-1. This reservoir, constructed subsequent to the earthquake, is located northeast of Fourth and Hubbard Streets adjacent to Well Nos. 1 and 6. It replaces the embankment type circular reservoir (consisting of a reinforced concrete bottom and side slopes) which was severely damaged by the earthquake. The new 50,000-gallon capacity ground level storage reservoir is a steel fabricated circular tank 24 feet in diameter and 16 feet high with a top water surface elevation of 1,146 feet.

Piping for this reservoir includes a 6-inch inlet from Well No. 6, an 8-inch inlet from Well No. 1, a 6-inch inlet with altitude valve for fire flow from Reservoirs R-2 and R-5, and a 10-inch outlet.

b. Reservoir R-2. This reservoir, built after the earthquake, is located northwest of Hubbard and Dronfield Streets. It replaces the embankment type rectangular reservoir (consisting of a reinforced concrete bottom and side slopes, together with a wood truss roof) which was severely damaged by the earthquake. The new 3 M.G. capacity semi-buried storage reservoir is a circular reinforced concrete reservoir, 181 feet in diameter and 17 feet high with a top water surface elevation of 1,260 feet.

Piping for this reservoir includes a 10-inch inlet from Wells No. 4 and 7A, a 6-inch inlet from Well No. 5, an 18-inch inlet from the Calleguas Conduit, and a 16-inch outlet.

c. Reservoir R-3. This reservoir, constructed prior to 1920, is located northwest of Foothill Boulevard and Hubbard Street and was not seriously damaged by the earthquake. It is a circular reinforced concrete ground level storage reservoir with a capacity of 113,000 gallons. It is 50 feet in diameter and 8 feet

high with a top water surface elevation of 1,315 feet. Piping for this reservoir includes a 6-inch inlet-outlet pipe from the 10-inch inlet to Reservoir R-4.

d. Reservoir R-4. This reservoir, constructed in 1963, is located adjacent to Reservoir R-3 and connected by piping to Reservoir R-3. The earthquake caused minor cracking which was repaired. It is a circular reinforced concrete ground level storage reservoir with a capacity of 1.0 M.G. It is 75 feet in diameter and 30 feet high with a top water surface elevation of 1,315 feet. Piping for this reservoir includes a 10-inch inlet-outlet pipe.

e. Reservoir R-5. This reservoir, constructed in 1964, is located northwest of Hubbard and Dronfield Streets adjacent to Reservoir R-2. The earthquake caused minor circumferential cracking which was repaired. It is a circular reinforced concrete semi-buried storage reservoir with a capacity of 2.4 M.G. It is 160 feet in diameter and 17 feet high with a top water surface elevation of 1,260 feet.

Piping for this reservoir includes a 6-inch inlet from Wells No. 4 and 7A, a 6-inch emergency supply inlet from the City of Los Angeles, an 18-inch inlet from the Calleguas Conduit, and an 18-inch outlet.

## C. PIPELINES

### 1. General

The City's transmission and distribution system piping consists of approximately 196 reaches of conduit totalling about 130,000 lineal feet, and ranges in size from 4-inch to 20 inches in diameter, exclusive of service connections. It includes 29,353 feet of 6-inch to 20-inch pipe installed following the Sylmar earthquake. Drawings referenced in Appendix C show the location of this piping, and the J. M. Montgomery report entitled, *"System Hydraulic Analysis,"* referenced in the Appendix gives the pipe reach reference numbers, diameter, length, friction loss factors, head losses, and flow rates.

### 2. Condition of Pipe

Buried pipelines installed by the City for transmission and distribution of water prior to the earthquake, consisted of approximately 85 percent of cast-iron pipe and 15 percent of riveted steel pipe. Subsequent to the earthquake, portions of both types of pipe were available for visual inspection. Notwithstanding the fact that there was no evidence

of a previously applied protective coating, the portions of pipe inspected showed no sign of serious internal or external corrosion. Discussions with representatives of the City and Corps of Engineers substantiated this fact.

3. 1971 Additions

New pipelines installed after the earthquake included sections replacing pipe damaged by the quake, and reaches necessary to place new or modified facilities into operation -- such as the MWD Booster Pumping Station suction and discharge transmission lines, Well No. 7A transmission line, and yard piping at reservoirs and wells as shown in Table 1.