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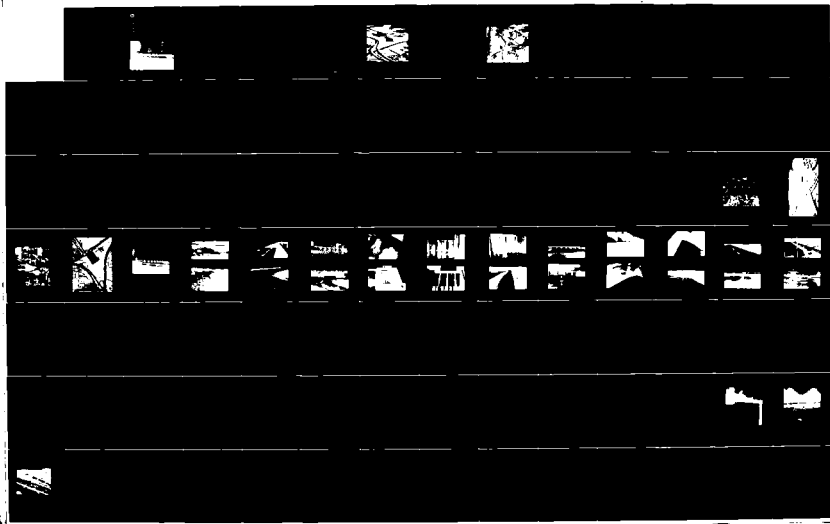
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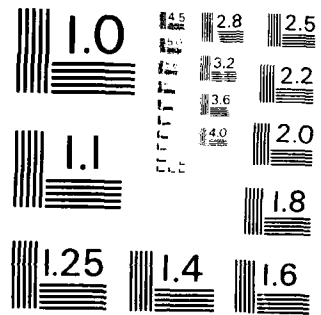
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US Army Corps  
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Los Angeles District

AD-A211 520

# WATER CONTROL MANUAL

SEPULVEDA DAM & RESERVOIR  
LOS ANGELES RIVER, CALIFORNIA

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Table 1  
SEPULVEDA DAM AND RESERVOIR  
LOS ANGELES COUNTY, CALIFORNIA

PERTINENT DATA  
SEPTEMBER 1988

|                                                         |                   |
|---------------------------------------------------------|-------------------|
| Construction Completed.....                             | 30 December 1941  |
| Stream System.....                                      | Los Angeles River |
| Drainage area.....sq. miles..                           | 152               |
| Reservoir:                                              |                   |
| Elevation                                               |                   |
| Top of spillway gates (raised position)...ft., NGVD...  | 710.0             |
| Flood control pool.....ft., NGVD...                     | 710.0             |
| Spillway design surcharge level.....ft., NGVD...        | 716.7             |
| Top of dam.....ft., NGVD...                             | 725**             |
| Spillway gates begin to automatically                   |                   |
| lower.....ft., NGVD...                                  | 712.0             |
| Spillway gates complete automatic                       |                   |
| lowering.....ft., NGVD...                               | 715.0             |
| Area                                                    |                   |
| Top of spillway gates (raised position).....acres..     | 1,335             |
| Flood control pool.....acres..                          | 1,335             |
| Fixed spillway crest.....acres..                        | 765               |
| Fixed spillway design surcharge level.....acres..       | 1,710             |
| Top of dam.....acres..                                  | 2,447             |
| Purchased real estate***.....acres..                    | 2,097             |
| Capacity, gross                                         |                   |
| Top of spillway gates (raised position).....acre-feet.. | 17,425 (2.15*)    |
| Flood control pool.....acre-feet..                      | 17,425 (2.15*)    |
| Fixed spillway crest.....acre-feet..                    | 6,857 (0.85*)     |
| Spillway design surcharge level.....acre-feet..         | 27,563 (3.40*)    |
| Top of dam.....acre-feet..                              | 44,727 (5.52*)    |
| Allowance for sediment.....acre-feet..                  | 0                 |
| Dam: - Type.....                                        | Earthfill         |
| Height above original streambed.....ft..                | 57                |
| Top length.....ft..                                     | 15,440            |
| Top width.....ft..                                      | 30                |
| Freeboard.....ft..                                      | 7.3               |
| Spillway: - type.....                                   | Concrete ogee     |
| Crest length.....ft..                                   | 399               |
| Crest elevation.....ft., NGVD...                        | 700               |
| Design surcharge.....ft..                               | 6.7               |
| Design discharge.....c.f.s..                            | 99,540            |
| Outlets:                                                |                   |
| Uncontrolled.....number..                               | 4                 |
| Size.....                                               | 6'W x 6.5'H       |
| Entrance invert elevation.....ft., NGVD...              | 668               |
| Controlled.....number..                                 | 4                 |
| Size.....                                               | 6'W x 9'H         |
| Gate type.....                                          | Vertical lift     |
| Entrance invert elevation.....ft., NGVD...              | 668               |
| Conduits - (Rectangular)                                |                   |
| Number and Size                                         |                   |
| Ungated.....                                            | 4 - 6'W x 6.5'H   |
| Gated.....                                              | 4 - 6'W x 9'H     |
| Length.....ft..                                         | 40                |
| Maximum capacity at spillway crest.....c.f.s..          | 16,500            |
| Regulated capacity at spillway crest.....c.f.s..        | 16,500            |
| Standard project flood:                                 |                   |
| Duration (inflow).....days..                            | 3                 |
| Total volume (including base flow).....acre-feet..      | 68,200 (8.41*)    |
| Inflow peak.....c.f.s..                                 | 50,000            |
| Probable maximum flood:                                 |                   |
| Duration (inflow).....days..                            | 4                 |
| Total volume.....acre-feet..                            | 163,200 (20.13*)  |
| Inflow peak.....c.f.s..                                 | 114,000           |
| Historic maximums:                                      |                   |
| Maximum inflow.....c.f.s..                              | 58,970            |
| Date.....                                               | 2-16-80           |
| Maximum release.....c.f.s..                             | 15,320            |
| Date.....                                               | 2-16-80           |
| Maximum water surface elevation.....ft., NGVD...        | 705.1             |
| Date.....                                               | 2-16-80           |
| Maximum storage.....acre-feet..                         | 11,470            |
| Date.....                                               | 2-16-80           |

\*Inches of runoff

\*\*December 1980 survey shows variation in elevation of top of dam from 723.7 feet northeast of Control House to 725.5 feet southwest of Control House.

\*\*\*There are no easements acquired in the reservoir area. All real estate is acquired in fee title.



| REPORT DOCUMENTATION PAGE                                                                                                                                                                                                                                                                                                                                                                            |                       | READ INSTRUCTIONS<br>BEFORE COMPLETING FORM                    |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------|----------------------------------------------------------------|
| 1. REPORT NUMBER                                                                                                                                                                                                                                                                                                                                                                                     | 2. GOVT ACCESSION NO. | 3. RECIPIENT'S CATALOG NUMBER                                  |
| 4. TITLE (and Subtitle)<br>Water Control Manual. Sepulveda Dam & Reservoir<br>Los Angeles Rivier, California.                                                                                                                                                                                                                                                                                        |                       | 5. TYPE OF REPORT & PERIOD COVERED                             |
|                                                                                                                                                                                                                                                                                                                                                                                                      |                       | 6. PERFORMING ORG. REPORT NUMBER                               |
| 7. AUTHOR(s)<br>U.S. Army Corps of Engineers Los Angeles Dist.                                                                                                                                                                                                                                                                                                                                       |                       | 8. CONTRACT OR GRANT NUMBER(s)                                 |
| 9. PERFORMING ORGANIZATION NAME AND ADDRESS<br>Same as above                                                                                                                                                                                                                                                                                                                                         |                       | 10. PROGRAM ELEMENT, PROJECT, TASK<br>AREA & WORK UNIT NUMBERS |
| 11. CONTROLLING OFFICE NAME AND ADDRESS<br>U.S. Army Corps of Engineer, Los Angeles<br>P.O. Box 2711<br>Los Angeles, CA 90053-2325                                                                                                                                                                                                                                                                   |                       | 12. REPORT DATE                                                |
|                                                                                                                                                                                                                                                                                                                                                                                                      |                       | 13. NUMBER OF PAGES                                            |
| 14. MONITORING AGENCY NAME & ADDRESS (if different from Controlling Office)                                                                                                                                                                                                                                                                                                                          |                       | 15. SECURITY CLASS. (of this report)                           |
|                                                                                                                                                                                                                                                                                                                                                                                                      |                       | 15a. DECLASSIFICATION/DOWNGRADING<br>SCHEDULE                  |
| 16. DISTRIBUTION STATEMENT (of this Report)<br><br>UNLIMITED                                                                                                                                                                                                                                                                                                                                         |                       |                                                                |
| 17. DISTRIBUTION STATEMENT (of the abstract entered in Block 20, if different from Report)                                                                                                                                                                                                                                                                                                           |                       |                                                                |
| 18. SUPPLEMENTARY NOTES                                                                                                                                                                                                                                                                                                                                                                              |                       |                                                                |
| 19. KEY WORDS (Continue on reverse side if necessary and identify by block number)<br>DAMS-Sepulveda<br>FLOOD CONTROL<br>RESERVOIR REGULATIONS                                                                                                                                                                                                                                                       |                       |                                                                |
| 20. ABSTRACT (Continue on reverse side if necessary and identify by block number)<br><br>This manual describes the drainage area and project at Sepulveda Dam. It is a plan for its operations and applications to various flood controls. Sources of hydrologic data and forecast are considered in this project. The drainage areas and significant hydraulic structures are listed in table 1-01. |                       |                                                                |

SEPULVEDA DAM AND RESERVOIR  
LOS ANGELES RIVER, CALIFORNIA

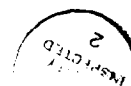
U.S. ARMY CORPS OF ENGINEERS  
LOS ANGELES DISTRICT

May, 1989

Prepared by

U.S. ARMY CORPS OF ENGINEERS  
LOS ANGELES DISTRICT

Reservoir Regulation. Section.

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SEPULVEDA DAM

#### NOTICE TO USERS OF THIS MANUAL

Regulations specify that this Water Control Manual be published in looseleaf form; and only those sections, or parts thereof, requiring changes will be revised and printed. Therefore, this copy should be preserved in good condition so that inserts can be made in order to keep the manual current.

#### EMERGENCY REGULATION ASSISTANCE PROCEDURES

In the event that unusual conditions arise, contact can be made by telephone to the U.S. Army Corps of Engineers, Los Angeles District Office during official business hours (0730-1600, Monday through Friday), plus during non-duty periods of flood operations:

Reservoir Regulation Unit (213) 824-6215



Sepulveda Dam and Reservoir (view from  
downstream of dam, taken 5/14/85).

## TABLE OF CONTENTS

|                                               | <u>Page</u>        |
|-----------------------------------------------|--------------------|
| TABLE 1. PERTINENT DATA .....                 | Inside Front Cover |
| TITLE PAGE.....                               | i                  |
| FRONTISPIECE (PHOTOGRAPH: SEPULVEDA DAM)..... | ii                 |
| NOTICE TO USERS OF MANUAL.....                | iii                |
| PHOTOGRAPH: SEPULVEDA DAM AND RESERVOIR.....  | iv                 |
| TABLE OF CONTENTS.....                        | v                  |
| ABBREVIATIONS USED.....                       | vi                 |
| TEXT OF MANUAL:                               |                    |

| <u>Paragraph No.</u> | <u>Title</u> | <u>Page</u> |
|----------------------|--------------|-------------|
|----------------------|--------------|-------------|

### I - INTRODUCTION

|       |                                  |     |
|-------|----------------------------------|-----|
| 1-01. | Authorization.....               | 1-1 |
| 1-02. | Purpose and Scope.....           | 1-1 |
| 1-03. | Related Manuals and Reports..... | 1-1 |
| 1-04. | Project Owner.....               | 1-1 |
| 1-05. | Operating Agency.....            | 1-1 |
| 1-06. | Regulating Agency.....           | 1-2 |

### II - DESCRIPTION OF PROJECT

|       |                                 |     |
|-------|---------------------------------|-----|
| 2-01. | Location.....                   | 2-1 |
| 2-02. | Purpose.....                    | 2-1 |
| 2-03. | Physical Components.....        | 2-1 |
| 2-04. | Related Control Facilities..... | 2-2 |
| 2-05. | Real Estate Acquisition.....    | 2-2 |
| 2-06. | Public Facilities.....          | 2-1 |

### III - HISTORY OF PROJECT

|       |                                    |     |
|-------|------------------------------------|-----|
| 3-01. | Authorization.....                 | 3-1 |
| 3-02. | Planning and Design.....           | 3-1 |
| 3-03. | Construction.....                  | 3-2 |
| 3-04. | Related Projects.....              | 3-2 |
| 3-05. | Modifications to Regulations.....  | 3-2 |
| 3-06. | Principal Regulation Problems..... | 3-3 |

### IV - WATERSHED CHARACTERISTICS

|       |                              |     |
|-------|------------------------------|-----|
| 4-01. | General Characteristics..... | 4-1 |
| 4-02. | Topography.....              | 4-1 |
| 4-03. | Geology and Soils.....       | 4-1 |
| 4-04. | Sediment.....                | 4-2 |
| 4-05. | Climate.....                 | 4-3 |
| 4-06. | Storms and Floods.....       | 4-3 |
| 4-07. | Runoff Characteristics.....  | 4-6 |

## TABLE OF CONTENTS (Cont'd)

| <u>Paragraph No.</u>                                  | <u>Title</u>                                       | <u>Page</u> |
|-------------------------------------------------------|----------------------------------------------------|-------------|
| <u>IV - WATERSHED CHARACTERISTICS (Cont'd)</u>        |                                                    |             |
| 4-08.                                                 | Water Quality.....                                 | 4-7         |
| 4-09.                                                 | Channel and Floodway Characteristics.....          | 4-8         |
| 4-10.                                                 | Upstream Structures.....                           | 4-8         |
| 4-11.                                                 | Downstream Structures.....                         | 4-9         |
| 4-12.                                                 | Economic Data.....                                 | 4-10        |
| <u>V - DATA COLLECTION AND COMMUNICATION NETWORKS</u> |                                                    |             |
| 5-01.                                                 | Hydrometeorological Stations.....                  | 5-1         |
| 5-02.                                                 | Water Quality Stations.....                        | 5-2         |
| 5-03.                                                 | Sediment Stations.....                             | 5-3         |
| 5-04.                                                 | Recording Hydrologic Data.....                     | 5-3         |
| 5-05.                                                 | Communication Network.....                         | 5-3         |
| 5-06.                                                 | Communication With Project.....                    | 5-3         |
| 5-07.                                                 | Project Reporting Instructions.....                | 5-3         |
| 5-08.                                                 | Warnings.....                                      | 5-4         |
| <u>VI - HYDROLOGIC FORECASTS</u>                      |                                                    |             |
| 6-01.                                                 | General.....                                       | 6-1         |
| 6-02.                                                 | Flood Condition Forecasts.....                     | 6-1         |
| 6-03.                                                 | Conservation Purpose Forecasts.....                | 6-1         |
| 6-04.                                                 | Long-Range Forecasts.....                          | 6-1         |
| <u>VII - WATER CONTROL PLAN</u>                       |                                                    |             |
| 7-01.                                                 | General Objectives.....                            | 7-1         |
| 7-02.                                                 | Major Constraints.....                             | 7-1         |
| 7-03.                                                 | Overall Plan for Water Control.....                | 7-1         |
| 7-04.                                                 | Standing Operating Instructions to Dam Tender..... | 7-2         |
| 7-05.                                                 | Flood Control.....                                 | 7-2         |
| 7-06.                                                 | Recreation.....                                    | 7-2         |
| 7-07.                                                 | Water Quality.....                                 | 7-2         |
| 7-08.                                                 | Fish and Wildlife.....                             | 7-2         |
| 7-09.                                                 | Drought Contingency Plan.....                      | 7-2         |
| 7-10.                                                 | Hydroelectric Power.....                           | 7-2         |
| 7-11.                                                 | Navigation.....                                    | 7-2         |
| 7-12.                                                 | Other.....                                         | 7-2         |
| 7-13.                                                 | Deviation from Normal Regulation.....              | 7-2         |
| 7-14.                                                 | Rate of Release Change.....                        | 7-2         |
| <u>VIII - EFFECT OF WATER CONTROL PLAN</u>            |                                                    |             |
| 8-01.                                                 | General.....                                       | 8-1         |
| 8-02.                                                 | Flood Control.....                                 | 8-1         |
| 8-03.                                                 | Recreation and Agriculture.....                    | 8-1         |
| 8-04.                                                 | Water Quality.....                                 | 8-1         |

## TABLE OF CONTENTS (Cont'd)

| <u>Paragraph No.</u>                                | <u>Title</u>             | <u>Page</u> |
|-----------------------------------------------------|--------------------------|-------------|
| <u>VIII - EFFECT OF WATER CONTROL PLAN (Cont'd)</u> |                          |             |
| 8-05.                                               | Fish and Wildlife.....   | 8-20        |
| 8-06.                                               | Water Supply.....        | 8-20        |
| 8-07.                                               | Hydroelectric Power..... | 8-20        |
| 8-08.                                               | Navigation.....          | 8-20        |
| 8-09.                                               | Frequencies.....         | 8-20        |
| 8-10.                                               | Other Studies.....       | 8-20        |

## IX - WATER CONTROL MANAGEMENT

|       |                                                                 |     |
|-------|-----------------------------------------------------------------|-----|
| 9-01. | Responsibilities and Organization.....                          | 9-1 |
| 9-02. | Interagency Coordination.....                                   | 9-1 |
| 9-03. | Interagency Agreements.....                                     | 9-1 |
| 9-04. | Commissions, River Authorities, Comacts, and<br>Committees..... | 9-1 |
| 9-05. | Reports.....                                                    | 9-1 |

## TABLES

| <u>Table No.</u> | <u>Title</u>                                                                                                                                    | <u>Page</u> |
|------------------|-------------------------------------------------------------------------------------------------------------------------------------------------|-------------|
| 1-01.            | Previously Issued Publications.....                                                                                                             | 1-1         |
| 2-01.            | Relationships of Water Surface Elevation to Capacity<br>(Storage) and Area, Sepulveda Dam, Los Angeles<br>County Drainage Area, California..... | 2-10        |
| 2-02.            | Inundations Caused By the Impoundment of Water to<br>Specific Elevations Behind Sepulveda Dam.....                                              | 2-1         |
| 3-01.            | Recreation, Wildlife, and Other Facilities in<br>Sepulveda Reservoir (with reference elevations).....                                           | 3-10        |
| 4-01.            | Summary of Climatological Data at Burbank, Calif.,<br>Sepulveda Flood Control Basin, Los Angeles County<br>Drainage Area, California.....       | 4-10        |
| 4-02.            | Summary of Precipitation Data at Sepulveda Dam and<br>Three Stations in Watershed Above Dam.....                                                | 4-10        |
| 4-03.            | Precipitation Frequency Values (Inches) For<br>Sepulveda Watershed.....                                                                         | 4-15        |



# TABLES (Cont'd)

| <u>Table No.</u> | <u>Title</u>                                                                                     | <u>Page</u> |
|------------------|--------------------------------------------------------------------------------------------------|-------------|
| 4-04.            | Sepulveda Dam Inflow History.....                                                                | 4-14        |
| 4-05.            | Annual Maximum Inflow, Outflow, and Capacity<br>(Storage) of Water at Sepulveda Dam.....         | 4-15        |
| 4-06.            | Effects of Watershed Urbanization on Inflow to<br>Sepulveda Reservoir.....                       | 4-16        |
| 4-07.            | Sepulveda Dam Runoff Data (all values in ac-ft).....                                             | 4-17        |
| 4-08.            | Rainfall, Inflow, Outflow, and Elevation Frequency<br>Values, Sepulveda Reservoir.....           | 4-20        |
| 4-09.            | Galt Hyetograph Ordinates for Watershed Above<br>Sepulveda Dam.....                              | 4-21        |
| 4-10.            | Population Projections Near Sepulveda Dam.....                                                   | 4-          |
| 4-11.            | Segment Survey Data Summary.....                                                                 | 4-          |
| 5-01.            | Precipitation, Reservoir, and Stream Gages (from<br>near the Watershed Above Sepulveda Dam)..... | 5-          |
| 5-02.            | Hydrologic Interrelationships of Sepulveda Dam.....                                              | 5-          |
| 5-03.            | Comparison of Historical Floods with Design Floods<br>Sepulveda Reservoir.....                   | 5-          |
| 6-01.            | Peak Discharges of Floods in Los Angeles River Below<br>Sepulveda Dam.....                       | 6-11        |
| 6-02.            | Table of Control for Floods in Operations Facilities ...                                         | 6-          |

# PHOTOS

| <u>Photo No.</u> | <u>Title</u>                                                                                                                  | <u>Page</u> |
|------------------|-------------------------------------------------------------------------------------------------------------------------------|-------------|
| 1-01.            | Los Angeles River, with Sepulveda Dam and Reservoir<br>(view from downstream of dam, taken 6 May 51).....                     | 1-1         |
| 2-01.            | Sepulveda Dam, Reservoir, and Los Angeles River<br>Channel (view from downstream of dam, taken<br>between 1960 and 1970)..... | 2-11        |
| 3-01.            | Sepulveda Flood Control Basin (aerial composite,<br>taken 16 December 51).....                                                | 3-          |

# PHOTOS (Cont'd)

| <u>Photo No.</u> | <u>Title</u>                                                                                                                                                        | <u>Page</u> |
|------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------|
| 2-04.            | Sepulveda Dam (enlargement of Photo No. 2-03).....                                                                                                                  | 2-21        |
| 2-05.            | Sepulveda Dam with Control House (left) and Spillway<br>(view from downstream, along Ventura Freeway).....                                                          | 2-22        |
| 2-06.            | Sepulveda Dam (view from upstream, within reservoir)..                                                                                                              | 2-23        |
| 2-07.            | Upstream Slope of Dam Southwest of Outlet Works<br>(view toward southwest, from outlet works).....                                                                  | 2-23        |
| 2-08.            | Upstream Face of Dam Northeast of Spillway (view<br>toward northeast, from spillway bridge).....                                                                    | 2-24        |
| 2-09.            | Upstream Slope of Dam Northeast of Spillway (view<br>toward south, from east embankment of dam).....                                                                | 2-24        |
| 2-10.            | Control House (right) and Spillway (view from<br>upstream, with reservoir).....                                                                                     | 2-25        |
| 2-11.            | Control House and Outlet Works, with Spillway to<br>Left (view from upstream, within reservoir,<br>along approach channel).....                                     | 2-25        |
| 2-12.            | Los Angeles River: Approach Channel to Outlet Works,<br>with Portion of Spillway Approach to Right (view<br>toward upstream from bridge above outlet works).....    | 2-26        |
| 2-13.            | Outlet Works (gates fully open), with Edge of<br>Spillway to Left (view from channel upstream).....                                                                 | 2-26        |
| 2-14.            | Approach to Outlet Works (gates partially open)<br>(view from channel upstream).....                                                                                | 2-27        |
| 2-15.            | Outlet Works (center gates fully open) (view from<br>channel downstream).....                                                                                       | 2-27        |
| 2-16.            | Outlet Works (all gates open), with Edge of Spillway<br>to Right (view from alongside channel downstream)...                                                        | 2-28        |
| 2-17.            | Los Angeles River: Outlet Channel, with Spillway Apron<br>on Left (view toward downstream from bridge above<br>outlet works during high outflows of Feb. 1930)..... | 2-28        |
| 2-18.            | Spillway (longe type), with Control House and Outlet<br>Works on Left (view from downstream, below spill-<br>way apron).....                                        | 2-29        |

**PHOTOS (Cont'd)**

| <u>Photo No.</u> | <u>Title</u>                                                                                                                                                                                                                                                              | <u>Page</u> |
|------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------|
| 2-19.            | Spillway, Apron (Spillway Outlet Channel), with<br>Portion of Spillway in Background (view from<br>downstream, atop spillway apron).....                                                                                                                                  | 2-29        |
| 2-20.            | Approach to Spillway, with Spillway at Left (view<br>from approach slab to spillway, looking toward<br>southwest).....                                                                                                                                                    | 2-30        |
| 2-21.            | Spillway Gate in Lowered Position (view from spill-<br>way bridge, with reservoir to left).....                                                                                                                                                                           | 2-30        |
| 2-22.            | Spillway Gate Partially Raised (during test opera-<br>tion of spillway gates) (view from spillway bridge,<br>with reservoir to left).....                                                                                                                                 | 2-31        |
| 2-23.            | Spillway Apron, with Outlet Channel to Right (view<br>from spillway bridge, toward downstream).....                                                                                                                                                                       | 2-31        |
| 2-24.            | Landscaped Recreation Area within Reservoir (view<br>toward south near northeast end of dam).....                                                                                                                                                                         | 2-32        |
| 2-25.            | Wildlife Pond (view from within reservoir, looking<br>downstream toward southeast).....                                                                                                                                                                                   | 2-32        |
| 2-26.            | Donald C. Tillman Water Reclamation Plant (view<br>toward northwest from atop plant building, located<br>in northeastern portion of reservoir).....                                                                                                                       | 2-33        |
| 2-27.            | Japanese Garden (constructed as mitigation for the<br>Donald C. Tillman Water Reclamation Plant).....                                                                                                                                                                     | 2-33        |
| 4-01.            | Flood of 16 February 1980, Los Angeles River at<br>Cedros Street, approximately 1.5 river miles below<br>Sepulveda Dam (view toward downstream, showing<br>overflow of left bank resulting from hydraulic<br>instability due to a side drain in the channel<br>wall)..... | 4-24        |
| 4-02.            | Flood of 16 February 1980, Los Angeles River at<br>Cedros Street (view toward right bank, from<br>location downstream of channel overflow in<br>Photo No. 4-01).....                                                                                                      | 4-25        |
| 4-03.            | Aftermath, Flood of 16 February 1980, Los Angeles<br>River below Willow Road, Long Beach (view toward<br>downstream showing debris at top of levee left by<br>flood).....                                                                                                 | 4-26        |

### PHOTOS (Cont'd)

| <u>Photo No.</u> | <u>Title</u>                                                                                                                                                        | <u>Page</u> |
|------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------|
| 8-01.            | Flood of 1 March 1993, Los Angeles River at Whitsett Avenue Channel, Studio City (approximately 5 river miles below Sepulveda Dam).....                             | 8-10        |
| 8-02.            | Flood of 1969 (most likely 25 January), Los Angeles River near downtown Los Angeles, approximately 22 river miles below Sepulveda Dam (view toward downstream)..... | 8-12        |

### FIGURES

| <u>Fig. No.</u> | <u>Title</u>                                                    | <u>Page</u> |
|-----------------|-----------------------------------------------------------------|-------------|
| 9-01.           | Flood Control Basin Operation Report.....                       | 9-1         |
| 9-02.           | Monthly Reservoir Operation, Sepulveda Flood-Control Basin..... | 9-6         |
| 9-03.           | Rainfall Record.....                                            | 9-7         |
| 9-04.           | Record of Calls.....                                            | 9-8         |
| 9-05.           | Record of Data From Digital Recorders.....                      | 9-9         |
| 9-06.           | Reservoir Computations.....                                     | 9-10        |
| 9-07.           | Reservoir Operation Report.....                                 | 9-11        |

### PLATES

| <u>Plate No.</u> | <u>Title</u>                                                                                                                                                                                              |
|------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 2-01.            | Location and Vicinity Map                                                                                                                                                                                 |
| 2-02.            | Los Angeles County Drainage Area, Rivers and Dams                                                                                                                                                         |
| 2-03.            | Rivers and Reservoirs above Sepulveda Dam                                                                                                                                                                 |
| 2-04.            | Channel Capacities and Configurations, Los Angeles River<br>Sheet 1. Sepulveda Dam to Los Feliz Boulevard<br>Sheet 2. Los Feliz Boulevard to Florence Avenue<br>Sheet 3. Florence Avenue to Pacific Ocean |
| 2-05.            | General Plan and Profile                                                                                                                                                                                  |
| 2-06.            | Embankment Sections                                                                                                                                                                                       |
| 2-07.            | Sepulveda Basin Wildlife and Recreation Master Plan                                                                                                                                                       |
| 2-08.            | Spillway and Outlet Works - Perspective                                                                                                                                                                   |
| 2-09.            | Spillway and Outlet Works - General Plan                                                                                                                                                                  |

## PLATES (Cont'd)

| <u>Plate No.</u> | <u>Title</u>                                                                                                                                                             |
|------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 2-10.            | Spillway and Outlet Works - Upstream and Downstream Elevations                                                                                                           |
| 2-11.            | Spillway and Outlet Works - Elevation and Transverse Sections                                                                                                            |
| 2-12.            | Spillway and Outlet Sections                                                                                                                                             |
| 2-13.            | Outlet Discharge Curves<br>Sheet 1. Outlets Fully Open<br>Sheet 2. For Partial Gate Openings<br>Sheet 3. For Partial Gate Openings<br>Sheet 4. For Partial Gate Openings |
| 2-14.            | Schematic Diagram of Crest Gate Operation                                                                                                                                |
| 2-15.            | Elevation of Crest Gates vs. Water Surface Elevation in Gate Pit and Float Well                                                                                          |
| 2-16.            | Crest Gate Operation for Storm of 22 February 1944                                                                                                                       |
| 2-17.            | Crest Gate Operation, 22 February 1944                                                                                                                                   |
| 2-18.            | Operating Instructions for Crest Gates                                                                                                                                   |
| 2-19.            | Spillway Discharge Curve, Automatic Operation                                                                                                                            |
| 2-20.            | Water Surface Elevation vs. Capacity and Area                                                                                                                            |
| 4-01.            | Mean Annual Precipitation in Inches                                                                                                                                      |
| 4-02.            | Mass Precipitation Curves for Stations in Sepulveda Basin, 16-17 February, 1980                                                                                          |
| 4-03.            | Variation in 10-Year Mean Peak Discharge, Los Angeles County Region                                                                                                      |
| 4-04.            | Estimated Percent of Impervious Cover in Drainage Basin                                                                                                                  |
| 4-05.            | Inflow vs. Urbanization                                                                                                                                                  |
| 4-06.            | Discharge Frequency Curves, 1980 Conditions                                                                                                                              |
| 4-07.            | Elevation Frequency Curve, 1980 Conditions                                                                                                                               |
| 4-08.            | Unit Hydrograph                                                                                                                                                          |
| 4-09.            | Los Angeles River and Major Tributaries Streambed Profiles                                                                                                               |
| 4-10.            | San Fernando Reservoirs                                                                                                                                                  |

## PLATES (Cont'd)

| <u>Plate No.</u> | <u>Title</u>                                             |
|------------------|----------------------------------------------------------|
| 5-01.            | Precipitation and Stream Gauges                          |
| 5-02.            | Rating Curves for Stream Gauges on the Los Angeles River |
| 7-01.            | Storage Allocations                                      |
| 7-02.            | Reservoir Regulation Schedule                            |
| 8-01.            | Probable Maximum Flood Routing                           |
| 8-02.            | Standard Project Flood Routing                           |
| 8-03.            | 100-Year Flood Routing                                   |
| 8-04.            | Operation Hydrographs: 21-25 January 1943                |
| 8-05.            | Operation Hydrographs: 20-24 February 1944               |
| 8-06.            | Operation Hydrographs: 23-37 January 1949                |
| 8-07.            | Operation Hydrographs: 28 February - 5 March 1973        |
| 8-08.            | Operation Hydrographs: 15-17 February 1980               |
| 8-09.            | Operation Hydrographs: 28 February - 3 March 1983        |
| 8-10.            | Comparison of Historical Floods and Design Floods        |
| 8-11.            | Dam Failure Inundation Map                               |

## EXHIBITS

| <u>Exhibit No.</u> | <u>Title</u>                                                                            | <u>Page</u> |
|--------------------|-----------------------------------------------------------------------------------------|-------------|
| A                  | Standing Operating Instructions to Dam Tender.....                                      | A-1         |
| B                  | Supplementary Pertinent Data.....                                                       | B-1         |
| C                  | Pertinent Data for Other Reservoirs Affecting<br>Los Angeles River.....                 | C-1         |
| D                  | Reservoir Water Surface Elevation vs. Capacity<br>(Storage) for Sepulveda Dam.....      | D-1         |
| E                  | Water Surface Elevation vs. Outflow (all outlet gates<br>open) for Sepulveda Dam.....   | E-1         |
| F                  | Rating Table for Stream Gauges on Los Angeles River<br>Downstream of Sepulveda Dam..... | F-1         |
| G                  | Finding of No Significant Impact.....                                                   | G-1         |
| H                  | Chain of Correspondence for Approval of Water Control<br>Manual.....                    | H-1         |

#### ABBREVIATIONS USED

|        |                                                                                                                                                                                                                                                                            |
|--------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| ac-ft  | acre-feet                                                                                                                                                                                                                                                                  |
| ALERT  | Automated Local Evaluation in Real Time (a hydrologic system consisting of automatic telemetry precipitation and stream gauges that report to a local community computer which is programmed to process data from these gauges in real time and make hydrologic forecasts) |
| cfs    | cubic feet per second                                                                                                                                                                                                                                                      |
| LACDA  | Los Angeles County Drainage Area (the drainage area, or watershed, of Los Angeles and San Gabriel Rivers and their tributaries)                                                                                                                                            |
| LACDPW | Los Angeles County Department of Public Works                                                                                                                                                                                                                              |
| mph    | miles per hour                                                                                                                                                                                                                                                             |
| NGVD   | National Geodetic Vertical Datum                                                                                                                                                                                                                                           |
| NOAA   | National Oceanic and Atmospheric Administration                                                                                                                                                                                                                            |

## I - INTRODUCTION

### 1-01. Authorization

The authority and directives for the preparation of this manual are contained in the following U.S. Army Corps of Engineers publications:

ETL 1110-2-251, 14 March 1980: Guide for Preparing Water Control Manuals.

ER 1110-2-240, 8 October 1982: Engineering and Design, Water Control Management.

EM 1110-2-3600, 30 November 1987: Engineering and Design, Management of Water Control Systems.

### 1-02. Purpose and Scope

This water control manual is prepared pursuant to requirements set forth in the Code of Federal Regulations, Title 33, Part 208.11, subparagraph d-4, entitled, "Water Control Plan and Manual." This Manual contains (a) descriptive information pertaining to the drainage area and the project; (b) a description of the plan of operation of Sepulveda Dam and its application to various floods; (c) the organization for operations by the U.S. Army Corps of Engineers, Los Angeles District; and (d) sources of hydrologic data and forecasts.

### 1-03. Related Manuals and Reports

Manuals and reports relevant to Sepulveda Dam, Sepulveda Reservoir, the drainage areas above and below Sepulveda Reservoir, and significant hydraulic structures relating to these drainage areas are listed in table 1-01.

### 1-04. Project Owner

Sepulveda Dam and the Reservoir lands behind the dam (frequently referred to as the Sepulveda Flood Control Basin) are owned by the Federal Government and are under the jurisdiction of the U.S. Army Corps of Engineers, Los Angeles District.

Under the authority of Public Law 387, 77th Congress (PL 77-387), PL 78-534 and PL 79-526 (the latter two have effectively superseded PL 77-387), the Corps of Engineers leases reservoir lands behind Sepulveda Dam. One thousand five hundred twenty-seven (1,527) acres are leased to the City of Los Angeles, Department of Parks and Recreation, for park and recreational purposes. Ninety-five point six (95.6) acres are leased to the City of Los Angeles, Department of Public Works, for operation of the Donald C. Tillman Water Reclamation Plant. The Corps also leases 28 acres to Franklin Field, Inc., for use as a children's baseball park and other purposes.



1-05. Operating Agency

The operation of Sepulveda Dam is the responsibility of the U.S. Army Corps of Engineers, Los Angeles District. The District Engineer has delegated authority for this function through the Chief, Engineering Division, Chief, Hydrology and Hydraulics Branch, to the Chief, Reservoir Regulation Section. The chain of command for reservoir operations decisions is given in table 9-01.

1-06. Regulating Agency

The U.S. Army Corps of Engineers, Los Angeles District, is totally responsible for the regulation and maintenance of Sepulveda Dam and associated structures and facilities in Sepulveda Reservoir and along portions of Los Angeles River and its tributaries.

Table 1-01. Previously Issued Publications.

| Title                                                                                                                                 | Date                                |
|---------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------|
| Analysis of Design, Vol. I, Sepulveda Dam                                                                                             | August 1939<br>Revised October 1941 |
| Analysis of Design, 57-ft. x 10-ft. Crest Gates<br>for Sepulveda Dam                                                                  | October 1939                        |
| Survey Report, Sepulveda Dam                                                                                                          | January 1940                        |
| Analysis of Design, Vol. II, Bridges and Channels                                                                                     | March 1940                          |
| Analysis of Design, Vol. III, Balboa Blvd. Bridge                                                                                     | November 1940                       |
| Trash Rack Alteration, Historical, Removing Trash<br>Racks and Construction of Temporary Timber Bulkhead                              | January 1946                        |
| Preliminary Report, Recreational Development,<br>Sepulveda Flood-Control Basin                                                        | April 1957                          |
| Report, Master Recreation Plan, Sepulveda<br>Flood-Control Reservoir                                                                  | March 1958                          |
| Draft: Sedimentation Studies for Sepulveda<br>Flood-Control Basin, June 1961 Survey                                                   | September 1962                      |
| Sepulveda Dam and Reservoir, Periodic Inspection and<br>Continuing Evaluation, Report No. 1                                           | May 1970                            |
| Operation and Maintenance Manual for Sepulveda Dam,<br>Los Angeles River Improvement, Los Angeles County<br>Drainage Area, California | December 1970                       |
| Report on Sedimentation, Resurvey of June 1961,<br>Sepulveda Flood Control Reservoir                                                  | August 1971                         |
| Revised Recreation Master Plan for Sepulveda Flood<br>Control Reservoir                                                               | November 1973                       |
| Sepulveda Dam: Dam, Outlet Works and Spillway,<br>Periodic Inspection Report No. 2                                                    | July 1975                           |
| Operation and Maintenance Manual, Los Angeles County<br>Drainage Area Project, California                                             | December 1975                       |
| Interim Report on Hydrology and Hydraulic Review of<br>Design Features of Existing Dams for Los Angeles<br>County Drainage Area Dams  | June 1978                           |

Table 1-01. (Continued)

| Title                                                                                            | Date          |
|--------------------------------------------------------------------------------------------------|---------------|
| Sepulveda Dam: Dam, Outlet Works and Spillway,<br>Periodic Inspection No. 3                      | May 1980      |
| Sepulveda Basin Master Plan, Final Environmental Impact<br>Report/Environmental Impact Statement | March 1981    |
| Sepulveda Basin Recreation Lake: Feature Design<br>Memorandum                                    | March 1987    |
| Environmental Assessment, Water Control Plan,<br>Sepulveda Flood Control Basin                   | May 1987      |
| Sepulveda Basin Recreation Lake and Wildlife Area:<br>Specifications                             | August 1987   |
| <u>Draft: Los Angeles County Drainage Area Review:</u><br>Part I, Hydrology Report               | February 1988 |

## II - DESCRIPTION OF PROJECT

### 2-01. Location

Sepulveda Dam is located across the Los Angeles River, 43 miles above the mouth of the river, and 6 miles above the confluence of Tujunga Wash and the Los Angeles River. The dam is in the south-central portion of the San Fernando Valley, just northwest of the junction of the Ventura Freeway (U.S. Highway 101) and the San Diego Freeway (Interstate Highway 405). (See pls. 2-01 through 2-04).

Sepulveda Dam, which lies within the City of Los Angeles, is about 2 miles southwest of the City of Van Nuys Civic Center, 9 miles west of the City of Burbank, and about 15 miles northwest of the Civic Center of Los Angeles. The geographical coordinates of the outlet works of the dam are  $34^{\circ}09'48''\text{N}$  latitude,  $118^{\circ}27'59''\text{W}$  longitude.

### 2-02. Purpose

The primary purpose for which Sepulveda Dam was constructed is flood control. Other uses and benefits of the dam and reservoir, such as recreation, agriculture, and wildlife mitigation are secondary. Sepulveda Dam regulates flows on the Los Angeles River, and is designed to prevent flooding along the river below the dam.

Sepulveda Dam forms part of the system of flood control structures located on the San Gabriel and the Los Angeles Rivers and their tributaries, which are collectively known as the Los Angeles County Drainage Area (LACDA) (see pl. 2-02 and Exhibit C).

### 2-03. Physical Components

Sepulveda Dam consists of an earthfilled embankment with a reinforced concrete spillway and outlet works. The components of Sepulveda Dam and Reservoir include:

a. Dam. The dam is an unzoned, impervious, rolled-earth embankment with a crest length, including outlet works and spillway, of 15,484 feet (2.93 miles) at top of dam, elevation 725 feet, NGVD, and a crest width of 30 feet (pl. 2-05). The maximum height above the original Los Angeles River streambed is 57 feet. The upstream slope is 1:2, and the downstream slope is 1:4. The upstream slope is protected by grouted stone paving.

One flank of the dam's embankment extends southwestward from the outlet works, then westward alongside the Ventura Freeway (merging with the freeway embankment for approximately 0.6 mile) (pl. 2-07). The other flank extends northeastward, then northward, along the San Diego Freeway (merging with the freeway embankment for approximately 1.1 miles).

b. Outlet Works. The outlet works are located at the southwest end of the spillway section and aligned to discharge into the downstream Los Angeles River (pls. 2-08 through 2-12).

(1) Approach Channel. Inflow to the outlet works (when water is not stored behind the dam) is from the northwest via the approach channel of the Los Angeles River (pls. 2-05 and 2-08).

(2) Outlets. The outlets of the dam are installed in a concrete section, 83 feet in width. Outflow is discharged through four gated outlets, 6 feet wide by 9 feet high, and four ungated outlets, 6 feet wide by 6.5 feet high--all with entrance invert (sometimes referred to as gated sill) at elevation 668 feet.

The four gated outlets are in the center of the outlet works, with two ungated outlets on each side (pls. 2-08 through 2-12). The hydraulically operated, vertical lift type gates open and close about one foot per minute and may be locked in any position.

The outlet works are equipped with trash racks on the upstream side to prevent debris from obstructing the outlets or washing downstream (pl. 2-10).

Plate 2-13 shows discharge rating curves for each of the four gated and four ungated outlets at Sepulveda Dam, plus curves for all gated and/or ungated outlets combined. The discharge (in thousands of cubic feet per second) is plotted against reservoir water surface elevation (in feet, NGVD), assuming in each case fully opened gates. A tabulation of total discharge through all eight gates (fully open) is given in Exhibit E.

(3) Outlet Channel. Downstream of the conduit outlet portals, piers 13 feet in length provide a smooth transition to the flow from the eight conduits to the downstream channel (see pls. 2-08 through 2-12). Below the piers, the outflow discharges into a rectangular concrete channel, which is 83 feet wide for a distance of 294 feet, then tapers, over a 400-foot transition, to a width of 50 feet (pls. 2-08 through 2-12).

The channel invert, from the portal piers through the transition taper, is designed on a slope of 0.00924, which is sufficient to prevent backwater on the conduits and to insure smooth flow through the transition for discharges up to at least 15,300 cubic feet per second (cfs).

The combined maximum capacity of the outlets is 16,500 cfs at a reservoir water surface elevation of 710 feet--the height of the spillway crest with spillway gates raised (see Section 2-03.d.(2)).

Downstream of Sepulveda Dam, the channel capacity of Los Angeles River increases progressively (pl. 2-04).

c. Control House. A control house, located on top of the dam and centered over the outlet conduits (pls. 2-08 through 2-12), contains a switchboard, standby power units, service hoist, and communication and hydrologic equipment. Commercial power is supplied for lighting, with standby power available.

d. Spillway. The spillway is a reinforced concrete ogee section of the overflow gravity type, having a gross length of 462 feet and a crest elevation of 700 feet, NGVD (pls. 2-08 through 2-12). The spillway has seven submersible drum gates, each 57 feet long. The description of a drum gate is given in EM 1110-2-3600 (4-2.b.(3)) and is quoted below.

A drum gate is designed to float on water in a chamber located in the spillway crest. The water which is being spilled flows over the top of the drum onto the ogee section of the spillway. The drum is raised by hydrostatic pressure and its range of operation is from its lower limit where the top of the drum is at the spillway crest elevation (fully open) to its upper limit where the top of the drum corresponds to full pool level (fully closed).

The drum gates are separated by six 10-foot-wide piers, with a 5-foot-wide pier abutting each end of the spillway (pl. 2-09). The total net spillway width over which water can pass is thus 322 feet.

(1) Spillway Approach. The approach to the spillway (pls. 2-08 and 2-09; photograph 2-20) is a very gently sloping, unpaved earthen ramp, rising from the river's approach channel to an elevation of 680 feet (pl. 2-10).

(2) Crest Gates. Sepulveda Dam was designed with operable crest gates instead of with a fixed spillway. This was done in order to minimize the water surface elevation of a spillway design flood, and hence minimize the height of the top of the dam--thus saving on both construction costs and the amount of land that would have to be acquired for the reservoir. With a fixed spillway elevation, flow over the spillway crest would increase rather gradually as the water would rise above the reservoir design flood elevation (and spillway crest elevation) of 710 feet. With movable spillway crest gates, on the other hand, the lowering of these gates would allow for a much greater discharge from the reservoir at heights not greatly in excess of the spillway crest.

The seven crest gates, each submersible drum gates, are constructed of structural steel, with each complete gate assembly weighing about 100,000 pounds. These gates are designed to rise out of the ogee section in unison to a maximum elevation of 710 feet--the elevation above which an uncontrolled spill occurs (pls. 2-08 and 2-10). The gates are set for fully automatic operation, but can also be operated in semi-automatic or emergency manual modes, as described below.

(a) Fully Automatic Operation. The crest gates are designed to operate automatically as the reservoir water surface elevation rises above 692.5 feet. This operation, which is essential to prevent overtopping and failure of the embankment of the dam by a probable maximum flood, is depicted on plates 2-14 and 2-15, and is explained in the subparagraphs below.

Elevation. 1. Crest Gate Operation as Function of Water Surface

a. Water Surface Elevation Below 692.5 feet. At all reservoir surface elevations below approximately 692.5 feet, the crest gates are in their lowest position, with spillway crest elevation of 700 feet.

Below each crest gate is a gate pit. When the reservoir water surface elevation reaches elevation 686 feet (the bottom of the gate pit inlet--pls. 2-09 through 2-12), water begins to flow through the inlet into the gate pit (pls. 2-14, diagram I).

The water surface elevation inside the gate pit rises with that of the reservoir, but lags behind the reservoir water surface elevation by perhaps a foot or more if the reservoir is rising rapidly (pl. 2-14).

b. Water Surface Elevation 692.5-699 feet. When the gate pit water surface elevation reaches 692.5 feet, the corresponding crest gate begins to float. The gate then rises ahead of the reservoir surface, maintaining an increasing freeboard above the reservoir (pl. 2-15), but with the maximum rate of rise of each crest gate limited to approximately 6 feet per hour. When the water surface inside each gate pit has reached approximately 699 feet, the corresponding crest gate has reached its maximum elevation of 710 feet.

During the floods of 16 February 1933 (when the reservoir water surface elevation reached its all-time historical maximum of 705.10 feet) and 1 March 1933 (maximum reservoir surface 703.53 feet), all crest gates had risen to their maximum height of 710 feet.

If the reservoir water surface elevation were to peak below 699 feet, the water in each gate pit will begin to flow out through the inlet, back into the reservoir, and the crest gate will begin to lower.

During the storm and reservoir impoundment of 20-24 February 1944, the automatic operation of each crest gate was recorded, and the results are diagrammed on plates 2-16 and 2-17. Plate 2-16 depicts the rise and fall with time of both the reservoir water surface and each of the seven crest gates on 22 February 1944. Plate 2-17 plots the crest gate elevation against the reservoir water surface elevation. The lag of each crest gate behind the rise or fall of the reservoir can be seen on plate 2-17.

c. Water Surface Elevation 699-712 feet. As can be seen on plate 2-15, the top of each crest gate is maintained at maximum elevation of 710 feet for reservoir surface elevations between approximately 699 feet and 712 feet. The latter number is the current setting of an adjustable elevation at which the crest gates begin to automatically lower.

The diagrams of plate 2-14 show a cable stretching from the crest gate around an idler wheel and a pair of pulleys to a float housed within a float well located within the reservoir. At a water surface elevation of about 710 feet (diagram II), the idler wheel has been lifted to near the top of its slot by upward forces exerted by both the float and the floating crest gate.

d. Water Surface Elevation 712-715 feet. When the reservoir water surface elevation (and hence the water surface inside each float well) reaches 712 feet (according to the current setting), the idler wheel rises sufficiently to hoist the lift valve, opening the outflow conduit, and allowing water to escape from the gate pit (pl. 2-14, diagram III). Since the outflow conduit is larger than the inflow conduit, the water surface in the gate pit lowers, and the floating crest gate also begins to fall until the lift valve reaches a level at which the inflow to, and outflow from, the gate pit are balanced. The rate of spill over the top of the lowering crest gates is now increasing rapidly.

The lowering of the crest gates as a function of the rising reservoir surface (between 712 and 715 feet--the current settings) can be seen on plate 2-15. The mechanical cause of the automatic lowering of each crest gate is the continued rise of the float inside the float well.

The leverage that is exerted by the rising float (pl. 2-14) is determined by settings of the Crest Gate Control Mechanism. These are described on plate 2-13. According to the current settings, a float rise of 3 feet (from 712 to 715) will lower the top of the crest gate all the way down from its maximum elevation of 710 to its lowest position of 700 feet (pl. 2-12).

It should be noted that the physical top of the crest gate is its exposed end point when the gate is mostly or totally elevated (pl. 2-14, diagrams II and III). As the gate is lowered, the highest point on the gate travels along the curved upper surface of the gate, progressively closer to the gate hinge (pl. 2-14, diagram I).

The minimum time required for the crest gates to lower all the way from 710 to 700 feet is about 15 minutes.

e. Water Surface Elevation Above 715 Feet. For any reservoir water surface elevation above 715 feet (according to the current setting), the crest gates will have completely lowered to the ogee crest elevation of 700 feet (pl. 2-15), and water will be spilling over all seven bays of the spillway at depths exceeding 15 feet.

2. Spillway Discharge Rates. Plate 2-19 depicts the rating curve for the discharge through the seven spillway bays as a function of reservoir water surface elevation, given the current fully



automatic crest gate settings. For reservoir surface elevations between 710 and 712 feet, the discharge over the top of the crest gates increases very slowly. At elevations between 712 and 715 feet, however, the rate of discharge increases very rapidly with elevation, as the crest gates lower from 710 feet to 700 feet.

One characteristic of this type of crest gate is that for reservoir elevations in excess of 712 feet (as the crest gates are currently set), the spill rate increases so rapidly that serious downstream flooding could result in the event of a reservoir surface elevation of 713 or 714 feet. The Standard Project Flood is calculated to produce a maximum reservoir surface elevation of 713.52 feet. This is discussed and illustrated in more detail in Section 8-02.b.

3. Adjustments of Crest Gate Settings. The crest gates, as currently set, begin to lower automatically when the reservoir surface elevation reaches 712 feet. They complete their lowering process when the reservoir surface reaches 715 feet. These elevations are individually adjustable within certain limits.

The reservoir surface elevation at which the crest gates begin to lower automatically can be individually set between 710 feet and 715 feet. The reservoir surface at which the gates become fully lowered can be set between 710 feet and 716 feet. The mechanisms by which these adjustments are possible, along with diagrams, discussions, and examples of how such adjustments are made, are depicted on plate 2-12.

(b) Semi-Automatic Crest Gate Operation. It is also possible for the control mechanism of each crest gate to be adjusted so that the gate will float upward ahead of a rising reservoir surface, but will remain at any selected elevation from 700 through 710 feet inclusively, without automatically lowering again as the reservoir surface continues to rise above elevation 710 feet. This semi-automatic operation procedure option is described on plate 2-15, and in more detail in the Operation and Maintenance Manual for Sepulveda Dam, Los Angeles River Improvements, Los Angeles County Drainage Area, California (December 1970).

Implementation of this semi-automatic type of crest gate control requires a minimum of one-half hour for each of the seven crest gates, and requires the physically demanding labor of at least one person (for the opening and closing of nine gate valves by the turning of large, heavy valve wheels). If all gates were to be placed from fully automatic operation into semi-automatic operation at the same time (for example, during a major storm and runoff event), a crew of seven trained persons would be required. The same task could perhaps be accomplished with a crew of four, working for at least one hour. (In the opinion of the current Sepulveda Dam Tender, two gates are about the maximum that one person could change at one time without becoming overly fatigued.)

The reverse procedure (from semi-automatic to fully automatic) involves approximately the same time and manpower requirements.

During a major storm event, with streets flooded and with helicopter travel dangerous because of low clouds and strong winds, it may not be practical to transport a crew to Sepulveda Dam in time to implement such semi-automatic operation in order to avoid the automatic lowering of the crest gates. On the other hand, the crest gates must not be left on semi-automatic operation permanently. This would defeat the purpose for which the fully automatic crest gate operation is designed and programmed in order to prevent overtopping and failure of the embankment of the dam by a Probable Maximum Flood. (And for the same reasons as those cited above, it may not be possible during stormy conditions to transport a crew to the dam in time to change the crest gate operation from semi-automatic to fully automatic in anticipation of a near Probable Maximum Flood.)

(c) Manual Crest Gate Operation. The crest gates can also be operated manually during periods of low or zero water storage behind Sepulveda Dam, as is illustrated on plate 2-18.

1. Testing, Using City Water. In this test operation, which is normally performed once each year, city water is piped into the gate pit of each crest gate, and the gate is floated to its maximum elevation of 710 feet. The water is then released, and the gate lowers to its minimum elevation of 700 feet. The entire test operation of all seven crest gates takes several hours and requires many thousands of gallons of city water.

The automatic lowering of the spillway gates cannot, however, be tested by the use of city water. There is no easy way to sustain high water in the float well. Furthermore, no historical flood has ever approached the threshold of automatic lowering (currently set at 712 feet), so no natural test of this feature has ever occurred.

2. Emergency Manual Operation. If the control mechanism of any crest gate should become inoperative, there is an emergency procedure by which a crest gate can be manually raised or lowered. Implementation of this procedure requires at least one-half hour, and requires the services of one able-bodied crew member for each gate.

(3) Spillway Apron. Water spilling over the raised crest gates would cascade down across the ogee onto the spillway apron. This apron is a large concrete slab with a gentle downward slope, extending 694 feet downstream of the ogee (see pls. 2-05 through 2-09).

e. Reservoir Lands. The boundaries of this normally dry reservoir are defined according to the real estate acquired by the Federal Government for the purpose of flood control behind Sepulveda Dam. These boundaries (shown on pl. 2-07) encompass a total of 2,097 acres and extend essentially from the San Diego Freeway (I-405) on the east and the Ventura Freeway (U.S.-101) on the south to Victory Boulevard on the north and to about 0.2 mile beyond Balboa Boulevard on the west, with a strip of flood control land about 0.4 mile wide extending westward on either side of the Los Angeles River to White Oak Avenue.

Table 2-01 lists the volume of, and area covered by, impounded water in Sepulveda Reservoir as a function of water surface elevation. Plate 2-20 graphically depicts these relationships. Exhibit D is a detailed table of the reservoir water surface elevation vs. capacity (storage) for Sepulveda Dam.

The inundations caused by the impoundment of water to specific elevations behind Sepulveda Dam are shown in table 2-02.

f. Los Angeles River Channel. The channel of the Los Angeles River, along most of its length below Sepulveda Dam, and for about 7 miles upstream of Sepulveda Dam, is of concrete construction on the sides and bottom, either rectangular or trapezoidal, with a shallow rectangular low-flow channel in the center. The channel capacities and configurations of the Los Angeles River between Sepulveda Dam and the Pacific Ocean are depicted on plate 2-04.

#### 2-04. Related Control Facilities

The flows of the Los Angeles River, upstream to the confluence with Tujunga Wash, is regulated exclusively by Sepulveda Dam. Below Tujunga Wash, the Los Angeles River is regulated jointly by Sepulveda, Pacoima, Lopez, and Hansen Dams. Still farther downstream, other dams, including Devil's Gate and Whittier Narrows, are added to the list (see Section 4-11).

#### 2-05. Real Estate Acquisition

The boundaries of real estate that the U.S. Army Corps of Engineers acquired for Sepulveda Reservoir are depicted on plate 2-07. The original cost of this 2,097-acre acquisition, which took place between 1939 and 1942, was \$1,427,525.

#### 2-06. Public Facilities

Plate 2-07 is a map of Sepulveda Reservoir, depicting the various recreational and other facilities that comprise the Sepulveda Basin Master Plan.

A summary and discussion of existing and proposed facilities within Sepulveda Reservoir is contained in the U.S. Army Corps of Engineers Final Report of Sepulveda Basin Master Plan, Final Environmental Impact Report/Environmental Impact Statement (March 1981) and the Sepulveda Basin Recreation Lake; Feature Design Memorandum (March 1987). Table 2-03 lists these facilities.

In accordance with guidance outlined in EC 1130-2-121, the Corps of Engineers participates with the City of Los Angeles in a cost-sharing program for recreational development, known as the Code 710 Program. The Sepulveda Basin Master Plan, Final Environmental Impact Report/Environmental Impact Statement, approved in March 1981, provides the basis for future development within the basin.

a. Recreation Facilities. Bull Creek Park, located in the central area of Sepulveda Flood Control Basin, is to be composed of a 26-acre recreation lake and adjacent facilities and 134 acres of park lands. The park will provide multiple recreational opportunities including bicycling, jogging, hiking, non-motorized boating, informal play activities, and picnicking.

The recreation lake facility is currently under construction. The volume of the lake will be approximately 180 ac-ft at a maximum water surface elevation of 704.5 feet. The entire lake will be formed by excavation. Materials excavated from the lake are deposited along the northern perimeter of the site above the Probable Maximum Flood (PMF) elevation of 716.66 feet resulting in no net impact to the Sepulveda Basin's flood storage capacity.

The maximum lake water surface elevation will be maintained by an overflow spillway leading to the Hayvenhurst Channel. The spillway is a concrete weir structure approximately 14 feet wide. The spillway will also serve as an egress point for floodwaters impounded in Sepulveda Basin that inundate the recreation lake facility.

b. Wildlife Management Facilities. A wildlife area is located in the eastern portion of the Sepulveda Basin. North of Burbank Boulevard, near the intersection of Woodley Avenue, a wildlife management section is currently under expansion; upon completion of the current phase the management section will include a 15-acre riparian area, an 8-acre Oak-woodland area, a 26-acre native grassland and coastal sage scrub area, and an 11-acre wildlife pond. At a maximum water surface elevation of 684 feet, the approximate volume of the pond will be 43 ac-ft. The volume will be completely compensated for by excavating material upstream and adjacent to the dam spillway structure below the spillway crest elevation (700 feet, NGVD), and removing the material from the basin. An overflow spillway will keep the maximum elevation of the pond at 684 feet by passing excess water to the Los Angeles River Channel. South of the intersection of Burbank Boulevard and Woodley Avenue is a designated wildlife area though no current or future plan exists for enforcement of wildlife management policies. Again, no net impact to flood control capacity of Sepulveda Dam has occurred as a result of wildlife mitigation activity.

c. Arts Park Facility. In the north-central corner of Sepulveda Basin, closest to urban areas with high intensity use and adjacent to the recreation lake, an Arts Park has been designated. The park will be limited to tents and other temporary structures that would be erected seasonally. The Arts Park poses no threat to Sepulveda Basin's primary objectives of flood control.

It can be anticipated that, in time, public facilities within the Sepulveda Flood Control Basin will be inundated at various elevations. It is for this reason that all projects within the basin must comply with hydraulic criteria as developed by the U.S. Army Corps of Engineers (Sepulveda Basin Recreation Lake: Feature Design Memorandum (March 1987))).

Subsequent phases of future project development intended for enhancement of public recreation and wildlife preservation must also not impact flood control objectives. Flood management needs are the primary purpose of Sepulveda Basin, with all future development adhering to these needs and requirements.

d. Wastewater Treatment Facilities. Located in the northeast corner of the Sepulveda Flood Control Basin is the Donald C. Tillman Water Reclamation Plant (TWRP). TWRP is owned and operated by the City of Los Angeles, Department of Public Works on land leased by the department from the U.S. Army Corps of Engineers since 1969. The plant was placed on-line in September 1985 and currently provides advanced secondary treatment for an average influent of 40 million gallons per day. Phase II expansion of TWRP is expected to be completed in 1991, increasing the capacity of the plant to 80 million gallons per day.

As a result of continuing urbanization in the San Fernando Valley (causing an increase in the expected inflow), the TWRP is located within the expected 100-year frequency flood water surface elevation (see pl. 2-07), increasing the chances of inundation of the plant. Because TWRP was constructed with Federal assistance, the National Flood Insurance Act Amendments of 1973 required that it be protected from the 100-year frequency flood event (see table 1-01; Environmental Assessment, Water Control Plan, Sepulveda Flood Control Basin, (May 1987)). The Environmental Protection Agency (EPA) has thus requested the City of Los Angeles to provide a floodwall and/or floodproofing for the plant. The design is currently under evaluation, however, the design alternative chosen will not result in any net negative impact to the flood control capability of the Sepulveda Flood Control Reservoir. As stated in previous sections of this report, operation of the reservoir is committed to flood control objectives regardless of any deleterious effects that may occur to facilities within the basin. In the event the TWRP becomes inundated during flood control operations, the plant would be shut down and all sewage would be diverted via a sewer line connected with the Los Angeles Hyperion Treatment Plant.

Any future development associated with the TWRP will be subject to the same conditions stated above, to preserve the flood control capability of the Sepulveda Flood Control Reservoir.

Table 2-01. Relationships of Water Surface Elevation to Capacity (Storage) and Area, Sepulveda Dam, Los Angeles County Drainage Area, California.

| Water Surface<br>Elev.*<br>(ft., NGVD) | Volume<br>(ac-ft) | % of Capacity to<br>Spillway Crest<br>(Crest Gates Raised) | Area<br>(acres) | Maximum<br>Depth<br>(ft) |
|----------------------------------------|-------------------|------------------------------------------------------------|-----------------|--------------------------|
| 668.0                                  | 0.0               | 0.00                                                       | 0.00            | 0                        |
| 669.0                                  | 0.3               | 0.00                                                       | 0.45            | 1                        |
| 670.0                                  | 0.9               | 0.01                                                       | 0.90            | 2                        |
| 671.0                                  | 2.1               | 0.01                                                       | 1.50            | 3                        |
| 672.0                                  | 3.9               | 0.02                                                       | 2.30            | 4                        |
| 673.0                                  | 6.7               | 0.04                                                       | 3.55            | 5                        |
| 674.0                                  | 11.0              | 0.06                                                       | 5.65            | 6                        |
| 675.0                                  | 18.0              | 0.10                                                       | 9.15            | 7                        |
| 676.0                                  | 29.3              | 0.17                                                       | 13.50           | 8                        |
| 677.0                                  | 45.0              | 0.26                                                       | 19.15           | 9                        |
| 678.0                                  | 65.6              | 0.38                                                       | 24.10           | 10                       |
| 679.0                                  | 93.2              | 0.53                                                       | 32.35           | 11                       |
| 680.0                                  | 130.3             | 0.75                                                       | 42.55           | 12                       |
| 681.0                                  | 178.3             | 1.02                                                       | 54.15           | 13                       |
| 682.0                                  | 238.6             | 1.37                                                       | 68.25           | 14                       |
| 683.0                                  | 314.6             | 1.81                                                       | 86.00           | 15                       |
| 684.0                                  | 410.6             | 2.36                                                       | 109.70          | 16                       |
| 685.0                                  | 524.2             | 3.07                                                       | 141.80          | 17                       |
| 686.0                                  | 624.2             | 3.98                                                       | 176.60          | 18                       |
| 687.0                                  | 887.4             | 5.09                                                       | 208.35          | 19                       |
| 688.0                                  | 1,110.0           | 6.38                                                       | 233.90          | 20                       |
| 689.0                                  | 1,367.2           | 7.85                                                       | 274.00          | 21                       |
| 690.0                                  | 1,658.9           | 9.52                                                       | 310.75          | 21                       |
| 691.0                                  | 1,985.7           | 11.41                                                      | 350.30          | 22                       |
| 692.0                                  | 2,359.5           | 13.54                                                      | 390.15          | 24                       |
| 693.0                                  | 2,762.0           | 15.59                                                      | 427.80          | 25                       |
| 694.0                                  | 3,215.1           | 18.45                                                      | 466.20          | 26                       |
| 695.0                                  | 3,701.4           | 21.24                                                      | 508.35          | 27                       |
| 696.0                                  | 4,231.8           | 24.29                                                      | 553.90          | 28                       |
| 697.0                                  | 4,809.2           | 27.60                                                      | 602.35          | 29                       |
| 698.0                                  | 5,436.5           | 31.20                                                      | 654.25          | 30                       |
| 699.0                                  | 6,117.7           | 35.11                                                      | 710.25          | 31                       |
| 700.0                                  | 6,857.0           | 39.35                                                      | 765.20          | 32                       |
| 701.0                                  | 7,648.1           | 43.89                                                      | 814.00          | 33                       |
| 702.0                                  | 8,485.1           | 48.69                                                      | 865.00          | 34                       |
| 703.0                                  | 9,378.1           | 53.82                                                      | 926.20          | 35                       |
| 704.0                                  | 10,337.5          | 59.33                                                      | 1,007.95        | 36                       |
| 705.0                                  | 11,364.0          | 65.22                                                      | 1,060.25        | 37                       |
| 706.0                                  | 12,458.0          | 71.49                                                      | 1,126.00        | 38                       |
| 707.0                                  | 13,616.0          | 78.14                                                      | 1,187.00        | 39                       |

Table 2-01. (Continued)

| Water Surface<br>Elev.*<br>(ft., NGVD) | Volume<br>(ac-ft) | % of Capacity to<br>Spillway Crest<br>(Crest Gates Raised) | Area<br>(acres) | Maximum<br>Depth<br>(ft) |
|----------------------------------------|-------------------|------------------------------------------------------------|-----------------|--------------------------|
| 708.0                                  | 14,832.0          | 85.12                                                      | 1,243.50        | 40                       |
| 709.0                                  | 16,103.0          | 92.41                                                      | 1,296.50        | 41                       |
| 710.0                                  | 17,425.0          | 100.00                                                     | 1,335.25        | 42                       |
| 711.0                                  | 18,799.0          | 107.88                                                     | 1,403.00        | 43                       |
| 712.0                                  | 20,225.0          | 116.07                                                     | 1,453.00        | 44                       |
| 713.0                                  | 21,704.0          | 124.56                                                     | 1,504.00        | 45                       |
| 714.0                                  | 23,232.0          | 133.33                                                     | 1,555.00        | 46                       |
| 715.0                                  | 24,813.0          | 142.41                                                     | 1,609.00        | 47                       |
| 716.0                                  | 26,450.0          | 151.81                                                     | 1,667.00        | 48                       |
| 717.0                                  | 28,147.0          | 161.53                                                     | 1,731.00        | 49                       |
| 718.0                                  | 29,912.0          | 171.66                                                     | 1,800.00        | 50                       |
| 719.0                                  | 31,747.0          | 182.21                                                     | 1,873.00        | 51                       |
| 720.0                                  | 33,637.0          | 193.15                                                     | 1,954.00        | 52                       |
| 721.0                                  | 35,654.0          | 204.61                                                     | 2,046.00        | 53                       |
| 722.0                                  | 37,749.0          | 216.64                                                     | 2,150.00        | 54                       |
| 723.0                                  | 39,954.0          | 229.31                                                     | 2,226.00        | 55                       |
| 724.0                                  | 42,280.0          | 242.60                                                     | 2,387.00        | 56                       |
| 725.0                                  | 44,727.0          | 256.68                                                     | 2,447.00        | 57                       |

\*Outlet invert elevation is 668 ft., NGVD.

Table 2-02. Inundation Caused By the Impoundment of Water  
to Specific Elevations Behind Sepulveda Dam.

| Reservoir<br>Level                            | Max. Elevation<br>(ft., NGVD) | Volume<br>(acre-feet) | Area<br>(acres) |
|-----------------------------------------------|-------------------------------|-----------------------|-----------------|
| At Revised Spillway Design Flood              | 716.66                        | 27,563                | 1,710           |
| At Standard Project Flood                     | 713.52                        | 22,493                | 1,529           |
| At Top of Spillway Gates (raised<br>position) | 710.00                        | 17,425                | 1,335           |
| At 50-Year Flood                              | 706.50                        | 13,037                | 1,156           |
| At Historical Maximum                         | 705.10                        | 11,503                | 1,067           |
| At 25-Year Flood                              | 703.00                        | 9,378                 | 906             |



Table 2-03. Recreation, Wildlife, and Other Facilities in  
Sepulveda Reservoir (with reference elevations).

| Name of Facility<br>or Reference                                                                                    | Area<br>(acres)       | Range of<br>Elevations<br>(ft., NGVD) |
|---------------------------------------------------------------------------------------------------------------------|-----------------------|---------------------------------------|
| 1. Invert Outlet Work (Sill)                                                                                        |                       | 668.0                                 |
| 2. Recreational Lake (and adjacent lake<br>facilities)                                                              | 26                    | 676.7 - 704.5                         |
| 3. Wildlife Management Area (north<br>of Burbank Boulevard)                                                         | 60                    | 678.5 - 690.8                         |
| 4. Wildlife Management Area (south of<br>Burbank Boulevard)                                                         | 48                    | 680.2 - 690.8                         |
| 5. Sepulveda Golf Course                                                                                            | 300                   | 682.8 - 714.2                         |
| 6. Hjelte Park - Phase I: Athletic Fields                                                                           | 25                    | 687.2 - 697.2                         |
| 7. Burbank Boulevard (lowest elevation<br>at Los Angeles River)                                                     |                       | 687.2 - 725.2                         |
| 8. Agricultural lands                                                                                               | variable <sup>a</sup> | 688.2 - 725.2                         |
| 9. Bicycle Trail                                                                                                    | 11                    | 688.7 - 725.2                         |
| 10. Woodley Avenue (lowest elevation<br>at Burbank Blvd; highest elevation<br>at Victory Blvd.)                     |                       | 689.1 - 717.2                         |
| 11. Hjelte Park - Phase II: Athletic Fields,<br>Picnic Tables, Trails, Landscaping<br>(CURRENTLY UNDER DEVELOPMENT) | 25                    | 690.0 - 707.2                         |
| 12. Woodley Golf Course                                                                                             | 200                   | 690.6 - 713.0                         |
| 13. Model Airplane Center                                                                                           | 31                    | 694.6 - 696.5                         |
| 14. Woodley Avenue Park                                                                                             | 80                    | 698.1 - 711.4                         |
| 15. Family Services Community Center                                                                                | 15                    | 698.5 - 701.0                         |
| 16. Arts Park (FUTURE FACILITY)                                                                                     | 60                    | 699.0 - 720.8                         |
| 17. Spillway Crest (crest gates lowered)                                                                            |                       | 700.0                                 |

<sup>a</sup>Variable from season to season and year to year.

Table 2-03. (Continued)

| Name of Facility<br>or Reference                                                                                                                 | Area<br>(acres) | Range of<br>Elevations<br>(ft., NGVD) |
|--------------------------------------------------------------------------------------------------------------------------------------------------|-----------------|---------------------------------------|
| 18. Donald C. Tillman Water Reclamation Plant                                                                                                    | 80              | 702.6 - 713.0                         |
| 19. Balboa Sports Center                                                                                                                         | 80              | 703.0 - 715.0                         |
| 20. Balboa Boulevard (lowest elev.<br>near Los Angeles River; highest<br>elev. at Victory Boulevard)                                             |                 | 704.2 - 725.1                         |
| 21. Highest Reservoir Surface of<br>Record, 2/16/90                                                                                              |                 | 705.1                                 |
| 22. Hayvenhurst Avenue (lowest elev.<br>at Burbank Blvd.)                                                                                        |                 | 705.7 - 716 <sup>b</sup>              |
| 23. Headquarters Building, Sepulveda<br>Golf Course: Basement Floor (many<br>golf carts stored)                                                  |                 | 708.3                                 |
| 24. Parking Lot for Woodley Golf Course<br>and Bicycle Trail                                                                                     | 7               | 708.7 - 719.3                         |
| 25. Hayvenhurst Avenue Field (Exline<br>Little League)                                                                                           | 13              | 708.8 - 719.1                         |
| 26. Strawberries and Corn Stand (south-<br>west of corner, Burbank Blvd. and<br>Hayvenhurst Avenue)                                              |                 | 709.5                                 |
| 27. Hayvenhurst Avenue Offramp from<br>Ventura Freeway (U.S. 101) Westbound                                                                      |                 | 709.9 - 725.0                         |
| 28. Spillway Crest (crest gates raised)                                                                                                          |                 | 710.0                                 |
| 29. Franklin Field (Little League,<br>Velodrome)                                                                                                 | 33 <sup>c</sup> | 710.2 - 723.9                         |
| 30. Burbank Boulevard and Balboa Boulevard                                                                                                       |                 | 711.8                                 |
| 31. Residential private property: front<br>yard, southeast corner, McLellan Ave.<br>and Burbank Blvd. (lowest such<br>elevation upstream of dam) |                 | 711.9                                 |

<sup>b</sup> Approximate elevation at southern end of reservoir lands.

<sup>c</sup> Area of lease is 28.3 acres.

Table 2-03. (Continued)

| Name of Facility<br>or Reference                                                                                                                                 | Area<br>(acres) | Range of<br>Elevations<br>(ft., NGVD) |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------|---------------------------------------|
| 32. Spillway gates begin to lower                                                                                                                                |                 | 712.0                                 |
| 33. Garden Center                                                                                                                                                | 16              | 712.2 - 719.7                         |
| 34. 100-Year Flood Water Surface Elevation                                                                                                                       |                 | 712.2                                 |
| 35. Encino Velodrome (part of<br>Franklin Field)                                                                                                                 |                 | 712.4 <sup>d</sup> - 723.2            |
| 36. Hayvenhurst Avenue Onramp to Ventura<br>Freeway (U.S. 101) Eastbound                                                                                         |                 | 713.0 - 727.0                         |
| 37. Magnolia Avenue (lowest elev. at<br>Hayvenhurst Ave.)                                                                                                        |                 | 713.1 - 716 <sup>e</sup>              |
| 38. Valley Region Office and Service Yard                                                                                                                        | 4.5             | 713.3 - 715.1                         |
| 39. Standard Project Flood Water Surface<br>Elevation                                                                                                            |                 | 713.5                                 |
| 40. Residential private property: first<br>floor of dwelling, southeast corner,<br>McLellan Ave. and Burbank Blvd.<br>(lowest such elevation upstream<br>of dam) |                 | 713.8                                 |
| 41. Pro Shop (at Sepulveda Golf Course<br>Hdqtrs. Bldg.)                                                                                                         |                 | 714.0                                 |
| 42. Valley Christian League Fields<br>(Little League)                                                                                                            | 23              | 716.4 - 720.0                         |
| 43. Probable Maximum Flood Water Surface<br>Elevation                                                                                                            |                 | 716.7                                 |
| 44. Encino Inn Restaurant: floor (part of<br>Sepulveda Golf Course Headquarters Bldg)                                                                            |                 | 716.7                                 |

<sup>d</sup>Closed basin below 716.0 feet (not exposed to water from reservoir until reservoir surface exceeds 716.0 feet).

<sup>e</sup>Approximate elevation at Petit Avenue (west end of reservoir lands).

Table 2-03. (Continued)

| Name of Facility<br>or Reference                                                                                                                                                           | Area<br>(acres) | Range of<br>Elevations<br>(ft., NGVD) |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------|---------------------------------------|
| 45. Victory Boulevard Fields<br>(Senior Division Little League)                                                                                                                            | 9               | 717.2 - 718.9                         |
| 46. Commercial property: first floor,<br>southwest corner, Burbank and Balboa<br>Blvds, AND north side of Victory Blvd.<br>near Woodley Avenue (lowest such<br>elevations upstream of dam) |                 | 718.6                                 |
| 47. California National Guard Building,<br>south side of Victory Blvd. near<br>Encino Avenue                                                                                               |                 | 720 <sup>f</sup>                      |
| 48. U.S. Navy and Marine Reserve Building,<br>southwest of Victory and Balboa Blvds.                                                                                                       |                 | 720 <sup>f</sup>                      |
| 49. Air National Guard: Reserve Training and<br>Communication Center Installation                                                                                                          |                 | 720 <sup>f</sup>                      |
| 50. Railroad Track around Northeast End of<br>Dam                                                                                                                                          |                 | 721.7                                 |
| 51. Top of Dam: Design elevation<br>Actual range of elevations                                                                                                                             |                 | 725.0<br>723.1 - 725.5 <sup>g</sup>   |
| 52. Informal Park/Multi-purpose Play<br>(CURRENTLY UNDER CONSTRUCTION)                                                                                                                     | 280             | h - h                                 |
| 53. Community Tennis/Gym Center<br>(FUTURE FACILITY)                                                                                                                                       | 20              | h - h                                 |
| 54. Neighborhood Recreation (FUTURE<br>FACILITY)                                                                                                                                           | 10              | h - h                                 |
| 55. Sepulveda Fire Station of Magnolia                                                                                                                                                     | 9               | h - h                                 |

<sup>f</sup>Approximate elevation.

<sup>g</sup>The decrease in elevation of the northeastern embankment to as low as 723.7 feet reflects settlement that has taken place since the Dam was completed in December 1941 (data obtained from December 1980 topographic survey of the reservoir, and from ongoing Settlement Study, consisting of periodic elevation surveys of the dam, 1941-1985).

<sup>h</sup>Exact range of elevations not yet determined.



Photo No. 2-01. Los Angeles River, with Sepulveda Dam and Reservoir (view from downstream of dam, taken 5/6/75).

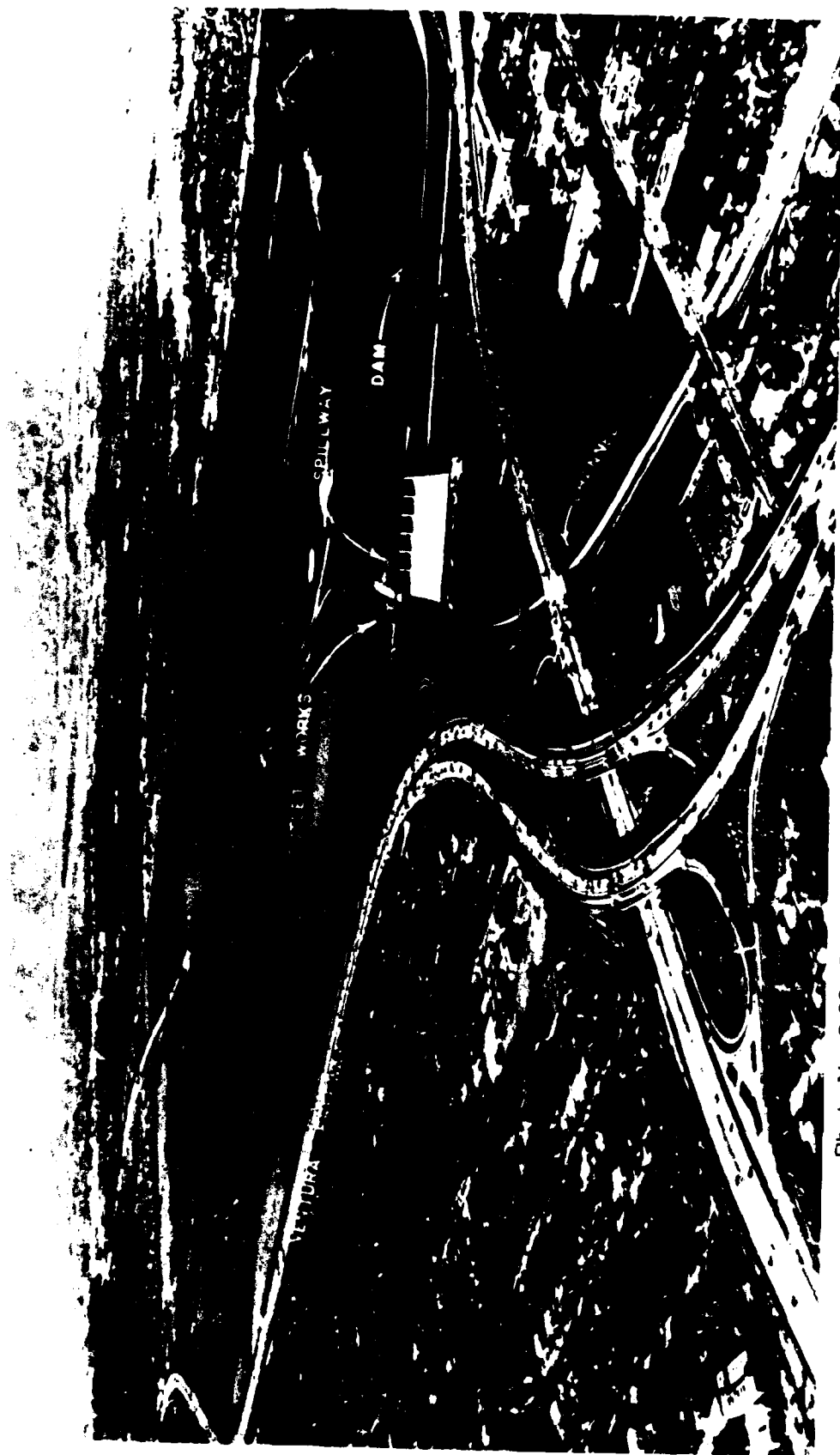


Photo No. 2-02. Sepulveda Dam, Reservoir, and Los Angeles River Channel  
(view from downstream of dam, taken between 1962 and 1970).

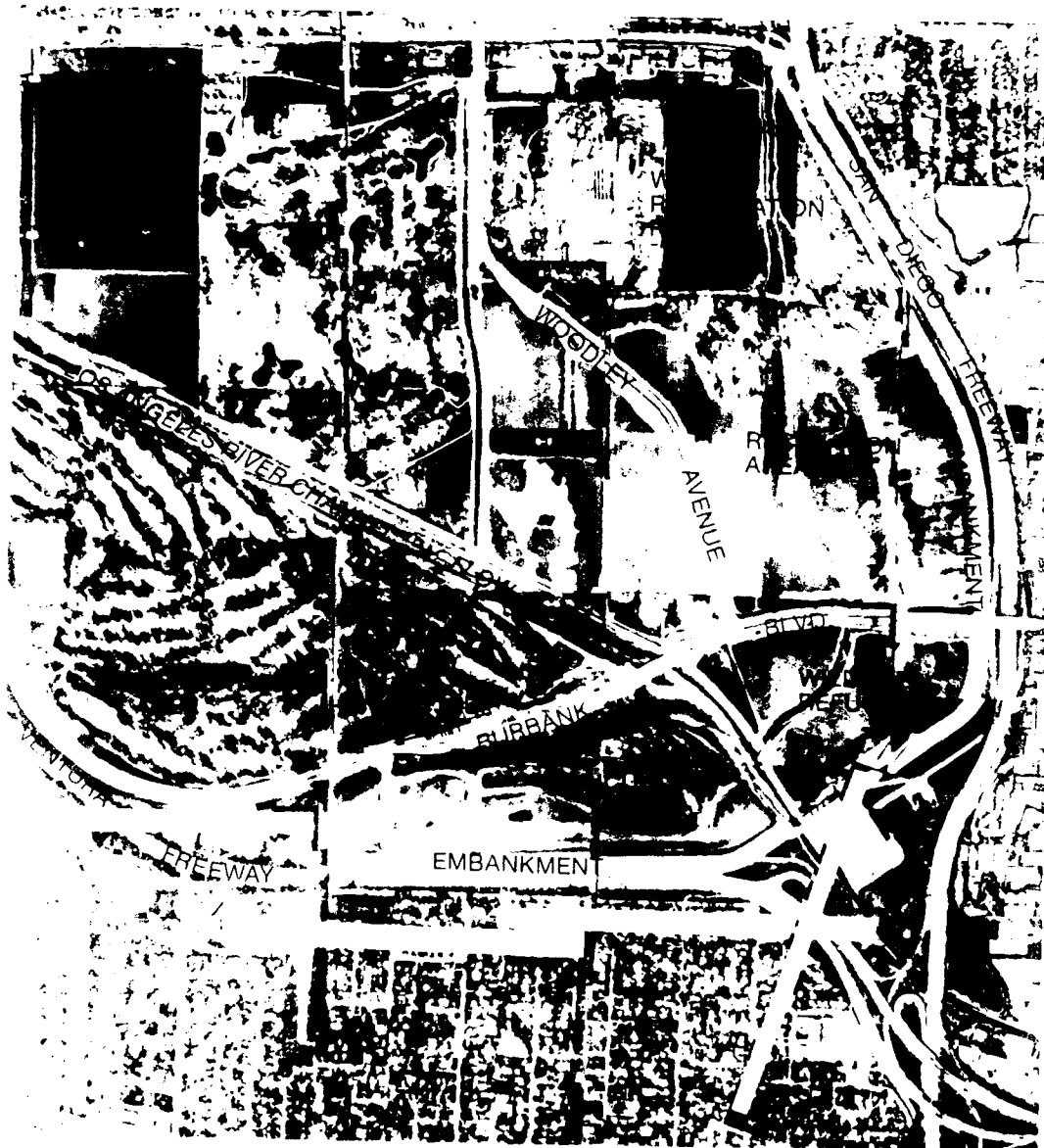


Photo No. 2-03. Sepulveda Flood Control Basin (aerial composite, taken 12/16/82).



Photo No. 2-04. Sepulveda Dam (enlargement of Photo No. 2-03).





Photo No. 2-05. Sepulveda Dam, with Control House (left) and Spillway (view from downstream, along Ventura Freeway).



Photo No. 2-06. Sepulveda Dam (view from upstream, within reservoir).



Photo No. 2-07. Upstream Slope of Dam Southwest of Outlet Works (view toward southwest, from outlet works).

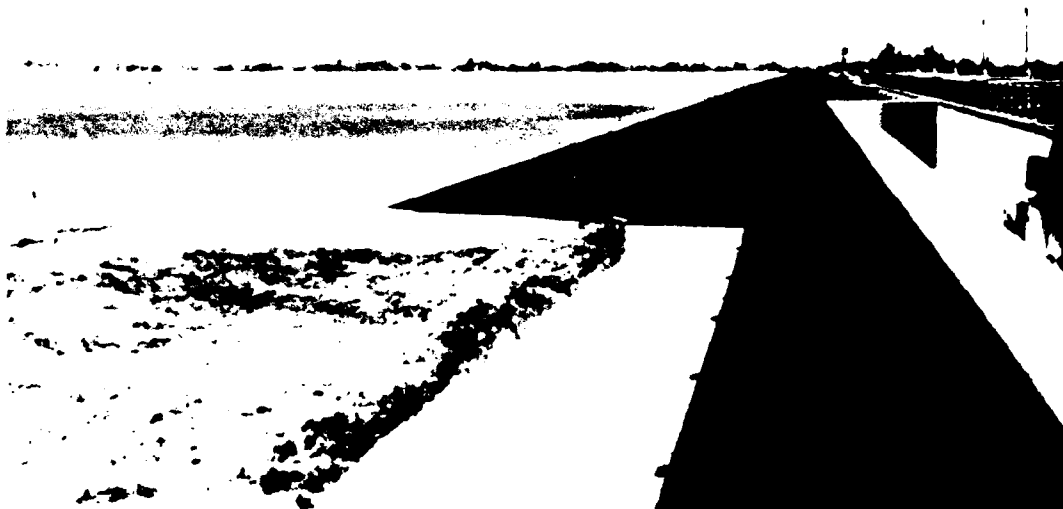


Photo No. 2-08. Upstream Face of Dam Northeast of Spillway (view toward northeast, from spillway bridge).



Photo No. 2-09. Upstream Slope of Dam Northeast of Spillway (view toward south, from east embankment of dam.)



Photo No. 2-10. Control House (right) and Spillway (view from upstream, with reservoir.)



Photo No. 2-11. Control House and Outlet Works, with Spillway to left (view from upstream, within reservoir, along approach channel)



Photo No. 2-12. Los Angeles River: Approach Channel to Outlet Works, with portion of spillway approach to right (view toward upstream from bridge above outlet works).

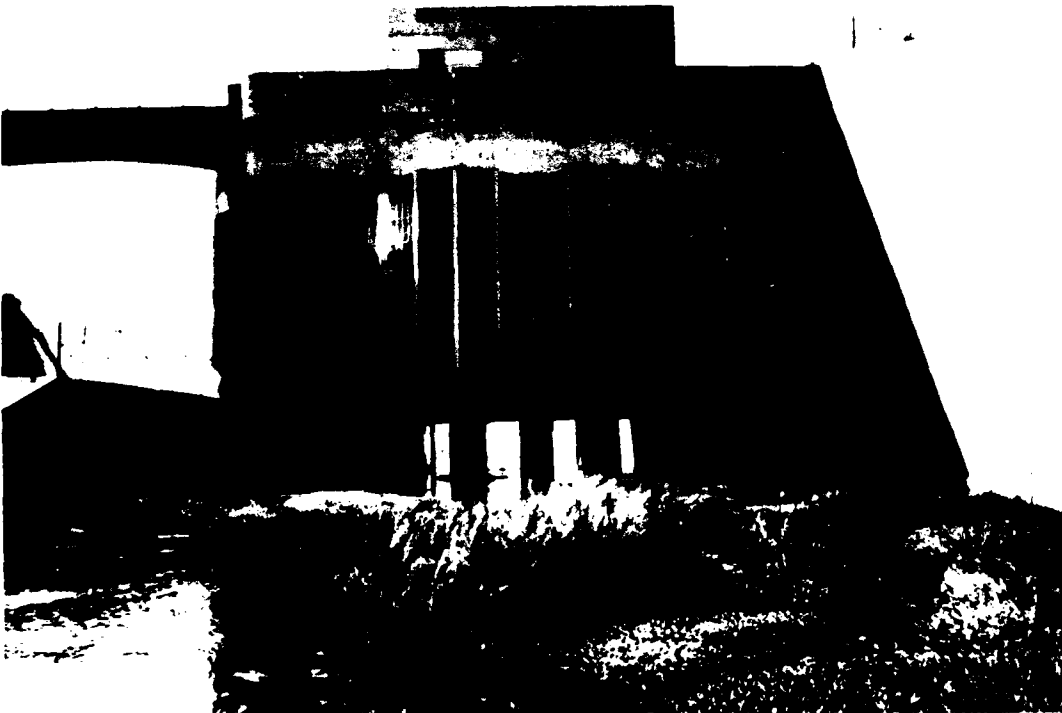


Photo No. 2-13. Outlet Works (gates fully open), with edge of spillway to left (view from channel upstream).



Photo No. 2-14. Approach to Outlet Works (gates partially open)  
(view from channel upstream).

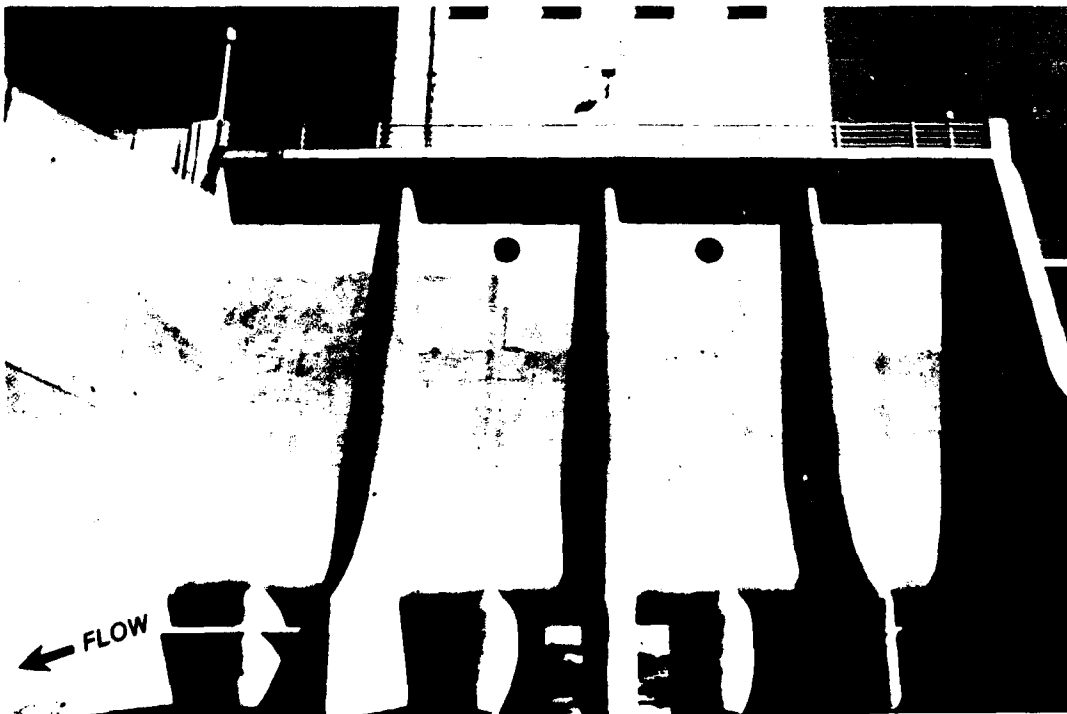


Photo No. 2-15. Outlet Works (center gates fully open)  
(view from channel downstream).



Photo No. 2-16. Outlet Works (all gates open), with edge of Spillway to right (view from alongside channel downstream).

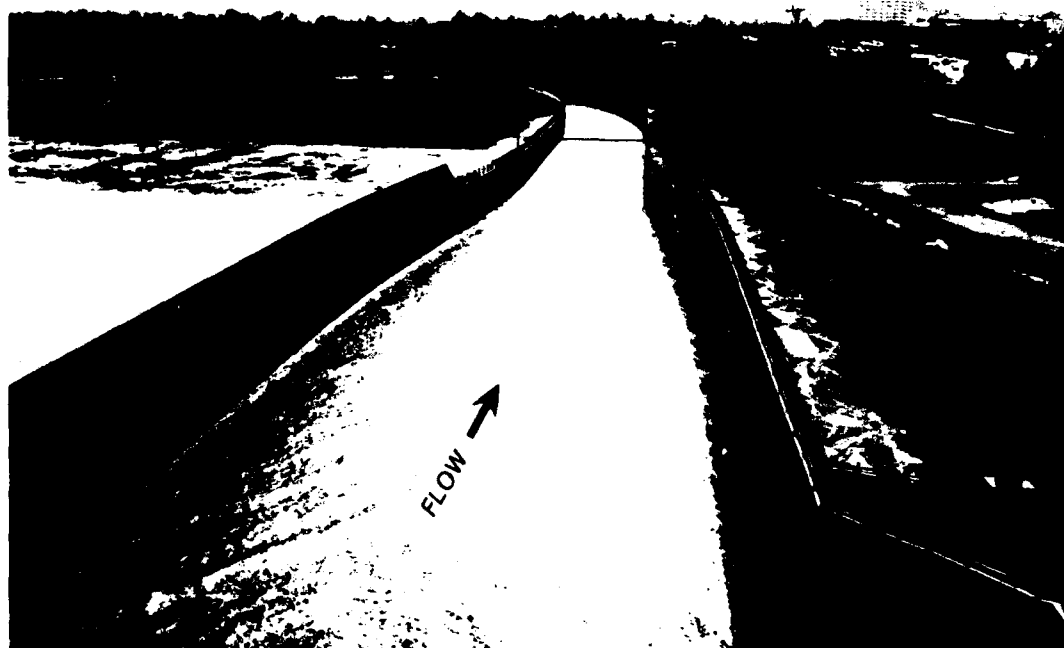


Photo No. 2-17. Los Angeles River: Outlet Channel, with Spillway Apron on left (view toward downstream from bridge above outlet works during high outflows of February 1980).

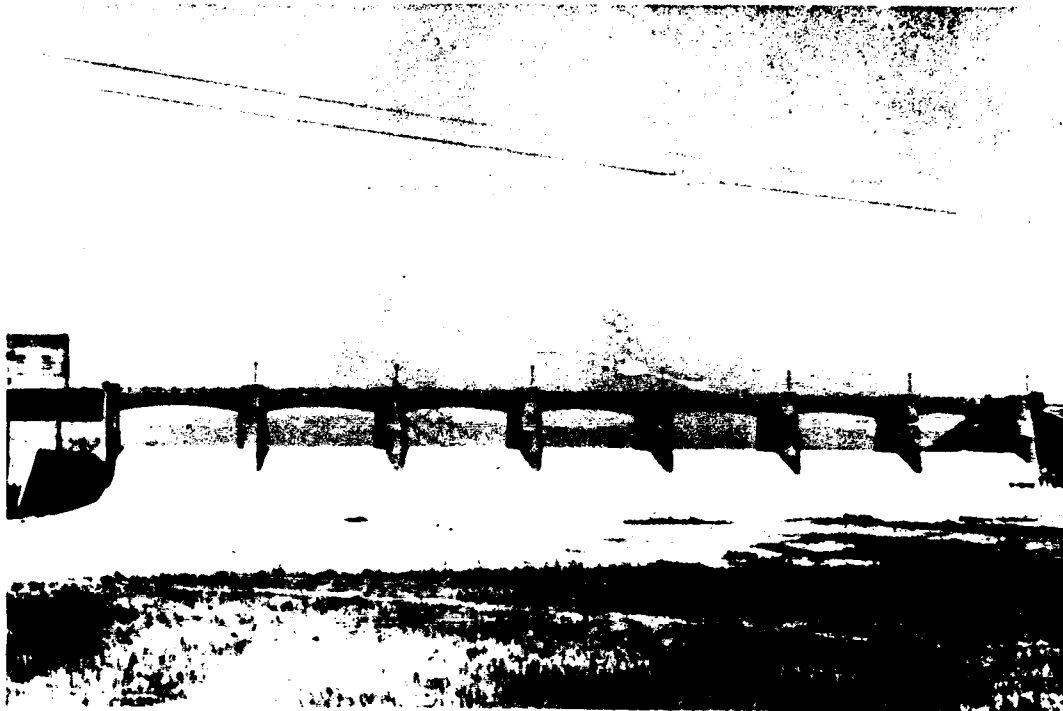


Photo No. 2-18. Spillway (Ogee type), with Control House and Outlet Works on left (view from downstream, below spillway apron).

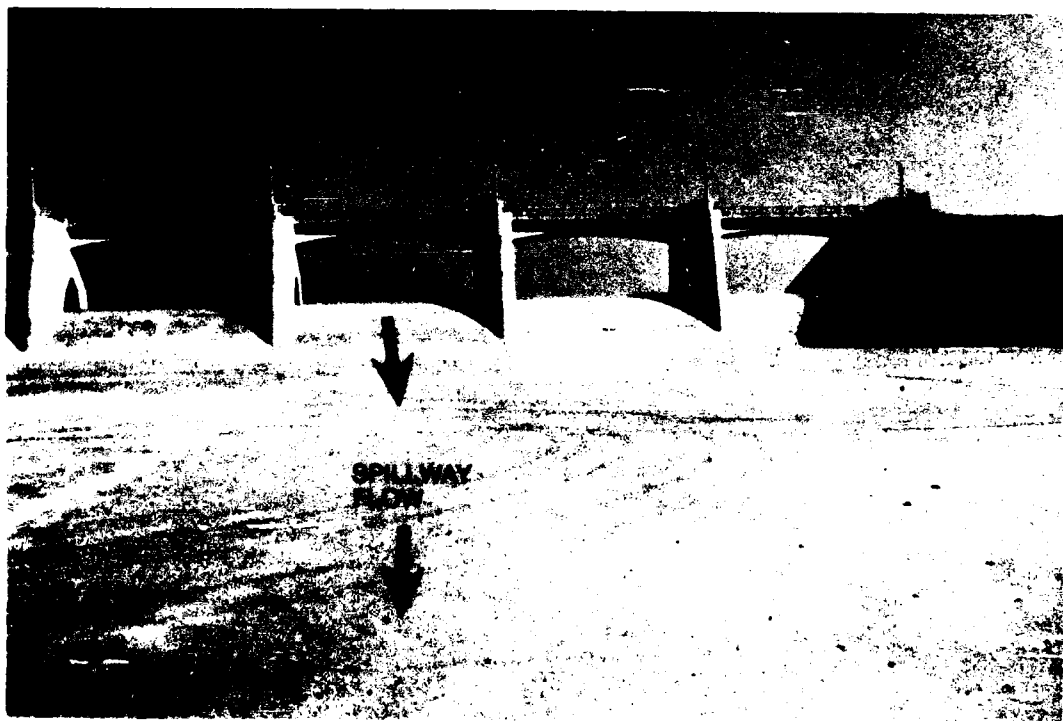


Photo No. 2-19. Spillway Apron (Spillway Outlet Channel), with portion of spillway in background (view from downstream, atop spillway apron).



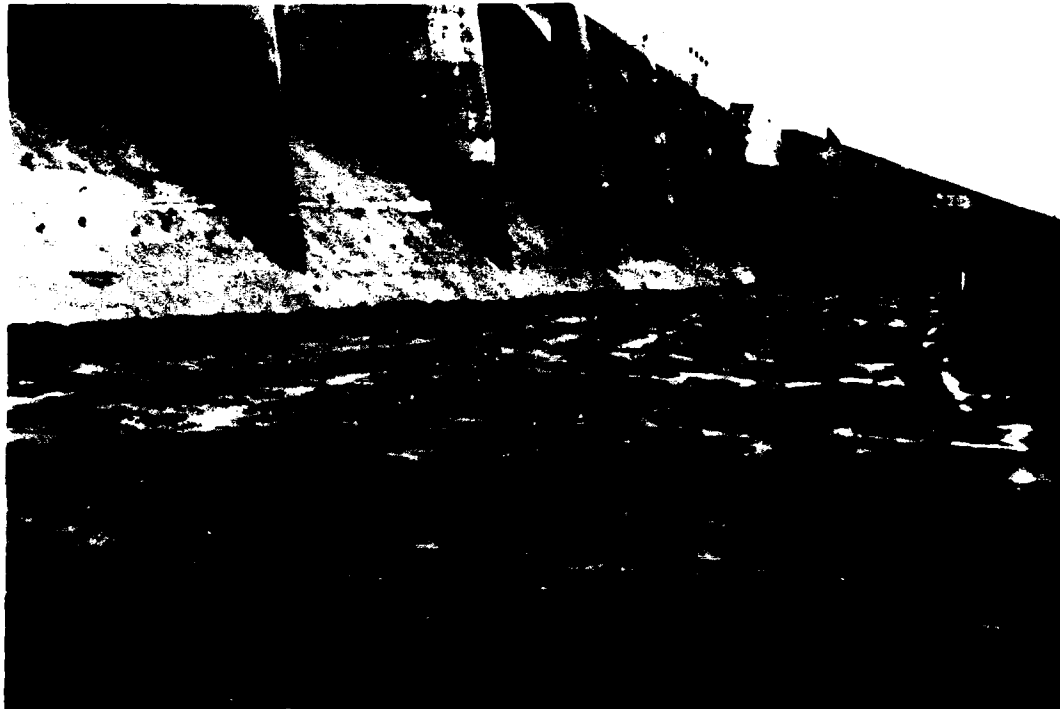


Photo No. 2-20. Approach to Spillway, with Spillway at left (view from approach slab to spillway, looking toward southwest).



Photo No. 2-21. Spillway Gate in Lowered Position (view from spillway bridge, with reservoir to left).

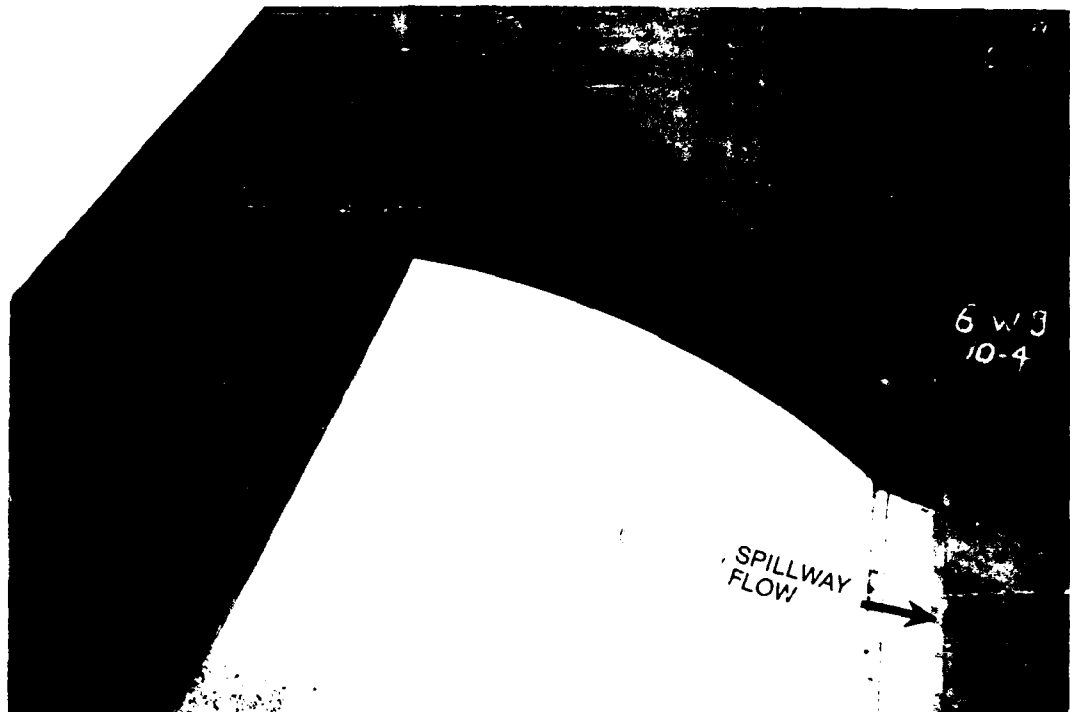


Photo No. 2-22. Spillway Gate Partially Raised (during test operation of spillway gates) (view from spillway bridge, with reservoir to left).

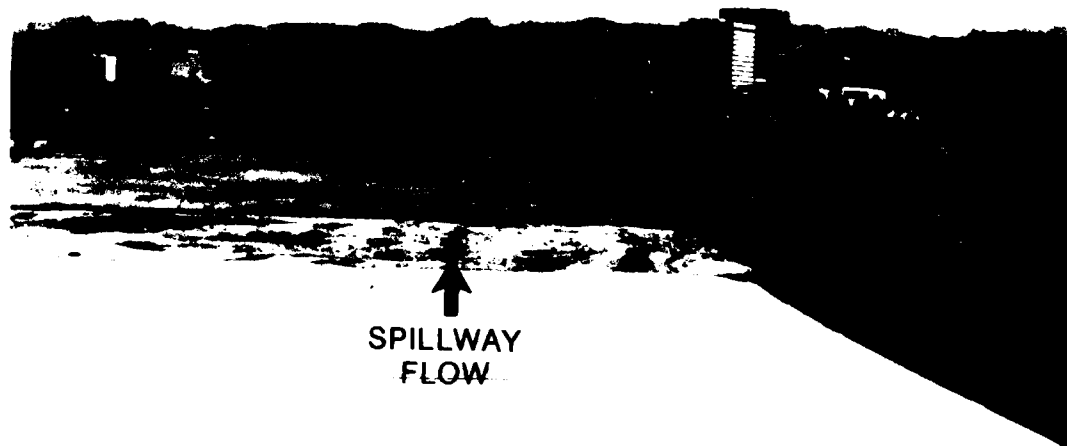


Photo No. 2-23. Spillway Apron, with Outlet Channel to right (view from spillway bridge, toward downstream).



Photo No. 2-24. Landscaped recreation area within reservoir  
(view toward south from near northeast end of dam).



Photo No. 2-25. Wildlife Pond (view from within reservoir,  
looking downstream toward southeast).



Photo No. 2-26. Donald C. Tillman Water Reclamation Plant (view toward northwest from atop plant building, located in northeastern portion of reservoir)



Photo No. 2-27. Japanese Garden (constructed as mitigation for the Donald C. Tillman Water Reclamation Plant)

### III - HISTORY OF PROJECT

#### 3-01. Authorization

The construction and operation of Sepulveda Dam and other flood-control projects in Los Angeles County by the U.S. Army Corps of Engineers are authorized by several Acts of Congress: the Emergency Relief Appropriation Acts of 8 April 1935 and 8 April 1936; and the Flood Control Act of 22 June 1936 (PL 74-738), as amended by the Acts of 15 May 1937 and 28 June 1938 (PL 75-761); plus the Flood Control Act of 18 August 1941 (PL 77-228).

#### 3-02. Planning and Design

The need for flood control in the coastal drainages of Los Angeles County was recognized before 1900, but really began to grow after the floods of January and February 1914. On 12 June 1915, Los Angeles County Flood Control District (now Los Angeles County Department of Public Works, Hydraulic Division) was created. This new County agency worked with the Corps of Engineers, Los Angeles District, on various minor flood control projects, but it was not until two decades later that major flood control construction projects were given serious consideration.

The major flood of 1 January 1934 emphasized the need for major flood control projects in southern California, and the Federal Depression-relief jobs programs provided the financial vehicle for comprehensive construction programs.

In 1935 and 1936, the Corps of Engineers, Los Angeles District, and Los Angeles County Flood Control District became partners in a large Works Progress Administration contract to design a comprehensive flood control plan for Los Angeles County. The Flood Control Act of 1936 changed the Civil Works mission of the Corps of Engineers from one of temporary status (designed to relieve unemployment during the Depression), to one of permanent responsibility for flood control.

During the next three years, a comprehensive flood control system for the Santa Ana, San Gabriel, and Los Angeles Rivers and their tributaries was designed. This included a Definite Project Report for the control of Los Angeles River, submitted in December 1936.

The severe storm and flood of February-March 1938 provided additional impetus for the need for a comprehensive flood control program in southern California, and it provided excellent rainfall and runoff data for use in new design criteria and as verification for existing design criteria.

Increasing hostilities overseas in 1938 and 1939 created still another aspect of flood-control--its importance to national defense through the need to protect defense industry facilities that were subject to flooding.

One of the components of the comprehensive flood control system under consideration for southern California was a large dam and reservoir on the main stem of the Los Angeles River in the San Fernando Valley. Several sites for this structure were examined, and the one ultimately selected was considered to be a best overall combination as to effectiveness, cost, and minimum disruption to existing dwellings, utilities, railroads, and other facilities (see table 1-01: Survey Report, Sepulveda Dam (January 1940) and Analysis of Design, Vol. I, Sepulveda Dam (August 1939, rev. October 1941)). The dam that was to be built on this site was named Sepulveda because of its location.

### 3-03. Construction

After approval of the final designs, construction on Sepulveda Dam was authorized, and work began on 31 December 1939. The crest gates and the outlet gates were completed in July 1941, and construction of the embankment and appurtenant concrete structures was completed on 30 December 1941. The cost of the project, which was financed by Federal funds, was \$6,650,561.

At the time that Sepulveda Dam was completed, the downstream channel capacity on the Los Angeles River was 7,100 cfs. A major channel improvement project, conducted in 1951-1953, increased the channel capacity to 16,900 cfs.

### 3-04. Related Projects

Sepulveda Dam is one component of a large Los Angeles County Drainage Area system of flood control dams and improved river channels. The operating agencies and major features of six reservoirs that directly affect the Los Angeles River (in addition to Sepulveda Dam), plus four other reservoirs in this system, are discussed in Sections 4-10 and 4-11 of this manual.

In addition to the facilities discussed in the above mentioned sections, there is an old dam on the upstream Browns Canyon Wash that is now completely filled with debris and thus functions merely as a waterfall. Its origins are unknown, according to the Los Angeles County Department of Public Works' historians.

### 3-05. Modifications to Regulations

At the time of construction of Sepulveda Dam in 1941, the downstream channel of the Los Angeles River had a capacity of about 7,100 cfs. Therefore, the initial water-control plan limited releases from Sepulveda Dam to 7,100 cfs or less, depending upon downstream tributary flow. In 1953 the U.S. Army Corps of Engineers improved the downstream channel, developing a capacity of about 16,900 cfs. Accordingly, the water control plan was then revised to allow release rates as high as the new channel capacity. Within this upper limit, the operating criteria for Sepulveda Dam were based strictly upon reservoir water surface elevation criteria, irrespective of downstream channel

conditions. Those basic criteria were applied for use in this manual (see Exhibit A), with additional options to consider real-time storm and channel conditions and available forecast information.

### 3-06. Principal Regulation Problems

There have been no major problems in the regulation of Sepulveda Dam since construction was completed in 1941. The dam has never spilled; there have never been any structural deficiencies or major hydraulic malfunctions. The dam has performed very adequately since its construction.

During the storms and impoundments of January 1943 and February 1944 (see Sections 8-02.c.(1) and (2)), the trash racks became clogged from excess debris accumulation, impeding flow through the outlet works. The condition was remedied in November and December 1944, when the racks were modified below elevation 687.5 feet by the removal of some of the frames and I-beams.

## IV - WATERSHED CHARACTERISTICS

### 4-01. General Characteristics

The drainage area of the Los Angeles River and its tributaries above Sepulveda Dam is 152 square miles, comprising the westernmost portion of the Los Angeles County Drainage Area (pl. 2-02), and covering virtually the entire San Fernando Valley and surrounding mountain slopes west of Interstate Highway 405 (San Diego Freeway) (pl. 2-03).

The drainage area boundary on the south is formed by the Santa Monica Mountains; on the west, by the Simi Hills; on the north, by the Santa Susana Mountains; and on the east by a line extending approximately north and south across the valley and generally along the San Diego Freeway (pl. 2-03).

The headwaters of the Los Angeles River are in the Simi Hills on the west, formed by Chatsworth Creek, Dayton Canyon Wash, Bell Creek, and Arroyo Calabazas (pl. 2-03). Other major tributaries above Sepulveda Dam include Devil Canyon, Brown's Canyon, Limekiln Canyon, Wilbur, and Aliso Canyon Washes; and Caballero and Bull Creeks. The longest watercourse above the dam is Devil Canyon-Brown's Canyon-Los Angeles River (See pls. 2-03 and 4-03). This watercourse is about 19 miles long with an average slope of 143 feet per mile.

### 4-02. Topography

Approximately 83 square miles of the drainage basin above Sepulveda Dam is of relatively steep, mountainous terrain, and about 67 square miles is of comparatively flat valley floor. Elevations in the valley vary from 668 feet at the base of the dam to about 1,200 feet at the base of the foothills. The average elevation of the Santa Monica Mountains is about 1,700 feet, NGVD; that of the Simi Hills is about 1,800 feet, NGVD; and that of the Santa Susana Mountains is about 2,000 feet, NGVD. The highest point in the drainage area is San Fernando Peak, in the Santa Susana Mountains, having an elevation of 3,741 feet, NGVD.

### 4-03. Geology and Soils

The dam is located in the San Fernando Valley which lies between the Santa Susana and San Gabriel Mountains to the north, the Santa Monica Mountains to the south, the Verdugo Hills to the east and the Simi Hills to the west. The valley is approximately 20 miles in length and ranges in width from 2 to 12 miles.

The San Gabriel, Verdugo, Santa Susana, and Santa Monica Mountains are part of the Traverse Ranges. The San Gabriel Mountains are generally composed of Mesozoic and older igneous and metamorphic rock. The Verdugo Mountains are in an uplifted sliver of crystalline rock, along the south side of the San Gabriel Mountains. The Santa Monica Mountains are composed mainly of Cretaceous to Miocene sedimentary and



volcanic rock. The Santa Susana Mountains are composed mainly of Miocene to Pleistocene marine and non-marine sedimentary rock. The adjacent Santa Susana Knolls are composed of upper Cretaceous marine sedimentary rock.

The greater part of the San Fernando Valley is overlaid by Recent Alluvium, consisting of unconsolidated and unweathered, poorly graded clay, silt, gravel, and boulders. The eastern half of the plain is largely dominated by Tujunga Wash and contains coarser alluvium than is found in the central and western parts. The material is chiefly of granitic origin. Along the Los Angeles River above the confluence with Tujunga Wash the alluvium is notably lacking in boulders and in appreciable quantities of coarse gravel. The dam site is almost entirely covered by Recent Alluvium composed of relatively fine material.

Between one and two miles west (upstream) from the spillway site there is a low, topographic ridge lying about midway between the river and Ventura Boulevard. This ridge is nearly a mile long, east and west, and is covered at both ends with older alluvium. About two miles east (downstream) from the spillway site and on the north side of the river there is a somewhat longer east-west ridge along which older alluvium is exposed. Elsewhere throughout the valley, particularly in the northern part, there are numerous small terraces of older alluvium at elevations somewhat above that of recent deposits. These terraces have been raised above the general level of present deposition and are now covered by a reddish-brown soil typical of older alluvium. Recent and older alluvium comprise the unconsolidated formations found within the valley. Both are continental deposits of Quaternary Age.

Underlying the unconsolidated alluvium formations are the Tertiary (Miocene) shales and sandstones which form the bedrock of this area. The top of bedrock ranges in depth from surface exposures south of Ventura Boulevard to more than 400 feet below the general ground level along Vanowen Street. Several deep wells have been drilled in the vicinity in which bedrock was penetrated to depths of several hundred feet. In general, the strike of this bedrock surface is parallel to the course of the Los Angeles River and the dip is northeasterly. The only outcrop of bedrock near the proposed site and north of Ventura Boulevard is at the central part of the low ridge previously mentioned as lying upstream from the spillway site. This outcrop of consolidated formation is classified as Tertiary (Miocene) shale, and lies between the two exposures of older alluvium which occupy either end of the same ridge. Its isolated position is due to an upthrust movement of formations north of the covered fault line parallel to the ridge.

#### 4-04. Sediment

Sediment production within the drainage area above Sepulveda Dam varies considerably, according to terrain. In the urbanized valley areas, production is at a minimum, and has been decreasing over the years as the percentage of urbanization has increased. In the steep and

largely unurbanized mountain and foothill areas, sediment production is significant, particularly during periods of recurring heavy rains, and especially great after a severe brush or forest fire. Upstream reservoirs and debris basins intercept part of this sediment load (see pl. 2-03).

A 1969 report by the U.S. Army Corps of Engineers, Los Angeles District entitled, Draft: Sedimentation Studies for Sepulveda Flood-Control Basin, June 1961 Survey (September 1969) indicates that between November 1944 and June 1961, a total of 141 acre-feet of sediment was deposited into Sepulveda Reservoir. This represents 0.8 percent of the total available storage to elevation 710 feet (spillway crest with crest gates raised). See table 4-11.

The rate of sediment accumulation in Sepulveda Reservoir, according to surveys (see table 4-11) appears to be relatively minor, and is thus considered insignificant to the viability of the project's flood control function.

#### 4-05. Climate

The climate of the drainage area above Sepulveda Dam is generally temperate and semi-arid, with warm, dry summers and mild, moist winters.

a. Temperature. Average daily minimum/maximum winter temperatures (degrees Fahrenheit) range from about 40/65 on the valley floor to about 35/55 in the surrounding mountains. The corresponding summer figures are about 65/95 and 60/85 respectively. All-time low/high extremes of temperatures are about 10/120 in portions of the valley and about 5/110 in the mountains.

Table 4-01 shows average and extreme temperature data for Burbank, California (located about 9 miles east of Sepulveda Dam)--the nearest station with complete climatological data. The regular U.S. Weather Bureau station at Burbank was closed in 1965, so the climatological data in table 4-01 extends only through 1964.

b. Precipitation. Plate 4-01 shows the normal annual precipitation over the Sepulveda drainage and surrounding areas. Within the Sepulveda drainage itself, normal annual precipitation ranges from less than 15 inches over much of the valley floor to more than 22 inches atop both the Santa Susana Mountains to the north and the Santa Monica Mountains to the south.

Table 4-01 lists the mean and maximum observed monthly precipitation for Burbank, California. Table 4-02 lists the same for Sepulveda Dam and for three stations within the Sepulveda drainage basin. This table shows that there can be great year-to-year variability in monthly, as well as annual, precipitation. Not listed in these tables are the minimum observed monthly precipitation values, which for each station are at most 0.01 or 0.02 inches for every month of the year.

Table 4-03 is a precipitation depth-duration-frequency tabulation for the centroid of the watershed above Sepulveda Reservoir. In it are listed the computed point-value precipitation depths for durations of from 5 minutes to 24 hours, and for return periods from 2 years to 100 years. Data for this table were obtained from the National Oceanic and Atmospheric Administration publication, NOAA Atlas 2.

(1) Winter Storms. Most precipitation in southern California coastal drainages occurs during the cool season, primarily from November through early April, as mid-latitude cyclones from the north Pacific Ocean occasionally move across the West Coast of the United States to bring precipitation to southern California. Most of these storms are of the general winter type, with hours of light to moderate steady precipitation, but with occasional heavy showers or thunderstorms. Plate 4-02 depicts the time distribution of precipitation during the intense winter storm of 16-17 February 1980 at Sepulveda Dam and in the upstream watershed.

(2) Summer Storms. Two other types of storms can affect southern California, although they are relatively rare.

(a) Local Thunderstorms. During humid periods between July and September, the deserts and eastern mountains of southern California experience occasional thunderstorms. On a few occasions, these can drift westward into the coastal drainages, including the Sepulveda watershed. These thunderstorms can at times result in very heavy rain for short periods of time over small areas.

(b) General Storms. General summer storms in southern California are quite rare; but on occasion a tropical storm from off the west coast of Mexico can drift far enough northward to bring rain, occasionally heavy, to southern California (sometimes with very heavy thunderstorms embedded). The season in which these storms are the most likely to significantly affect southern California is mid August through early October, although there have been some effects in southern California from tropical storms as early as late June and as late as early November.

On rare occasions, southern California has received light rain from non-tropical general summer storms, some of which have exhibited some characteristics of general winter storms.

c. Snow. Snow in southern California is relatively uncommon at elevations below 6,000 feet and is extremely rare below 2,000 feet. Although even the valley floor has experienced light snow on isolated occasions, snowfall and snowmelt are not considered to be a significant hydrologic factor in the Sepulveda drainage.

d. Evaporation. Few formal studies of evaporation have been made in the San Fernando Valley; and since Sepulveda Reservoir is normally dry, with any impoundment generally lasting less than 24 hours, evaporation is not a major consideration at this site. Studies for

nearby locations indicate that mean daily evaporation ranges about one-quarter inch in winter to about one-half inch in summer. On days of very strong, dry Santa Ana winds, evaporation can be considerably greater than one inch.

e. Wind. The prevailing wind in the San Fernando Valley is the sea breeze. This gentle onshore wind is normally strongest during late spring and summer afternoons, with speeds in the western San Fernando Valley typically 10 to 15 mph.

The Santa Ana is a dry desert wind that blows from out of the northeast, most frequently during late fall and winter. This type of wind does not normally occur when water is impounded behind Sepulveda Dam. The characteristic very low humidities and strong gusts of Santa Anas (which can exceed 70 miles per hour at times) usually create very high fire hazards, but can also be instrumental in drying a saturated watershed, thus reducing the flood hazard.

Rainstorm-related winds are the next most common type in southern California. Winds from the southeast ahead of an approaching storm average 20-30 mph, with occasional gusts to more than 40 mph. West to northwest winds behind storms can sometimes exceed 35 mph, with higher gusts.

#### 4-06. Storms and Floods

All of the major inflow and impoundment events in the history of Sepulveda Dam have been the result of general winter storms.

Prior to the construction of the dam, there were a number of major storms and floods on the Los Angeles River, including those of January 1862, February and March 1884, January and February 1914, January 1916, December 1921, February 1927, December 1933 - January 1934, and February - March 1938. There was also one significant summer tropical storm that occurred in September 1939, but no widespread flooding on the Los Angeles River resulted from this event.

a. Storm and Flood of February - March 1938. The flood of 27 February - 3 March 1938 was the most destructive of record on the Los Angeles River and several other streams of southern California, and its occurrence played a major role in the justification for the construction of Sepulveda Dam.

The storm developed as a series of low-latitude north Pacific disturbances and brought several bands of very heavy rain to southern California during a 5-day period. The intense band occurring during 1-2 March produced a peak flow of 11,600 cfs on the Los Angeles River at Van Nuys Boulevard (about 1.8 miles below the Sepulveda Dam site--see pl. 2-04), with a total volume of runoff for the 5-day storm estimated to be 16,400 acre-feet at that location. This flow combined with heavy runoff from the Tujunga Wash and other tributaries to produce a very destructive flood on the Los Angeles River through the southeastern San Fernando Valley, downtown Los Angeles, and downstream locations.

b. Storms and Floods since 1941. Several of the major storms and floods that have occurred on the Los Angeles River since the completion of Sepulveda Dam in 1941 are discussed in Section 8-02 of this manual.

#### 4-07. Runoff Characteristics

Runoff from the watershed is characterized by high flood peaks of short duration that result from high-intensity rainfall on the urban watershed. The time of concentration at the dam site is 1.5 hours. Flood hydrographs are typically of less than 12 hours' duration and are always less than 48 hours' duration. Inflow rates drop rapidly between storms, and inflow during the dry summer season is approximately 65 cfs due to outflow from the Donald C. Tillman Water Reclamation Plant. Long-term average inflow to Sepulveda Dam for the period 1930 through 1979 is reported by the U.S. Geological Survey as 24,920 acre-feet per year (or 34.4 cfs). Table 4-04 lists historic peak inflows to the Sepulveda Dam site from 1930 to 1987. Table 4-05 lists the annual maximum of inflows, outflows, and capacity (storage), elevation, and surface area at Sepulveda Dam from 1942 through 1987.

The greater Los Angeles area has historically experienced long-term wet and dry periods. Plate 4-03 illustrates the historic regional response of flood peaks from the 1870's to the 1970's.

Increasing urbanization and upstream channelization have caused inflow peaks and volumes to rise dramatically in recent years. Most of the valley area is urbanized, with a high percentage of the ground surface covered by paving or structures. Urbanization continues to increase in the western San Fernando Valley, but at a somewhat slower rate than that which occurred between 1950 and 1975. In the residential areas, much of the uncovered soil is under cultivation by grasses, trees, and plants. There remains a small and decreasing amount of commercial agriculture in the valley, especially in the far western portions. The small and diminishing amount of uncultivated native vegetation remaining in the valley consists of grass and scattered shrubs. The watershed currently has about 35 percent impervious cover. Plate 4-04 shows the historical increases in impervious cover over the past 50 years. An increase to about 45 percent impervious cover is projected for the year 2030.

Plate 4-05 shows the historic increase at peak inflow in response to watershed urbanization changes. Average annual peak inflow has risen from approximately 2,000 cfs in 1930 to about 12,000 cfs in 1980, and is expected to continue to rise more moderately over the next 50 years.

Table 4-06 summarizes the effect of watershed urbanization on increasing peak and volume characteristics of reservoir inflow.

For the period of 1970 to 1985 the median annual inflow was 62,797 acre-feet. Table 4-07 provides average monthly inflows for the 1970 to 1988 period. These values are considered representative of current 1987 conditions.

Plate 4-06 presents an inflow frequency curve computed for present watershed conditions and an outflow frequency curve computed for the present operating criteria. Plate 4-07 is an elevation frequency curve for Sepulveda Reservoir, based upon, and adjusted for, 1980 conditions. Table 4-08 lists the values of the curves of plates 4-06 and 4-07 at specific return periods (or specific frequencies). These values were obtained from the Draft: Los Angeles County Drainage Area Review: Part I, Hydrology Report (February 1988), a study performed by the U.S. Army Corps of Engineers, Los Angeles District.

In general, antecedent precipitation is required as a prerequisite for the occurrence of large floods from the unurbanized parts of the watershed. With substantial antecedent precipitation resulting from a series of winter storms, precipitation loss rates may decrease to as low as 0.15 inch per hour by the time a major storm occurs. Because much of the watershed is urbanized, however, significant runoff events may occur even when dry antecedent conditions exist.

Unit hydrograph values for the watershed upstream of Sepulveda Dam are tabulated in table 4-09 and shown graphically on plate 4-08.

Unit hydrographs were derived using a rainfall distribution having intensities of 1 inch per hour for each 15-minute period. The derivation is applied to the 152-square mile watershed above the dam.

#### 4-08. Water Quality

Because Sepulveda Reservoir is strictly a flood control project that rarely impounds water for more than 24 hours, it has no appreciable affect on water quality. The nature of the urban storm runoff entering the reservoir is generally of poor quality. Routine base flow (usually less than 10 cfs) is typically high in salinity content, whereas storm runoff is generally low in salinity content. Also passing through Sepulveda Reservoir outlet works is treated effluent from the Donald C. Tillman Water Reclamation Plant (TWRP); average flows produced by the treatment plant area approximately 65 cfs. In the near future a portion of the reclaimed water produced by TWRP will be delivered for use in the Recreation Lake, Wildlife Lake, and various agricultural sections within Sepulveda Basin (see Sections 2-06.a., 2-06.b., 2-06.d., and 8-04; in addition see table 1-01, Sepulveda Basin Master Plan, Final Environmental Impact Report/Environmental Impact Statement (March 1981) and Sepulveda Basin Recreation Lake: Feature Design Memorandum (March 1987)).

Unless flood protection is provided for TWRP (as discussed above in Section 2-06.d.) portions of the plant will become inundated at an elevation of approximately 705 feet, NGVD. Initially, contamination of surface waters from untreated or partially treated wastewater sewage will occur. Continued increase of the water surface elevation will result in plant shut down and diversion of untreated sewage to the Los Angeles Hyperion Treatment Plant.

Instream channel use downstream of Sepulveda Dam is limited. Two diversions exist for groundwater recharge facilities. Generally the quality of urban base flow has been so poor that these facilities are

rarely used. A downstream reach with cobblestone invert near Griffith Park has been identified as having some environmental attributes. No actions taken to regulate the discharge rates from Sepulveda Dam will adversely affect this reach.

#### 4-09. Channel and Floodway Characteristics

The channel of the Los Angeles River downstream from Sepulveda Dam is a concrete-lined open channel: rectangular through the San Fernando Valley, and trapezoidal from there to the Pacific Ocean (except for a short rectangular portion just north of downtown Los Angeles) (see pl. 2-04). Along portions of the lower Los Angeles River, the trapezoidal sides are formed by levees that rise above adjacent ground levels.

Channel capacities increase from 16,900 cfs just below Sepulveda Dam to 129,000 cfs from Del Amo Boulevard to the ocean (pl. 2-04). Travel times for significant flows are also shown on plate 2-04, and include a total time of 3.2 hours from Sepulveda Dam to the ocean.

#### 4-10. Upstream Structures

a. Chatsworth Reservoir. This now unused reservoir site formerly served as a water-storage facility for Los Angeles Department of Water and Power (DWP). It is located on Chatsworth Creek in the far northwestern portion of the San Fernando Valley, about 10 river miles above Sepulveda Dam (see pls. 2-02 and 2-03). Pertinent Data for Chatsworth Dam and Reservoir are included in Exhibit C of this manual.

Chatsworth Dam, an older earthen facility, was deemed unsafe in 1969, and no water has since been stored in Chatsworth Reservoir (all runoff is passed directly through the outlet). The structure was considered to be unable to withstand a major earthquake--a point that was underscored by the severe damage sustained by the Lower Van Norman Dam in the February 1971 San Fernando Earthquake (see Section 4-10.c.). DWP however, is considering a long-term plan to restore Chatsworth Reservoir for water supply impoundment.

It should be noted that whereas the normal outlet for Chatsworth Dam is located at the south-central corner of the reservoir, the emergency spillway is located at the far eastern end of the reservoir, and spillway flow would flood a developed area adjacent to Tampa Avenue in Chatsworth. From there, these waters would drain southward toward Bell Creek and the Los Angeles River, and eventually to Sepulveda Dam.

b. Encino Reservoir. This small reservoir, located in the steep, densely developed northern slopes of the Santa Monica Mountains south of the San Fernando Valley (see pls. 2-02 and 2-03), is another water-supply reservoir, owned and operated by DWP. Pertinent Data on this reservoir is included in Exhibit C.

Although this reservoir, filled by imported water, does not have a regular outlet, the path of spillway flow, which would flood a residential area, would be northward toward the Los Angeles River and Sepulveda Dam (see pl. 2-03).

c. Los Angeles Reservoir. Another water-supply reservoir, owned and operated by DWP and located upstream of Sepulveda Dam, is Los Angeles Reservoir. Located at the north end of Bull Creek, in the far northern San Fernando Valley about 8 river miles north of Sepulveda Dam (see pls. 2-02 and 2-03), this reservoir was completed and began storing water in August 1977.

This facility was built as a replacement for the Upper and Lower Van Norman Reservoirs, whose dams were found to be structurally unsound following the February 1971 San Fernando Earthquake. (The Lower Van Norman Dam was severely damaged by the earthquake). Both the Upper and Lower Van Norman Dams have been reconstructed to modern safety standards, but the reservoir basins behind these two dams now serve only for emergency flood control storage. They are now known as the Upper and Lower San Fernando Storm Water Detention Basins. Plate 4-10 (furnished by DWP) depicts the entire Los Angeles and San Fernando Reservoir complex, including reservoirs and bypass channels.

Pertinent Data for Los Angeles Reservoir, which is fed by the main stem of the California Aqueduct, and which serves as a major water-supply facility for the greater Los Angeles area, are included in Exhibit C.

#### 4-11. Downstream Structures

a. Lopez Dam. This dam is constructed on Pacoima Wash in the far northeastern San Fernando Valley, 6.4 miles above the confluence of Pacoima Wash with Tujunga Wash. This gated facility is owned by the Federal Government and maintained by the U.S. Army Corps of Engineers, Los Angeles District, as part of the overall Los Angeles County Drainage Area (LACDA) flood control project. The reservoir drainage area is 34 square miles. Pertinent Data for Lopez Dam are included in Exhibit C.

b. Hansen Dam. Located along Tujunga Wash, 9 miles above its confluence with the Los Angeles River (see pl. 2-02), Hansen Dam is a major flood control facility owned by the Federal Government and operated and maintained by the U.S. Army Corps of Engineers, Los Angeles District, as part of the LACDA system. The reservoir drainage area is 151.9 square miles.

Like Sepulveda Dam, Hansen Dam controls floods on the downstream portions of the Los Angeles River, as well as on Tujunga Wash, immediately downstream of Hansen Dam. During appreciable flows on the Los Angeles River, these two dams must be operated as a system. (See Section 7-05).

c. Whittier Narrows Dam. This unique flood control facility was built by the U.S. Army Corps of Engineers at the narrows of the San Gabriel River and Rio Hondo in Los Angeles County, just north of Pico Rivera (see pl. 2-02). The facility is Federally owned and is operated and maintained by the Corps of Engineers. The reservoir drainage area is 554 square miles. Pertinent Data for Whittier Narrows Dam are included in Exhibit C.



This dam has the capability of diverting San Gabriel River inflow westward for discharge into Rio Hondo. During moderate and high reservoir impoundment behind the dam, the waters from the two rivers combine within the reservoir, and can be let out into either of the two downstream channels. Thus a major portion of, and at times the total, inflow from the entire upper Rio Hondo and San Gabriel River drainages can, when necessary or desired, be passed into the lower Rio Hondo, and ultimately into the lower Los Angeles River. During significant flows, however, the outflow from Whittier Narrows Dam is normally discharged into both the Rio Hondo and the San Gabriel River. Thus, along with Hansen Dam, Whittier Narrows Dam is operated in conjunction with Sepulveda Dam to control floods on the lower reaches of the Los Angeles River.

d. Other Facilities. Upstream of each of the three U.S. Army Corps of Engineers dams discussed in Sections 4-11.a. through 4-11.c., are one or more additional dams with reservoirs (see pl. 2-02 and Exhibit C).

(1) Pacoima Dam. This project is a water supply and flood control facility of Los Angeles County Department of Public Works and is located on Pacoima Wash upstream of Lopez Dam. The reservoir drainage area is 28.2 square miles.

(2) Big Tujunga Dam. This project is a water supply and flood control facility of Los Angeles County Department of Public Works and is on Big Tujunga Creek above Hansen Dam. The reservoir drainage area is 82.3 square miles.

(3) Santa Fe Dam. This Federally owned, U.S. Army Corps of Engineers-operated flood control facility is on the San Gabriel River upstream of Whittier Narrows Dam. It is operated in conjunction with Whittier Narrows Dam, and thus, at times, indirectly in conjunction with Hansen and Sepulveda Dams. The reservoir drainage area is 236 square miles.

(4) Other Projects. There are numerous other water supply reservoirs upstream of Whittier Narrows and Santa Fe Dams on Rio Hondo, San Gabriel River, and their tributaries. These can be seen on plate 2-02, and Pertinent Data for these reservoirs are included in Exhibit C.

#### 4-12. Economic Data

a. Population. No population figures are available specifically for the watersheds above or below Sepulveda Dam. The San Fernando Valley is estimated to have a population of approximately 1,081,000, according to the 1980 Census. The population of the greater San Fernando Valley, including Sunland, Tujunga, and Lakeview Terrace, is approximately 1,133,000. Table 4-10 lists the estimated population as of 1979 and the projected population for the years 1990 and 2000 for each of the four communities surrounding Sepulveda Dam. Sepulveda Reservoir lies in the center of these four communities.

b. Agriculture. Agriculture was at one time a major activity in the San Fernando Valley, both upstream and downstream of Sepulveda Reservoir, but declined sharply between 1946 and the early 1970's, as urban growth in the valley displaced the existing farmland.

There remains a very small amount of commercial agriculture in the far western valley, along with many small private orchards, vineyards, and vegetable gardens. There are a few remaining small private horse ranches in the northwestern San Fernando Valley.

About 340 acres of Sepulveda Reservoir land is leased by the U.S. Army Corps of Engineers to commercial agriculture. The primary products grown here are corn, alfalfa, and other truck crops. These agricultural leases are limited to periods not exceeding 5 years and are subject to termination by the Corps of Engineers if the Corps should require the land for other usage.

c. Industry. Industry has increased dramatically in the San Fernando Valley since World War II, and is scattered throughout all portions of the valley. There is little heavy industry in any portion of the San Fernando Valley. There are a number of moderate-sized factories in the central and northeastern portions of the valley, and a large amount of light industry (especially electronics and related fields) is scattered throughout all portions of the valley.

There is a corridor of commerce along the entire length of Ventura Boulevard, which closely parallels the Los Angeles River below Sepulveda Dam.

d. Flood Damages. Flood damage estimates are not available for most floods that occurred in the Sepulveda Dam drainage area. However, estimates are available for the flood of 1938, which caused considerable loss of life and major property damage in the Los Angeles County Drainage Area. Although no lives were lost in the Sepulveda drainage area, \$43,300 in property damages occurred. Considerable runoff occurred above and below Sepulveda Dam on 20 February and 3 March 1941. Numerous thunderstorms were observed and flood damage above the dam in the vicinity of Reseda was estimated at \$370,260. Since completion of the dam in 1941, there has been relatively little in the way of damaging flows on the Los Angeles River. There have, however, been a few incidents in recent years in which water has left the channel as the result of hydraulically unstable channel flow. An example of this, which can be seen in Photographs 4-01 and 4-02, occurred along the river 1.5 miles below Sepulveda Dam in February 1980. In this and other cases, the water approached, but did not enter, residential and commercial property alongside the river. Further downstream on the Los Angeles River through parts of Long Beach, where the contribution from Sepulveda Dam constitutes only a relatively small portion of the total flow, the water reached the top of the levees, as can be seen by the debris left on the levees in Photograph 4-03.

An ongoing Corps of Engineers review study for Los Angeles County Drainage Area rivers and reservoir indicates that there is a fairly low level of protection along the middle and lower portions of the Los Angeles River, and that a storm and flood not greatly in excess of those experienced during recent years (including the floods of 1969, 1973, and 1980, and 1983) could overtop the levees on the Lower Los Angeles River.

Table 4-31. Summary of Climatological Data at Burbank, Calif.,  
Sepulveda Flood Control Basin, Los Angeles County  
Drainage Area, California\*

| Month    | Temperature                |                            |                            | Precipitation |         |         |
|----------|----------------------------|----------------------------|----------------------------|---------------|---------|---------|
|          | Mean                       | Record                     | Record                     | Mean          | Maximum | Minimum |
|          | monthly                    | highest                    | lowest                     | monthly       | monthly | monthly |
|          | Degrees<br>Fahren-<br>heit | Degrees<br>Fahren-<br>heit | Degrees<br>Fahren-<br>heit | Inches        | Inches  | Inches  |
| Jan..... | 53.0                       | 87                         | 21                         | 2.95          | 13.42   | (T)     |
| Feb..... | 54.7                       | 91                         | 25                         | 3.29          | 13.84   | (T)     |
| Mar..... | 57.0                       | 90                         | 32                         | 2.18          | 10.24   | 0       |
| Apr..... | 60.6                       | 100                        | 33                         | 1.09          | 4.00    | (T)     |
| May..... | 63.5                       | 105                        | 36                         | .16           | 1.23    | (T)     |
| Jun..... | 67.4                       | 103                        | 43                         | .06           | .37     | (T)     |
| Jul..... | 73.5                       | 108                        | 47                         | 0             | .03     | 0       |
| Aug..... | 73.7                       | 111                        | 47                         | .05           | .72     | 0       |
| Sep..... | 72.2                       | 111                        | 43                         | .26           | 6.63    | 0       |
| Oct..... | 66.0                       | 103                        | 33                         | .47           | 2.42    | (T)     |
| Nov..... | 59.3                       | 95                         | 26                         | 1.09          | 6.61    | 0       |
| Dec..... | 55.3                       | 92                         | 27                         | 2.42          | 8.07    | (T)     |
| Annual   | 63.1                       | 111                        | 21                         | 14.02         |         |         |

\* 34°12'N latitude; 118°22'W longitude; elevation 699 feet, NGVD.

T Indicates less than 0.01 inch of precipitation.

NOTE: Period of record is 34 years (1931-1964).

Table 4-02. Summary of Precipitation Data at Sepulveda Dam and Three Stations in Watershed Above Dam.

| LACDPW<br>Number | Station Name          | Lat. (N)    | Long. (W)    | Elev.<br>(feet) | Period of<br>Record | 446   |                    |                  |       | 445                |                  |       |                    | 465              |       |                    |                  |
|------------------|-----------------------|-------------|--------------|-----------------|---------------------|-------|--------------------|------------------|-------|--------------------|------------------|-------|--------------------|------------------|-------|--------------------|------------------|
|                  |                       |             |              |                 |                     | Mean  | Maximum<br>Monthly | Maximum<br>Daily | Mean  | Maximum<br>Monthly | Maximum<br>Daily | Mean  | Maximum<br>Monthly | Maximum<br>Daily | Mean  | Maximum<br>Monthly | Maximum<br>Daily |
| 446              | Aliso Canyon-Dam 300  | 34° 18' 33" | 118° 13' 55" | 2367            | 1939-1983           | 4.63  | 21.59              | 8.20             | 2.85  | 5.55               | 6.51             | 3.65  | 16.32              | 6.91             | 2.82  | 16.26              | 4.61             |
| 735              | Bell Canyon           | 34° 11' 40" | 118° 19' 21" | 895             | 1946-1983           | 4.66  | 19.22              | 6.03             | 3.59  | 13.60              | 4.30             | 3.83  | 16.78              | 4.55             | 2.96  | 18.38              | 5.77             |
| 2590             | Chatsworth-Twin Lakes | 34° 16' 43" | 118° 35' 41" | 1275            | 1929-1983           | 3.66  | 13.90              | 4.40             | 2.63  | 13.80              | 4.70             | 3.01  | 10.87              | 6.10             | 2.32  | 13.18              | 5.53             |
| 465              | Sepulveda Dam         | 34° 09' 48" | 118° 27' 59" | 727             | 1939-1983           | 1.84  | 8.35               | 2.74             | 1.30  | 5.65               | 2.15             | 1.52  | 6.94               | 2.59             | 1.17  | 6.66               | 1.93             |
|                  |                       |             |              |                 |                     | .52   | 3.35               | 1.94             | .35   | 3.20               | 2.00             | .43   | 2.70               | 1.44             | .33   | 3.94               | 2.40             |
|                  |                       |             |              |                 |                     | .11   | .62                | .62              | .07   | .44                | .35              | .09   | .50                | .50              | .07   | .16                | .16              |
|                  |                       |             |              |                 |                     | .05   | .20                | .19              | .03   | .08                | .08              | .04   | .20                | .20              | .03   | .61                | .61              |
|                  |                       |             |              |                 |                     | .11   | 3.47               | 3.19             | .07   | 2.60               | 2.50             | .09   | 2.75               | 2.47             | .07   | 3.00               | 2.90             |
|                  |                       |             |              |                 |                     | .34   | 3.53               | 2.80             | .23   | 2.60               | 1.80             | .28   | 3.31               | 3.00             | .22   | 2.25               | 1.32             |
|                  |                       |             |              |                 |                     | .77   | 2.95               | 1.91             | .51   | 1.37               | .64              | .64   | 2.52               | 1.13             | .49   | 1.63               | .09              |
|                  |                       |             |              |                 |                     | 2.24  | 18.98              | 5.95             | 1.49  | 6.60               | 5.26             | 1.85  | 14.42              | 5.23             | 1.43  | 12.90              | 6.16             |
|                  |                       |             |              |                 |                     | 3.98  | 11.00              | 5.66             | 2.64  | 6.16               | 3.30             | 3.27  | 7.36               | 4.61             | 2.53  | 8.67               | 6.05             |
| Annual           |                       |             |              |                 |                     | 22.71 |                    |                  | 15.07 |                    |                  | 18.79 |                    |                  | 14.44 |                    |                  |

NOTES: 1. Minimum observed monthly values are approximately zero at each station.

2. Data were obtained from Los Angeles County Department of Public Works (LACDPW).

Table 4-03. Precipitation Frequency Values (Inches) for Sepulveda Watershed.

| DURATION | RETURN PERIOD |      |       |       |       |        |
|----------|---------------|------|-------|-------|-------|--------|
|          | 2-YR          | 5-YR | 10-YR | 25-YR | 50-YR | 100-YR |
| 5-MIN    | 0.13          | 0.23 | 0.27  | 0.32  | 0.35  | 0.38   |
| 10-MIN   | 0.27          | 0.36 | 0.42  | 0.49  | 0.54  | 0.60   |
| 15-MIN   | 0.35          | 0.46 | 0.53  | 0.62  | 0.69  | 0.76   |
| 30-MIN   | 0.48          | 0.63 | 0.73  | 0.86  | 0.95  | 1.05   |
| 1-HR     | 0.61          | 0.80 | 0.92  | 1.09  | 1.21  | 1.33   |
| 2-HR     | 0.85          | 1.11 | 1.28  | 1.51  | 1.67  | 1.83   |
| 3-HR     | 1.08          | 1.41 | 1.62  | 1.90  | 2.11  | 2.31   |
| 6-HR     | 1.62          | 2.10 | 2.42  | 2.83  | 3.13  | 3.42   |
| 12-HR    | 2.24          | 3.05 | 3.57  | 4.26  | 4.76  | 5.26   |
| 24-HR    | 2.86          | 3.99 | 4.74  | 5.69  | 6.40  | 7.10   |

NOTES: 1. Values, from NOAA Atlas 2 data, are for a site at the centroid of the watershed above Sepulveda Dam at latitude  $34^{\circ}13'N$ , longitude  $118^{\circ}34'W$ , elevation 320 feet.

2. All values are for annual series.

Table 4-04. Sepulveda Dam Inflow History.

| Water Year | Peak Inflow<br>(cfs) | Water Year | Peak Inflow<br>(cfs) |
|------------|----------------------|------------|----------------------|
| 1929-30    | 389                  | 1961-62    | 16,100               |
| 1930-31    | 2,295                | 1962-63    | 8,123                |
| 1931-32    | 2,000                | 1963-64    | 4,637                |
| 1932-33    | 1,720                | 1964-65    | 6,170                |
| 1933-34    | 7,382                | 1965-66    | 17,040               |
| 1934-35    | 885                  | 1966-67    | 12,879               |
| 1935-36    | 281                  | 1967-68    | 15,995               |
| 1936-37    | 2,700                | 1968-69    | 16,800               |
| 1937-38    | 11,600               | 1969-70    | 6,816                |
| 1938-39    | 2,980                | 1970-71    | 20,013               |
| 1939-40    | 2,690                | 1971-72    | 7,097                |
| 1940-41    | 6,610                | 1972-73    | 13,400               |
| 1941-42    | 1,060                | 1973-74    | 10,788               |
| 1942-43    | 12,700               | 1974-75    | 16,017               |
| 1943-44    | 15,900               | 1975-76    | 4,348                |
| 1944-45    | 1,360                | 1976-77    | 10,627               |
| 1945-46    | 1,450                | 1977-78    | 25,670               |
| 1946-47    | 900                  | 1978-79    | 17,149               |
| 1947-48    | 310                  | 1979-80    | 53,970               |
| 1948-49    | 85                   | 1980-81    | 8,600                |
| 1949-50    | 400                  | 1981-82    | 12,125               |
| 1950-51    | 290                  | 1982-83    | 38,675               |
| 1951-52    | 12,400               | 1983-84    | 6,281                |
| 1952-53    | 4,680                | 1984-85    | 8,276                |
| 1953-54    | 3,200                | 1985-86    | 36,938               |
| 1954-55    | 2,400                | 1986-87    | 16,520               |
| 1955-56    | 4,300                |            |                      |
| 1956-57    | 3,040                |            |                      |
| 1957-58    | 8,000                |            |                      |
| 1958-59    | 8,020                |            |                      |
| 1959-60    | 4,420                |            |                      |
| 1960-61    | 4,740                |            |                      |

NOTES: 1. Data prior to 1941 were obtained from Los Angeles County Flood Control District gauging station on the Los Angeles River at Van Nuys Blvd bridge (about 1-1/2 miles below the dam site). Data after Sepulveda Dam was completed (1941 to date) were computed by the Corps of Engineers.

2. 1941-42 and subsequent years are maximum mean hourly discharges.

Table 4-05. Annual Maximum Inflow, Outflow, Elevations Capacity (Storage), and Surface Area at Sepulveda Dam  
Los Angeles County Drainage Area, California

May 1985

| Water<br>Year | Peak<br>Inflow<br>(cfs) | Date   | Peak<br>Outflow<br>(cfs) | Date   | Maximum<br>Water Surface<br>Elev.<br>(ft., NGVD) | Date   | Maximum<br>Capacity<br>(ac-ft) | Date   | % of Capacity to<br>threshold of<br>Spilling with<br>Spillway Gates<br>Raised | Surface<br>Area<br>(Acres) |
|---------------|-------------------------|--------|--------------------------|--------|--------------------------------------------------|--------|--------------------------------|--------|-------------------------------------------------------------------------------|----------------------------|
| 41-42         | 1,060                   | 28 DEC | 1,040                    | 28 DEC | 671.83                                           | 28 DEC | 10                             | 28 DEC | 0.1                                                                           | 2.15                       |
| 42-43         | 12,700                  | 23 JAN | 2,710                    | 23 JAN | 699.29                                           | 23 JAN | 6,341                          | 23 JAN | 36.4                                                                          | 727.28                     |
| 43-44         | 15,900                  | 22 FEB | 4,740                    | 22 FEB | 697.92                                           | 22 FEB | 5,070                          | 22 FEB | 29.1                                                                          | 656.00                     |
| 44-45         | 1,360                   | 2 FEB  | 1,360                    | 2 FEB  | 675.00                                           | 2 FEB  | 26                             | 2 FEB  | 0.2                                                                           | 9.15                       |
| 45-46         | 1,450                   | 21 DEC | 1,450                    | 21 DEC | 673.20                                           | 21 DEC | 15                             | 21 DEC | 0.1                                                                           | 3.85                       |
| 46-47         | 900                     | 26 DEC | 900                      | 26 DEC | 671.44                                           | 26 DEC | 8                              | 26 DEC | 0.0                                                                           | 1.80                       |
| 47-48         | 310                     | 24 MAR | 310                      | 24 MAR | 670.27                                           | 24 MAR | 3                              | 24 MAR | 0.0                                                                           | 1.05                       |
| 48-49         | 85                      | 17 DEC | 85                       | 17 DEC | 668.44                                           | 17 DEC | 0                              | 17 DEC | 0.0                                                                           | 0.40                       |
| 49-50         | 400                     | 6 FEB  | 400                      | 6 FEB  | 669.87                                           | 6 FEB  | 2                              | 6 FEB  | 0.0                                                                           | 0.85                       |
| 50-51         | 290                     | 29 JAN | 290                      | 29 JAN | 668.80                                           | 30 JAN | 1                              | 30 JAN | 0.0                                                                           | 0.40                       |
| 51-52         | 12,400                  | 18 JAN | 7,000                    | 15 JAN | 692.86                                           | 18 JAN | 2,600                          | 18 JAN | 14.9                                                                          | 422.65                     |
| 52-53         | 4,690                   | 15 NOV | 1,500                    | 15 NOV | 686.00                                           | 15 NOV | 613                            | 15 NOV | 3.5                                                                           | 176.67                     |
| 53-54         | 3,200                   | 13 FEB | 3,200                    | 13 JAN | 676.00                                           | 13 FEB | 34                             | 13 FEB | 0.2                                                                           | 13.57                      |
| 54-55         | 2,400                   | 18 JAN | 2,400                    | 18 JAN | 673.50                                           | 18 JAN | 16                             | 18 JAN | 0.1                                                                           | 4.45                       |
| 55-56         | 4,300                   | 26 JAN | 4,300                    | 26 JAN | 677.83                                           | 26 JAN | 52                             | 26 JAN | 0.3                                                                           | 23.77                      |
| 56-57         | 3,040                   | 13 JAN | 3,160                    | 13 JAN | 676.20                                           | 13 JAN | 36                             | 13 JAN | 0.2                                                                           | 14.40                      |
| 57-58         | 8,000                   | 15 DEC | 8,000                    | 15 DEC | 684.35                                           | 15 DEC | 346                            | 15 DEC | 2.0                                                                           | 120.07                     |
| 58-59         | 8,020                   | 6 JAN  | 9,000                    | 6 JAN  | 682.90                                           | 6 JAN  | 162                            | 6 JAN  | 0.9                                                                           | 84.05                      |
| 59-60         | 4,420                   | 1 FEB  | 5,320                    | 11 JAN | 678.00                                           | 11 JAN | 54                             | 11 JAN | 0.3                                                                           | 24.10                      |
| 60-61         | 4,740                   | 5 NOV  | 5,700                    | 5 NOV  | 678.40                                           | 5 NOV  | 58                             | 5 NOV  | 0.3                                                                           | 27.10                      |
| 61-62         | 16,100                  | 12 FEB | 13,600                   | 12 FEB | 686.50                                           | 12 FEB | 790                            | 12 FEB | 4.0                                                                           | 192.83                     |
| 62-63         | 8,123                   | 9 FEB  | 7,820                    | 9 FEB  | 671.00                                           | 9 FEB  | 2                              | 9 FEB  | 0.0                                                                           | 1.50                       |
| 63-64         | 4,637                   | 22 JAN | 2,830                    | 20 NOV | 675.00                                           | 20 NOV | 14                             | 20 NOV | 0.1                                                                           | 9.15                       |
| 64-65         | 6,170                   | 9 APR  | 6,170                    | 9 APR  | 678.26                                           | 9 APR  | 49                             | 9 APR  | 0.3                                                                           | 26.05                      |
| 65-66         | 17,040                  | 29 DEC | 11,150                   | 29 DEC | 691.40                                           | 29 DEC | 2,191                          | 29 DEC | 12.2                                                                          | 366.50                     |
| 66-67         | 12,879                  | 6 NOV  | 9,425                    | 6 NOV  | 687.00                                           | 6 NOV  | 896                            | 6 NOV  | 5.1                                                                           | 204.35                     |
| 67-68         | 15,905                  | 8 MAR  | 9,375                    | 8 MAR  | 686.82                                           | 8 MAR  | 857                            | 8 MAR  | 4.6                                                                           | 200.85                     |
| 68-69         | 16,900                  | 25 JAN | 11,825                   | 25 JAN | 693.30                                           | 25 JAN | 2,945                          | 25 JAN | 16.5                                                                          | 426.93                     |
| 69-70         | 6,916                   | 6 NOV  | 7,150                    | 28 FEB | 682.43                                           | 28 FEB | 205                            | 28 FEB | 1.2                                                                           | 78.47                      |
| 70-71         | 20,013                  | 29 NOV | 1,170                    | 29 NOV | 693.03                                           | 29 NOV | 2,929                          | 29 NOV | 15.9                                                                          | 425.90                     |
| 71-72         | 7,097                   | 27 DEC | 6,850                    | 27 DEC | 681.90                                           | 27 DEC | 172                            | 27 DEC | 1.0                                                                           | 67.47                      |
| 72-73         | 13,400                  | 11 FEB | 9,940                    | 11 FEB | 688.38                                           | 11 FEB | 1,229                          | 11 FEB | 6.7                                                                           | 252.57                     |
| 73-74         | 10,788                  | 7 JAN  | 8,681                    | 7 JAN  | 685.45                                           | 7 JAN  | 590                            | 7 JAN  | 3.2                                                                           | 157.85                     |
| 74-75         | 16,017                  | 4 DEC  | 9,919                    | 4 DEC  | 688.33                                           | 4 DEC  | 1,215                          | 4 DEC  | 6.6                                                                           | 250.90                     |
| 75-76         | 4,348                   | 9 FEB  | 5,150                    | 9 FEB  | 679.20                                           | 9 FEB  | 70                             | 9 FEB  | 0.4                                                                           | 34.37                      |
| 76-77         | 10,627                  | 2 JAN  | 8,150                    | 2 JAN  | 684.36                                           | 2 JAN  | 416                            | 2 JAN  | 2.4                                                                           | 120.25                     |
| 77-78         | 25,670                  | 4 MAR  | 13,190                   | 4 MAR  | 697.65                                           | 4 MAR  | 5,253                          | 4 MAR  | 30.2                                                                          | 635.66                     |
| 78-79         | 16,410                  | 27 MAR | 9,680                    | 27 MAR | 687.62                                           | 27 MAR | 1,038                          | 27 MAR | 6.0                                                                           | 227.65                     |
| 79-80         | 58,970                  | 16 FEB | 15,100                   | 16 FEB | 705.10                                           | 16 FEB | 11,503                         | 16 FEB | 66.6                                                                          | 1074.00                    |
| 80-81         | 8,600                   | 29 JAN | 7,300                    | 28 JAN | 682.69                                           | 29 JAN | 289                            | 29 FEB | 1.2                                                                           | 80.10                      |
| 81-82         | 12,125                  | 17 MAR | 8,514                    | 17 MAR | 685.00                                           | 17 MAR | 534                            | 17 MAR | 3.0                                                                           | 141.80                     |
| 82-83         | 38,676                  | 1 MAR  | 14,397                   | 1 MAR  | 702.53                                           | 1 MAR  | 8,950                          | 1 MAR  | 51.4                                                                          | 896                        |
| 83-84         | 6,281                   | 25 DEC | 6,079                    | 25 DEC | 680.62                                           | 25 DEC | 159                            | 25 DEC | 0.9                                                                           | 49.55                      |
| 84-85         | 8,276                   | 13 NOV | 4,024                    | 13 NOV | 683.11                                           | 19 DEC |                                |        |                                                                               |                            |
| 85-86         | 36,938                  | 8 MAR  | 10,310                   | 15 FEB | 689.20                                           | 15 FEB |                                |        |                                                                               |                            |
| 86-87         | 16,520                  | 17 NOV | 4,300                    | 17 NOV | 686.80                                           | 17 NOV |                                |        |                                                                               |                            |

NOTE: Computed Values from Corps of Engineers Data.



Table 4-06. Effects of Watershed Urbanization  
on Inflow to Sepulveda Reservoir.

| Inflow Characteristics<br>Average Annual | Average Rate of Inflow  |                           |
|------------------------------------------|-------------------------|---------------------------|
|                                          | 0% Impervious*<br>Cover | 35% Impervious**<br>Cover |
|                                          | (cfs)                   | (cfs)                     |
| Peak                                     | 2,000                   | 12,000                    |
| Maximum 1-Day Duration                   | 800                     | 3,500                     |
| Maximum 2-Day Duration                   | 350                     | 2,100                     |
| Maximum 3-Day Duration                   | 300                     | 1,600                     |
| Maximum 5-Day Duration                   | 200                     | 1,300                     |

\* 1930 watershed conditions. When Sepulveda Dam was completed in 1941, watershed impervious cover was about 3%, and watershed runoff was about the same as for the 0% impervious cover.

\*\* 1980 watershed conditions.

Table 4-07. Sepulveda Dam Runoff Data (all values in ac-ft).

| Water<br>Year | OCT     | NOV     | DEC     | JAN     | FEB     | MAR     | APR    | MAY    | JUN    | JUL    | AUG    | SEP    | Annual<br>Total |
|---------------|---------|---------|---------|---------|---------|---------|--------|--------|--------|--------|--------|--------|-----------------|
| 1970          | 468.0   | 2656.0  | 500.0   | 2884.0  | 7061.0  | 6067.0  | 855.0  | 682.0  | 643.0  | 805.0  | 688.0  | 625.0  | 23934.0         |
| 1971          | 508.0   | 18530.0 | 15941.0 | 2029.0  | 4437.0  | 5643.0  | 2172.0 | 999.0  | 815.0  | 670.0  | 589.0  | 928.0  | 53261.0         |
| 1972          | 972.0   | 615.0   | 12248.0 | 492.0   | 736.0   | 591.0   | 589.0  | 601.0  | 577.0  | 571.0  | 599.0  | 686.0  | 19277.0         |
| 1973          | 428.0   | 4140.0  | 1730.0  | 7940.0  | 20533.0 | 5651.0  | 726.0  | 887.0  | 817.0  | 787.0  | 450.0  | 538.0  | 44627.0         |
| 1974          | 428.0   | 2168.0  | 1531.0  | 19204.0 | 424.0   | 6099.0  | 589.0  | 700.0  | 533.0  | 499.0  | 436.0  | 315.0  | 32926.0         |
| 1975          | 1571.0  | 284.0   | 7559.0  | 478.0   | 4889.0  | 10100.0 | 3025.0 | 573.0  | 482.0  | 500.0  | 260.0  | 313.0  | 30034.0         |
| 1976          | 373.0   | 401.0   | 496.0   | 286.0   | 6946.0  | 1545.0  | 756.0  | 575.0  | 563.0  | 409.0  | 482.0  | 3604.0 | 16436.0         |
| 1977          | 547.0   | 900.0   | 1091.0  | 7410.0  | 357.0   | 2628.0  | 234.0  | 5320.0 | 290.0  | 234.0  | 3638.0 | 125.0  | 22774.0         |
| 1978          | 182.0   | 224.0   | 6793.0  | 20602.0 | 30456.0 | 46342.0 | 3989.0 | 728.0  | 657.0  | 637.0  | 428.0  | 1688.0 | 112726.0        |
| 1979          | 442.0   | 3350.0  | 1789.0  | 17964.0 | 7256.0  | 11611.0 | 1349.0 | 1166.0 | 680.0  | 672.0  | 617.0  | 736.0  | 47632.0         |
| 1980          | 6127.0  | 4407.0  | 4592.0  | 88990.0 | 52080.0 | 14507.0 | 5242.0 | 3108.0 | 2184.0 | 3221.0 | 3935.0 | 3808.0 | 192201.0        |
| 1981          | 5903.0  | 5712.0  | 5617.0  | 8670.0  | 4374.0  | 10996.0 | 4389.0 | 2459.0 | 2380.0 | 2459.0 | 2848.0 | 2856.0 | 58663.0         |
| 1982          | 3961.0  | 8329.0  | 4167.0  | 7031.0  | 4284.0  | 12833.0 | 7139.0 | 4669.0 | 2380.0 | 2459.0 | 2459.0 | 3086.0 | 62797.0         |
| 1983          | 4062.0  | 13440.0 | 5819.0  | 21642.0 | 16322.0 | 44727.0 | 9273.0 | 4415.0 | 4320.0 | 4721.0 | 4925.0 | 4897.0 | 138563.0        |
| 1984          | 3477.0  | 7307.0  | 10897.0 | 3188.0  | 3681.0  | 5135.0  | 4979.0 | 4959.0 | 4030.0 | 2936.0 | 2848.0 | 2412.0 | 55843.0         |
| 1985          | 2584.0  | 4608.0  | 10302.0 | 5865.0  | 5893.0  | 6026.0  | 4760.0 | 4530.0 | 2380.0 | 2642.0 | 2951.0 | 2005.0 | 54546.0         |
| 1986          | 2858.0  | 8626.0  | 5345.0  | 11421.0 | 17639.0 | 15544.0 | 7307.0 | 6426.0 | 1785.0 | 3512.0 | 3396.0 | 4447.0 | 88306.0         |
| 1987          | 4711.0  | 5835.0  | 3872.0  | 5030.0  | 4082.0  | 4798.0  | 3316.0 | 3197.0 | 3094.0 | 3166.0 | 3209.0 | 3439.0 | 47749.0         |
| 1988          | 11847.0 | 5599.0  | 8474.0  | 7626.0  | 7983.0  | 5074.0  | 8039.0 | 3840.0 | 3951.0 | 3935.0 | 3935.0 | 3838.0 | 73841.0         |
| Mean          | 2707.8  | 5112.2  | 5708.6  | 12565.9 | 10496.5 | 11364.1 | 3617.3 | 2622.8 | 1713.7 | 1833.4 | 2036.5 | 2123.5 | 64011.6         |
| Median        | 1571    | 4407    | 5345    | 7410    | 5893    | 6067    | 3316   | 2459   | 817    | 805    | 2459   | 2005   | 62797           |
| High          | 11847.0 | 18530.0 | 15941.0 | 88990.0 | 52080.0 | 46342.0 | 9273.0 | 6426.0 | 4320.0 | 4721.0 | 4925.0 | 4897.0 | 192201.0        |
| Low           | 182.0   | 224.0   | 496.0   | 286.0   | 357.0   | 591.0   | 234.0  | 573.0  | 290.0  | 234.0  | 260.0  | 125.0  | 16436.0         |

NOTE: 1. Data are for U.S. Geological Survey gauge, "Los Angeles River at Sepulveda Dam," located immediately downstream of dam. Because impoundment durations are relatively short, these data are representative of both inflow and outflow.

Table 4-08. Rainfall, Inflow, Outflow and Elevation Frequency Values, Sepulveda Reservoir.

| Return<br>Period<br>(Years) | 24-Hour<br>Rainfall<br>(In) | Rainfall<br>Loss<br>(In) | Excess<br>Rainfall<br>(In) | 48-Hour<br>Runoff<br>Volume<br>(Ac-Ft) | 48-Hour<br>Rainfall<br>Volume<br>(Ac-Ft) | Peak<br>Inflow<br>(cfs) | Peak<br>Outflow<br>(cfs) | Maximum<br>Elevation<br>(Ft., NGVD) |
|-----------------------------|-----------------------------|--------------------------|----------------------------|----------------------------------------|------------------------------------------|-------------------------|--------------------------|-------------------------------------|
| 500                         | 11.23                       | 3.82                     | 7.41                       | 60,049                                 | 91,038                                   | 108,970                 | 77,584                   | 714.57                              |
| 200                         | 9.94                        | 3.92                     | 6.12                       | 49,497                                 | 80,580                                   | 94,735                  | 40,633                   | 713.36                              |
| 100                         | 8.84                        | 3.77                     | 5.07                       | 41,106                                 | 71,663                                   | 82,516                  | 16,989                   | 712.24                              |
| 50                          | 7.37                        | 3.63                     | 3.74                       | 30,334                                 | 59,746                                   | 54,863                  | 15,645                   | 706.46                              |
| 25                          | 6.59                        | 3.47                     | 3.12                       | 25,292                                 | 53,423                                   | 47,327                  | 14,740                   | 703.04                              |
| 10                          | 5.24                        | 3.18                     | 2.06                       | 16,653                                 | 42,479                                   | 34,285                  | 12,806                   | 696.44                              |
| 5                           | 4.41                        | 2.94                     | 1.47                       | 11,930                                 | 35,750                                   | 26,162                  | 11,481                   | 692.53                              |
| 2                           | 3.05                        | 2.19                     | 0.86                       | 6,983                                  | 24,725                                   | 12,851                  | 8,860                    | 685.86                              |

NOTE: Peak inflow, outflow, and max. elevation values represent 1980 watershed conditions. The data were derived from a rainfall-runoff analysis as part of a 1985 Corps of Engineers hydrologic review study. See plates 4-06 and 4-07.

Table 4-09. Unit Hydrograph Ordinates for  
Watershed Above Sepulveda Dam.

| 15-min<br>Time<br>Period | Discharge*<br>(cfs) |
|--------------------------|---------------------|
| 1                        | 11,115              |
| 2                        | 29,758              |
| 3                        | 52,124              |
| 4                        | 63,490              |
| 5                        | 69,358              |
| 6                        | 67,854              |
| 7                        | 39,574              |
| 8                        | 11,994              |
| 9                        | 1,314               |
| 10                       | 8,538               |
| 11                       | 4,706               |
| 12                       | 2,186               |
| 13                       | 2,186               |
| 14                       | 2,186               |
| 15                       | 276                 |

\*Unit hydrograph derived on the basis of 1 inch per 15-minute period.  
Application uses a rainfall distribution having intensities of 1 inch  
per hour for each 15-minute period. Applied to the 150-square mile  
watershed.

Table 4-10. Population Projections Near Sepulveda Dam.

|                                  | <u>10/1/79<sup>(1)</sup></u> | <u>1990<sup>(2)</sup></u> | <u>2000<sup>(2)</sup></u> |
|----------------------------------|------------------------------|---------------------------|---------------------------|
| Encino - Tarzana                 | 72,478                       | 80,158                    | 83,700                    |
| Reseda - W. Van Nuys             | 79,259                       | 86,530                    | 90,405                    |
| Sherman Oaks -<br>Studio City    | 70,613                       | 73,822                    | 76,588                    |
| Van Nuys -<br>North Sherman Oaks | <u>113,016</u><br>335,366    | <u>110,660</u><br>351,170 | <u>114,007</u><br>364,789 |

NOTES: (1) Population Estimate and Housing Inventory as of 1 October 1979, Los Angeles City Planning Department.

(2) Projected Population (1990-2000), Los Angeles City Planning Department, April, 1979.

(3) Sepulveda Dam lies in the center of the four communities indicated above.

Table 4-11. Sediment Survey Data Summary.

| Date of Survey | Type of Survey | No. of Ranges or Contour Inc. | Surface Area (Acres) | Capacity (Ac-Ft) | Period Capacity Loss (Ac-Ft) |                 | Depth Designation Range in Ft. below Crest Elevation |                                                                                |       |       |       |          |    |  |  |
|----------------|----------------|-------------------------------|----------------------|------------------|------------------------------|-----------------|------------------------------------------------------|--------------------------------------------------------------------------------|-------|-------|-------|----------|----|--|--|
|                |                |                               |                      |                  | Period Total                 | Aver. Annual    | Per Sq. Mile Per Year                                | Z of Total Sediment Located Within Depth Designation                           |       |       |       |          |    |  |  |
|                |                |                               |                      |                  |                              |                 |                                                      | 42-40                                                                          | 40-30 | 30-20 | 20-10 | 10-Crest |    |  |  |
| Nov 41         | Contour        | 5 feet                        | 1301                 | 16,720           | Original Survey              | Original Survey |                                                      |                                                                                |       |       |       |          |    |  |  |
| Nov 44         | Ranges         | 76                            | 1335                 | 17,437           | -717                         | -239            | -1.68                                                | Change from a topographic to a range line survey shows an increase in storage. |       |       |       |          |    |  |  |
| Jun 61         | Ranges         | 76                            | 1335                 | 17,296           | 141                          | 8.49            | 0.06                                                 | 1                                                                              | 0     | 0     | 15    |          | 84 |  |  |
| Dec 80         | Contour        | 2 feet                        | 1348                 | 17,425           | -129                         | -6.61           | -0.05                                                | Change from range line to topographic survey shows increase in storage.        |       |       |       |          |    |  |  |



Photo No. 4-01. Flood of 16 February 1980, Los Angeles River at Cedros Street, approximately 1.5 river miles below Sepulveda Dam (view toward downstream, showing overflow of left bank resulting from hydraulic instability due to a side drain in the channel wall).



Photo No. 4-02. Flood of 16 February 1980, Los Angeles River at Cedros Street (view toward right bank, from location downstream of channel overflow in Photo No. 4-01).





Photo No. 4-03 Aftermath, Flood of 16 February 1980, Los Angeles River below Wardlow Road, Long Beach (view toward downstream, showing debris at top of levee left by flood).

## V - DATA COLLECTION AND COMMUNICATION NETWORKS

### 5-01. Hydrometeorological Stations

a. Facilities. Plate 5-01 is a map of gauging stations for precipitation, reservoir level, and streamflow in and immediately surrounding the watershed above Sepulveda Dam, plus the stream gauge stations on the Los Angeles River between Sepulveda Dam and the Pacific Ocean. These stations, along with their latitudes, longitudes, and elevations, are listed in table 5-01. Many of the stations consist of more than one type of gauge, such as a recording and a non recording precipitation gauge. Stream gauge rating curves for stations located between Sepulveda Dam and the Pacific Ocean are shown on plate 5-02. The relationship depicted between gauge height and discharge can provide useful information about downstream channel conditions (this is discussed further in section 8-09.c.; in addition rating tables associated with the rating curves are given in Exhibit F).

b. Reporting. Hydrologic data from Sepulveda Dam and the upstream and downstream watersheds are observed and reported in three different ways, as illustrated in table 5-02.

(1) Manual. The Sepulveda Dam Tender observes precipitation, water surface elevation, and gate settings, and reports these to the District Office, as described in Section 5-06.a.

(2) Recording Instruments. The recording instruments store data on paper tape, which is removed at predetermined intervals (once each month, October-April, plus once during the summer) and maintained on file by the District.

(3) Telemetry System. Hydrologic data measured at the dam and other gauges are transmitted to the Los Angeles District Office (LAD) by the Los Angeles Telemetry System. These gauges automatically transmit reports at predetermined 24-hour intervals. The event mode is the primary data sources for the telemetry system. As a gauge registers an event, current data are radio-transmitted to a repeater from which it is sent via microwave to the LAD office. Each gauge is programmed to trigger whenever 0.04 inches of precipitation, or a 0.25-foot change in water surface elevation is recorded. All gauges can also be interrogated at any time for current data via polled mode.

(4) ALERT System. There is also an event-reporting gauge system throughout southern California sponsored by the National Weather Service. This system is referred to as the ALERT System (Automatic Local Evaluation in Real Time). Access to this information can be obtained through the REPORT program on the Water Control Data System computer.

c. Maintenance. Each operating agency is responsible for the maintenance of its own gauges.

#### 5-02. Water Quality Stations

There are no water quality stations in the watershed above Sepulveda Reservoir. The U.S. Geological Survey operates a water quality station downstream at the gauge site known as "Los Angeles River at Willow Street Bridge, Long Beach, California."

#### 5-03. Sediment Stations

There are no sediment stations (as such) in the watershed above Sepulveda Reservoir or along the Los Angeles River downstream of Sepulveda Dam. However, estimates of sediment production can be obtained from records at debris basins within the watershed.

#### 5-04. Recording Hydrologic Data

Each agency maintains records of its own data (Section 5-01 above). The National Weather Service data are archived at the National Oceanic and Atmospheric Administration, National Climatic Data Center in Asheville, North Carolina. Precipitation and other data are published monthly by the National Climatic Data Center in Climatological Data and Hourly Precipitation Data.

The State of California, Department of Water Resources, publishes monthly data from the ALERT telemetry gauge network. The Ventura County Flood Control District and Los Angeles County Department of Public Works archive their recording and nonrecording data and furnish these data to other agencies upon request.

The U.S. Army Corps of Engineers maintains a file of data from its recording and telemetry gauges and provides selected data to the National Weather Service for publication. The Corps also enters data from its manual observations on various forms, which are maintained on file in the District. These are discussed further in Section 9-05 and illustrated in figures 9-01 through 9-07.

#### 5-05. Communication Network

The U.S. Army Corps of Engineers maintains a voice radio communication network for its entire operations activities. This routinely includes communication between the District Office and the various dam tenders, as well as with vehicles in the field.

During periods of significant runoff, communication to and from the dam tenders becomes vital. The existing radio network, which has proven itself reliable, is backed up by the local telephone system.

Power at the District Office, as well as at each dam, is backed up by an emergency generator system; there is also a complete radio station at the District's Base Yard, a few miles east of the District Office in El Monte, California.

#### 5-06. Communication With Project

a. Regulating Office with Project Office. During the flood season (15 November through 15 April) a routine radio call is made at least once each weekday from the District Office to each dam tender, including that of Sepulveda Dam. This Reservoir Operation Report (or "Morning Report") is usually made at 0800 hours, Monday through Friday (see fig. 9-07). Other routine or nonroutine radio or telephone calls are made as needed (see also Section 5-07).

In the event that all communication with the District Office, including the Base Yard, should be interrupted, a set of Standing Operating Instructions to Dam Tenders have been compiled for each dam. A copy of these instructions for Sepulveda Dam is included in Exhibit A of this manual.

b. Between Project Offices and Others. No routine communication exists between Sepulveda Dam and other agencies.

c. Between Regulating Office and Others. Before and during the various stages of any reservoir impoundment, the Corps of Engineers notifies offices of the City of Los Angeles, as well as selected private interests, of the impending rises in the reservoir water surface elevation and corresponding outflow. A list of agencies to notify, with applicable office and home telephone numbers, is published annually by the Corps of Engineers, Los Angeles District, in the Instructions for Reservoir Operations Center Personnel (hereinafter referred to as the "Orange Book"). During major runoff events, the Reservoir Operations Center of the Corps is in constant contact with the Hydraulics Division of Los Angeles County Department of Public Works in order to fully coordinate the operations of both agencies' reservoirs. The County is directly tied into the Corps of Engineers radio and telephone system. The Reservoir Operation Center is also in direct radio contact with channel observers dispatched to patrol the downstream channel during significant floods.

#### 5-07. Project Reporting Instructions

During periods of water operations, communication between the District Office and each affected dam tender is made on a frequent basis, normally once each hour (at times more frequent communication may be required). If a gate change is required, the operating hydrologic engineers provide the radio operator at the District Office with the gate change instructions. These are broadcast to the dam tender. When the gate change is completed, the dam tender calls back to the District radio operator with information on the change. The radio operator then informs the engineer who initiated the change.

Other special instructions to dam tenders are conducted in a similar manner. This network of radio communication is also used by the dam tender to report any failure of machinery or other equipment or any other unusual problems at the dam.

#### 5-08. Warnings

The responsibility for issuing all weather watches and warnings and all flood and flash flood watches and warnings rests with the National Weather Service. Local emergency officials of cities and counties are responsible for issuing any public warnings regarding unusual overflows, evacuations, unsafe roads or bridges, toxic spills, etc. The U.S. Army Corps of Engineers is responsible for providing these officials with up-to-date information, and forecasts where possible, of water rises within Sepulveda Reservoir and on the Los Angeles River downstream of Sepulveda Dam. If an uncontrolled spillway flow or dam break were imminent, the Reservoir Operations Center of the Corps would immediately notify the Los Angeles Police Department, Van Nuys Division (telephone no. (818) 989-8383), the Los Angeles County Sheriff, Disaster Communications Office (telephone no. (213) 946-7935), the California Office of Emergency Services--Headquarters, Sacramento (telephone no. (916) 427-4990), and the California Highway Patrol, 24 hour Communications Center (telephone no. 911). Upon completing the above notifications, contact would be made with the District Emergency Response Team. For other pertinent telephone numbers refer to the "Orange Book".

Table 3.01. Precipitation, Reservoir, and Stream Gauges in and near the Watershed Above Sepulveda Dam, July 1985.

| Station | Elevation | Station Name                                            | Altitude | Longitude  | Elevation | Type of Gauge(s)                       |
|---------|-----------|---------------------------------------------------------|----------|------------|-----------|----------------------------------------|
| 1. 01   | 8,662     | Newhall-Solobad Division Headquarters                   | 8,662    | 118°11'56" | 1,743     | RP                                     |
| 1. 02   | 8,662     | Office View Station                                     | 8,662    | 118°11'56" | 1,743     | SR                                     |
| 1. 03   | 8,662     | Las Flores Canyon                                       | 8,662    | 118°11'56" | 1,743     | SR                                     |
| 1. 04   | 8,662     | Stad Hills - Barro Flat                                 | 8,662    | 118°11'56" | 1,743     | SR, RR                                 |
| 1. 05   | 8,662     | Susana Falls - County Fire Station                      | 8,662    | 118°11'56" | 1,743     | SR                                     |
| 1. 06   | 8,662     | Las Flores Canyon                                       | 8,662    | 118°11'56" | 1,743     | SR, RR                                 |
| 1. 07   | 8,662     | Red Canyon                                              | 8,662    | 118°11'56" | 1,743     | RR                                     |
| 1. 08   | 8,662     | Calabazas                                               | 8,662    | 118°11'56" | 1,743     | SR                                     |
| 1. 09   | 8,662     | Old Tancopa Canyon                                      | 8,662    | 118°11'56" | 1,743     | SR                                     |
| 1. 10   | 8,662     | Santa Maria Creek - Moor                                | 8,662    | 118°11'56" | 1,743     | SR                                     |
| 1. 11   | 8,662     | El Caballero County Club                                | 8,662    | 118°11'56" | 1,743     | SR                                     |
| 1. 12   | 8,662     | Fresno Reservoir                                        | 8,662    | 118°11'56" | 1,743     | SR, RR                                 |
| 1. 13   | 8,662     | Sepulveda Canyon - Mulholland Highway                   | 8,662    | 118°11'56" | 1,743     | SR, RR                                 |
| 1. 14   | 8,662     | Mindwell Canyon Road                                    | 8,662    | 118°11'56" | 1,743     | SR, RR                                 |
| 1. 15   | 8,662     | Stone Canyon Reservoir                                  | 8,662    | 118°11'56" | 1,743     | SR                                     |
| 1. 16   | 8,662     | Upper Stone Canyon                                      | 8,662    | 118°11'56" | 1,743     | SR                                     |
| 1. 17   | 8,662     | Sepulveda Dam                                           | 8,662    | 118°11'56" | 1,743     | RR                                     |
| 1. 18   | 8,662     | Van Raves                                               | 8,662    | 118°11'56" | 1,743     | RR, SR, RR, CR, NW, PM, CW, NG, PG, CG |
| 1. 19   | 8,662     | Birmingham Hospital                                     | 8,662    | 118°11'56" | 1,743     | SR                                     |
| 1. 20   | 8,662     | Woodland Hills                                          | 8,662    | 118°11'56" | 1,743     | SR                                     |
| 1. 21   | 8,662     | Goodland Park - Pierce College                          | 8,662    | 118°11'56" | 1,743     | SR                                     |
| 1. 22   | 8,662     | Northridge - Los Angeles Downtown at Water and Power    | 8,662    | 118°11'56" | 1,743     | SR                                     |
| 1. 23   | 8,662     | California State Fair - Hollywood                       | 8,662    | 118°11'56" | 1,743     | SR                                     |
| 1. 24   | 8,662     | Granada Hills                                           | 8,662    | 118°11'56" | 1,743     | SR                                     |
| 1. 25   | 8,662     | Van Nuys Lake - Lower                                   | 8,662    | 118°11'56" | 1,743     | SR                                     |
| 1. 26   | 8,662     | Mc Donnell Wash                                         | 8,662    | 118°11'56" | 1,743     | SR                                     |
| 1. 27   | 8,662     | Northridge Dams                                         | 8,662    | 118°11'56" | 1,743     | SR                                     |
| 1. 28   | 8,662     | Sepulveda and River                                     | 8,662    | 118°11'56" | 1,743     | SR                                     |
| 1. 29   | 8,662     | Chatsworth                                              | 8,662    | 118°11'56" | 1,743     | SR                                     |
| 1. 30   | 8,662     | Chatsworth Ranch                                        | 8,662    | 118°11'56" | 1,743     | SR                                     |
| 1. 31   | 8,662     | Chatsworth - Tolu Lakes                                 | 8,662    | 118°11'56" | 1,743     | SR                                     |
| 1. 32   | 8,662     | Altamira Canyon - Old Canyon                            | 8,662    | 118°11'56" | 1,743     | SR                                     |
| 1. 33   | 8,662     | Altamira Canyon                                         | 8,662    | 118°11'56" | 1,743     | SR                                     |
| 1. 34   | 8,662     | Van Nuys Lake - Upper                                   | 8,662    | 118°11'56" | 1,743     | SR                                     |
| 1. 35   | 8,662     | Chatsworth Reservoir                                    | 8,662    | 118°11'56" | 1,743     | SR                                     |
| 1. 36   | 8,662     | Chatsworth Reservoir                                    | 8,662    | 118°11'56" | 1,743     | SR                                     |
| 1. 37   | 8,662     | Los Angeles River above Arroyo Seco                     | 8,662    | 118°11'56" | 1,743     | SR                                     |
| 1. 38   | 8,662     | Los Angeles River at Inglewood Avenue                   | 8,662    | 118°11'56" | 1,743     | SR                                     |
| 1. 39   | 8,662     | Los Angeles River below El Estero Boulevard             | 8,662    | 118°11'56" | 1,743     | SR                                     |
| 1. 40   | 8,662     | Los Angeles River below Verdugo Road                    | 8,662    | 118°11'56" | 1,743     | SR                                     |
| 1. 41   | 8,662     | Barbours - Western County Drain above Los Angeles River | 8,662    | 118°11'56" | 1,743     | SR                                     |
| 1. 42   | 8,662     | Los Angeles River below Sepulveda Dam                   | 8,662    | 118°11'56" | 1,743     | SR                                     |

1. 43. Inflow of these gauges, see Figure 3.02.

Table 3-02 Hydrologic Data in Form of Report or File

| <u>Location</u>         | <u>Gauge Type</u>                                          | <u>Report Mode</u> | <u>Report Period Available</u>                                                                        | <u>Comments</u>                                                                                                                 |
|-------------------------|------------------------------------------------------------|--------------------|-------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------|
| Water Surface Elevation | staff beads                                                | Visual             | Flood Control Basin Operation Report SPL 19 (1941-present)                                            |                                                                                                                                 |
|                         | Stevens A-11 recorder w/ quartz clock & D.R.*              | Visual             | paper strip chart (1941-present)<br>punch tape (1974-present)                                         | the paper strip chart is operated at 9.6"/day during the rainy season for better data definition; 2.4"/day in other periods     |
|                         |                                                            | Telemetry          | telemetry data file                                                                                   |                                                                                                                                 |
| Downstream Gauge Height | Digital Recorder *                                         | Visual             | Flood Control Basin Operation Report SPL 19 (1941-present)                                            | paper punch tape stored via telemetry systems                                                                                   |
|                         |                                                            | Telemetry          | punch tape (1974-present)<br>telemetry data file                                                      |                                                                                                                                 |
| Outlet Gate Opening     | gate opening indicator                                     | Visual             | Flood Control Basin Operation Report SPL 19 (1941-present)                                            |                                                                                                                                 |
|                         | Leopold & Stevens recorders                                |                    |                                                                                                       |                                                                                                                                 |
| Precipitation           | tipping bucket gauge connected by magnetic sensor to D.R.* | Telemetry          | Reservoir Operation Report SPL 424 (1941-present)<br>punch tape (1974-present)<br>telemetry data file |                                                                                                                                 |
|                         | Belford recording gauge                                    | None               | paper chart (1941-present)                                                                            | data on paper charts is evaluated for daily rainfall amounts and charts are then sent to AWS in Asheville, N.C. for publication |
|                         | glass rain tube                                            | Visual             | Rainfall Record SPL 31 (1941-present)                                                                 |                                                                                                                                 |

\* Digital Recorder - A device that converts gauge motion into coded digital information and records this periodically as a pattern of punch holes in paper tape

## VI - HYDROLOGIC FORECASTS

### 6-01. General

a. Role of Corps of Engineers. The U.S. Army Corps of Engineers does not make any formal hydrologic forecasts for Sepulveda Dam. Los Angeles River water quality is also not predicted by the Corps of Engineers or any other agency.

Despite the lack of formal hydrologic forecasts, the Corps of Engineers does carefully monitor the reservoir water surface elevation in Sepulveda Reservoir, and does notify other agencies of any significant changes or anticipated changes.

The Corps of Engineers continues to improve its monitoring capabilities, not only at Sepulveda Dam, but in upstream and downstream water-sheds. Many stream and precipitation gauges have been upgraded with event-reporting telemetry technology. Future plans include placement of additional event-reporting gauges to increase drainage area coverage to enable improved representation of watershed characteristics for fore-casting and modelling purposes. The improved data collection status will eventually be used in a real-time rainfall-runoff model to forecast inflow into the Los Angeles County Drainage Area reservoirs and downstream control points. It is intended that these predictions will become accurate and reliable enough that they can be shared with the National Weather Service, Los Angeles County Department of Public Works and other County Flood Control Districts, city and county emergency officials, and others, and used as a basis for reservoir systems operations during the upcoming years.

The Corps of Engineers, Los Angeles District, Meteorologist prepares special quantitative precipitation forecasts for the Los Angeles River drainages and other watersheds. These are used in determining the potential for significant runoff into Sepulveda and other reservoirs. Research is progressing into the direct incorporation of these quantitative precipitation forecasts into the rainfall-runoff forecast models being developed.

b. Role of Other Agencies. No agency has any specific forecast responsibility for water surface elevations in Sepulveda Reservoir or for discharges on the Los Angeles River, either upstream or downstream of Sepulveda Dam. About the closest that any forecast or warning would come to this might be a Flash Flood Watch or Flash Flood Warning issued by the National Weather Service for rivers and other watercourses in the San Fernando Valley.

The U.S. Army Corps of Engineers does receive real-time weather reports and forecasts, as well as historical weather data, from the National Weather Service, NOAA. This is accomplished by means of weather facsimile pictures and teletype data and forecasts transmitted by the National Weather Service, and also by means of direct telephone communication with, and visits by the District Meteorologist to, the National Weather Service Forecast Office, Los Angeles.



Historical precipitation data are available from Los Angeles County Department of Public Works and Ventura County Flood Control District. Historical streamflow data are also available from these agencies and from the U.S. Geological Survey. These data, while not of use in real time, are important to studies of historical storms and floods, which aid in the development and refinement of computerized rainfall-runoff forecast models.

#### 6-02. Flood Condition Forecasts

Forecasts of flood hydrographs are not currently made. However, routine evaluation of inflow, observed precipitation, and forecast precipitation provides for valuable subjective predictions of flood situations (see pl. 4-08 and tables 4-08 and 4-09). Using such information, the Reservoir Operation Center of the Corps can evaluate if an ongoing flood will increase or decrease over the next 24 hours. See table 5-01 and plate 5-01 for control points in and near the watershed above Sepulveda Dam.

#### 6-03. Conservation Purpose Forecasts

Since Sepulveda Dam is strictly a flood control facility, no forecasts for the purpose of water conservation, hydropower, fish spawning, or other such objectives are made.

#### 6-04. Long-Range Forecasts

Since the watershed above Sepulveda Dam is relatively small (152 square miles), with no major upstream flood control facilities, and since water is impounded behind Sepulveda Dam for as short a time as possible, there is little if any direct need for long-range forecasts in the operation of Sepulveda Dam.

Only in the event of major impoundment at Sepulveda Reservoir, as well as simultaneously at other reservoirs affecting the downstream Los Angeles River (see Section 4-11), would a forecast of more than one day be of immediate significance to the operation of Sepulveda Dam. In such a case, the forecast of another impending major storm or lack of such storm might influence the release rate of water from Sepulveda Dam in consideration of the release rates from all of the other dams in the system in order to prevent or minimize downstream damages.

## VII - WATER CONTROL PLAN

### 7-01. General Objectives

The objective of Sepulveda Dam is flood control, specifically, the minimization of flood damages on the Los Angeles River downstream from Sepulveda Dam. In this regard, water is temporarily stored behind Sepulveda Dam during periods of high inflows and is released more slowly through the downstream Los Angeles River channel.

There is no objective to operate the dam to reduce inundation damages to its improved reservoir lands. All usage of reservoir land is intended to have a purpose secondary to its role as the bottom of the flood control reservoir. All costs associated with reservoir inundation are intended to be routine maintenance costs. The Los Angeles District should ensure that reservoir lease holders have a clear understanding of risk and subsequent willingness to locate within the flood control reservoir.

### 7-02. Major Constraints

Constraints that impact the regulation and operation of Sepulveda Dam are as follows:

a. Channel Capacity. The channel capacity downstream of the dam is restricted to 16,900 cfs. The river channel just above the Verdugo Wash confluence is restricted to a maximum 35,500 cfs capacity in order to maintain a 2-foot freeboard, as determined by the Los Angeles County Drainage Area Review (see table 1-01; Draft: Los Angeles County Drainage Area Review: Part I, Hydrology Report).

b. Rubber Dam. The City of Los Angeles Department of Water and Power constructed a rubber dam approximately 10 miles below Sepulveda Dam for diversion of water into adjacent spreading grounds. The dam, which is air-inflated, is 6.9 feet in height and is designed to impound water to maximum depth of 8.3 feet in the channel before automatically deflating. The flow over the dam is 800 cfs at this stage. Approximately 30 minutes is required to completely deflate the dam; the dam is also equipped with manual override capabilities if automatic deflation fails. The maximum channel capacity with the dam fully raised is approximately 20,000 cfs. The maximum channel capacity with the dam lowered is 55,000 cfs.

The dam is currently not in operation because the necessary water quality permits to divert the river water have not been obtained.

c. Tributary Inflow Downstream from Dam. Major tributary inflow occurs in the river channel downstream from a side drain near Cedros Avenue, and at the Tujunga Wash, Verdugo Wash, Arroyo Seco Wash, and Rio Hondo River confluence. The inflows can cause hydraulic instability and possible overbank flow in the river channel at these locations. Releases from Sepulveda Dam should be reduced accordingly in order to

compensate for the effect of these inflows as necessary. Referring back to photo 4-01, an example of this potential instability is shown at Cedros Street during the flood of 16 February 1980.

During a major flood event, channel observers should be sent to the above locations and report on conditions as directed by the Reservoir Operation Center.

#### 7-03. Overall Plan for Water Control

Sepulveda Dam is operated for flood control on the Los Angeles River. Plate 7-01, which depicts the storage allocations for Sepulveda Reservoir, shows that the entire space of the reservoir below the elevation 710.0 feet (the spillway crest, with crest gates raised) is devoted to flood control. Between elevation 710.0 and 713.52 feet (the maximum reservoir surface elevation for a Standard Project Flood (SFP)), the space is used jointly for flood control and spillway surcharge. Between 713.52 and 716.66 feet (the maximum reservoir surface elevation for a Probable Maximum Flood (PMF)), the space is allocated to spillway surcharge, with flood control no longer the primary objective in deference to passing as much water out of the reservoir as is required to assure the safety of the dam. The space between elevation 716.66 and 725.0 feet (the top of the dam) is reserved for freeboard.

Sepulveda Dam is operated in coordination with other projects protecting the upper Los Angeles River. These projects include Pacoima, Hansen, Big Tujunga, and Devil's Gate Dams. Because of Sepulveda Dam's ungated outlets (four of eight are ungated) and limited capacity (spillway flow occurs for events with return periods of greater than an estimated 80-years, as determined by the Los Angeles County Drainage Area Review; refer to the report listed in table 1-01, Draft: Los Angeles County Drainage Area Review: Part I, Hydrology Report, (February 1988); in addition see table 4-08 and pl. 4-07), it is given a priority over these other projects with respect to releases into the Los Angeles River.

There may, however, be instances where some reduction in releases may be considered necessary from a systems perspective. These conditions are discussed in Section 7-13.

#### 7-04. Standing Operating Instructions to Dam Tender

In the event that all communication with the District Office, including the Base Yard, should be interrupted, a set of Standing Operating Instructions to Dam Tender have been compiled for each dam. A copy of these instructions for Sepulveda Dam are included in Exhibit A of this manual.

#### 7-05. Flood Control

a. General. The plan for controlling floods on the Los Angeles River below Sepulveda Dam is presented in this section.

The objective of the water control plan is to maximize flood control benefits. Project releases will be regulated to protect downstream communities and to avoid spillway flow.

The most critical reach of the downstream channel extends from the dam to the Tujunga Wash confluence (see Plate 2-04).

The project should be regulated to pass all inflow through the dam as rapidly as possible. This is achieved by keeping the four gated outlets fully open until spillway flow occurs, and then by progressively closing the gated outlets such that the combined flow from the spillway and from the gated and ungated outlets does not exceed the downstream channel capacity of 16,900 cfs. Plate 7-02 provides a schedule that is to be used as a guide in achieving this regulation.

It should be noted that as a result of the Los Angeles County Drainage Area Review (see table 1-01, Draft: Los Angeles County Drainage Area Review: Part I, Hydrology Report, (February 1983)), the channel capacity immediately downstream of the outlet works was found to be 100 cfs less than previously computed (see pl. 2-04). Because of this change, the water surface elevation at which gate operations were performed on the previous version of the reservoir regulation schedule were modified, though not by more than 0.2 foot (see pl. 7-02). This change was necessary to stay within the channel capacity of 16,900 cfs.

Sepulveda Dam will be regulated as a component of a reservoir system protecting (primarily) the upper and middle Los Angeles River and (to a lesser extent) the lower Los Angeles River, downstream from the Rio Hondo confluence. From a systems perspective, Sepulveda will normally be given priority to make channel capacity releases. However, if system conditions should warrant, Sepulveda releases may be curtailed in order to minimize downstream channel over flow and damages or threat to life, based upon reports from telemetry gauges or channel observers.

b. Reservoir Evacuation. Sepulveda Reservoir should be drained as rapidly as possible, consistent with the achievement of downstream flood control. The objective is to empty the reservoir in preparation for the next flood. When no additional storms are forecast, however, and flood control benefits can be achieved, the four gated outlets may be partially or fully closed.

c. Forecasts. A forecast to make operational decisions may be either a series of computer-generated inflow hydrographs (expected in future years) or a reasonable judgemental assessment of ongoing rainfall and runoff, based upon available information. In either case, the Reservoir Operation Center of the Corps of Engineers, Los Angeles District, would be responsible for developing the forecast and for determining confidence in it toward its application to reservoir water-control decisions. The intent is to consider all appropriate information in implementing the water control plan described above.

#### 7-06. Recreation

As mentioned previously (Section 2-06.a.), the sole purpose of Sepulveda Dam is flood control. No water is impounded by the dam for the purpose of recreation.

The channel of the Los Angeles River downstream of Sepulveda Dam is strictly a flood control channel, and provides no water-oriented recreational use. Thus no releases are made for recreational purposes.

#### 7-07. Water Quality

Because Sepulveda Dam has four ungated outlets, it cannot be operated to totally contain contaminant spills. Sepulveda Dam is not operated for water quality objectives (refer to Section 2-06.d.).

#### 7-08. Fish and Wildlife

No Sepulveda Dam water control objectives exist for fish and wildlife, either within the reservoir, or within the channel of the Los Angeles River downstream of the reservoir (refer to Section 2-06.b.).

#### 7-09. Drought Contingency Plan

Sepulveda Dam and Reservoir does not contain any storage allocation for water supply or water conservation. The Los Angeles River downstream of the dam is mostly concrete lined. Groundwater recharge facilities approximately 10 miles below Sepulveda Dam can divert 40 cfs, however, because there are four ungated outlets at Sepulveda Dam, no water can be impounded. However, in the event of a drought, should a water conservation plan be proposed that would not compromise the flood control purpose of the project, it's implementation would be considered.

#### 7-10. Hydroelectric Power

No facilities for the generation of hydroelectric power at Sepulveda Dam exist, nor are any contemplated.

#### 7-11. Navigation

No navigation of any sort is possible or allowed in Sepulveda Reservoir or in the Los Angeles River, either upstream or downstream of Sepulveda Dam.

#### 7-12. Other

Maintenance and construction on the downstream channel of the Los Angeles River normally occur during the dry season of late spring and summer. During such periods, the four Sepulveda Dam gated outlets may be closed in order to reduce releases in support of such downstream activities.

### 7-13. Deviation from Normal Regulation

As outlined on plate 7-02, and as discussed in Sections 7-05.b. and 7-05.c.(1), the release plan for Sepulveda Dam generally calls for all gated outlets to be fully open for any water surface elevation below 710.2 feet. Thus the rate of release from Sepulveda Dam cannot be increased above that which is prescribed.

It is physically possible, however, and would be desirable, under certain limited circumstances, for the release rate from Sepulveda Dam to be decreased below what is called for on plate 7-02.

For water surface elevations above 710.2 feet, it would be physically possible to either increase or decrease the release rate from that which is published on plate 7-02.

In addition to the prevention of downstream damages (discussed in Sections 7-05.b. and 7-05.c.), there are other possible reasons for deviation from the normal release plan at Sepulveda Dam:

a. Emergencies. In the event of a potential drowning, toxic spill, or other accident in which high flows on the Los Angeles River downstream of Sepulveda Dam could prevent rescue or could cause further injury, the four gated outlets at Sepulveda Dam could temporarily be partially or totally closed. However, because of the four ungated outlets, this would reduce, but not eliminate, the flow to the downstream channel. (See section 2-03.b.(2) for gate descriptions). Such emergency action should be taken immediately, unless such action would likely result in worse conditions. Notifications to all concerned agencies of emergency actions must be made as soon as possible.

b. Unplanned Minor Deviations. Unplanned events that could create a temporary need for minor deviations from the schedule published in plate 7-02 include emergency bridge repairs, the restoration of utility lines across the Los Angeles River, and certain unplanned necessary maintenance and inspection. Sepulveda Dam may be operated to support these activities, provided that flood protection is not jeopardized, and that no significant threat is made to potentially endangered wildlife species in the reservoir (see Section 8-05), and that the City of Los Angeles Donald C. Tillman Water Reclamation Plant is not unnecessarily subjected to inundation.

c. Planned Deviations. The same arguments apply to planned construction, maintenance, inspections, etc., as under Section 7-13.b. Such planned activities should be scheduled for the dry season, whenever possible. (The dry season is normally May through October, although on a rare occasion, a tropical storm with heavy rain and high runoff potential can occur during the late summer or early fall).

d. No Spillway Flow Forecast. When forecast information clearly indicates that Sepulveda Dam will not experience spillway flow (reservoir water surface will not exceed elevation 710 feet), all four

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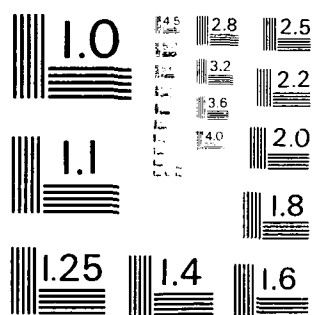
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gated outlets may be partially or fully closed in order to alleviate downstream emergencies (see Section 7-13), to prevent downstream damages, or to add an additional safety factor when the downstream channel is experiencing high flows. Outflow might then be limited to the discharge from the four ungated outlets, which is a maximum of approximately 7000 cfs at reservoir elevation 710 feet.

As discussed in Section 2-03.d.(2)(a), the crest gates are designed to lower automatically during major spillway flow events. This feature was provided in the interest of dam safety in order to increase the hydraulic outflow capacity during extreme inflows.

There may be some instances, however, when the fully automatic lowering of the crest gates, and the consequent major downstream flooding, could be avoided. When real-time data and forecast information indicate that: (a) the inflow peak of a major storm and flood event has occurred, and the inflow is in recession, and (b) all data and forecasts indicate that future rainfall clearly will not produce amounts of runoff that could possibly threaten the overtopping of the dam, then actions to prevent the automatic lowering of the crest gates should be taken.

The semi-automatic operation procedures described in Section 2-03.d.(2)(c) allow for the manual locking of the crest gates in the fully upright position (elevation 710 feet). That section also noted that the implementation of this locking procedure is awkward and time-consuming, with travel of crews to Sepulveda Dam often difficult during stormy conditions. Thus, under certain conditions, it may not be possible to achieve a rapid change from fully automatic crest gate operation to semi-automatic operation on all seven crest gates. Such action, however, even if only partially achieved, may be able to prevent substantial downstream damages.

It is important, though, that all crest gates be reset to the fully automatic mode immediately after the flood crest has passed, or sooner if updated forecast information indicates the possibility of appreciable additional precipitation and runoff.

#### 7-14. Rate of Release Change

The gated outlets at Sepulveda Dam can generally be adjusted in as rapid a manner as possible without concern over the rate of rise of the downstream channel. This is possible because the ungated outlets will always be releasing large discharges at times when significant changes could be achieved through the gated outlets. Concrete lining of the downstream channel precludes concern over bank erosion or sloughing due to sudden gate changes. During emergencies, or when downstream inflow has filled the channel of the Los Angeles River, gradual increases in gate openings, based on downstream reports, may be desired.

## VIII - EFFECT OF WATER CONTROL PLAN

### 8-01. General

The sole purpose of Sepulveda Dam is flood control, and by far the greatest effect and benefit of the dam is the protection of life and property downstream of the facility. The major aspects of flood control at Sepulveda Dam for both the reservoir and spillway design floods, as well as several major historical floods, are discussed in Section 8-02.

Any other effects or benefits of Sepulveda Dam are decidedly secondary to those of flood control, but they are briefly described in Sections 8-03 through 8-08.

### 8-02. Flood Control

a. Spillway Design Flood. The spillway of the dam was designed to pass, without danger to the dam or threat of overtopping the dam, the greatest rate of discharge that could be expected from the most severe combination of rainfall and runoff conditions that could reasonably occur. This hypothetical flood is called the Probable Maximum Flood.

(1) Original Criteria. The spillway at Sepulveda Dam was designed in 1939 for a peak outflow of 100,500 cfs, having a surcharge of 17.6 feet on the ogee crest (with crest gates at their lowest position--elevation 700 feet). An additional 7.4 feet of freeboard to handle runup by waves set the top of the dam at elevation 725 feet.

The spillway design flood resulted from a hypothetical four-day storm that produced 8.4 inches of rain during the maximum 24 hours, as averaged over the drainage area above Sepulveda Dam. Such a storm would result in a peak inflow of 177,000 cfs and a maximum impoundment of 28,700 ac-ft of water.

In a subsequent 1973 study, the adequacy of the Sepulveda Dam spillway was reviewed under the revised criteria. This led to the development of a revised Probable Maximum Flood.

(2) Revised Criteria. Plate 8-01 depicts the hyetograph (graph of incremental precipitation vs. time) of the revised Probable Maximum Precipitation over the drainage area above Sepulveda Dam, plus the hydrograph of the computed inflow, reservoir water surface elevation, and outflow that would result if such a storm were routed into Sepulveda Reservoir and through Sepulveda Dam.

The probable maximum precipitation is based upon a hypothetical 72-hour rain storm developed from the criteria published by the National Weather Service in Hydrometeorological Report No. 36, entitled, "Interim Report - Probable Maximum Precipitation in California" (1961, revised 1969). This storm is then critically centered over the drainage area above Sepulveda Dam.

The judgments made for this revised spillway design flood include: reservoir initially full to elevation 710.0 feet (spillway crest with crest gates raised); the flood control outlet works completely blocked by debris; and initial infiltration rates (loss rates) over the 70% pervious portion of the drainage area at the constant low value of 0.12 inch per hour (for a basin average effective infiltration rate of 0.08 inch per hour).

The revised Probable Maximum Flood generates a maximum inflow to Sepulveda Reservoir of 114,000 cfs late on the third day of the storm (see pl. 8-01). The maximum water surface elevation in the reservoir rises to 716.66 feet, storing 27,563 ac-ft behind the dam. At this time, the automatic crest gates will have lowered all the way down to 700 feet, and the computed maximum outflow would be 99,300 cfs.

b. Standard Project Flood. The Standard Project Flood represents the runoff event that would result from the most severe combination of rainfall and watershed conditions that are considered reasonably characteristic for the region in question.

For the rainfall to be used in the determination of the Standard Project Flood at a given site, a Standard Project Storm is normally selected as the most severe reasonably characteristic storm of record within a climatically homogeneous region surrounding the site, and is then transposed to the drainage area above the target site.

For the drainage area above Sepulveda Dam, the storm of 21-25 January 1943, centered in the San Gabriel Mountains and foothills about 15 to 25 miles east-northeast of Sepulveda Dam, was selected (see Section 8-02.c.(1) for more discussion of this storm). The storm was transposed to the drainage area above Sepulveda Dam, using a transposition factor based upon the mean annual precipitation.

As with the Probable Maximum Precipitation, the portion of the basin impervious to infiltration was set at 30% (with the pervious portion thus at 70%). The infiltration rate for the pervious portion of the basin was determined to average 0.16 inches per hour (for an effective infiltration rate of 0.11 inches per hour). The reservoir was judged to be empty at the start of the Standard Project Storm, but rapidly fills up during the storm and runoff.

Plate 8-02 depicts the hyetograph of the Standard Project Storm and the inflow, storage, and outflow hydrographs of the Standard Project Flood at Sepulveda Dam. The maximum inflow to the dam was computed to be 50,000 cfs on the second day of the storm. Shortly thereafter, the water surface elevation in the reservoir would reach a maximum of 713.52 feet, with 22,492 ac-ft of water stored behind the dam. At the same time, the combined outflow through the ungated outlets and over the spillway (with crest gates partially lowered) would be 41,300 cfs. Under a Standard Project Flood (using modern criteria, with modern watershed conditions), the downstream channel (16,900 cfs capacity) would overflow, inundating a highly urbanized area.

c. Other Floods.

(1) 21-25 January 1943. The storm of 21-25 January 1943 was in many respects the most severe of record in the coastal drainages of southern California. It occurred as a series of warm Pacific cyclones from Hawaii, collided with a cold storm moving south from British Columbia, producing strong winds and heavy rain over most of California.

Plate 8-04 depicts the rainfall and runoff of this storm. The total 21-25 January precipitation ranged from less than 8 inches in the northern and western San Fernando Valley to more than 25 inches in the Santa Monica Mountains southwest of Sepulveda Dam. Rainfall was heaviest during the first hour of 22 January, with a less intense but longer-lasting period of generally heavy rain during the last six hours of that day.

Because of unseasonably dry antecedent conditions, infiltration rates were high at the beginning of the storm. This is reflected in a relatively moderate peak inflow rate to Sepulveda Dam following the intense burst of rain early on 22 January (pl. 8-04). Progressive saturation of the ground, brought on by prolonged and increasingly heavy rain on 22 January, resulted in an increasing rate of inflow late in the day. The maximum of the computed mean hourly inflow values was 12,700 cfs during the first hour of 23 January.

The maximum water surface elevation of 699.29 feet was reached several hours later, then 6,341 ac-ft water was stored behind the dam. The maximum outflow released to the channel downstream was 2,710 cfs near mid-day 23 January.

(2) 20-24 February 1944. The storm of late February 1944 developed as a cold storm from the north moved into southern California and intensified. The rainfall of the 20-24 February 1944 event actually began on 19 February (pl. 8-05), but the reservoir did not begin to rise until early 20 February. Rainfall intensities fluctuated over the light to moderate range until early 22 February, when a 4-hour period of heavier rain resulted in a major acceleration of inflow to Sepulveda Dam.

Because of fairly substantial antecedent precipitation, infiltration rates began relatively low, and dropped even further during the course of the event. By the time of the heaviest rain of early 22 February, the ground was largely saturated. As a result of this, the peak in the mean hourly inflow to Sepulveda Dam was 15,900 cfs early 22 February; and the maximum water surface elevation of 697.92 feet, with 5,070 ac-ft of water stored behind the dam, occurred about 4 hours later. The maximum outflow of 4,740 cfs occurred at that time.

It might be noted that it was during this event that a documentation of the rise and fall of the crest gates was made (see Sections 2-03.d.(2)(a) 1b, and pls. 2-16 and 2-17).

(3) 23-27 January 1969. The period of 18-27 January 1969 was exceptionally wet throughout southern California, as a series of warm storms from south of Hawaii were funneled into this area. After moderate to heavy rain 18-22 January, followed by a one-day break, rain resumed 23 January, with several moderate rain bands and one long-lasting, heavy band that climaxed early 25 January (see pl. 8-06). The total precipitation for the period of 23-27 January to southern California ranged from 5-8 inches in the coastal lowlands to more than 25 inches in the San Gabriel Mountains.

By the time of the 24-25 January rain, the ground throughout the Sepulveda Basin and elsewhere was heavily saturated, with a high runoff potential. The result was a peak in the mean hourly inflow to Sepulveda Dam of 16,800 cfs between 0600 and 0700 hours 25 January (pl. 8-06). The water surface in the reservoir peaked four hours later at 693.30 feet, with 2,945 ac-ft of water stored; and the maximum outflow of 11,825 cfs occurred at the same time.

(4) 28 February - 5 March 1978. The storm of late February and early March of 1978 was actually a series of low-latitude Pacific storms that moved into southern California from the west and southwest, dropping more than 10 inches of rain in portions of the coastal drainages. Because of numerous heavy storms in January and February 1978, the ground in southern California was almost totally saturated by the time of the major February-March storm.

There were three major peaks of rain between 28 February and 5 March 1978: 28 February, 1 March, and 4 March (pl. 8-07). Each resulted in a sharp up-and-down pattern in the inflow, water surface elevation, and outflow at Sepulveda Dam. The third and largest peak, with four consecutive hours, each having rainfall over the watershed equal to or greater than 0.8 inch, resulted in a maximum hourly inflow of 25,670 cfs just before noon 4 March, followed shortly by a maximum reservoir surface elevation of 697.65 feet, with 5,253 ac-ft stored. The maximum outflow was 13,190 cfs just after noon.

(5) 15-17 February 1980. From 13 through 21 February 1980 a series of intense, warm Pacific storms moved into southern California from out of the west-southwest. The heaviest of these occurred on 16 February (pl. 8-08), in which an intense cold front nearly stalled directly over the western portion of the San Fernando Valley, bringing very heavy rain throughout the afternoon over the drainage area above Sepulveda Dam.

The intensity and total amount of this rainfall can be seen on plate 4-02, which depicts mass curves of accumulated precipitation for the date at Sepulveda Dam and at two stations within the watershed above the reservoir: on (Encino Reservoir) in the Santa Monica Mountains to the south, and the other (Aliso Canyon-Oat Mountain) in the foothills north of the San Fernando Valley. At each of these stations, rainfall rates approaching or exceeding 1 inch per hour were recorded for at least 3 consecutive hours.

With the ground nearly saturated from heavy rains in late January and again 13-15 February, the intense rain of 16 February resulted in the greatest inflow to, and storage of water behind, Sepulveda Dam ever recorded. From 1600 to 1700 hours on the 16th, a mean hourly inflow of 58,970 cfs was computed; this included a maximum of 62,636 cfs recorded at 1625 hours.

As the result of this heavy inflow, and to some extent, the result of a temporarily reduced outflow because of the flooding problems on the downstream Los Angeles River channel, the water behind Sepulveda Dam reached an elevation of 705.10 feet at 1845 hours, with 11,503 ac-ft stored (also see section 2-03.e.(5)). At this time the downstream problems abated and all gated outlets were reopened, producing a peak outflow of 15,288 cfs (the largest ever recorded at Sepulveda Dam).

(6) 23 February - 3 March 1983. The storm period of late February and early March 1983 was the climax of a winter and spring of repeated intense, low-latitude Pacific storms that moved into southern California from the west. Plate 8-09 shows the precipitation, inflow, water surface elevation, and outflow at Sepulveda Dam from 28 February through 3 March.

During the course of the storm, there were several up-and-down fluctuations in each of these parameters, but the largest by far of these occurred during the morning of 1 March, when the maximum hourly inflow reached 38,676 cfs; the maximum water surface elevation reached 702.53 feet, storing 8,950 ac-ft; and the maximum outflow reached 14,300 cfs after a brief reduction during mid-morning to alleviate downstream channel problems. Each of these 1 March 1983 values (inflow, water surface elevation, contents stored, and outflow) represents the second greatest value of record (after February 1980) for the respective parameters at Sepulveda Dam.

(d) Comparison of Floods. Plate 8-10 is a comparison of the floods discussed in Sections 8-02.a. through 8-02.c. Table 8-01 is a listing of the values depicted on plate 8-10 (as well as on pls. 8-01 through 8-09). The four diagrams of plate 8-10 (corresponding to the four columns of table 8-01) depict the maximum values of water surface elevation, reservoir capacity, the mean hourly inflow, and outflow for the six historical floods and the two design floods at Sepulveda Reservoir. In each of the diagrams of plate 8-10, the floods are arranged in ascending order, according to maximum water surface elevations and capacity.

In all four diagrams of plate 8-10, the Probable Maximum Flood (PMF) is clearly of greatest magnitude. The Standard Project Flood (SPF) is second, except for inflow, where the highest mean hourly inflow on 16 February 1980 exceeded that for the Standard Project Flood. The flood of 1 March 1983 is the second greatest historical flood in all four diagrams of plate 8-10 (fourth highest when the design floods are

included). Based on a recent hydrologic study conducted in February 1988 (see table 1-01; Draft: Los Angeles County Drainage Area Review; Part I, Hydrology Report), the maximum flood for which spillway flow will not occur is approximately the 80-year event (refer to table 4-09 and pl. 4-07).

It can be seen from plate 8-10 and table 8-01 that although the maximum inflows of the 1943 and 1944 floods were not as high as those of 1969 and 1978, the maximum storage of water in 1944 was comparable to that of 1978 and was much greater in 1943 than it was in 1969. This is because the outflows were considerably more limited before the 1953 completion of the downstream Los Angeles River channel improvement (Sections 3-03 and 3-05) than they have been in recent years.

e. Hypothetical Dam Failure. Plate 8-11 depicts the areas of probable inundation downstream of Sepulveda Dam that could result in the extremely unlikely event of a failure of Sepulveda Dam with water impounded to the top of the spillway crest with crest gates raised (elevation 710 feet). The floodwaters would, in such a scenario, spread out across a broad zone on either side of the Los Angeles River, with widths exceeding one mile in some places. This inundation zone would narrow rapidly at a distance of about 5 miles downstream of the dam, would widen slightly again about three miles further downstream, and would eventually narrow and become confined to the river channel near downtown Los Angeles.

Travel times for such a dam-failure crest are shown on plate 8-11. The travel rates would be very rapid at first, reaching about 5 miles downstream within the first 30 minutes, but requiring 1 hour 50 minutes to reach the Ventura (U.S.-101) and Golden State (I-5) Freeway interchange, approximately 6 miles further downstream.

### 3-03. Recreation and Agriculture.

a. Recreation. None of the recreational facilities in Sepulveda Reservoir depend upon runoff water impounded behind the dam. Thus, there are no direct recreational benefits that result from the dam or its operation. The recreational facilities were constructed because the land within the reservoir could not be used for other purposes. Thus there is an indirect benefit of the project upon recreation.

The effects of the dam and its operation upon the recreational facilities within the reservoir are by necessity all negative, that is, some of these facilities are occasionally flooded by the impoundment of water behind the dam for flood control. These recreational facilities, however, were constructed and are operated with this understanding.

b. Agriculture. The same arguments cited above regarding recreation also apply to the agricultural products that are cultivated on Sepulveda Reservoir lands. Because the overall acreage of agriculture within the reservoir basin is small compared to the needs of the local population, the impact of Sepulveda Dam and its operation upon the overall food production and consumption in the region is negligible.

#### 8-04. Water Quality

There are no benefits of Sepulveda Dam to the water quality of the Los Angeles River. On the other hand, Sepulveda Dam and its operation should not in any way contribute to the degradation of the water quality of the river.

The Donald C. Tillman Water Reclamation Plant (TWRP), constructed within the reservoir boundaries of Sepulveda Dam provides advanced secondary treatment of wastewater produced by the San Fernando Valley area (refer to section 2-06.d.). To date, reclaimed water is designated for the recreation lake, wildlife management, and irrigation. Sepulveda Flood Control Reservoir will in no way supplement treatment of wastewater and because of potential inundation to TWRP, all flood control operations will have zero or negative net benefits on the plant.

#### 8-05. Fish and Wildlife

The reservoir lands that constitute the Sepulveda Flood Control Basin provide open space and some natural riparian habitat in the middle of an extensive urban area, thereby providing very important wildlife habitat. A large portion of the Los Angeles River within the basin is one of only two reaches of the river that constitutes a soft-bottom channel, thus allowing a unique habitat to flourish. More than 200 species of birds, 20 species of mammals, 13 species of reptiles and amphibians, and 5 species of fish have been reported in the reservoir basin (see table 1-01; Sepulveda Basin Master Plan, Final Environmental Impact Report/Environmental Impact Statement, (March 1980), in addition see Planning Aid Report--A Reconnaissance Survey of Biological Resources in the Los Angeles County Drainage Area, prepared for U.S. Army Corps of Engineers, Los Angeles District, by U.S. Fish and Wildlife Service, 1984).

Flooding within the reservoir basin is relatively uncommon (especially May-October) and is usually not prolonged, and therefore does not normally cause serious adverse impacts upon biological resources within the basin, although some impacts are inevitable. Wildlife taking refuge in burrows, or slow-moving species, such as the San Diego horned lizard, a Category 2 Federal Candidate Species, might be trapped and killed by flooding. If deviations from the reservoir regulation schedule for closing the gated outlets (pl. 7-02) should result in the flooding of greater areas of reservoir lands than would have otherwise been the case, then a greater number of animals may drown. Any deviations from the reservoir regulation schedule (pl. 7-02) occurring after approximately the beginning of April could disrupt the nesting of some birds, including some sensitive species: for example the Least Bell's Vireo and the Yellow Warbler. The Blue Grosbeak is another species of interest which, although not uncommon in the western United States, is a rare nester in Los Angeles County and is found along this portion of the channel of the Los Angeles River.

Flooding within the reservoir basin also has a beneficial impact upon some wildlife. Large numbers of migratory waterfowl and shorebirds utilize low-lying flooded areas within the basin for wintering.



This manual is the first operational document written for Sepulveda Flood Control Reservoir since passage of the National Environmental Protection Act in 1969. An environmental assessment, prepared in conjunction with this manual, resulted in a Finding of No Significant Impact (FONSI). The FONSI was signed by Colonel Butler, District Engineer, Los Angeles District, on 21 May 1987, and is included as Exhibit G.

#### 8-06. Water Supply

Since Sepulveda Dam is not operated for water supply, there are no direct effects or benefits of the dam or its operation upon the water supply of the San Fernando Valley or other parts of the greater Los Angeles Basin. There are no practical indirect benefits of Sepulveda Dam upon the downstream groundwater spreading facilities even though the flow rates on the Los Angeles River, past these facilities, are at times reduced, and the duration of runoff prolonged, by the dam.

#### 8-07. Hydroelectric Power

There is no existing or contemplated hydroelectric power generation at Sepulveda Dam.

#### 8-08. Navigation

There is no navigation on the Los Angeles River or in Sepulveda Reservoir at any time.

#### 8-09. Frequencies

a. Peak Inflow and Outflow Probability. Plate 4-06 is a graph of the inflow and outflow frequencies at Sepulveda Dam, computed from the 1985 Los Angeles County Drainage Area review study (see table 1-01; Draft: Los Angeles County Drainage Area Review: Part I Hydrology Report (February 1988)). The values of these curves at specific return periods are listed in table 4-08. The inflow curve, which was discussed in Section 4-07, is of course not affected by the water control plan for Sepulveda Dam, which has bearing only upon regulation of the outflow and consequently the impoundment of water behind the dam. This inflow curve, however, reflects the effects of the upstream Los Angeles River channel improvement, which has been in place for many years.

The outflow curve of the plate 4-06, on the other hand, does reflect the Sepulveda Dam water control plan, including the gate operation schedule shown in plate 7-02. The sharp break in the slope of the curve reflects the fact that (according to the current settings) the crest gates are set to begin to lower when the water surface reaches elevation 712 feet, with the outflow rate thus increasing rapidly for any additional rise to the reservoir water surface (pl. 2-19).

b. Pool Elevation Duration and Frequency. Plate 4-07 is the computed filling frequency curve for Sepulveda Dam, based upon, and adjusted for, 1980 conditions. These conditions include percent of impervious cover in the drainage area above Sepulveda Reservoir, runoff

routing conditions, and the gate operation schedule of the water control plan. The values of the curve at specific return periods are listed in table 4-08. As with the outflow frequency curve (pl. 4-06), the relatively sharp change in slope of the filling frequency curve (pl. 4-07) reflects the fact that the crest gates begin to lower as the reservoir water surface exceeds elevation 712 feet, thus reducing the rate of additional impoundment of water within the reservoir for a given increase in flow.

c. Key Control Points. Exhibit F is a set of four stage/discharge rating tables for stream gauges on the Los Angeles River between Sepulveda Dam and the Pacific Ocean. These ratings, which were furnished by Los Angeles County Department of Public Works, are graphically depicted on plate 5-02. The stages, or gauge heights, and the corresponding discharges in Exhibit F and plate 5-02 range from zero at the bottom of the low-flow channel to approximately the channel capacity of the river at each location (refer to pl. 2-04).

As one measure of comparison, table 3-02 lists the peak discharges at each of the four gauges listed in Exhibit F for several of the greatest floods of record. It should be noted that none of these historical floods has exceeded channel capacity at any of the gauges, although during the flood of 16 February 1980, water reached the top of the levees near the gauge on the Los Angeles River below Wardlow Road (see Section 4-12.d. and Photograph 4-03), apparently as the result of a local hydraulic instability.

### 3-10. Other Studies

a. Examples of Regulation. Discharge frequency values presented in this manual were derived from ongoing (1985) investigations in the U.S. Army Corps of Engineers Los Angeles County Drainage Area Study. Preliminary analyses in this study have been applied to evaluate Sepulveda Dam and have been considered in preparing the water control plan. The Interim Report on Hydrology and Hydraulic Review of Design Features of Existing Dams for Los Angeles County Drainage Area Dams, dated June 1978, presents the derivation of the Probable Maximum and Standard Project Floods used in this manual.

b. Channel and Floodway Improvement. No floodplain management studies addressing the downstream channel have been conducted by the U.S. Army Corps of Engineers since the downstream channel was constructed. Several Flood Insurance Studies have been completed to date by the Corps of Engineers and Los Angeles County Flood Control District (now part of the Department of Public Works) for the Federal Emergency Management Agency. These studies show no downstream flood problem. Currently (1988) the Corps of Engineers is conducting an ongoing review study of the entire Los Angeles County Drainage Area system in order to reassess the adequacy of flood protection provided by the downstream channels. This study does show that there is a potential for flooding on the Los Angeles River for floods having a return period of approximately 50 years (see pl. 4-06 and table 1-01; Draft: Los Angeles County Drainage Area Review: Part I, Hydrology report (February 1988)).

Table 8-01. Comparison of Historical Floods and  
Design Floods, Sepulveda Reservoir.

|                        | Plate<br>No. | Water<br>Surface<br>Elevation<br>(ft., NGVD) | Capacity<br>(ac-ft) | Inflow*<br>(cfs) | Outflow<br>(cfs) |
|------------------------|--------------|----------------------------------------------|---------------------|------------------|------------------|
| Probable Maximum Flood | 8-01         | 716.66                                       | 27,563              | 114,000          | 99,300           |
| Standard Project Flood | 8-02         | 713.52                                       | 22,422              | 50,000           | 41,300           |
| 23 January 1943        | 8-04         | 699.29                                       | 6,341               | 12,700           | 3,710            |
| 22 February 1944       | 8-05         | 697.92                                       | 5,070               | 15,000           | 4,740            |
| 23 January 1969        | 8-06         | 698.30                                       | 2,945               | 16,300           | 11,920           |
| 4 March 1973           | 8-07         | 697.65                                       | 5,253               | 25,670           | 13,130           |
| 16 February 1980       | 8-08         | 705.10                                       | 11,503              | 58,970**         | 15,100           |
| 1 March 1983           | 8-09         | 700.53                                       | 8,950               | 33,670           | 14,330           |

\*Maximum of mean hourly values.

\*\*Maximum inflow for 25 minutes: 60,636 cfs.

NOTE: See plate 8-10 for graphical comparison of the values listed  
here.

Table 8-02. Peak Discharges of Record, Los Angeles River  
Below Sepulveda Dam.

Values are in cubic feet per second (cfs)

| Name of Station                                    | <u>Date</u> |          |          |         |
|----------------------------------------------------|-------------|----------|----------|---------|
|                                                    | 1/25/69     | 2/10/78  | 2/16/80  | 3/01/83 |
| Los Angeles River at<br>Tujunga Avenue, F300-R     | 30,800*     | 30,100   | 27,625   | 27,625  |
| Los Angeles River<br>above Arroyo Seco, F57C-R     | 41,800      | 52,700** | 52,200   | 44,500  |
| Los Angeles River<br>below Firestone Blvd., F34D-R | 58,000      | 73,600   | 74,400** | 61,400  |
| Los Angeles River<br>below Wardlow Road, F319-R    | 102,000     | 94,820   | 128,700* | 81,800  |

\*Greatest discharge of record.

\*\*Greatest discharge since the construction of Sepulveda, Hansen, Santa Fe, and Whittier Narrows Dams in the early 1940's, and exceeded only by the flood of 3/02/38: 68,000 cfs (estimated) at F57C-R, and 79,000 cfs at F34D-R.

NOTE: See plate 5-01 for location of stations.

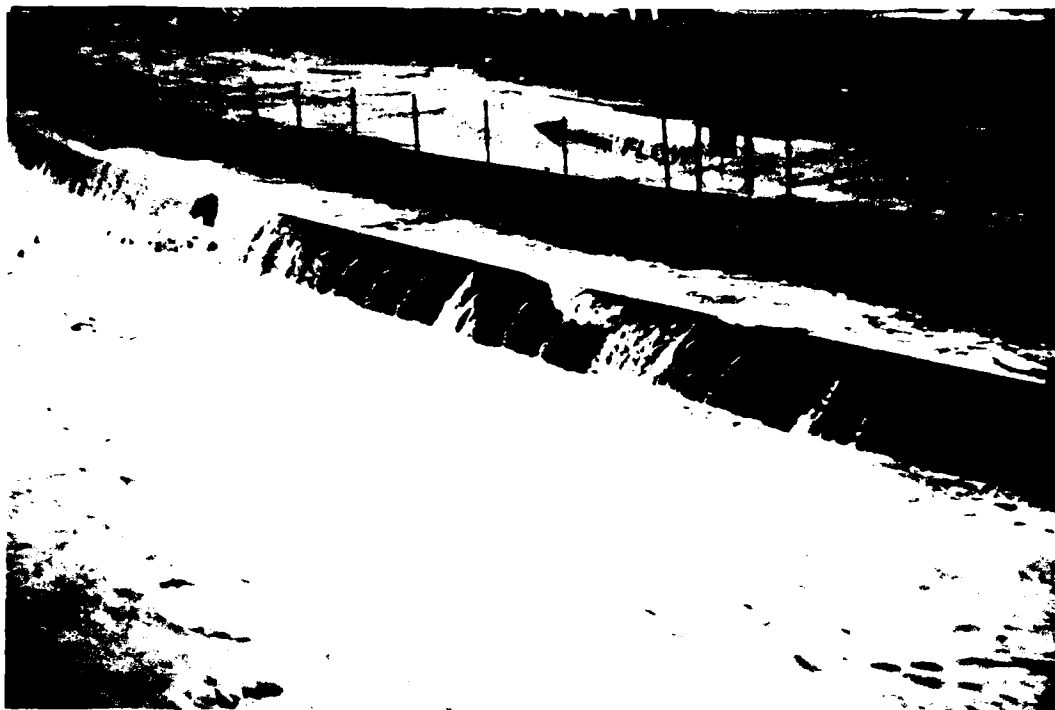


Photo No. 8-01. Flood of 1 March 1983, Los Angeles River at Whitsett Avenue Channel, Studio City (approximately 5 river miles below Sepulveda Dam).

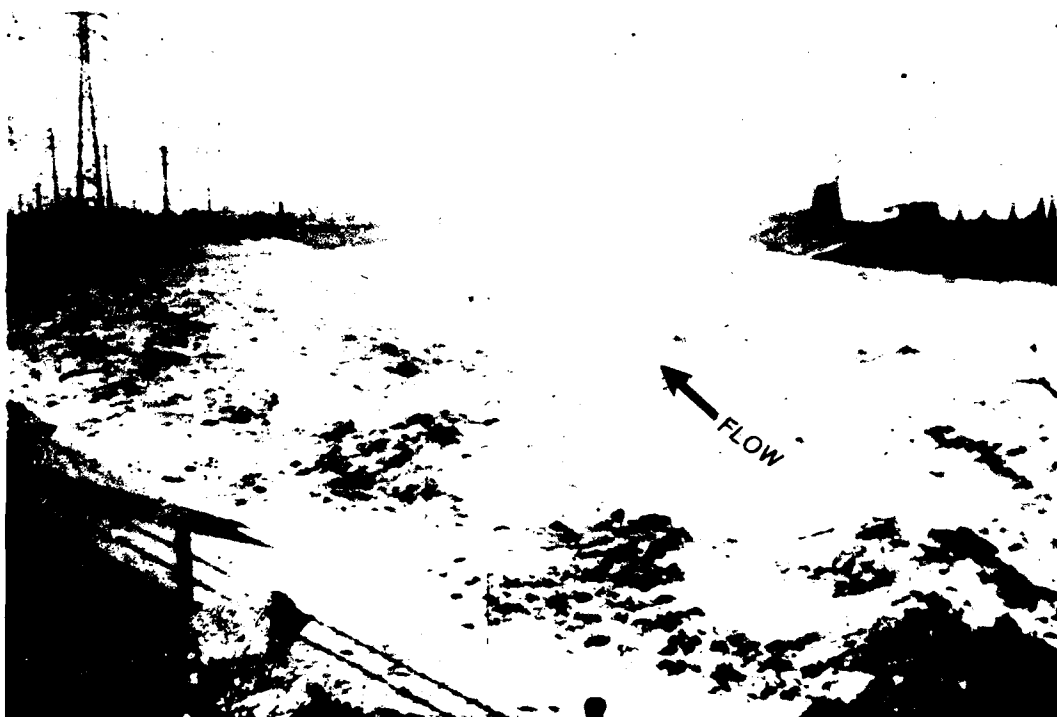


Photo No. 8-02. Flood of 1969 (most likely 25 January), Los Angeles River near downtown Los Angeles, approximately 22 river miles below Sepulveda Dam (view toward downstream).

## IX - WATER CONTROL MANAGEMENT

### 9-01. Responsibilities and Organization

a. Corps of Engineers. Sepulveda Dam is owned by the Federal Government and is operated and maintained by the U.S. Army Corps of Engineers, Los Angeles District, which has complete regulatory responsibility for the dam, the reservoir lands, and a portion of the downstream Los Angeles River.

Reservoir operations at Sepulveda Dam and other Corps of Engineers facilities are conducted by the Reservoir Regulation Unit of the Reservoir Regulation Section of Los Angeles District. Table 9-01 is an organizational chart depicting the chain of command for the Reservoir Regulation Unit.

Gate regulation instructions to the dam tender are issued by the Reservoir Regulation Unit (see Sections 5-05 and 5-06). In the event that communication between the Reservoir Regulation Unit and Sepulveda Dam are interrupted, a set of Standing Operating Instructions to Dam Tender are included in this manual as Exhibit A. Dam tenders are part of the Operations Branch, under the Construction-Operations Division of the Corps of Engineers, Los Angeles District.

b. Other Federal Agencies. The U.S. Army Corps of Engineers has complete responsibility for the operation of Sepulveda Dam; and although the Corps of Engineers receives data and information from other Federal and local agencies and informs these agencies of major decisions affecting Sepulveda Dam, no other agency has any responsibility in the operation of Sepulveda Dam. The U.S. Geological Survey operates stream gauges within Los Angeles County Drainage Area.

c. State and County Agencies. Los Angeles County Department of Public Works has maintenance responsibility for portions of the Los Angeles River channel downstream of Sepulveda Dam and maintains and operates a number of flood control reservoirs on tributary streams (see Exhibit C).

d. City of Los Angeles. A large portion of the Sepulveda Reservoir lands, owned by the Federal Government and operated by the Corps of Engineers, is leased to the City of Los Angeles for recreational and wildlife management purposes. The Corps of Engineers retains all rights to inundate this land.

e. Private Organizations. There is no involvement of private organizations in the regulation of Sepulveda Dam.

### 9-02. Interagency Coordination

The U.S. Army Corps of Engineers coordinates with other Federal, State, County, and local organizations, as well as with the press, concerning the water control for Sepulveda Reservoir.

a. Local Press and Corps of Engineers Bulletins. The Public Affairs Office of the Corps of Engineers, Los Angeles District, is responsible for interfacing with the press regarding operations at Sepulveda Dam and flows on the Los Angeles River downstream of the dam. This is accomplished through both interviews and the occasional issuance of press releases. The Corps of Engineers does not publicly issue flood watches or warnings or other status reports or forecasts. These are the responsibility of the National Weather Service.

b. National Weather Service. The Corps of Engineers utilizes National Weather Service data and forecasts in the operation of Sepulveda Dam, including the real-time telemetry data from gauges installed in the watershed by Los Angeles Department of Public Works and by other County Flood Control Districts in cooperation with the National Weather Service. The Corps shares data with the National Weather Service and other agencies both on a real-time basis and after the fact.

c. U.S. Geological Survey. The Corps of Engineers receives streamflow data in southern California from the U.S. Geological Survey, primarily on a historical basis. The Corps coordinates with the U.S. Geological Survey in many different ways and shares its data with the Geological Survey.

d. Other Federal, State, or Local Agencies. The Corps of Engineers and Los Angeles County Department of Public Works closely coordinate the operation of their reservoir projects and the maintenance and patrolling of their channels within Los Angeles County Drainage Area. The Corps keeps the City of Los Angeles informed of any anticipated and actual reservoir impoundments. Other interested agencies, such as the California Department of Transportation (CAL TRANS), are informed by the Corps of Engineers whenever a major inundation or release at Sepulveda Dam is anticipated.

#### 9-03. Interagency Agreements

The Corps of Engineers has a maintenance agreement with Los Angeles County Department of Public Works for portions of the improved channel of the Los Angeles River. The Corps maintains the reach between Lankershim Boulevard in North Hollywood (pl. 2-04) to Stewart and Gray Road, just south of Firestone Boulevard, in South Gate. All other portions of the Los Angeles River, above and below Sepulveda Dam, are maintained by Los Angeles County Department of Public Works.

#### 9-04. Commissions, River Authorities, Compacts, and Committees

Sepulveda Dam is not involved in any commissions, compacts, or other such formal multi-agency agreements.

#### 9-05 Reports

The U.S. Army Corps of Engineers, Los Angeles District, prepares and files several types of reports.

Each month during the runoff season, November through April, a flood situation and runoff potential report is prepared and sent to the South Pacific Division of the Corps of Engineers.

Seven specific forms are also prepared in conjunction with the District's reservoir operations. A copy of each of these forms is included as figures 9-01 through 9-07. These include: Flood Control Basin Operation Report (prepared by each dam tender), Monthly Reservoir Operation (operational hydrographs), Rainfall Record (from manual readings of glass tube rain gauges), Record of Calls (both radio and telephone), Record of Data from Digital Recorders, Reservoir Computations, and Reservoir Operation Report.

The Corps of Engineers also collects and files charts from recording instruments at Sepulveda Dam (and other dams), including precipitation, reservoir water surface elevation, and gate height. Daily precipitation totals and, as needed, other data (such as unusually high intensities) are manually extracted from the precipitation charts, and the charts are sent to the National Climatic Data Center of NOAA. The other charts are maintained on file at the Corps of Engineers, Los Angeles District.



Table 9-01. Chain of Command for Reservoir Operations Decisions.

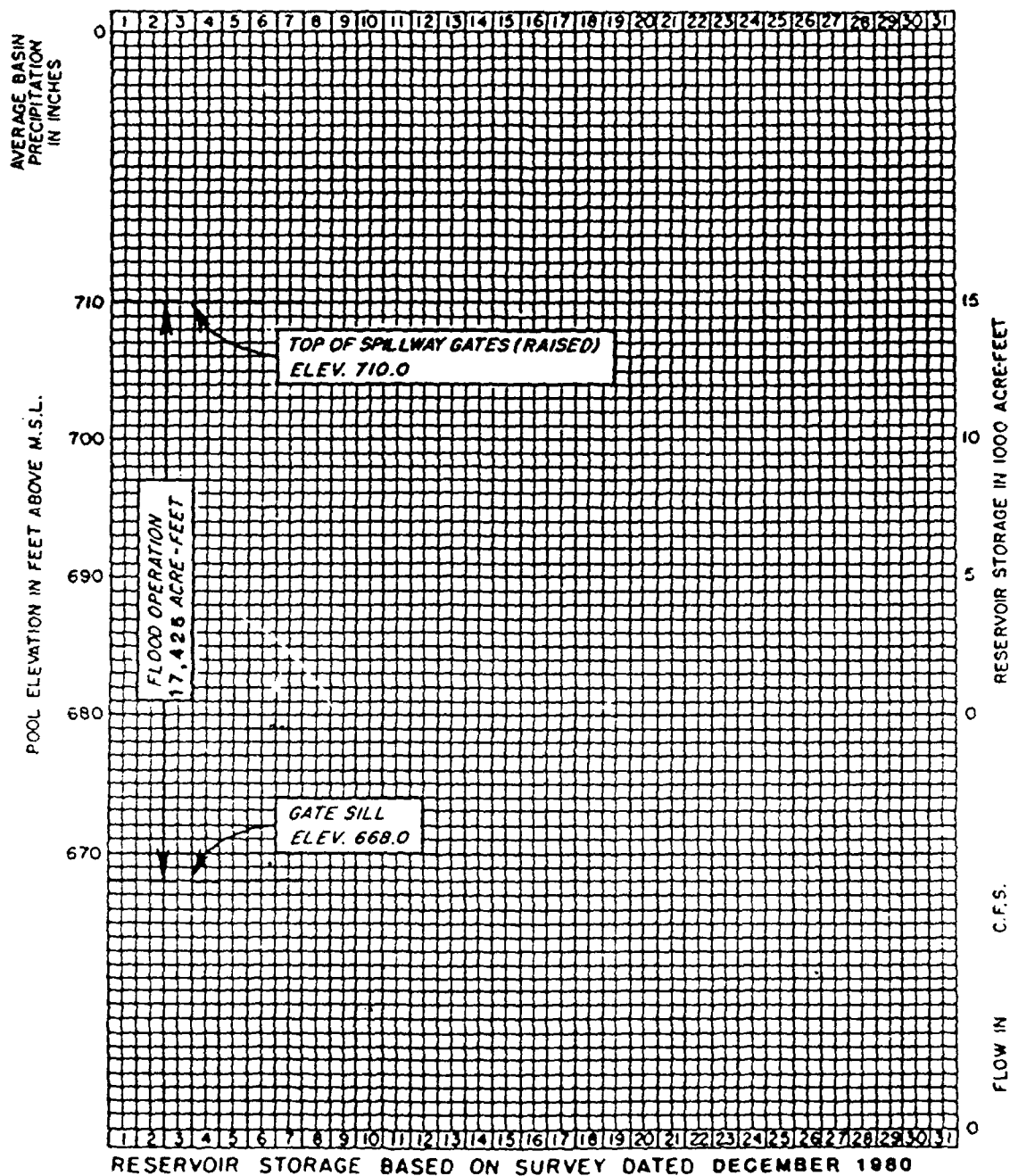
Corps of Engineers  
Los Angeles District

| <u>Title</u>      | <u>Office Phone Number:</u> |
|-------------------|-----------------------------|
| District Engineer | (213) 894-5300              |

| <u>Water Control Decisions</u>       |                | <u>Operational and Maintenance</u>        |                |
|--------------------------------------|----------------|-------------------------------------------|----------------|
| <u>Title</u>                         | <u>Phone:</u>  | <u>Title</u>                              | <u>Phone</u>   |
| Chief, Engineering Division          | (213) 894-5470 | Chief, Construction-Operations Division   | (213) 894-5600 |
| Chief, Hydrology & Hydraulics Branch | (213) 894-5520 | Chief, Operations Branch                  | (213) 894-5520 |
| Chief, Reservoir Regulation Section  | (213) 894-6915 | Chief, Operations and Maintenance Section | (818) 401-4008 |
| Chief, Reservoir Regulation Unit     | (213) 894-6916 | Dam Tender Foreman                        | (818) 401-4007 |
|                                      |                | Sepulveda Dam Tender                      | (818) 784-0240 |



ENGCW-E-6



RESERVOIR STORAGE BASED ON SURVEY DATED DECEMBER 1980

|                                            |       |                          |
|--------------------------------------------|-------|--------------------------|
| MONTH OF                                   | 19    |                          |
| ELEV.                                      |       | GROSS STORAGE (ACRE-FT.) |
| Conservation Pool                          |       | NONE                     |
| Full Pool                                  | 710.0 | 17,425                   |
| Outlet Capacity at Full Pool 16,500 c.f.s. |       |                          |

MONTHLY RESERVOIR OPERATION  
 SEPULVEDA FLOOD-CONTROL BASIN  
 LOS ANGELES RIVER BASIN  
 DRAINAGE AREA 152 SQ. MILES  
 SOUTH PACIFIC DIVISION  
 LOS ANGELES DISTRICT

FILE NO. RO 05/

# RAINFALL RECORD

| STATION |    |                 |              |             | <input type="checkbox"/> HOURLY <input type="checkbox"/> DAILY |          | DATE                        |
|---------|----|-----------------|--------------|-------------|----------------------------------------------------------------|----------|-----------------------------|
| HR      | DA | TIME OF READING | GAGE READING | STORM TOTAL | SEASON TOTAL                                                   | OBSERVER | REMARKS (SNOW, TEMP., ETC.) |
| 0000    | 1  |                 |              |             |                                                                |          |                             |
| 0100    | 2  |                 |              |             |                                                                |          |                             |
| 0200    | 3  |                 |              |             |                                                                |          |                             |
| 0300    | 4  |                 |              |             |                                                                |          |                             |
| 0400    | 5  |                 |              |             |                                                                |          |                             |
| 0500    | 6  |                 |              |             |                                                                |          |                             |
| 0600    | 7  |                 |              |             |                                                                |          |                             |
| 0700    | 8  |                 |              |             |                                                                |          |                             |
| 0800    | 9  |                 |              |             |                                                                |          |                             |
| 0900    | 10 |                 |              |             |                                                                |          |                             |
| 1000    | 11 |                 |              |             |                                                                |          |                             |
| 1100    | 12 |                 |              |             |                                                                |          |                             |
| 1200    | 13 |                 |              |             |                                                                |          |                             |
| 1300    | 14 |                 |              |             |                                                                |          |                             |
| 1400    | 15 |                 |              |             |                                                                |          |                             |
| 1500    | 16 |                 |              |             |                                                                |          |                             |
| 1600    | 17 |                 |              |             |                                                                |          |                             |
| 1700    | 18 |                 |              |             |                                                                |          |                             |
| 1800    | 19 |                 |              |             |                                                                |          |                             |
| 1900    | 20 |                 |              |             |                                                                |          |                             |
| 2000    | 21 |                 |              |             |                                                                |          |                             |
| 2100    | 22 |                 |              |             |                                                                |          |                             |
| 2200    | 23 |                 |              |             |                                                                |          |                             |
| 2300    | 24 |                 |              |             |                                                                |          |                             |
| 2400    | 25 |                 |              |             |                                                                |          |                             |
|         | 26 |                 |              |             |                                                                |          |                             |
|         | 27 |                 |              |             |                                                                |          |                             |
|         | 28 |                 |              |             |                                                                |          |                             |
|         | 29 |                 |              |             |                                                                |          |                             |
|         | 30 |                 |              |             |                                                                |          |                             |
|         | 31 |                 |              |             |                                                                |          |                             |
| TOTAL   |    |                 |              |             |                                                                |          |                             |

SPL FORM 31  
OCT 65

PREV. ED. OF THIS FORM MAY BE USED  
REPLACES SPL FORM 32 WHICH MAY BE USED





# RESERVOIR COMPUTATIONS

☐ HOURLY    ☐ DAILY

| DAM                |     |                                  |                    |                     |                     |               | TIME OF READING (IF DAILY) |             |                | DATE |                            |                      |                         |
|--------------------|-----|----------------------------------|--------------------|---------------------|---------------------|---------------|----------------------------|-------------|----------------|------|----------------------------|----------------------|-------------------------|
| COMPUTED BY        |     |                                  |                    | CHECKED BY          |                     |               |                            | DATA SOURCE |                |      |                            |                      |                         |
| HR.                | DA. | WATER<br>SURFACE<br>ELEV.<br>FT. | STORAGE<br>AC. FT. | GATE<br>STEP<br>NO. | INST. OUTFLOW       |               |                            | HRS.        | STORAGE CHANGE |      | AV.<br>OUT-<br>FLOW<br>CFS | AV.<br>INFLOW<br>CFS | GATE<br>SETTINGS<br>FT. |
|                    |     |                                  |                    |                     | OUT-<br>LETS<br>CFS | G. HT.<br>FT. | FLOW<br>CFS                |             | ACRE-<br>FEET  | CFS  |                            |                      |                         |
| PREVIOUS<br>REPORT |     |                                  |                    |                     |                     |               |                            |             |                |      |                            |                      |                         |
|                    | 1   |                                  |                    |                     |                     |               |                            |             |                |      |                            |                      |                         |
|                    | 2   |                                  |                    |                     |                     |               |                            |             |                |      |                            |                      |                         |
|                    | 3   |                                  |                    |                     |                     |               |                            |             |                |      |                            |                      |                         |
|                    | 4   |                                  |                    |                     |                     |               |                            |             |                |      |                            |                      |                         |
|                    | 5   |                                  |                    |                     |                     |               |                            |             |                |      |                            |                      |                         |
|                    | 6   |                                  |                    |                     |                     |               |                            |             |                |      |                            |                      |                         |
|                    | 7   |                                  |                    |                     |                     |               |                            |             |                |      |                            |                      |                         |
|                    | 8   |                                  |                    |                     |                     |               |                            |             |                |      |                            |                      |                         |
|                    | 9   |                                  |                    |                     |                     |               |                            |             |                |      |                            |                      |                         |
|                    | 10  |                                  |                    |                     |                     |               |                            |             |                |      |                            |                      |                         |
|                    | 11  |                                  |                    |                     |                     |               |                            |             |                |      |                            |                      |                         |
|                    | 12  |                                  |                    |                     |                     |               |                            |             |                |      |                            |                      |                         |
|                    | 13  |                                  |                    |                     |                     |               |                            |             |                |      |                            |                      |                         |
|                    | 14  |                                  |                    |                     |                     |               |                            |             |                |      |                            |                      |                         |
|                    | 15  |                                  |                    |                     |                     |               |                            |             |                |      |                            |                      |                         |
|                    | 16  |                                  |                    |                     |                     |               |                            |             |                |      |                            |                      |                         |
|                    | 17  |                                  |                    |                     |                     |               |                            |             |                |      |                            |                      |                         |
|                    | 18  |                                  |                    |                     |                     |               |                            |             |                |      |                            |                      |                         |
|                    | 19  |                                  |                    |                     |                     |               |                            |             |                |      |                            |                      |                         |
|                    | 20  |                                  |                    |                     |                     |               |                            |             |                |      |                            |                      |                         |
|                    | 21  |                                  |                    |                     |                     |               |                            |             |                |      |                            |                      |                         |
|                    | 22  |                                  |                    |                     |                     |               |                            |             |                |      |                            |                      |                         |
|                    | 23  |                                  |                    |                     |                     |               |                            |             |                |      |                            |                      |                         |
|                    | 24  |                                  |                    |                     |                     |               |                            |             |                |      |                            |                      |                         |
|                    | 25  |                                  |                    |                     |                     |               |                            |             |                |      |                            |                      |                         |
|                    | 26  |                                  |                    |                     |                     |               |                            |             |                |      |                            |                      |                         |
|                    | 27  |                                  |                    |                     |                     |               |                            |             |                |      |                            |                      |                         |
|                    | 28  |                                  |                    |                     |                     |               |                            |             |                |      |                            |                      |                         |
|                    | 29  |                                  |                    |                     |                     |               |                            |             |                |      |                            |                      |                         |
|                    | 30  |                                  |                    |                     |                     |               |                            |             |                |      |                            |                      |                         |
|                    | 31  |                                  |                    |                     |                     |               |                            |             |                |      |                            |                      |                         |
| REMARKS            |     |                                  |                    |                     |                     |               |                            | TOTAL       |                |      |                            |                      |                         |
|                    |     |                                  |                    |                     |                     |               |                            | MEAN        |                |      |                            |                      |                         |

SPL FORM 30 MAY 67 PREVIOUS EDITIONS MAY BE USED:  
REPLACES SPL FORM 29 WHICH MAY BE USED

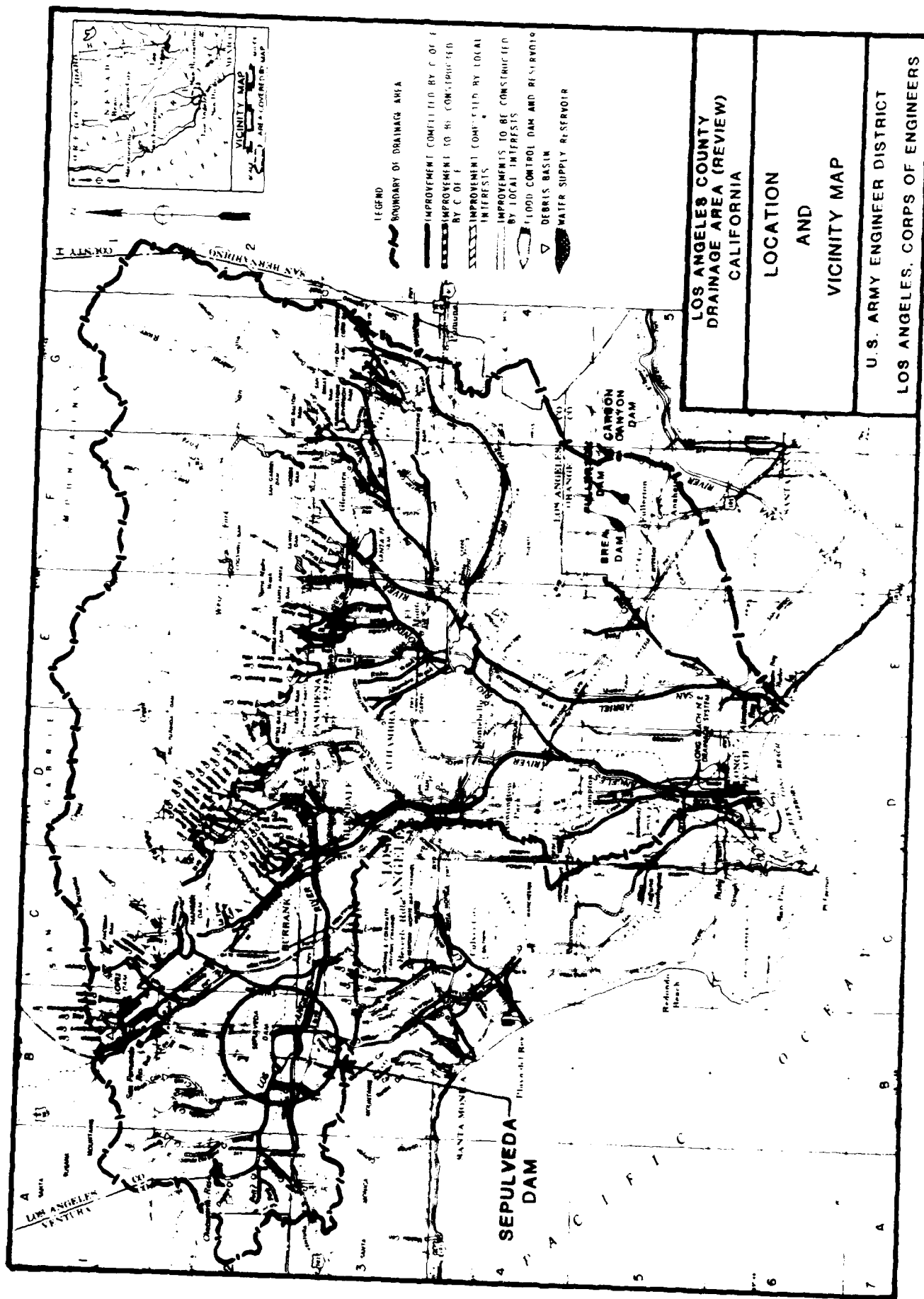
| RESERVOIR OPERATION REPORT   |                  |                                         |                                 |                     |                                  |                                          |                             |                                                                                           |                                 | DATE | TIME |
|------------------------------|------------------|-----------------------------------------|---------------------------------|---------------------|----------------------------------|------------------------------------------|-----------------------------|-------------------------------------------------------------------------------------------|---------------------------------|------|------|
| RADIO<br>CALL<br>SIGN<br>WUK | DAM              | WATER SURFACE<br>ELEVATION<br>(FT. MSL) | DIGITAL<br>RECORDER<br>READINGS | DIGITAL<br>RECORDER | RAINFALL                         |                                          |                             | GATE SETTINGS<br>(Printed values show initial settings<br>of gates prior to flood runoff) |                                 |      |      |
|                              |                  |                                         |                                 |                     | SINCE LAST<br>REPORT<br>(INCHES) | GLASS TUBE<br>STORM<br>TOTAL<br>(INCHES) | SEASON<br>TOTAL<br>(INCHES) |                                                                                           |                                 |      |      |
| 411                          | SEPULVEDA        |                                         | WS<br>GH                        |                     |                                  |                                          |                             | GATES OPEN 9.0 FT                                                                         | <input type="checkbox"/>        |      |      |
| 412                          | HANSEN           |                                         | WS<br>GH                        |                     |                                  |                                          |                             | GATES OPEN 8.0 FT.                                                                        | <input type="checkbox"/>        |      |      |
| 419                          | SANTA FE         |                                         | WS<br>GH                        |                     |                                  |                                          |                             | # 14 OPEN 0.5 FT.                                                                         | <input type="checkbox"/>        |      |      |
| 416                          | BREA             |                                         | WS<br>GH                        |                     |                                  |                                          |                             | GATES OPEN 2.0 FT.                                                                        | <input type="checkbox"/>        |      |      |
| 417                          | FULLERTON        |                                         | WS<br>GH                        |                     |                                  |                                          |                             | GATES OPEN 1.1 FT.                                                                        | <input type="checkbox"/>        |      |      |
| 418                          | CARBON CANYON    |                                         | WS<br>GH                        |                     |                                  |                                          |                             | # 1 OPEN 0.5 FT.                                                                          | <input type="checkbox"/>        |      |      |
| 421                          | PRADO            |                                         | WS<br>GH                        |                     |                                  |                                          |                             | GATES 1 & 6 OPEN 1.0 FT.<br>REM. GATES CLOSED                                             | <input type="checkbox"/>        |      |      |
| 420                          | SAN ANTONIO      |                                         | WS<br>GH                        |                     |                                  |                                          |                             | GATES CLOSED                                                                              | <input type="checkbox"/>        |      |      |
| 415                          | RIO HONDO POOL   | W. PIT                                  |                                 |                     |                                  |                                          |                             | LACFD DIVERSION GATE OPEN                                                                 | FT.                             |      |      |
|                              |                  | E. PIT                                  |                                 |                     |                                  |                                          |                             | GATE 1 OPEN                                                                               | FT.                             |      |      |
|                              |                  | COMB.                                   |                                 |                     |                                  |                                          |                             | GATES 2, 3, & 4 OPEN                                                                      | FT.                             |      |      |
|                              | WHITTIER NARROWS | TELEMARK                                |                                 |                     |                                  |                                          |                             |                                                                                           |                                 |      |      |
| W. STAFF                     |                  |                                         |                                 |                     |                                  |                                          |                             |                                                                                           |                                 |      |      |
| E. STAFF                     |                  |                                         |                                 |                     |                                  |                                          |                             |                                                                                           |                                 |      |      |
| 429                          | PAINTED ROCK     | COMB.                                   | GH                              |                     |                                  |                                          |                             | GATE # 8 OPEN 0.30 FT.                                                                    | <input type="checkbox"/>        |      |      |
|                              |                  | RES. S                                  |                                 |                     |                                  |                                          |                             | GATES OPEN 0.5 FT                                                                         | <input type="checkbox"/>        |      |      |
|                              |                  | B. PIT                                  |                                 |                     |                                  |                                          |                             | HOOK,<br>ANEMOMETER,<br>TEMPERATURE,                                                      |                                 |      |      |
| 437                          | ALAMO            | RES. S<br>T                             |                                 | XXXX                |                                  |                                          |                             | GATES CLOSED<br>GATE NO. 3 BYPASS                                                         | CFS<br><input type="checkbox"/> |      |      |

REPLACES EDITION JUL 75, WHICH IS OBSOLETE.

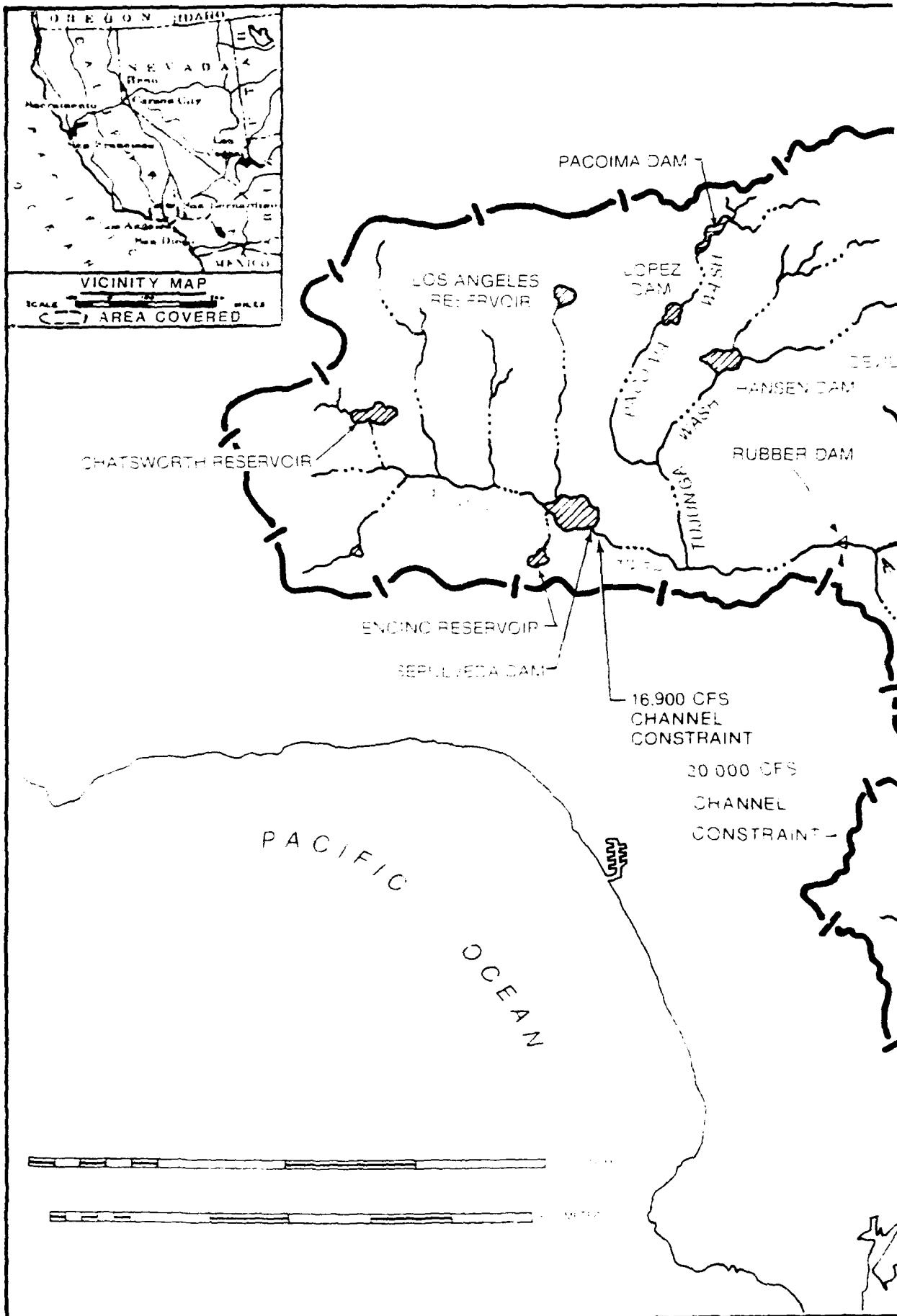
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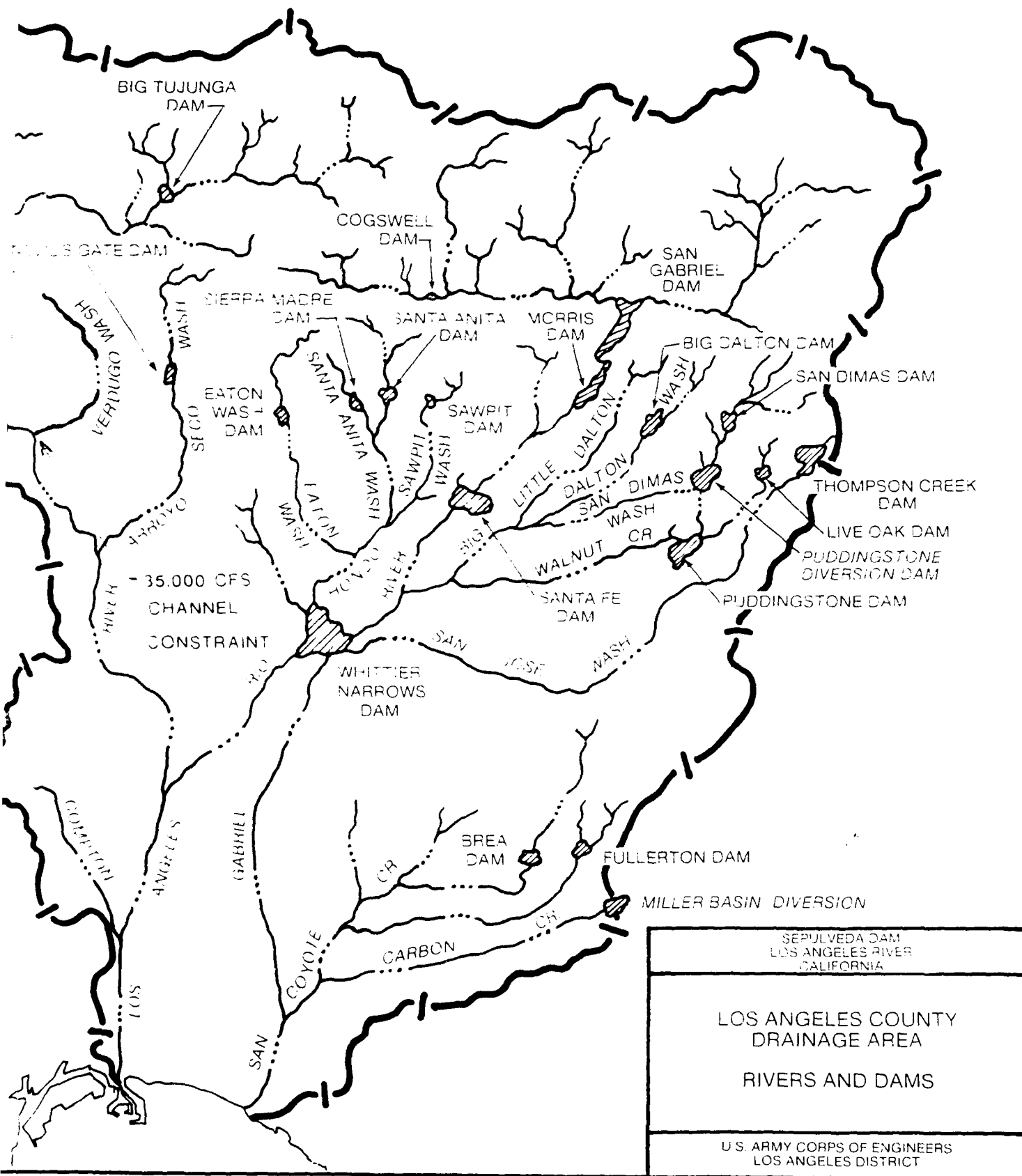
FIGURE 9-07



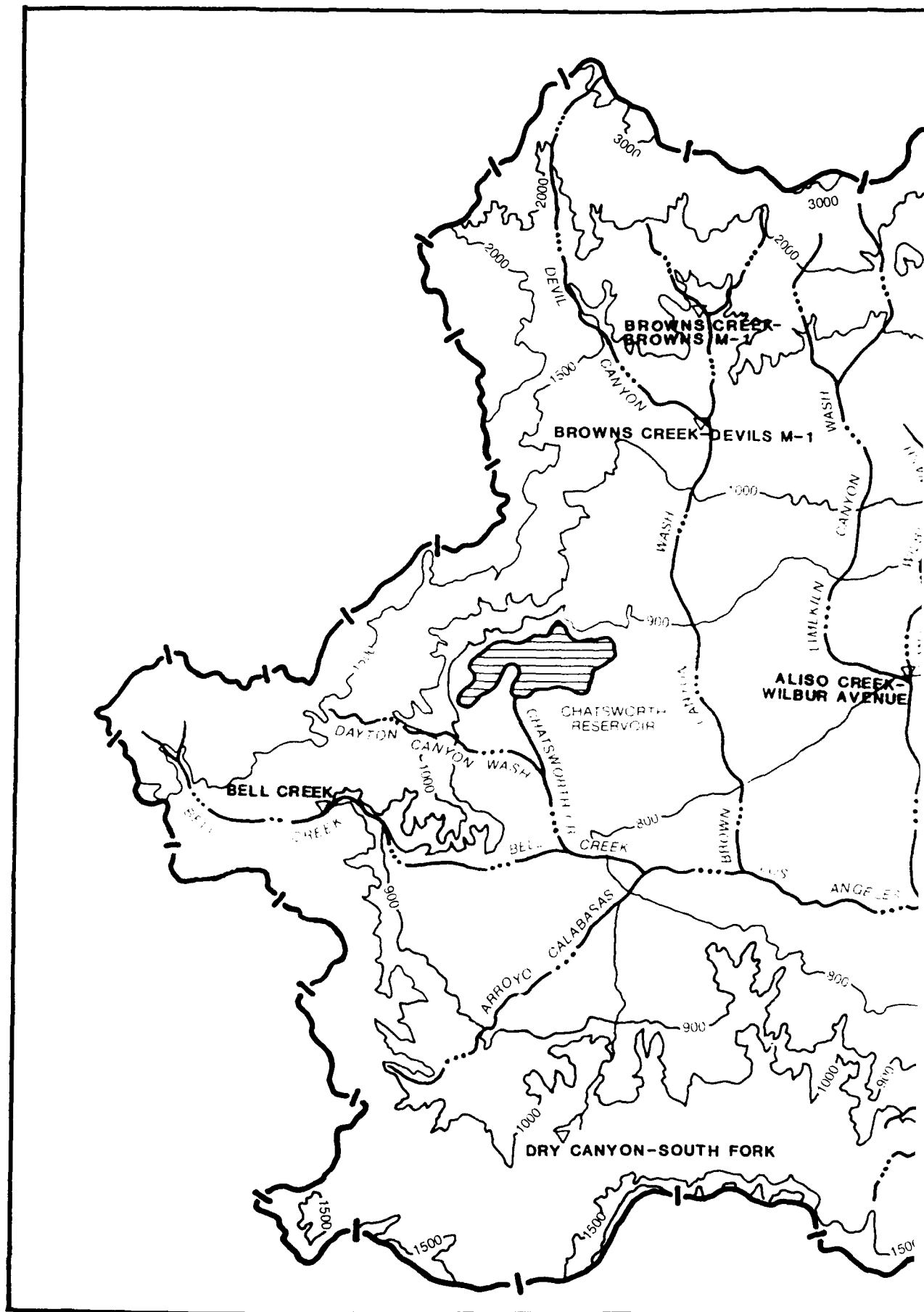


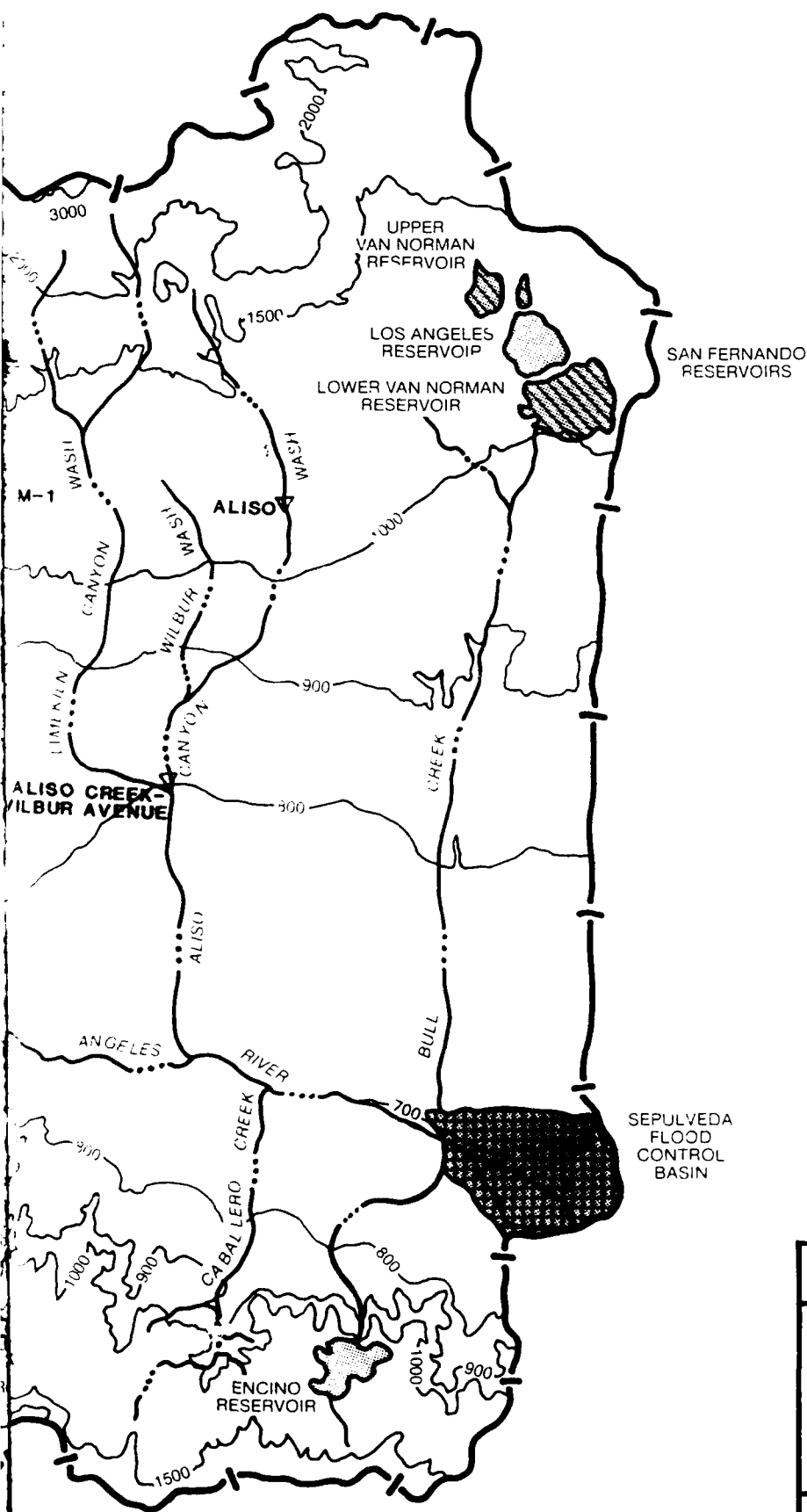
U.S. ARMY ENGINEER DISTRICT





U.S. ARMY ENGINEER DISTRICT





LEGEND

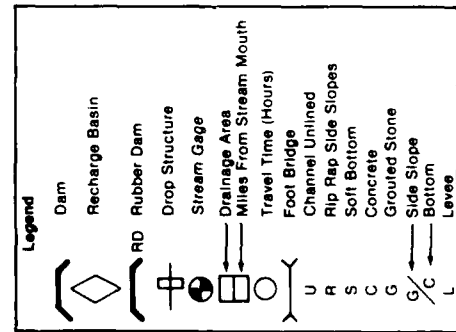
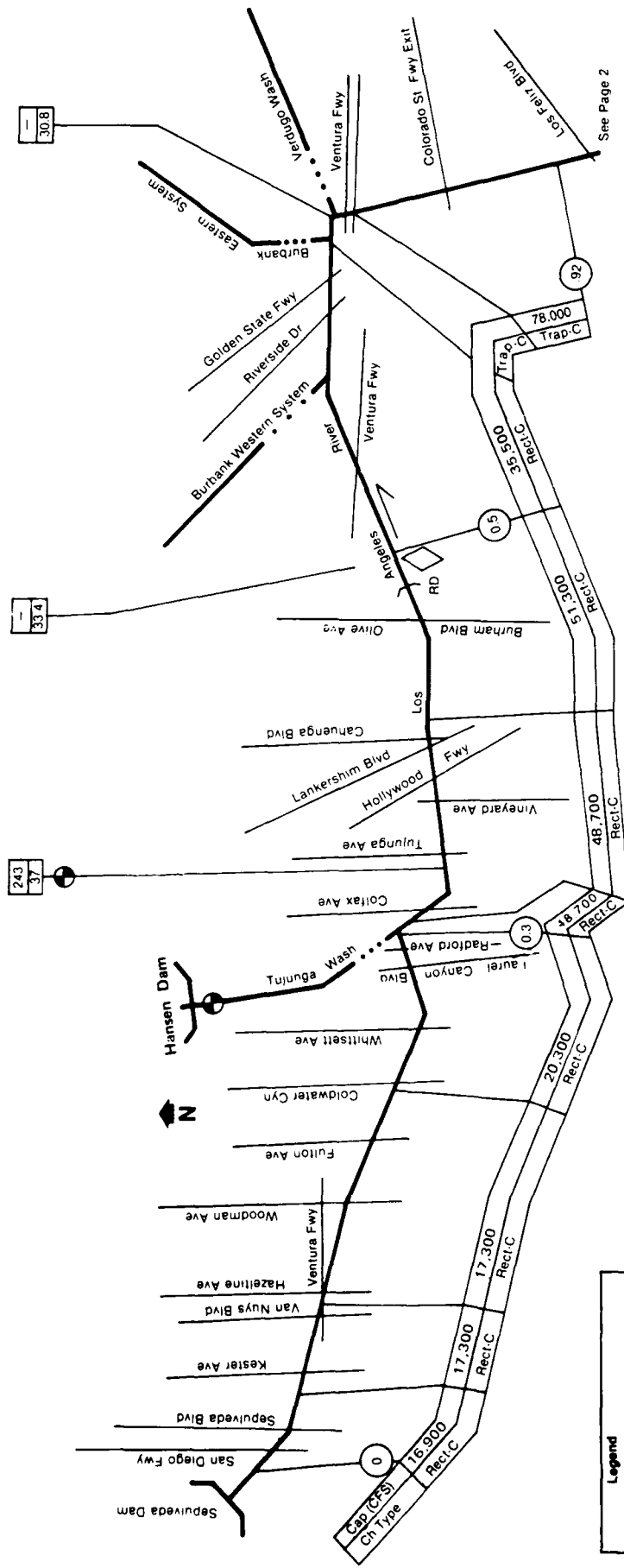
- · · · — RIVERS
- ~~~~~ CONTOURS IN FT.
- - - - - BOUNDARY FOR D.A.
- [Cross-hatched pattern] FLOOD CONTROL
- [Diagonal line pattern] EMERGENCY FLOOD STORAGE
- [Stippled pattern] WATER CONSERVATION
- [Horizontal line pattern] NOT CURRENTLY IN USE
- ▽ DEBRIS BASIN

SCALE 1 1.2 0 1 MILES

SEPULVEDA DAM  
LOS ANGELES RIVER  
CALIFORNIA

RIVERS AND RESERVOIRS  
ABOVE SEPULVEDA DAM

U.S. ARMY CORPS OF ENGINEERS  
LOS ANGELES DISTRICT



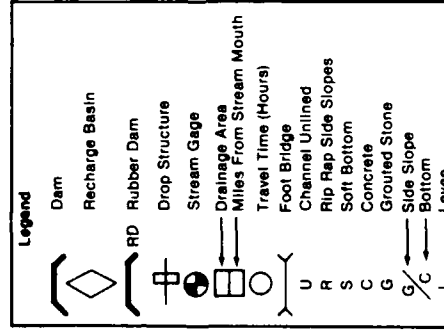
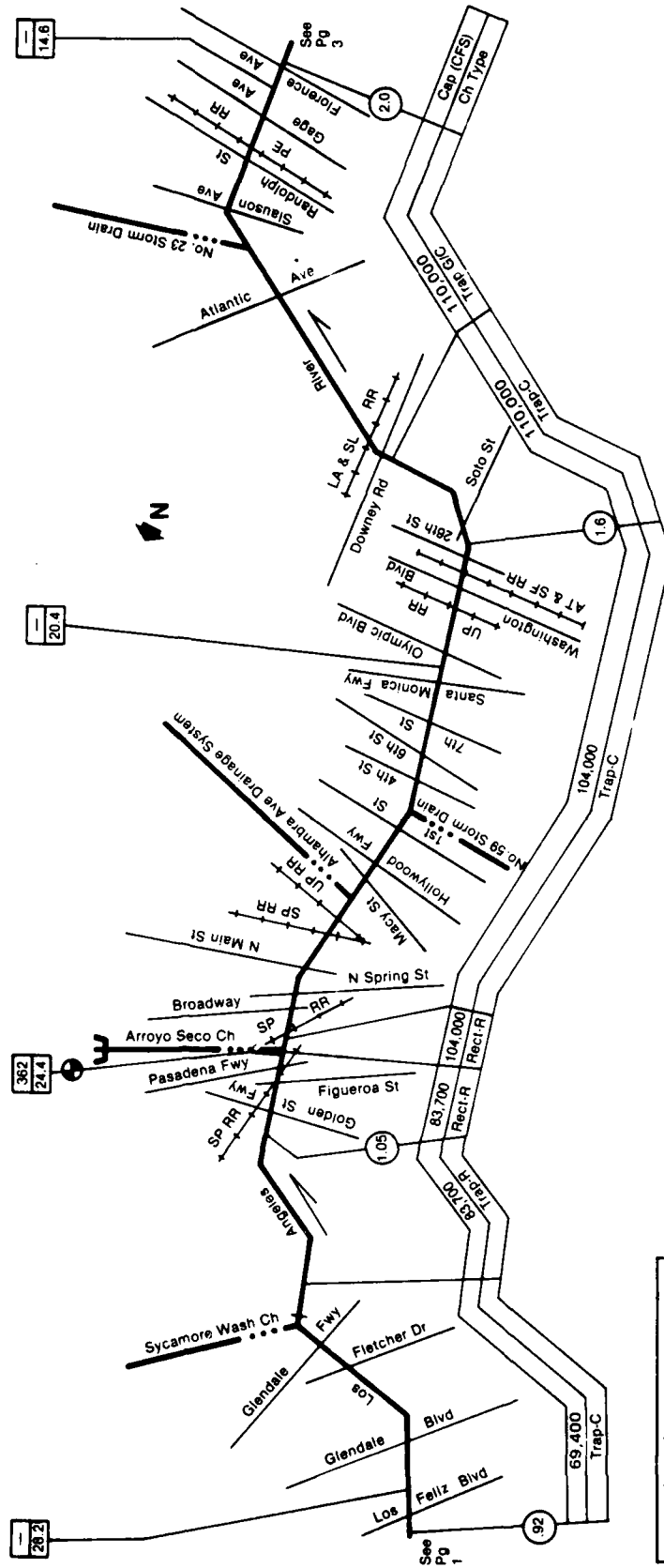
| RD | Significant Features                  | Miles | Remarks                                                        |
|----|---------------------------------------|-------|----------------------------------------------------------------|
|    | Headworks Spreading Grounds           | 33.4  | Intake Capacity 40 CFS at Rubber Dam                           |
|    | Los Angeles River at Tujunga (LACECD) | 37    | Telemetry LART                                                 |
|    | Tujunga Wash                          | 37.8  | Flows Regulated by Hansen, Big Tujunga, Pacoima and Lober Dams |

SEPULVEDA DAM  
LOS ANGELES RIVER  
CALIFORNIA

CHANNEL CAPACITIES & CONFIGURATIONS  
LOS ANGELES RIVER

SEPULVEDA DAM  
TO  
LOS FELIZ BLVD

U.S. ARMY CORPS OF ENGINEERS  
LOS ANGELES DISTRICT



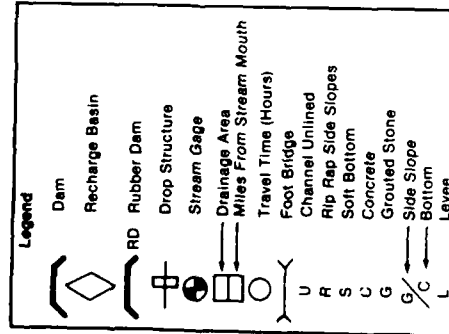
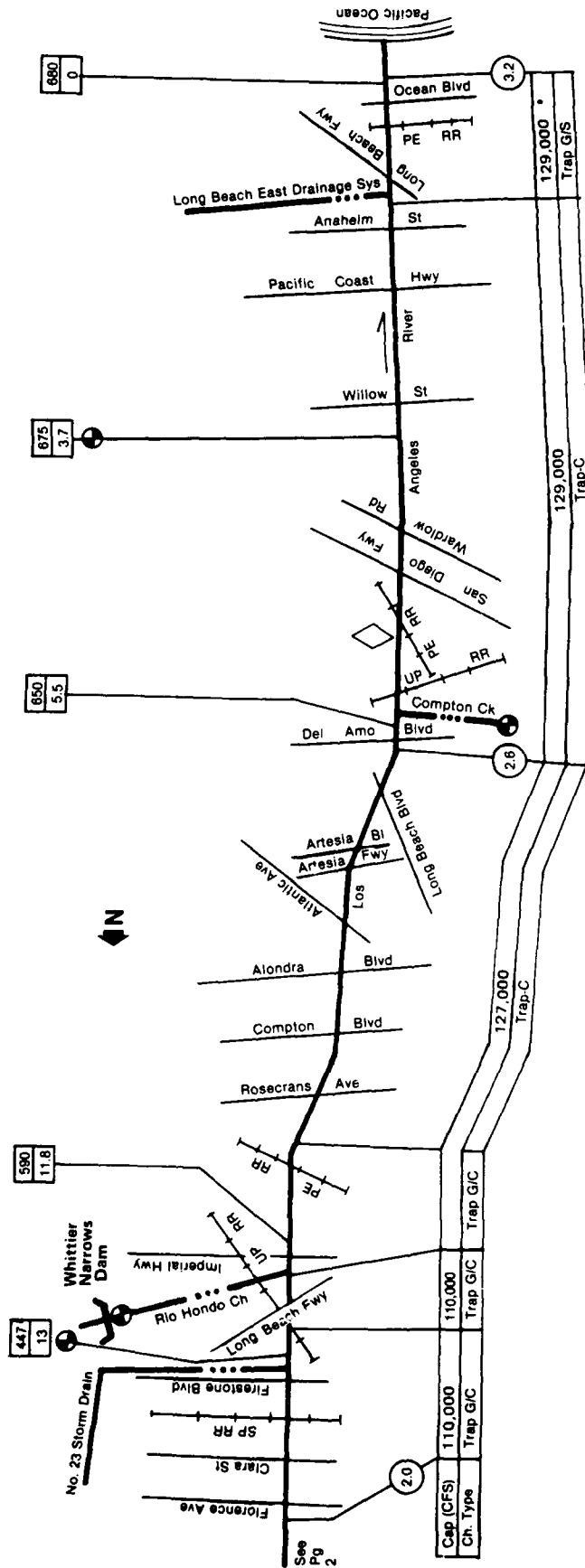
| Significant Features                | Miles | Remarks                                                |
|-------------------------------------|-------|--------------------------------------------------------|
| Los Angeles River Above Arroyo Seco | 24.4  | Telemetry 002 LARA                                     |
| Arroyo Seco Channel                 | 24.3  | Flow Regulated by Devils Gate Dam (Max Q = 43,000 CFS) |

SEPULVEDA DAM  
LOS ANGELES RIVER  
CALIFORNIA

CHANNEL CAPACITIES & CONFIGURATIONS  
LOS ANGELES RIVER

LOS FELIZ BLVD  
TO  
FLORENCE AVE

U.S. ARMY CORPS OF ENGINEERS  
LOS ANGELES DISTRICT



| Significant Features             | Miles | Remarks                                                     |
|----------------------------------|-------|-------------------------------------------------------------|
| Los Angeles River Near Firestone | 13    | Telemetry LARF                                              |
| Rio Hondo Channel near Downey    | 12.1  | Flows Regulated by Whittier Narrows Flood Control Reservoir |
| Dominguez Gap Spreading Grounds  | 4.7   | Intake Capacities 3-20 CFS                                  |
| Los Angeles River Near Wardlow   | 5.1   | Telemetry LARW (LACFCD)                                     |
| Compton Creek Near Greenleaf     | 3.7   |                                                             |

SEPULVEDA DAM  
LOS ANGELES RIVER  
CALIFORNIA

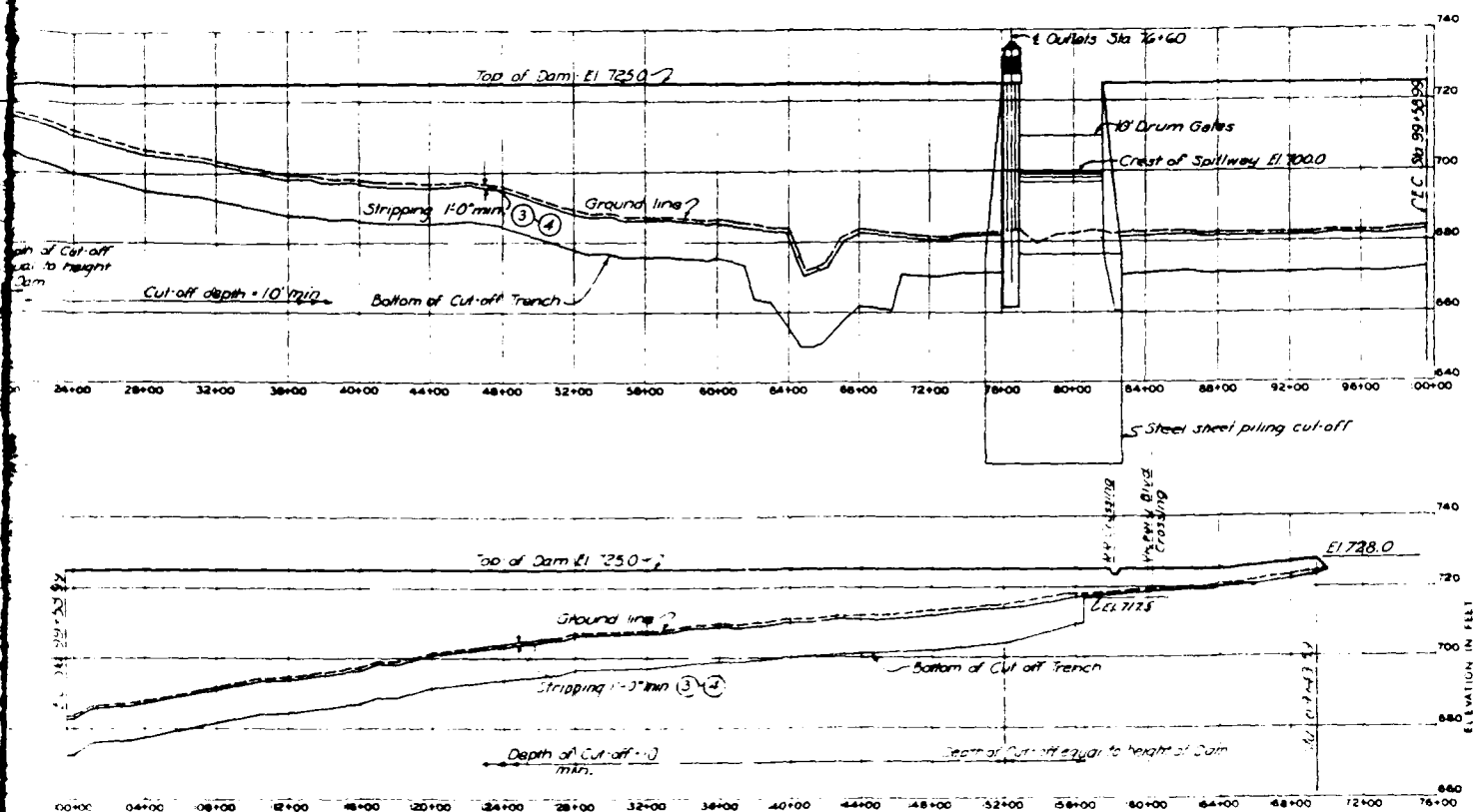
CHANNEL CAPACITIES & CONFIGURATIONS  
LOS ANGELES RIVER

FLORENCE AVE  
TO  
PACIFIC OCEAN

U.S. ARMY CORPS OF ENGINEERS  
LOS ANGELES DISTRICT

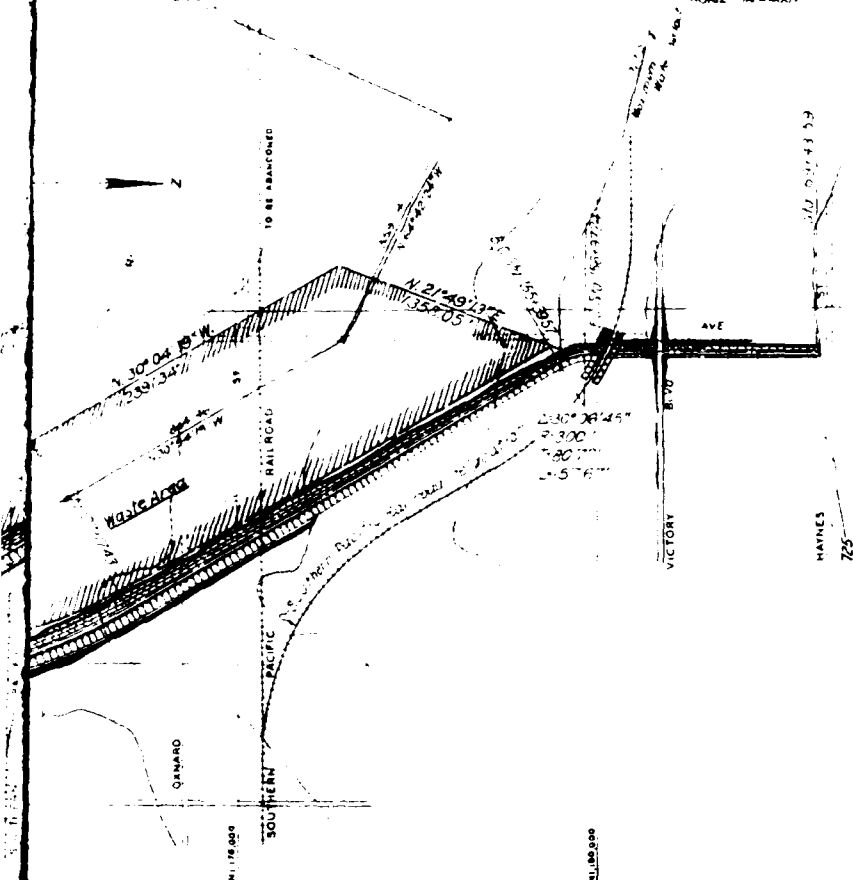






PROFILE ALONG AXIS OF DAM

SCALES VERT. 1" = 20 FT  
HORIZ. 1" = 400 FT

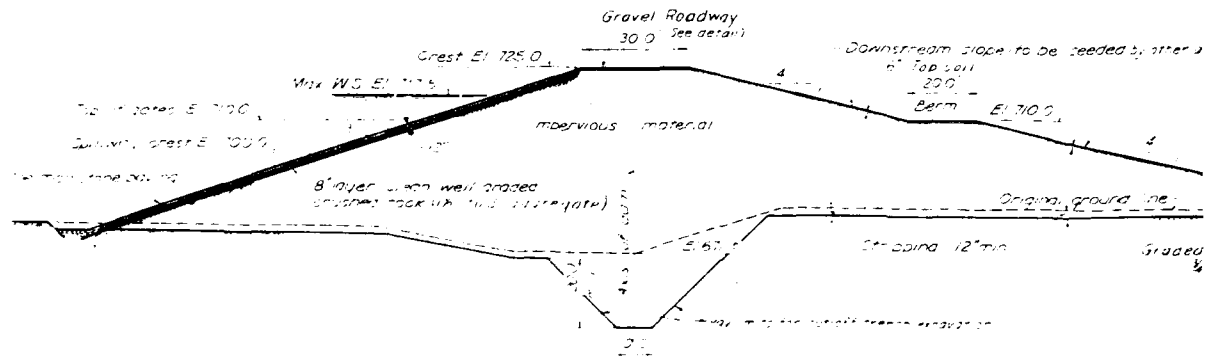


SEPULVEDA DAM  
LOS ANGELES RIVER  
CALIFORNIA

GENERAL PLAN AND PROFILE

U. S. ARMY ENGINEER DISTRICT  
LOS ANGELES, CORPS OF ENGINEERS

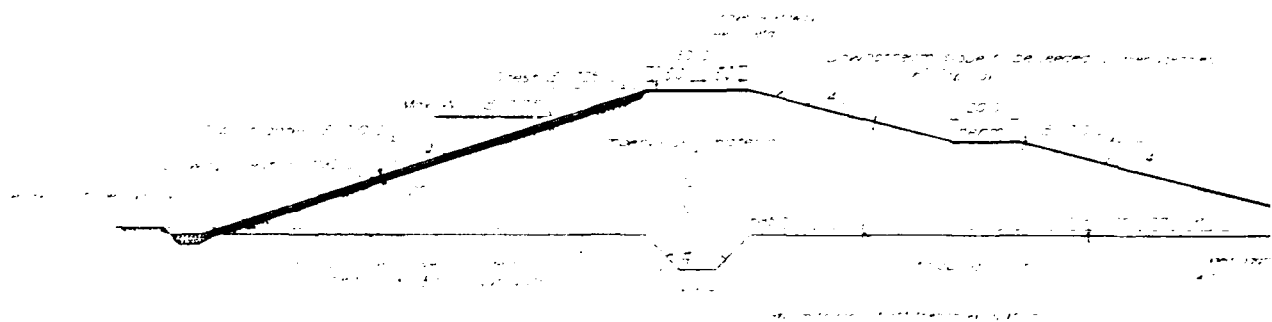
# U.S. ARMY ENGINEERING DISTRICT



CROSS SECTION OF DAM

AT STATION 85+00

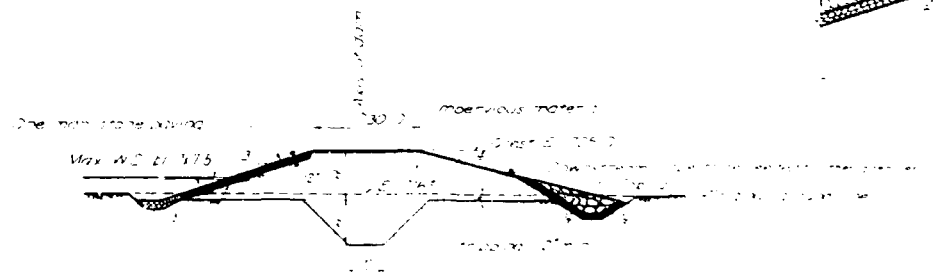
SCALE 1" = 20' 0"



CROSS SECTION OF DAM

AT STATION 100+00

SCALE 1" = 20' 0"



CROSS SECTION OF DAM

AT STATION 21+00

SCALE 1" = 20' 0"

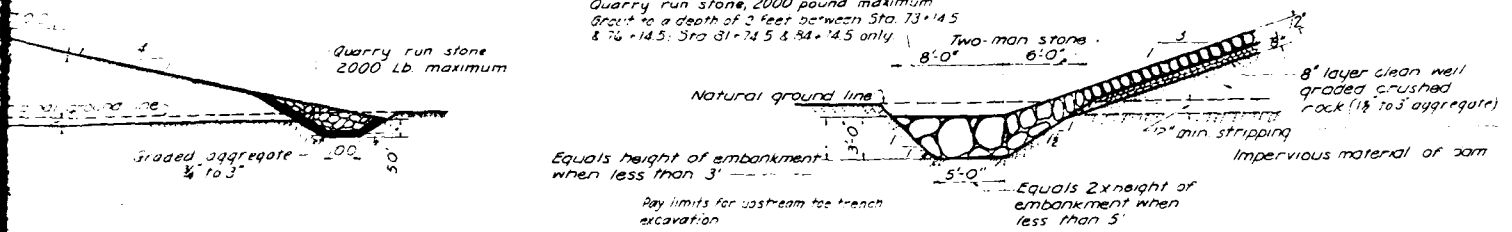
The upstream slope is to be seeded by other 6" Top Soil. The downstream slope is to be seeded by other 6" Top Soil. The dam body is to be constructed of 8" layer clean well graded crushed rock (1/2 to 3/4 inch) and impermeous material. The gravel roadway is to be 30' 0" wide. The original ground line is shown as a dashed line. The graded ground is shown as a solid line. The dam is 12' high.

Moisture to be determined after grading.  
One-man stone paving.  
Clean well graded crushed rock (1/2 to 3/4 inch) aggregate.  
(IN GROUP)

To be decided by other agencies

Quarry run stone, 2000 pound maximum  
Grout to a depth of 2 feet between Sta. 73+14.5  
& 74+14.5; Sta. 81+74.5 & 84+14.5 only

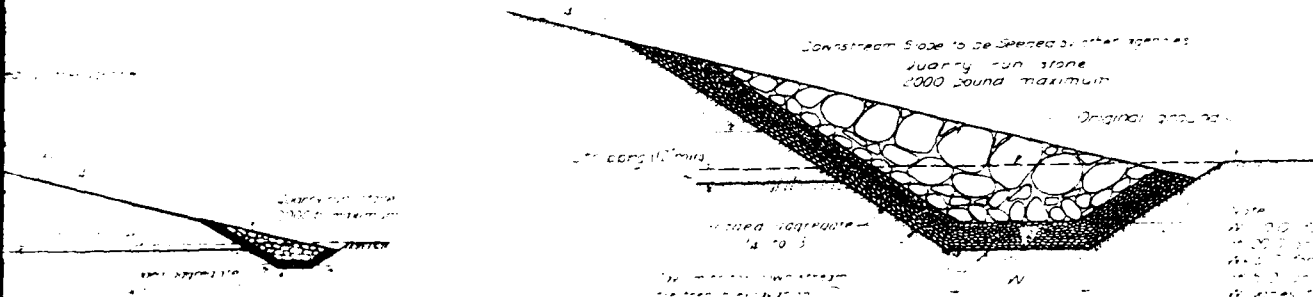
One-man stone paving. Grouted between  
Sta. 73+14.5 & 76+14.5; Sta. 81+74.5 & 84+14.5 only



DETAIL OF UPSTREAM ROCK TOE

SCALE 1 IN = 5 FT.

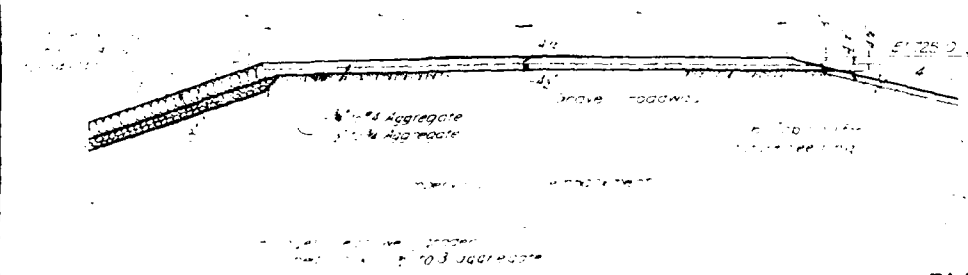
Note:  
The high point paving and grouting is to be  
done by the grouting and paving, etc. etc. etc.



DETAIL OF DOWNSTREAM ROCK TOE

SCALE 1 IN = 5 FT.

Note:  
The high point paving and grouting is to be  
done by the grouting and paving, etc. etc. etc.



TYPICAL SECTION AT CREST OF DAM

SCALE 1/4 IN = 1 FT.

ELEVATIONS SHOWN IN FEET (NGVD)

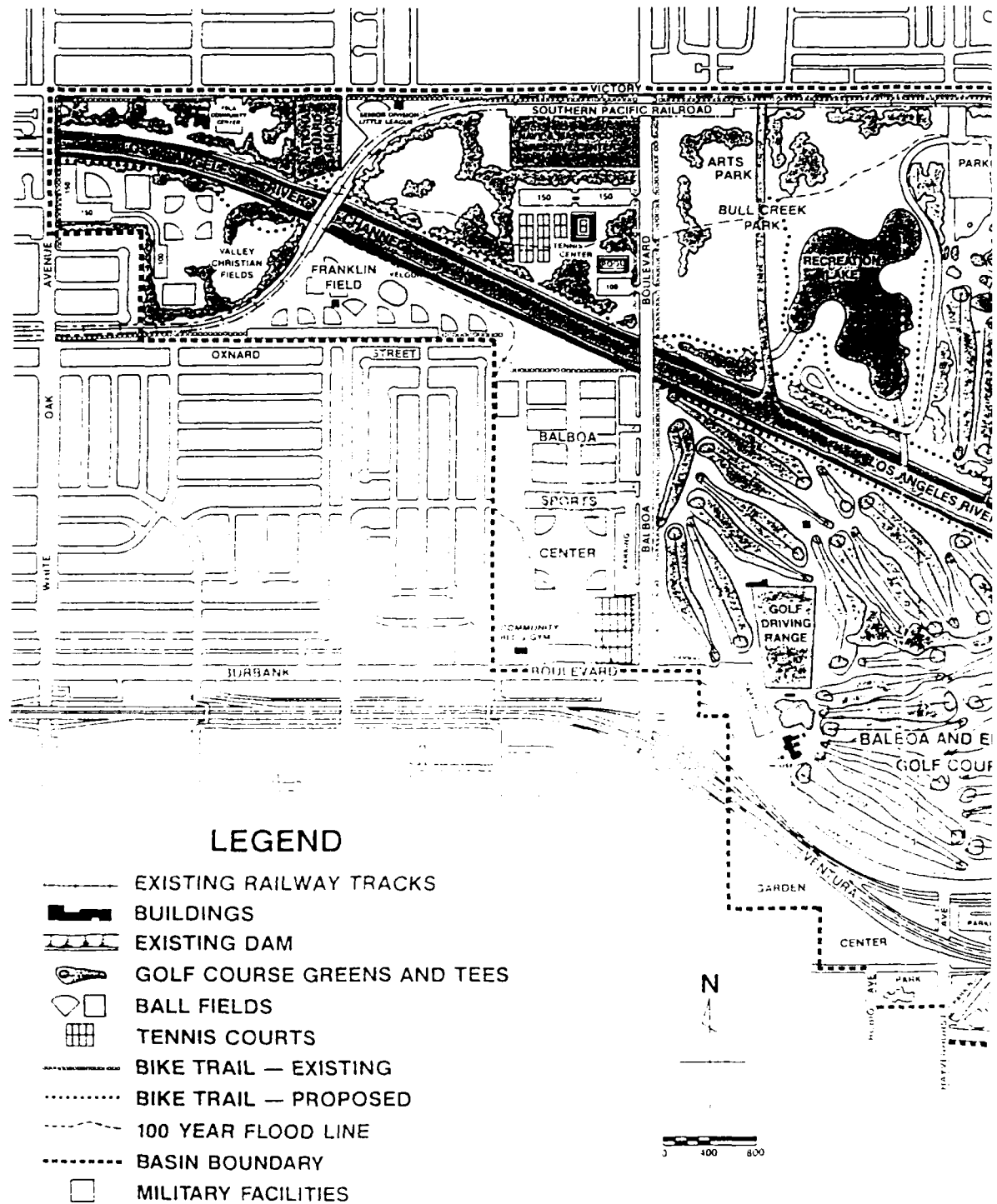
SEPULVEDA DAM  
LOS ANGELES RIVER  
CALIFORNIA

## EMBANKMENT SECTIONS

U.S. ARMY CORPS OF ENGINEERS  
LOS ANGELES DISTRICT

DETAIL OF WEEP HOLE  
(IN GROUTED SECTION OF UPSTREAM PAVING)

NOT TO SCALE



# SEPULVEDA BASIN



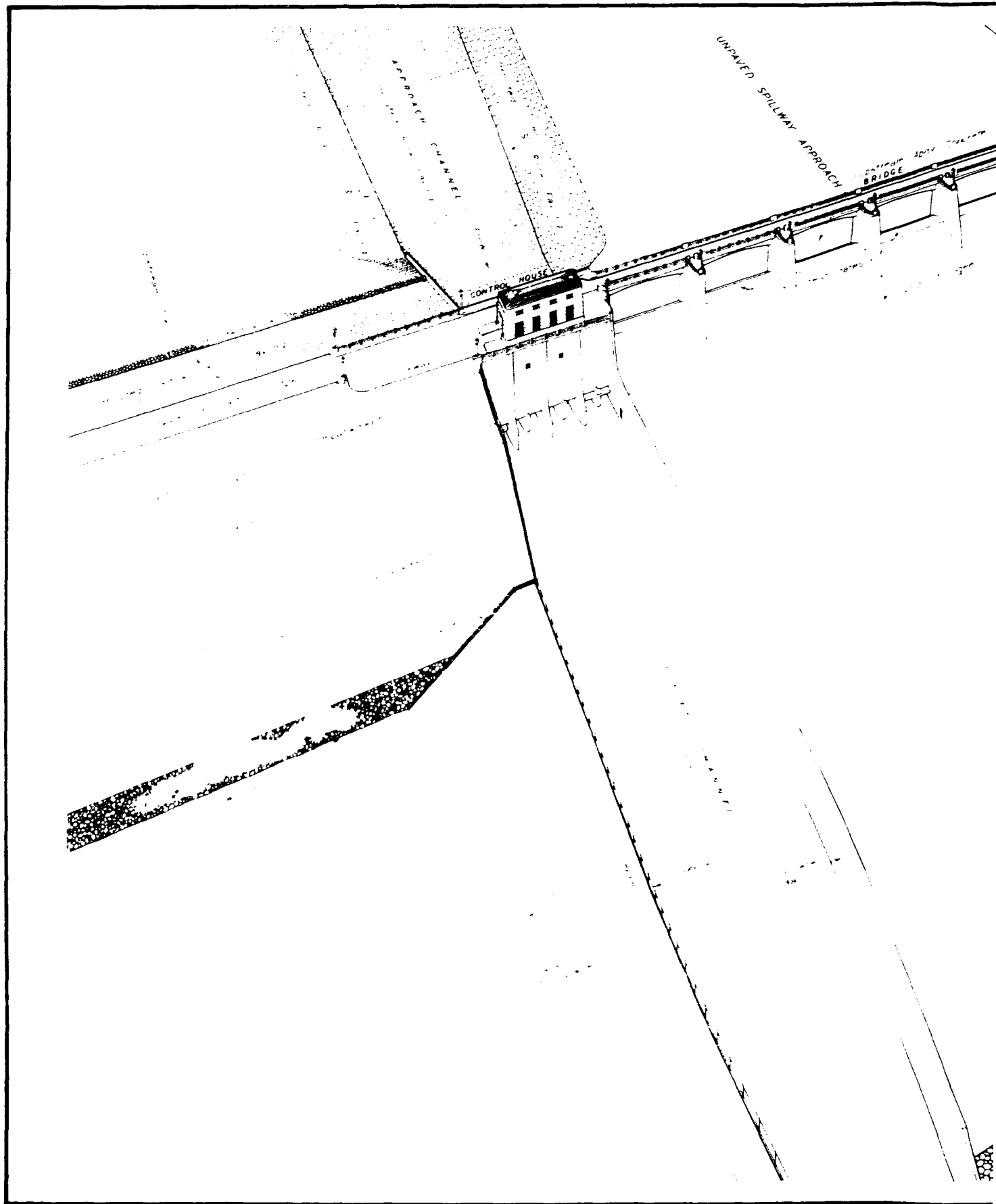
# **SEPULVEDA BASIN MASTER PLAN**

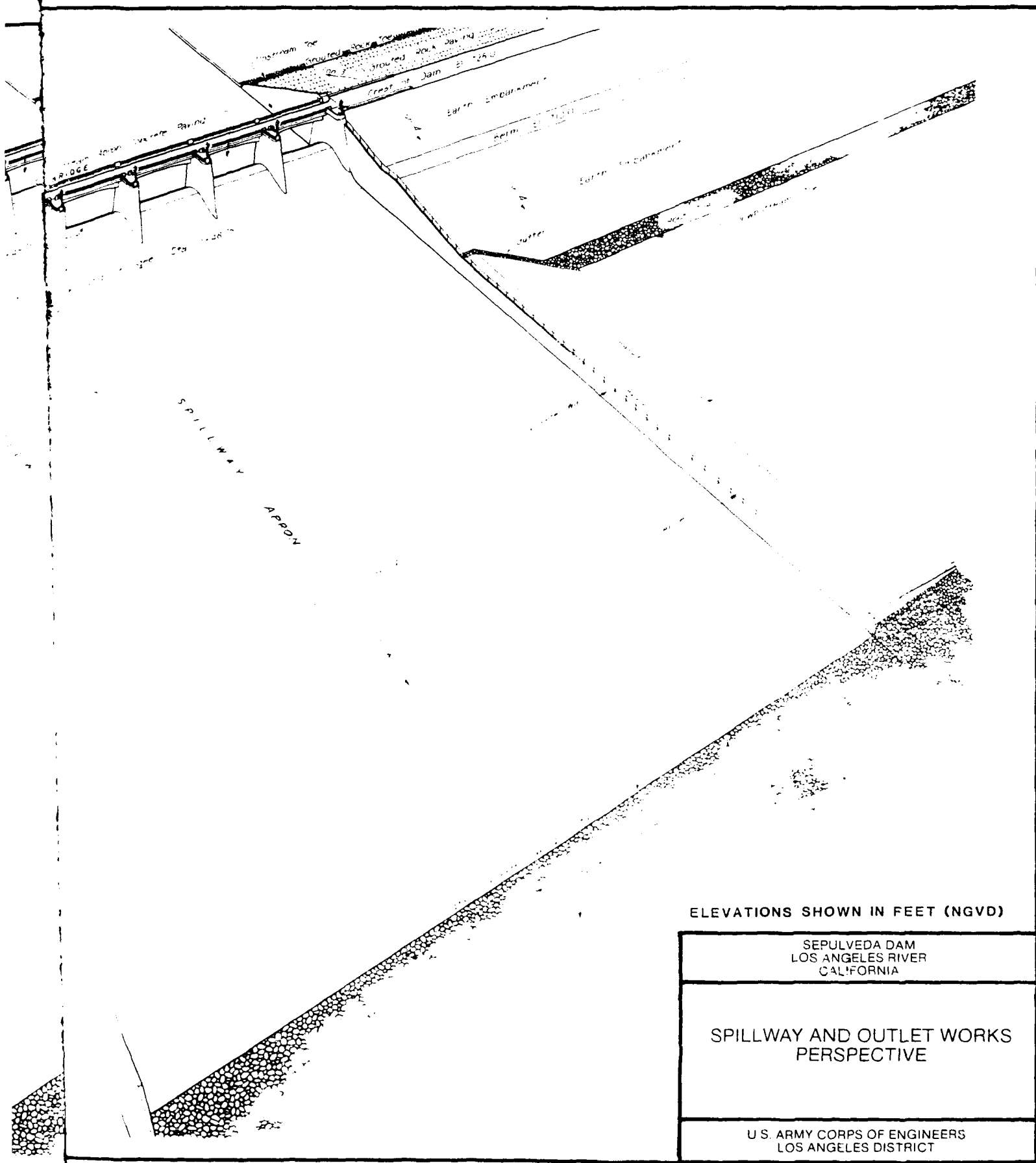
SEPULVEDA DAM,  
LOS ANGELES RIVER  
CALIFORNIA

SEPULVEDA BASIN  
WILDLIFE AND RECREATION  
MASTER PLAN

U.S. CORPS OF ENGINEERS  
LOS ANGELES DISTRICT

U.S. ARMY ENGINEER DISTRICT





ELEVATIONS SHOWN IN FEET (NGVD)

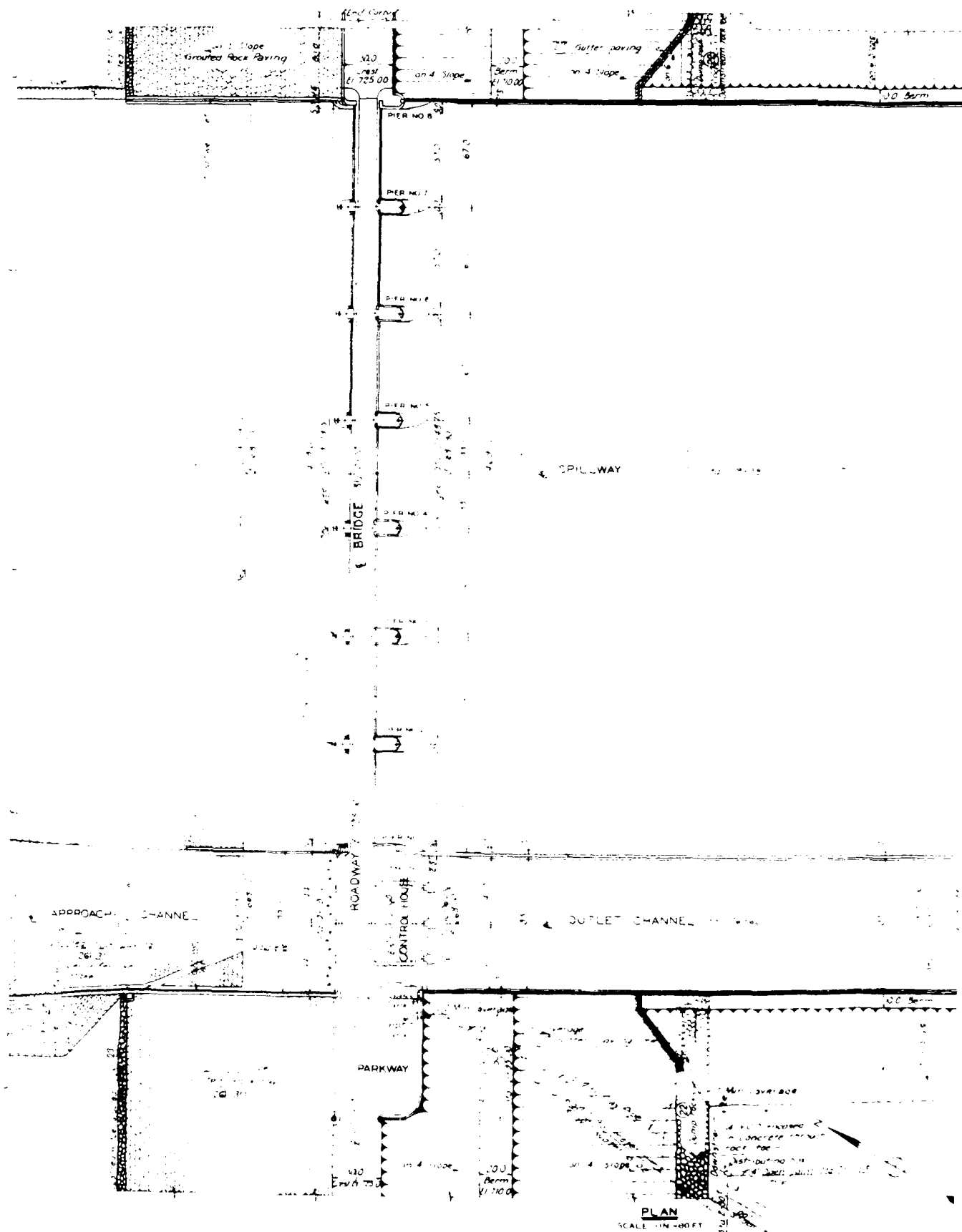
SEPULVEDA DAM  
LOS ANGELES RIVER  
CALIFORNIA

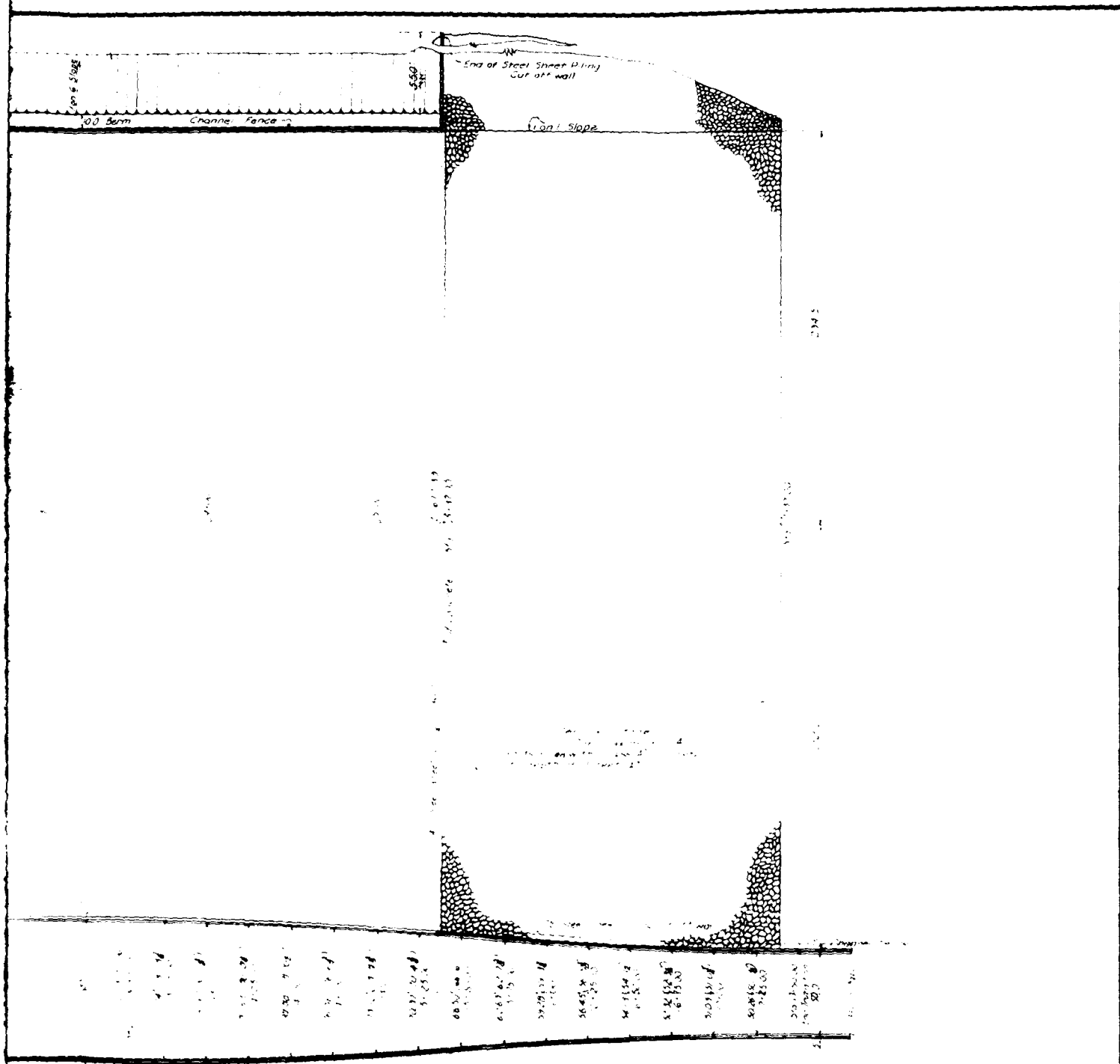
SPILLWAY AND OUTLET WORKS  
PERSPECTIVE

U. S. ARMY CORPS OF ENGINEERS  
LOS ANGELES DISTRICT



## U.S. ARMY ENGINEER DISTRICT





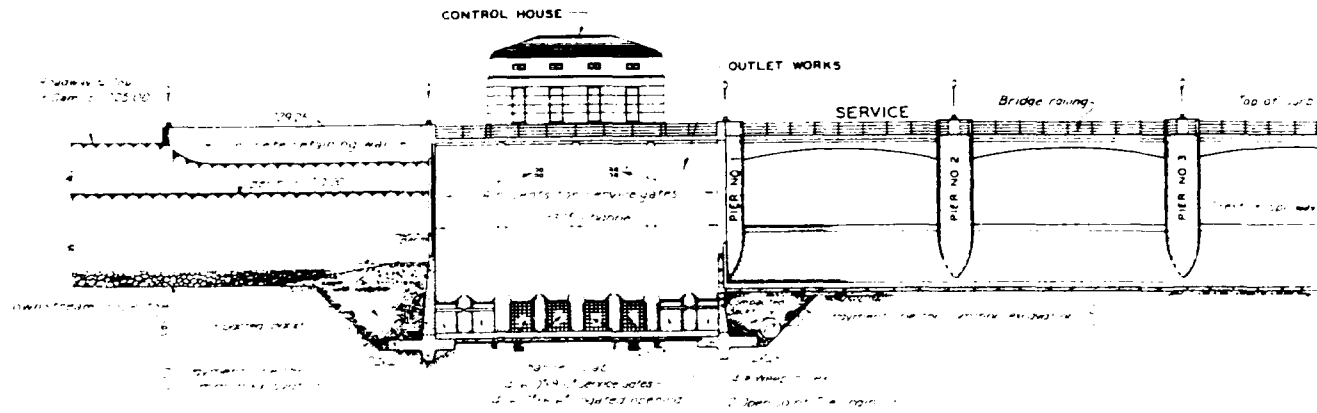
SEPULVEDA DAM  
LOS ANGELES RIVER  
CALIFORNIA

SPILLWAY AND OUTLET WORKS  
GENERAL PLAN

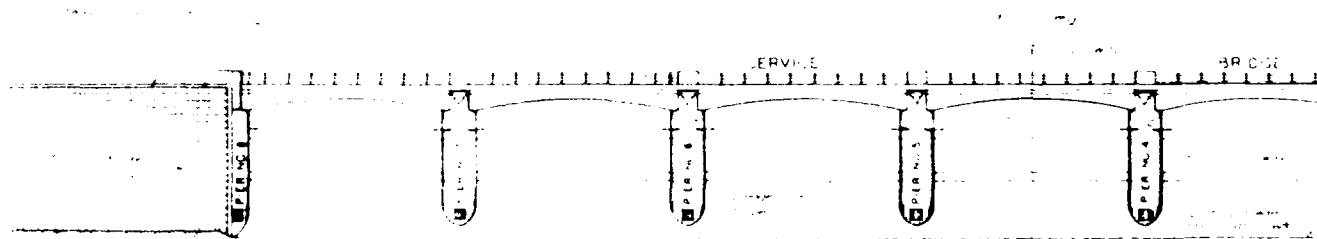
U.S. ARMY CORPS OF ENGINEERS  
LOS ANGELES DISTRICT

ELEVATIONS SHOWN IN FEET (NGVD)

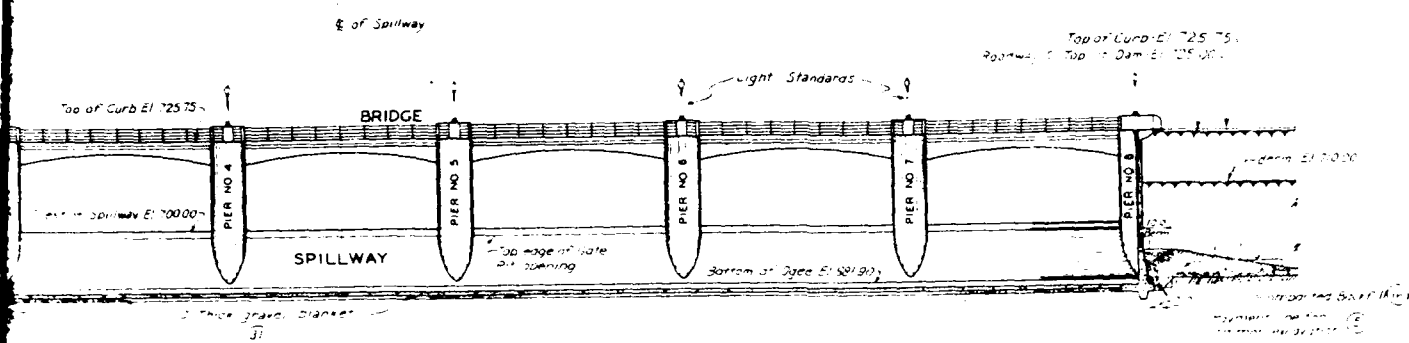
U.S. ARMY ENGINEER DISTRICT



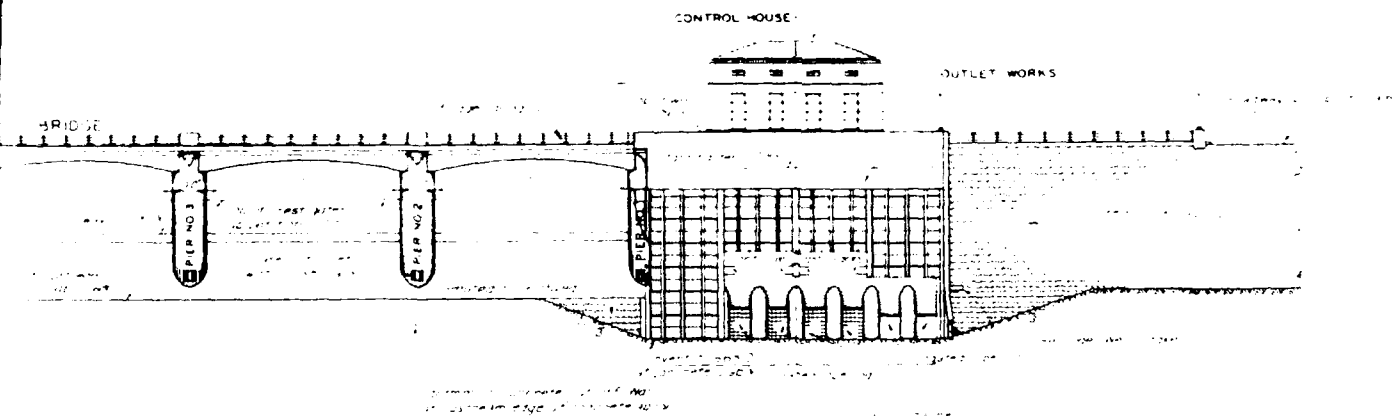
ELEVATION LOOKING



ELEVATION LOOKING



## ON LOOKING UPSTREAM



### ON LOCKING DOWNSTREAM

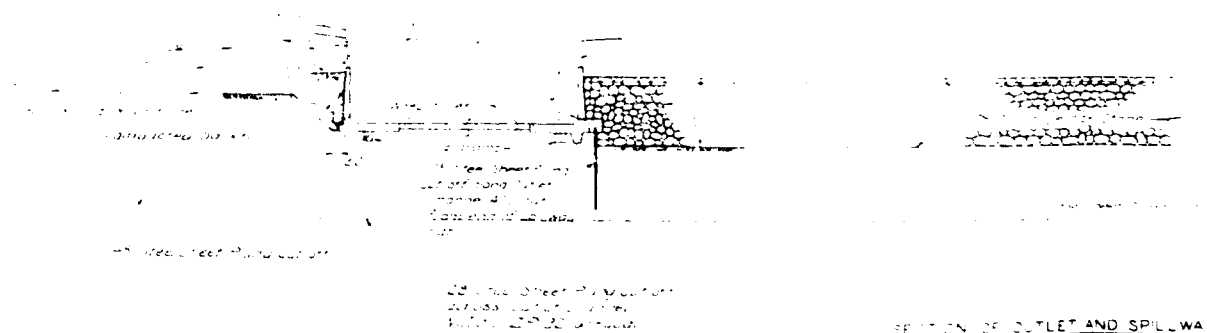
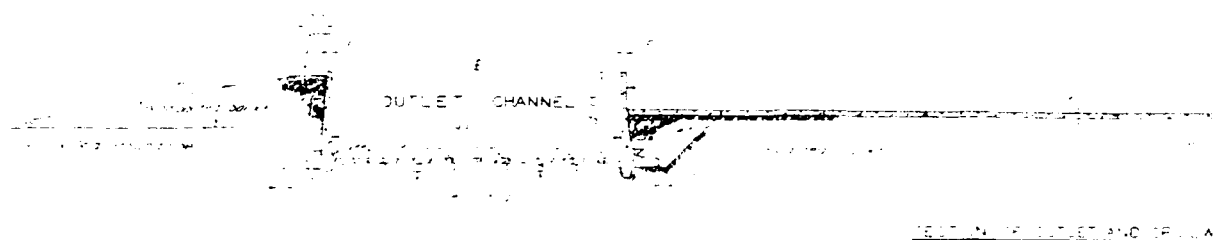
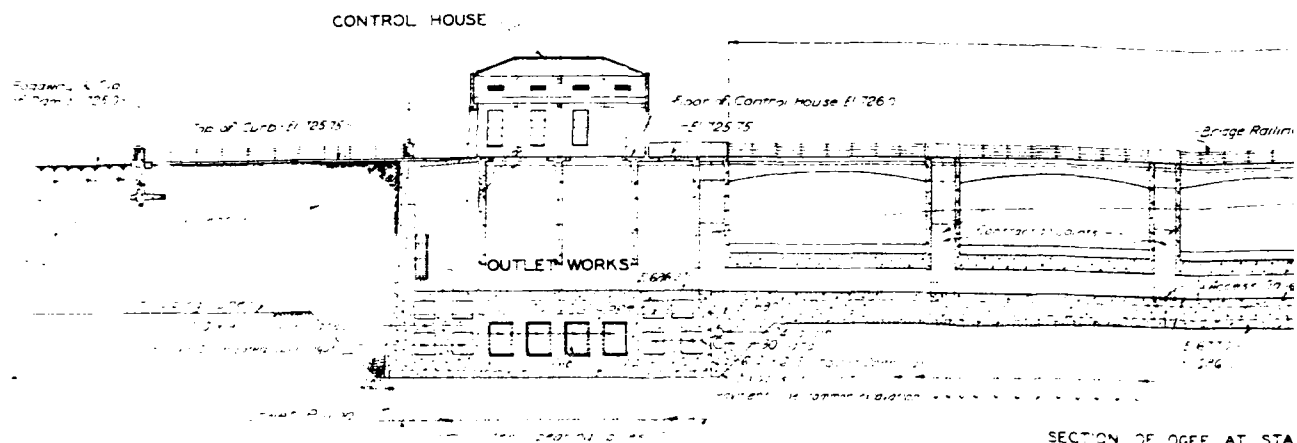
SEPULVEDA DAM  
LOS ANGELES RIVER  
CALIFORNIA

## SPILLWAY AND OUTLET WORKS UPSTREAM AND DOWNSTREAM ELEVATIONS

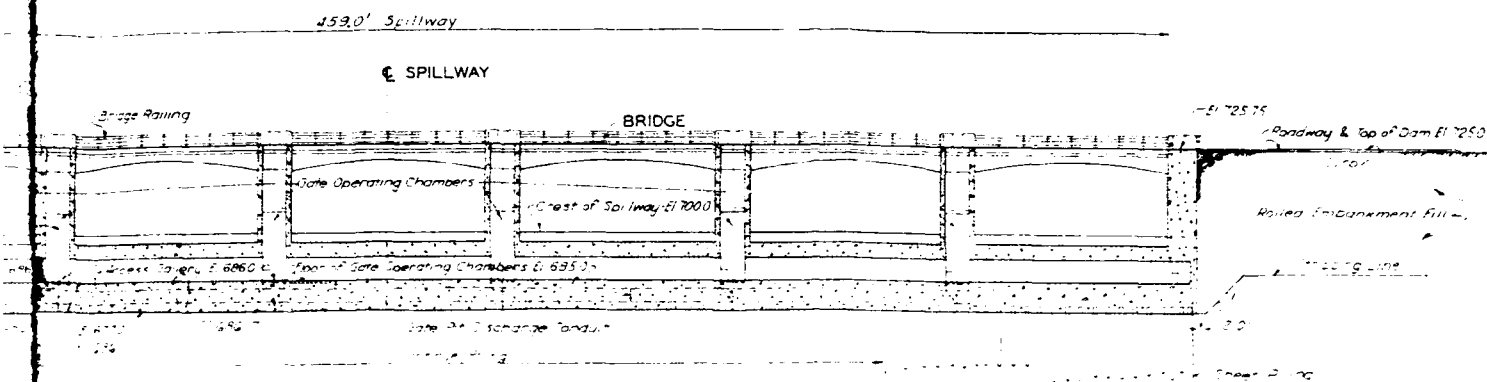
ELEVATIONS SHOWN IN FEET (NGVD)

U.S. ARMY CORPS OF ENGINEERS  
LOS ANGELES DISTRICT

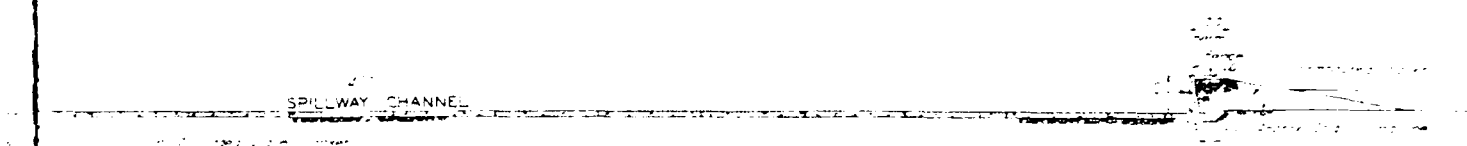
U.S. ARMY ENGINEER DISTRICT



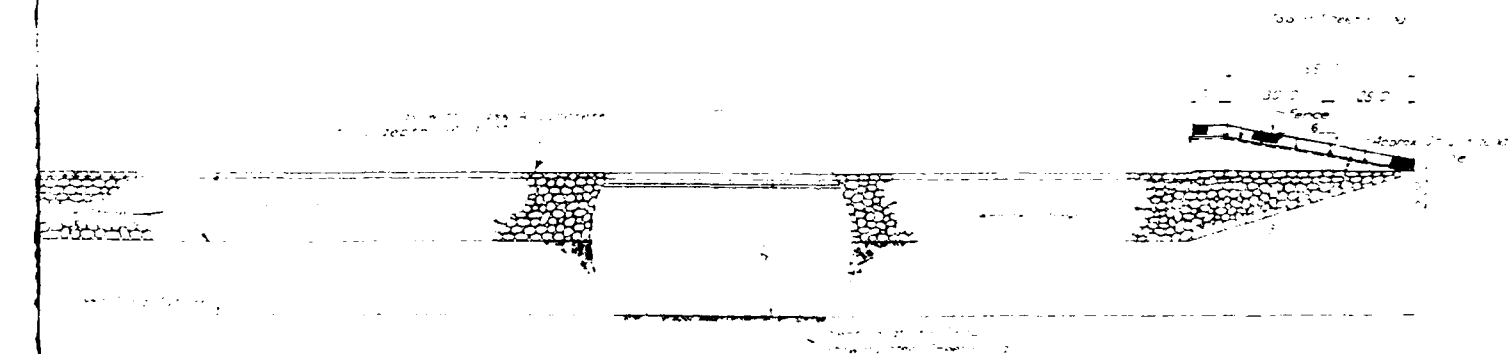
50 0  
SCALE



8 - GAGE AT STA 10+18.61 LOOKING UPSTREAM



... AND 1P...WAY CHANNELS AT STA 3+5000 LOOKING UPSTREAM



AND SPILLWAY CHANNELS AT STA 15+5700 LOOKING UPSTREAM



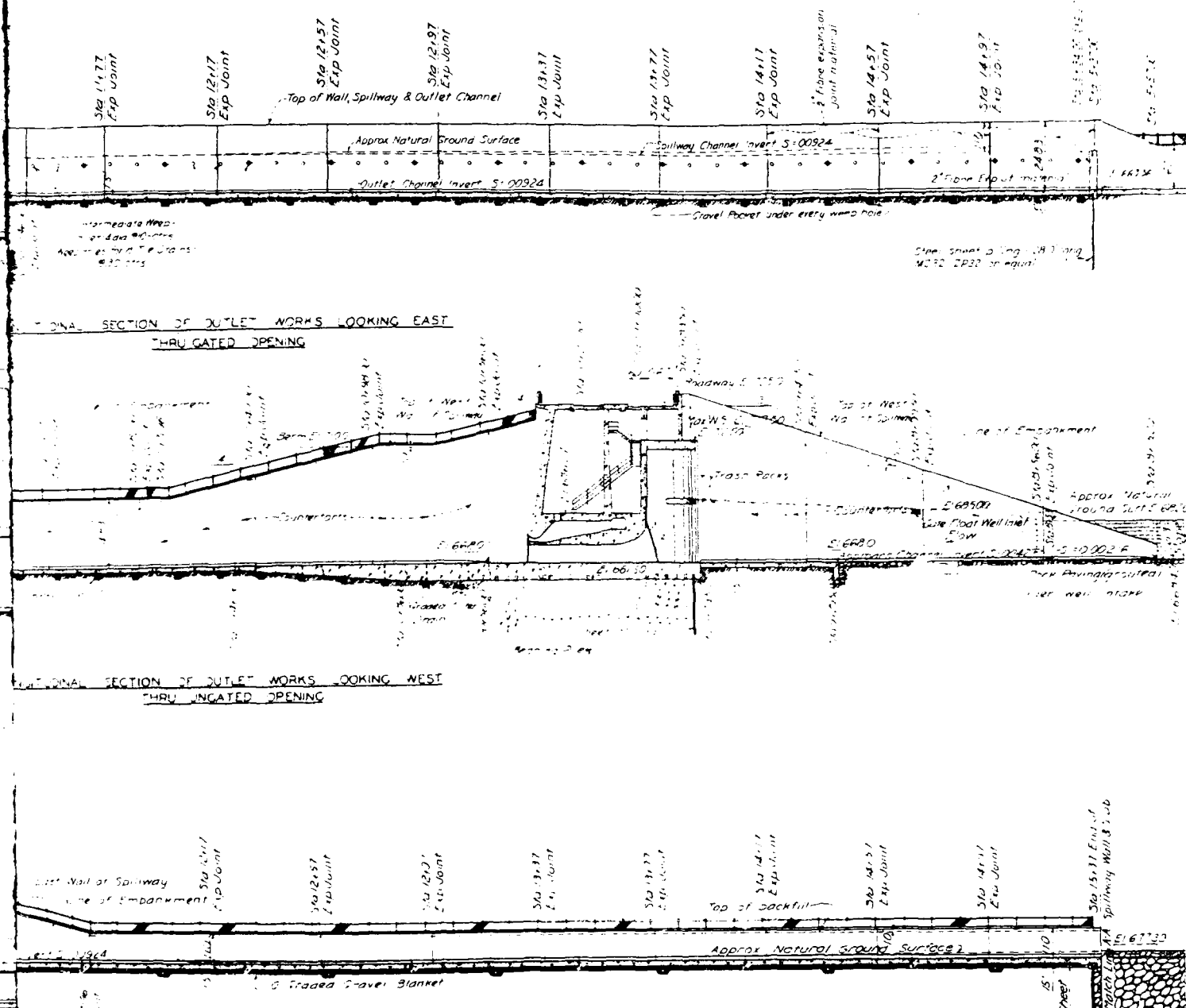
ELEVATIONS SHOWN IN FEET (NGVD)

SEPULVEDA DAM  
LOS ANGELES RIVER  
CALIFORNIA

### SPILLWAY & OUTLET WORKS ELEVATION & TRANSVERSE SECTIONS

U.S. ARMY CORPS OF ENGINEERS  
LOS ANGELES DISTRICT

[illegible]



SEPULVEDA DAM  
LOS ANGELES RIVER  
CALIFORNIA

## SPILLWAY & OUTLET

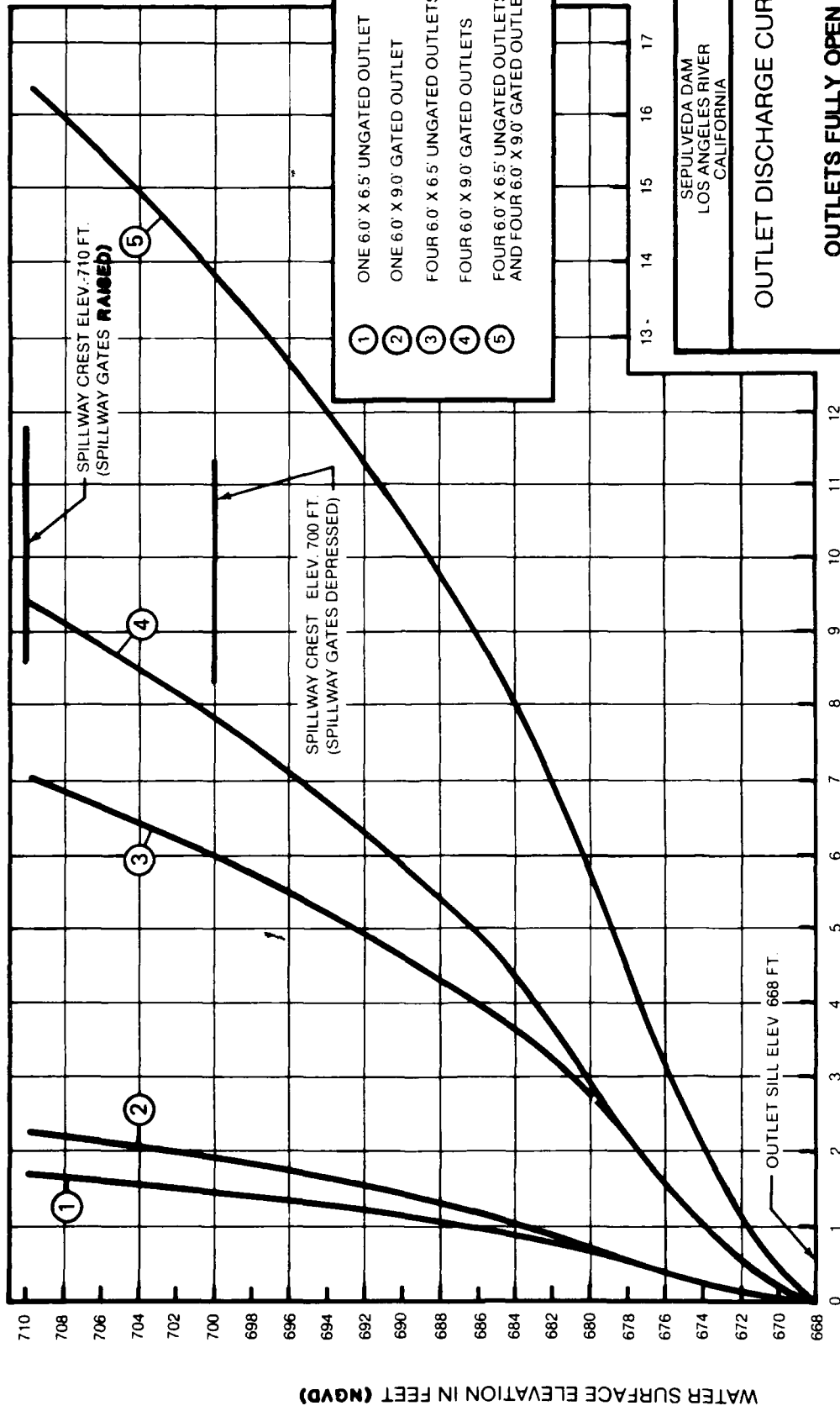
## SECTIONS

U.S. ARMY CORPS OF ENGINEERS  
LOS ANGELES DISTRICT

ELEVATIONS SHOWN IN FEET (NGVD)



GATE OPENINGS IN FEET



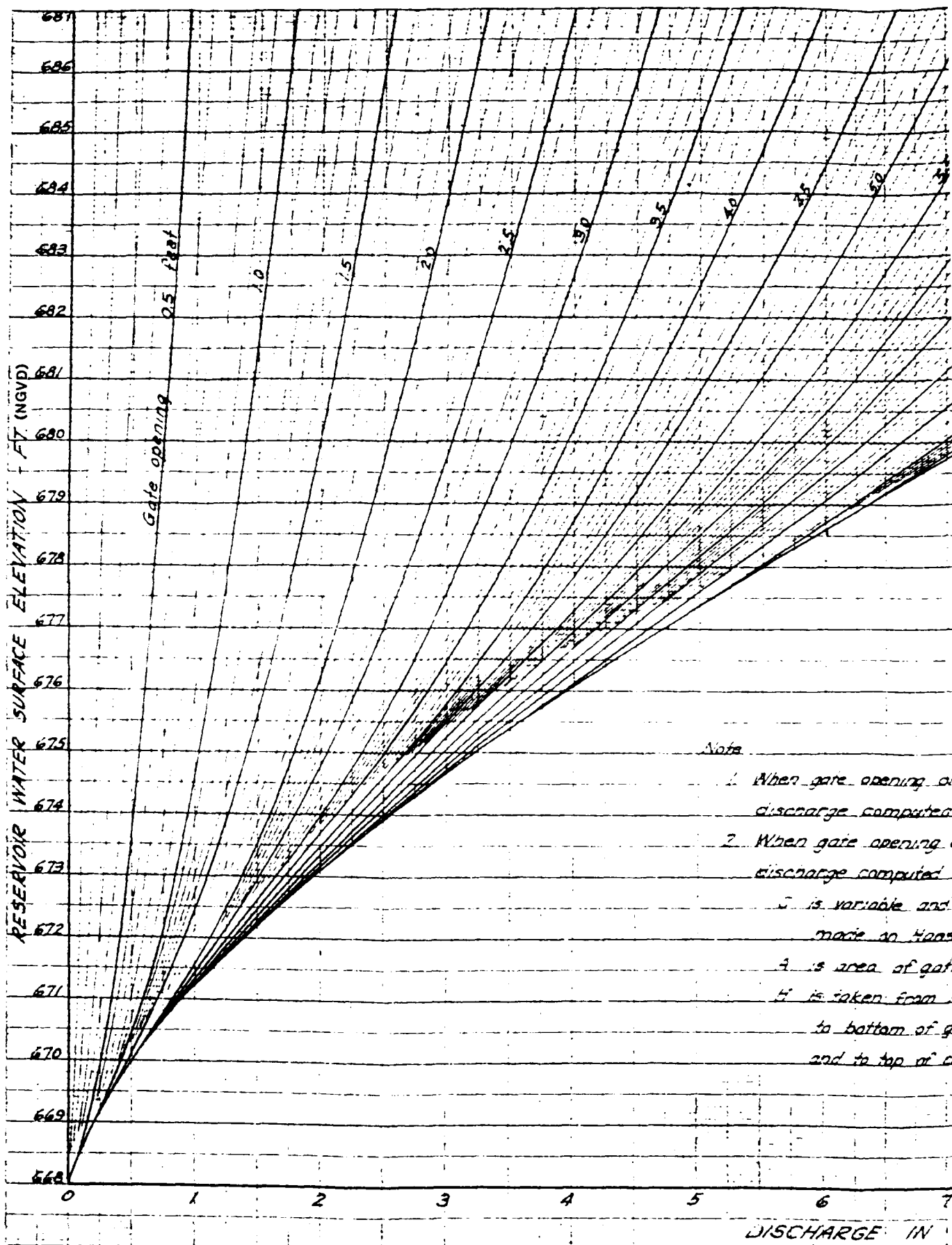
- ① ONE 6.0' X 6.5' UNGATED OUTLET
- ② ONE 6.0' X 9.0' GATED OUTLET
- ③ FOUR 6.0' X 6.5' UNGATED OUTLETS
- ④ FOUR 6.0' X 9.0' GATED OUTLETS
- ⑤ FOUR 6.0' X 6.5' UNGATED OUTLETS AND FOUR 6.0' X 9.0' GATED OUTLETS

SEPULVEDA DAM  
LOS ANGELES RIVER  
CALIFORNIA

OUTLET DISCHARGE CURVES

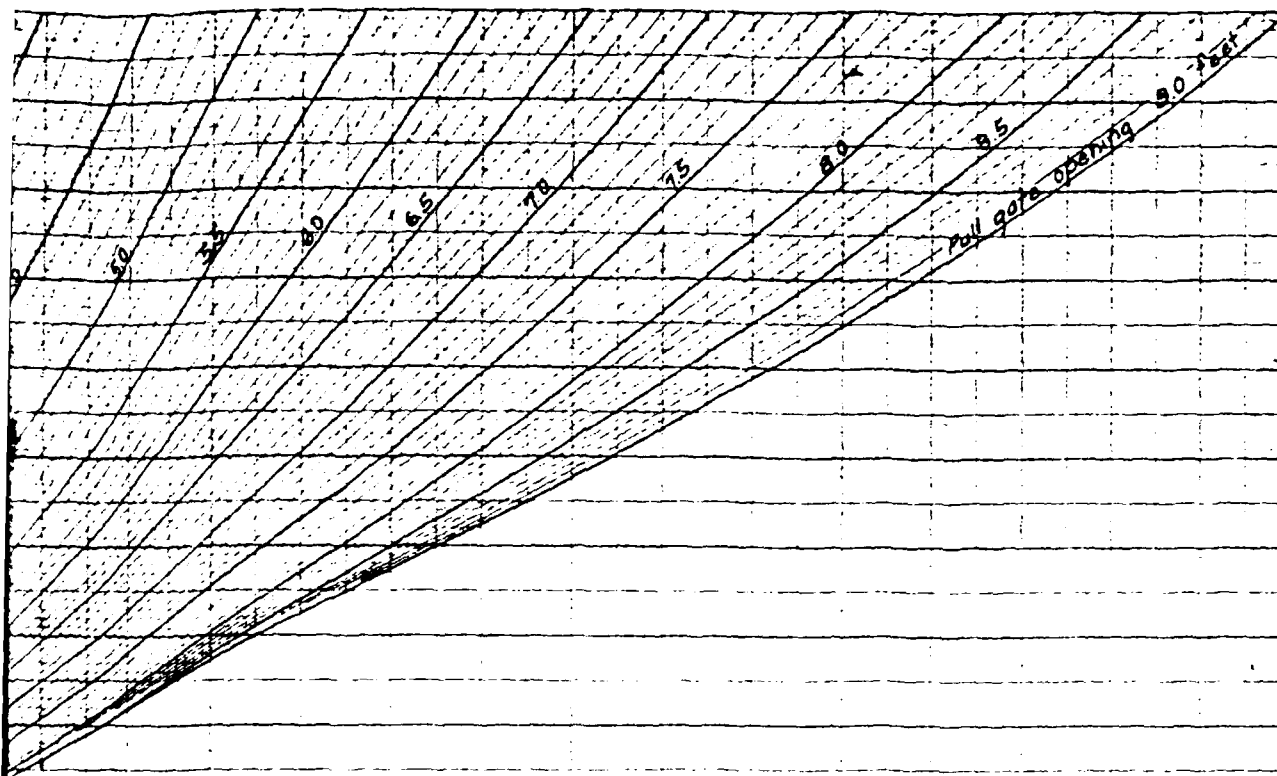
OUTLETS FULLY OPEN

U.S. ARMY CORPS OF ENGINEERS  
LOS ANGELES DISTRICT



Note

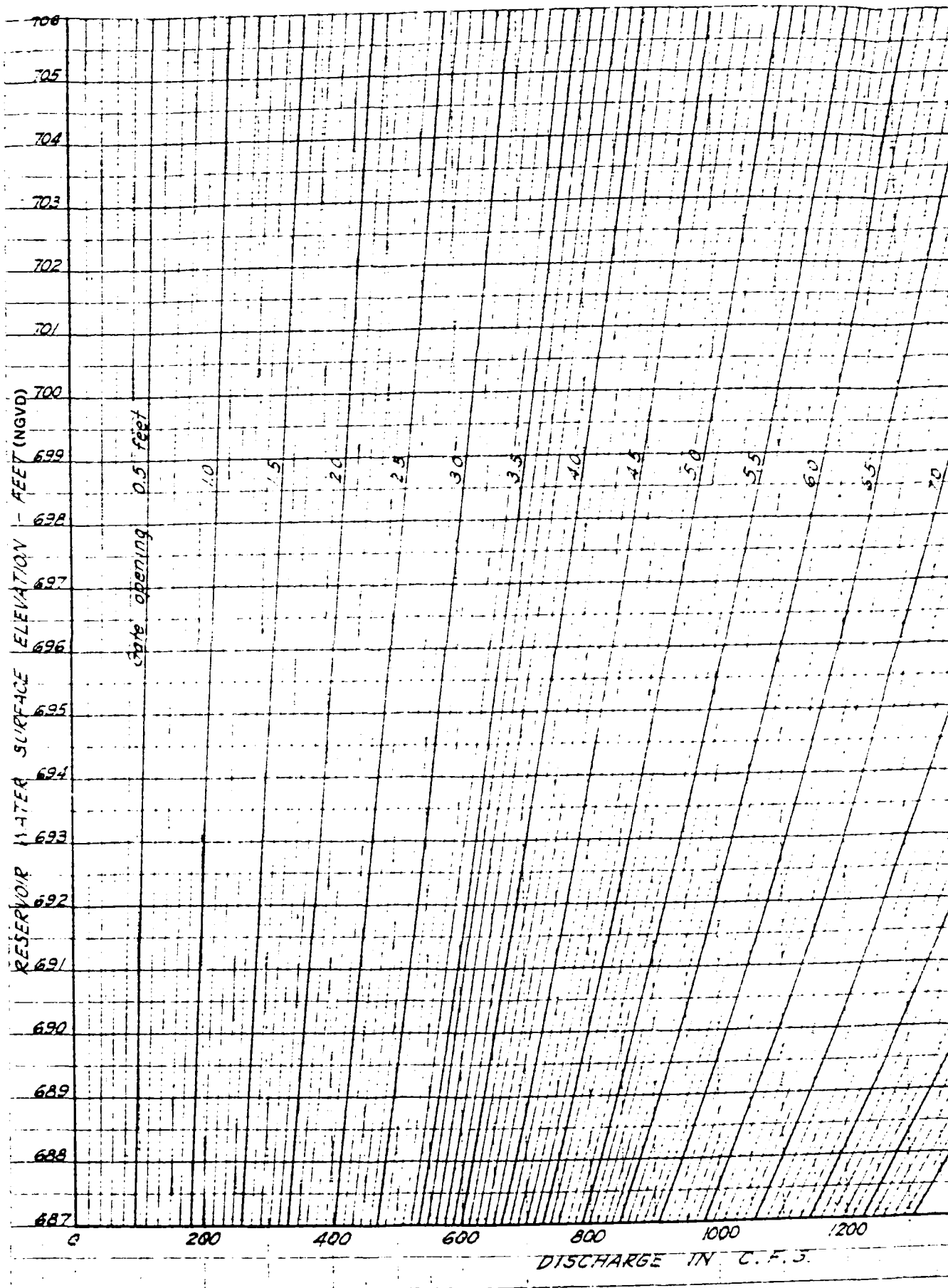
1. When gate opening or discharge computed
2. When gate opening or discharge computed
- $H$  is variable and made in ft
- $A$  is area of gate
- $H$  is taken from to bottom of gate and to top of gate

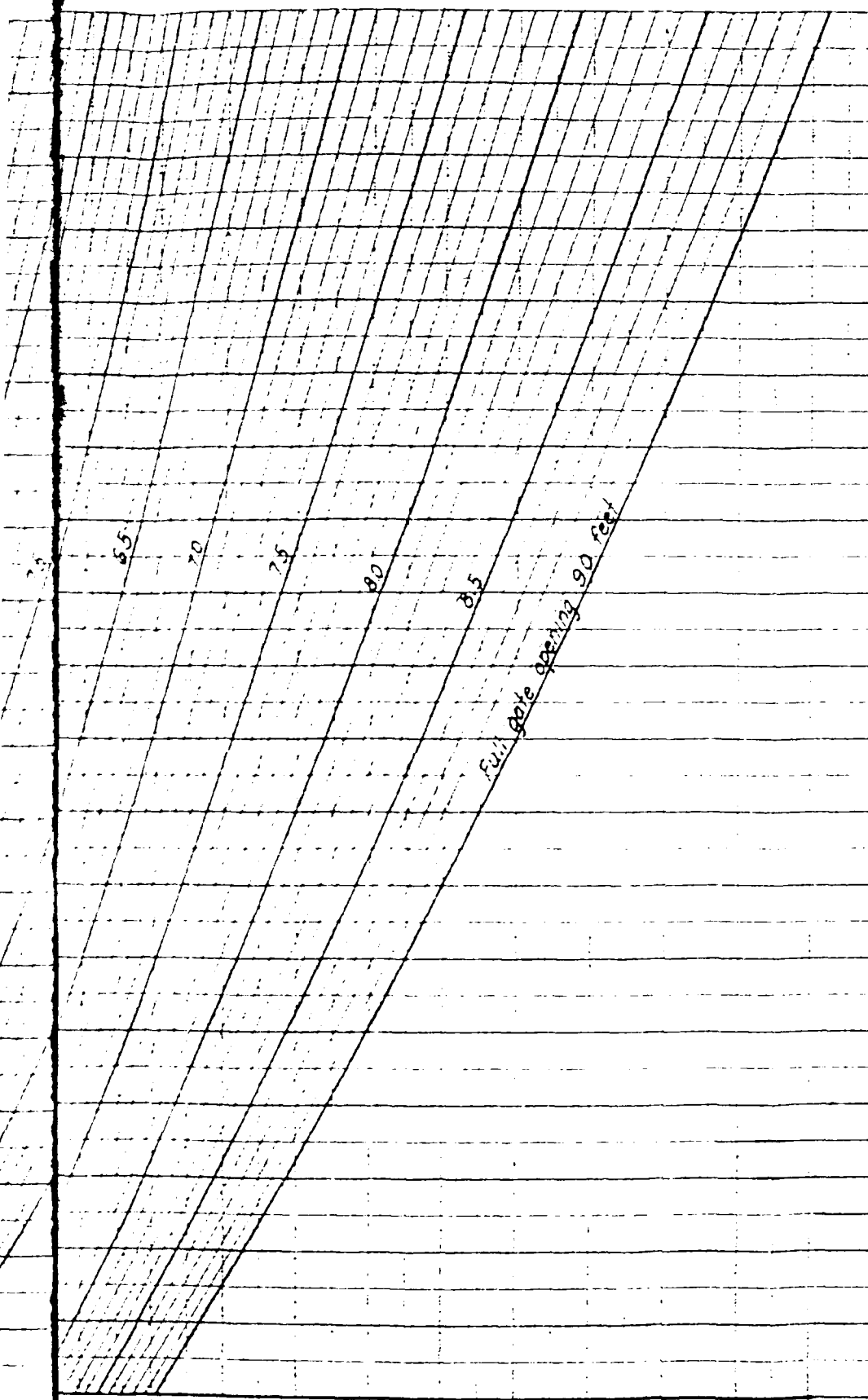


gate opening or conduit is not flowing full,  
 discharge computed by open channel method  
 gate opening or conduit flowing full,  
 discharge computed by  $Q = CA \sqrt{2gH}$ , where:  
 C is variable and based on field measurements  
 made on Hansen 5'-8' gated conduits  
 A is area of gate opening or conduit  
 H is taken from reservoir water surface  
 to bottom of gate for partial gate opening  
 and to top of conduit exit for full gate opening

SEPULVEDA DAM  
 LOS ANGELES RIVER  
 CALIFORNIA  
  
 OUTLET DISCHARGE CURVES  
 FOR PARTIAL GATE OPENINGS  
  
 U. S. ARMY ENGINEER DISTRICT  
 LOS ANGELES, CORPS OF ENGINEERS

6 7 8 9 10 11  
 DISCHARGE IN HUNDRED C.F.S.

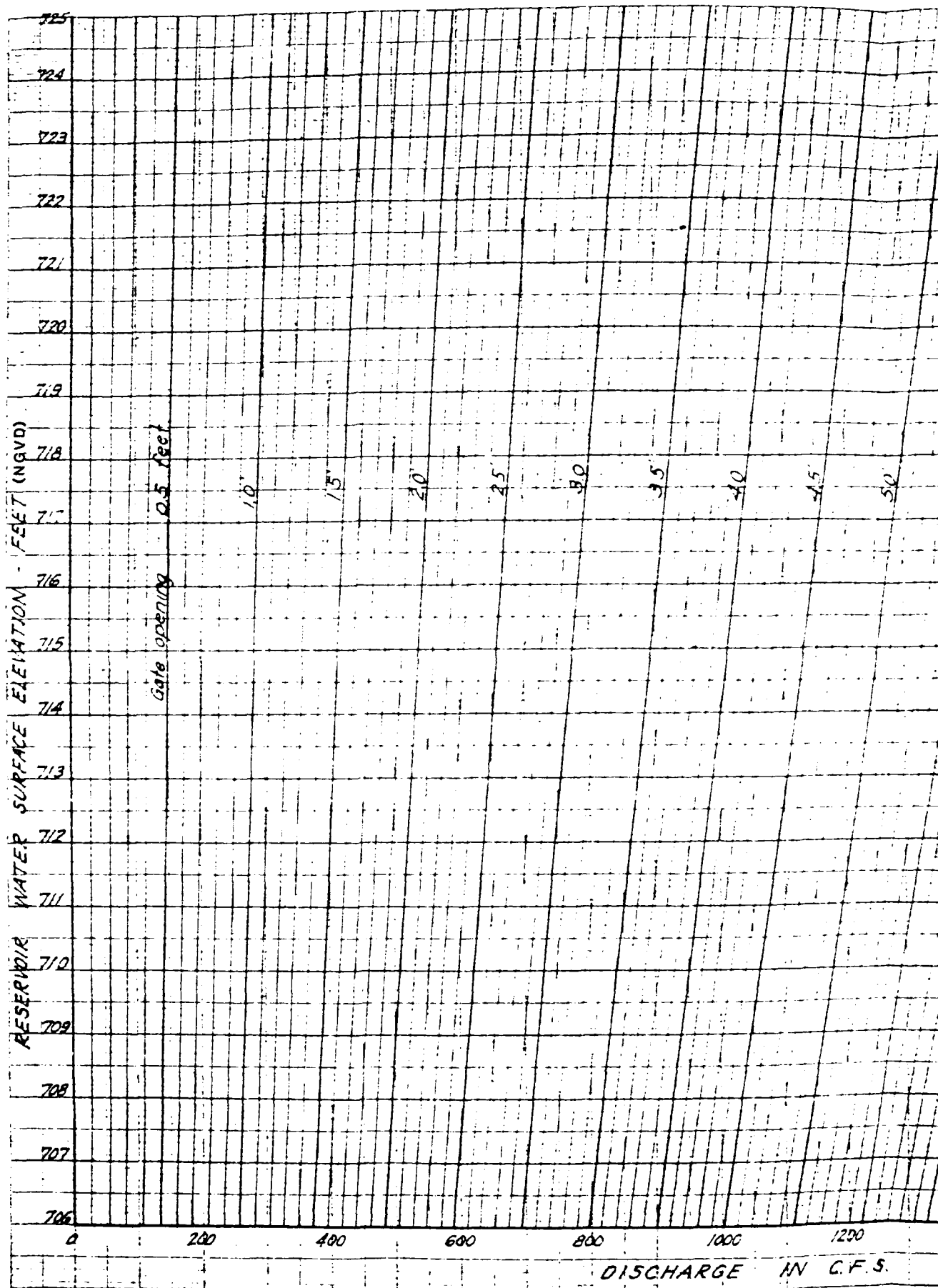


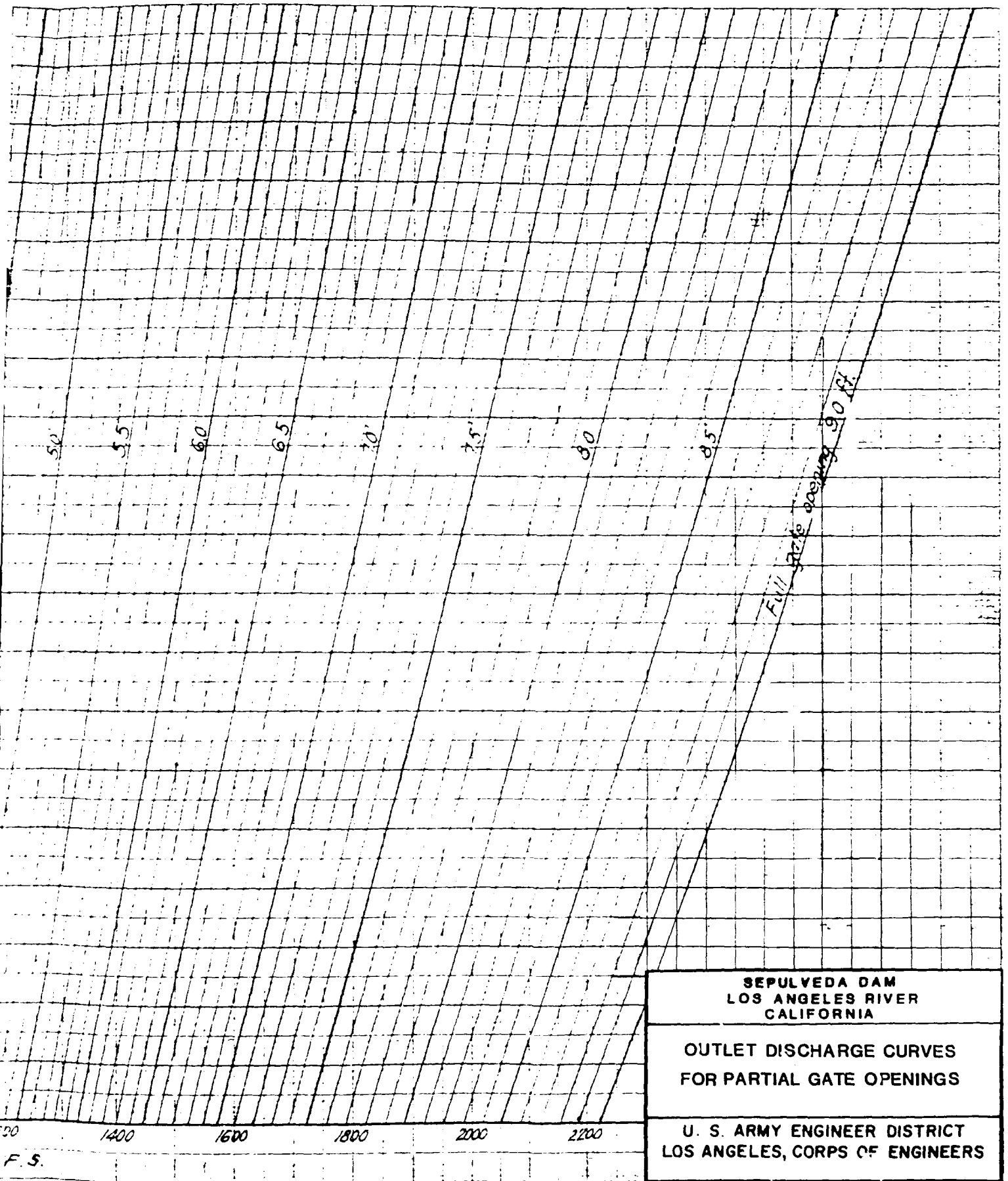


SEPULVEDA DAM  
LOS ANGELES RIVER  
CALIFORNIA

OUTLET DISCHARGE CURVES  
FOR PARTIAL GATE OPENINGS

U. S. ARMY ENGINEER DISTRICT  
LOS ANGELES, CORPS OF ENGINEERS

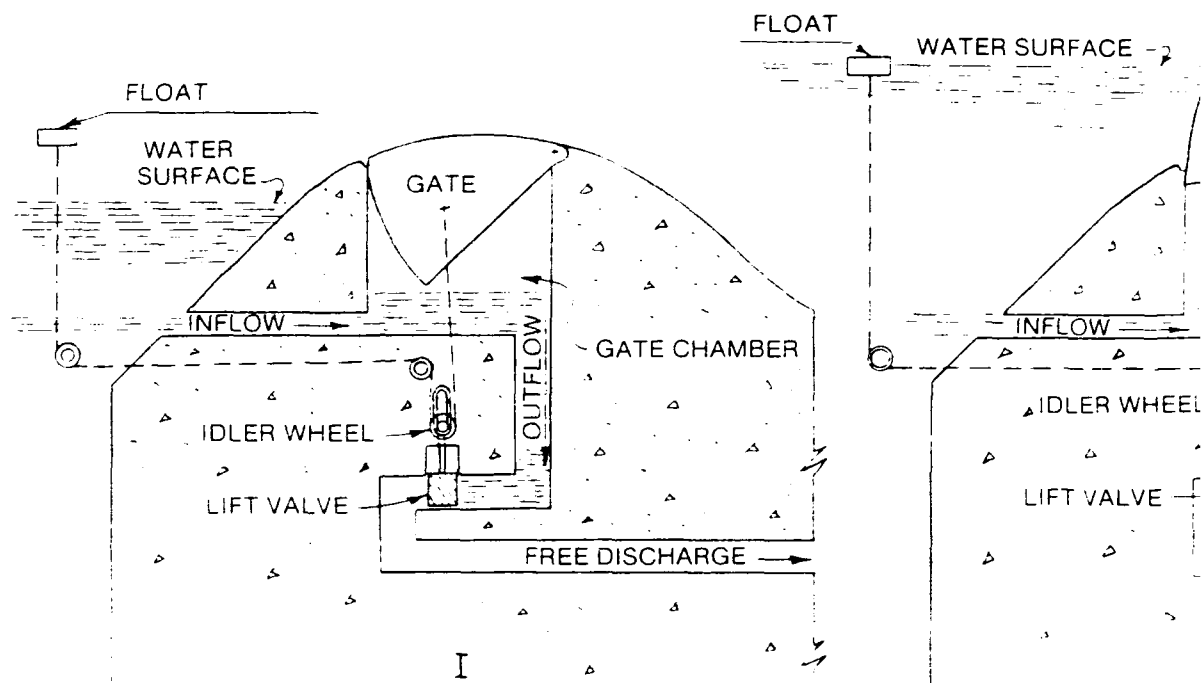




SEPULVEDA DAM  
LOS ANGELES RIVER  
CALIFORNIA

OUTLET DISCHARGE CURVES  
FOR PARTIAL GATE OPENINGS

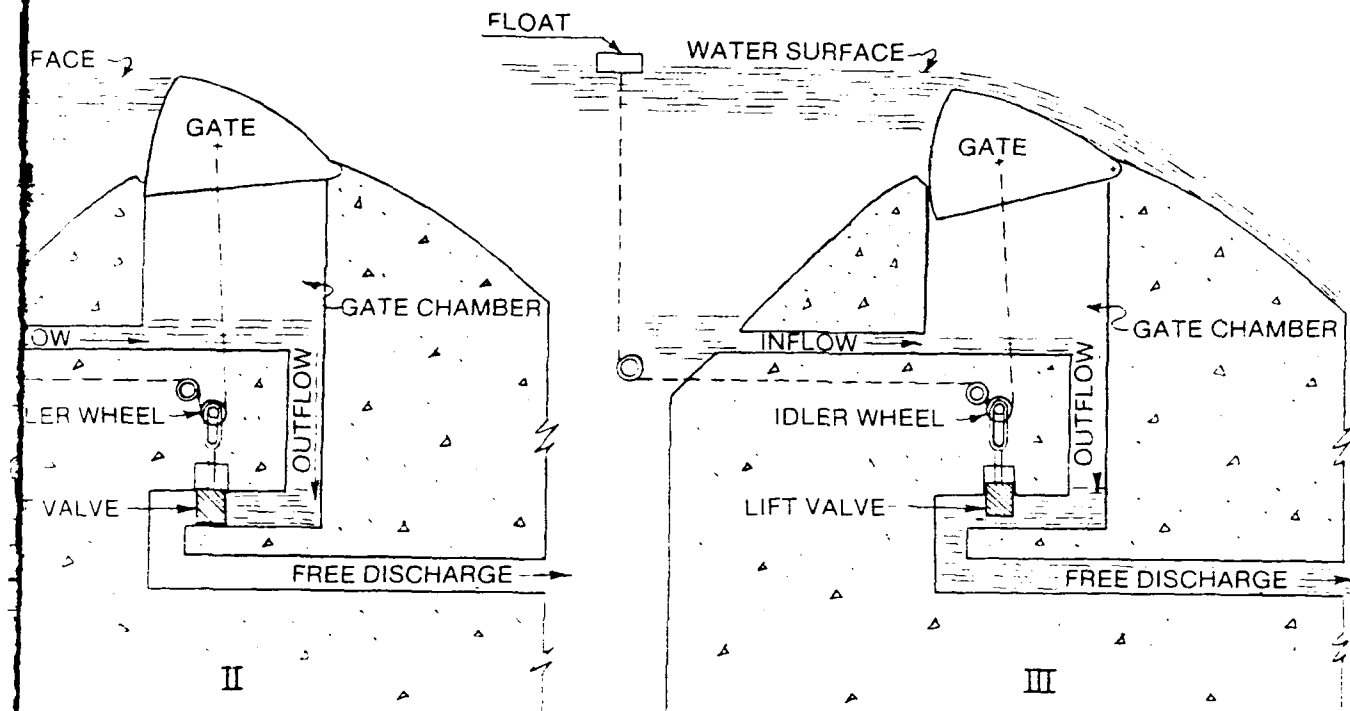
U. S. ARMY ENGINEER DISTRICT  
LOS ANGELES, CORPS OF ENGINEERS



WATER IS RISING. GATE IS CLOSED. AND FLOAT IS AT LOWEST POSITION. IDLER WHEEL IS AT BOTTOM OF SLOT TO TAKE UP SLACK IN CABLE. LIFT VALVE IS CLOSED BY ITS OWN WEIGHT.

WATER IS AT MAXIMUM. GATE IS OPEN. IDLER WHEEL IS RAISED TO POSITION BY WATER. LIFT VALVE IS STILL CLOSED. OF THE FLOAT BY ITSELF. OPEN THE LIFT VALVE.





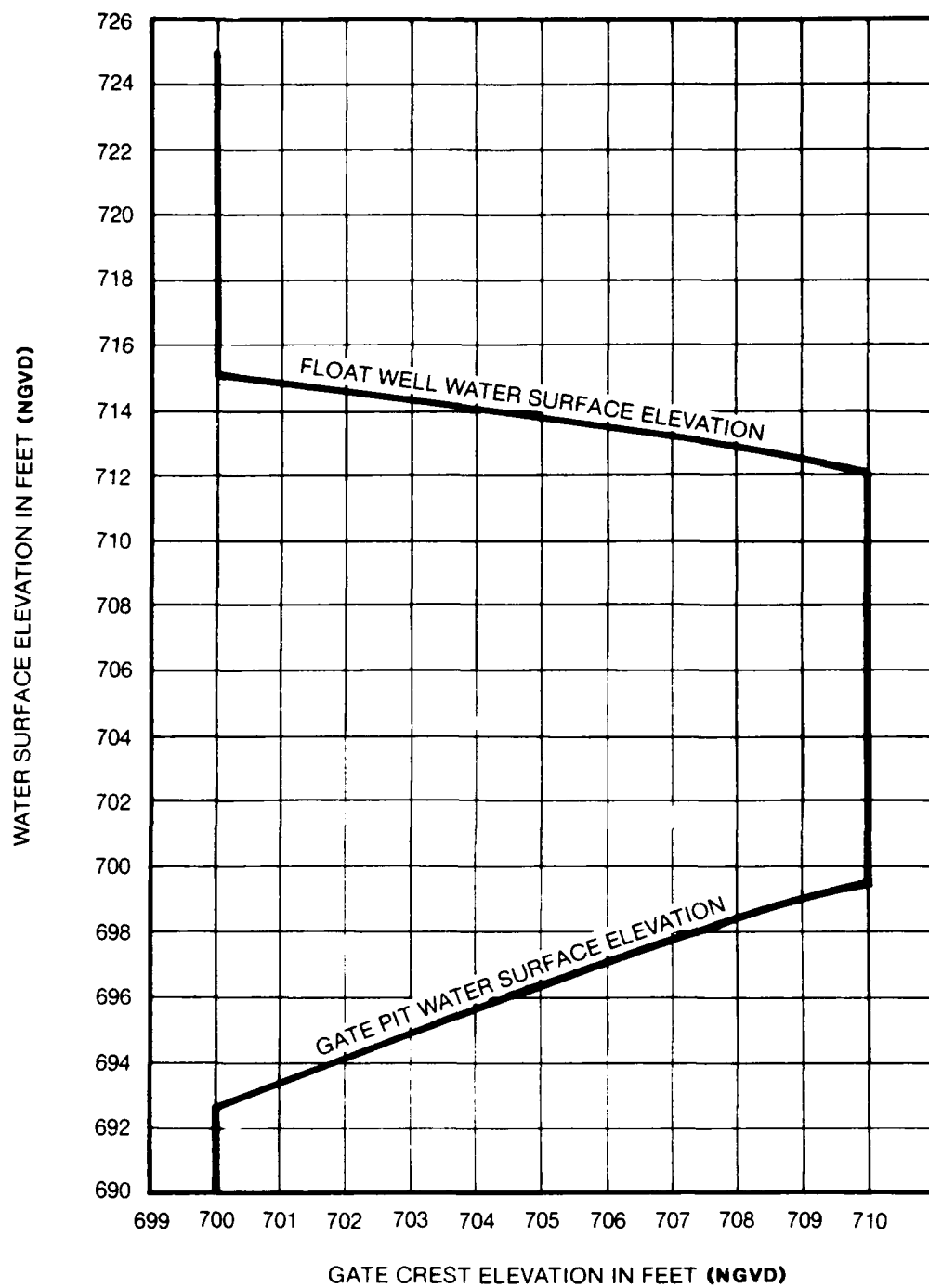
IS AT MAXIMUM ELEVATION WITHOUT  
G. GATE HAS FLOATED TO TOP  
ON BY WATER IN GATE CHAMBER. IDLER  
IS RAISED TO NEAR TOP OF SLOT, BUT  
LVE IS STILL CLOSED. A FURTHER RISE  
FLOAT BY MORE THAN 1 FOOT WILL  
HE LIFT VALVE.

WATER IS PASSING OVER GATE. A FLOAT  
ELEVATION OF MORE THAN 1 FOOT ABOVE  
POSITION II (THE THRESHOLD OF SPILLING)  
OPENS THE LIFT VALVE. WHEN OUTFLOW  
EXCEEDS INFLOW TO THE GATE CHAMBER, THE  
GATE IS LOWERED. THE LOWERING OF THE  
GATE ALLOWS THE LIFT VALVE TO CLOSE  
UNDER ITS OWN WEIGHT UNTIL THE OUTFLOW  
AND INFLOW BALANCE, AND THE GATE  
REMAINS STATIONARY.

SEPULVEDA DAM  
LOS ANGELES RIVER  
CALIFORNIA

# SCHEMATIC DIAGRAM OF CREST GATE OPERATION

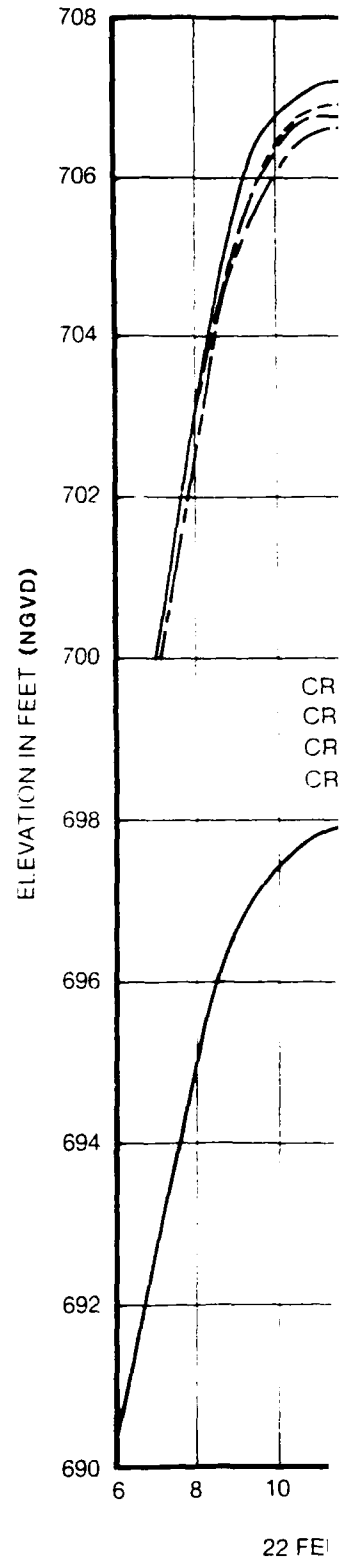
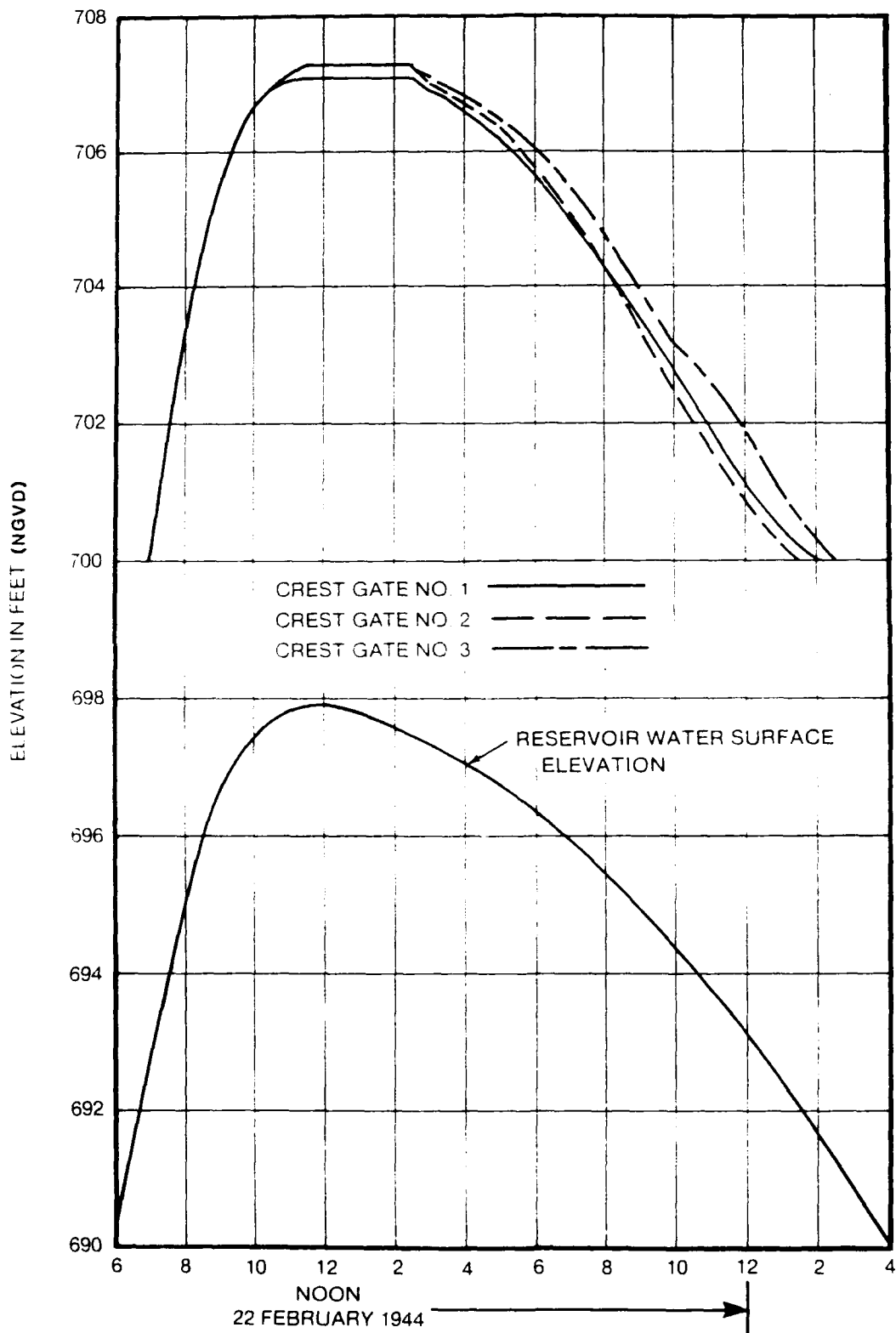
U.S. ARMY CORPS OF ENGINEERS  
LOS ANGELES DISTRICT

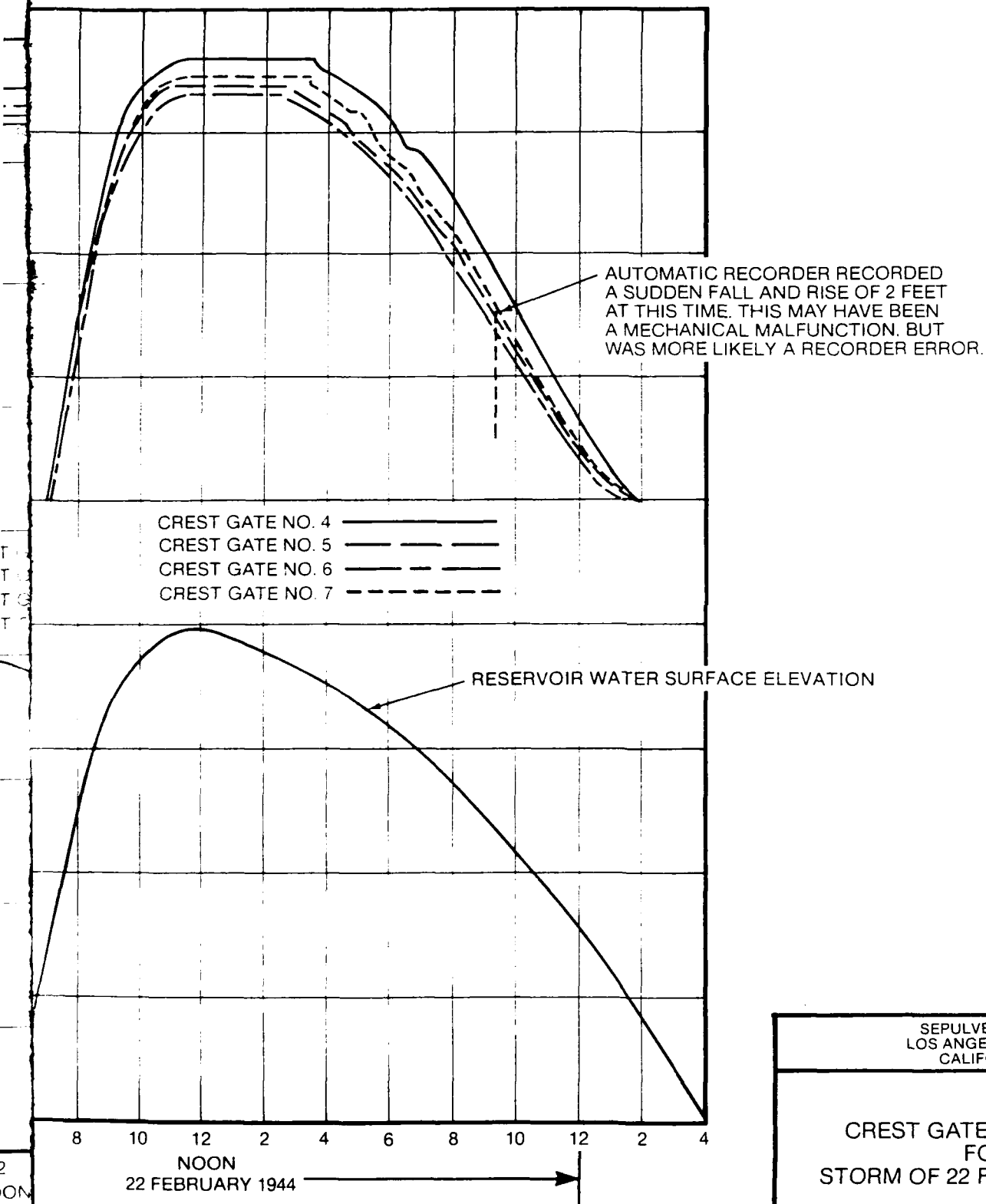


SEPULVEDA DAM  
LOS ANGELES RIVER  
CALIFORNIA

ELEVATION OF CREST GATES  
VS  
WATER SURFACE ELEVATION  
IN  
GATE PIT AND FLOAT WELL

U.S. ARMY CORPS OF ENGINEERS  
LOS ANGELES DISTRICT

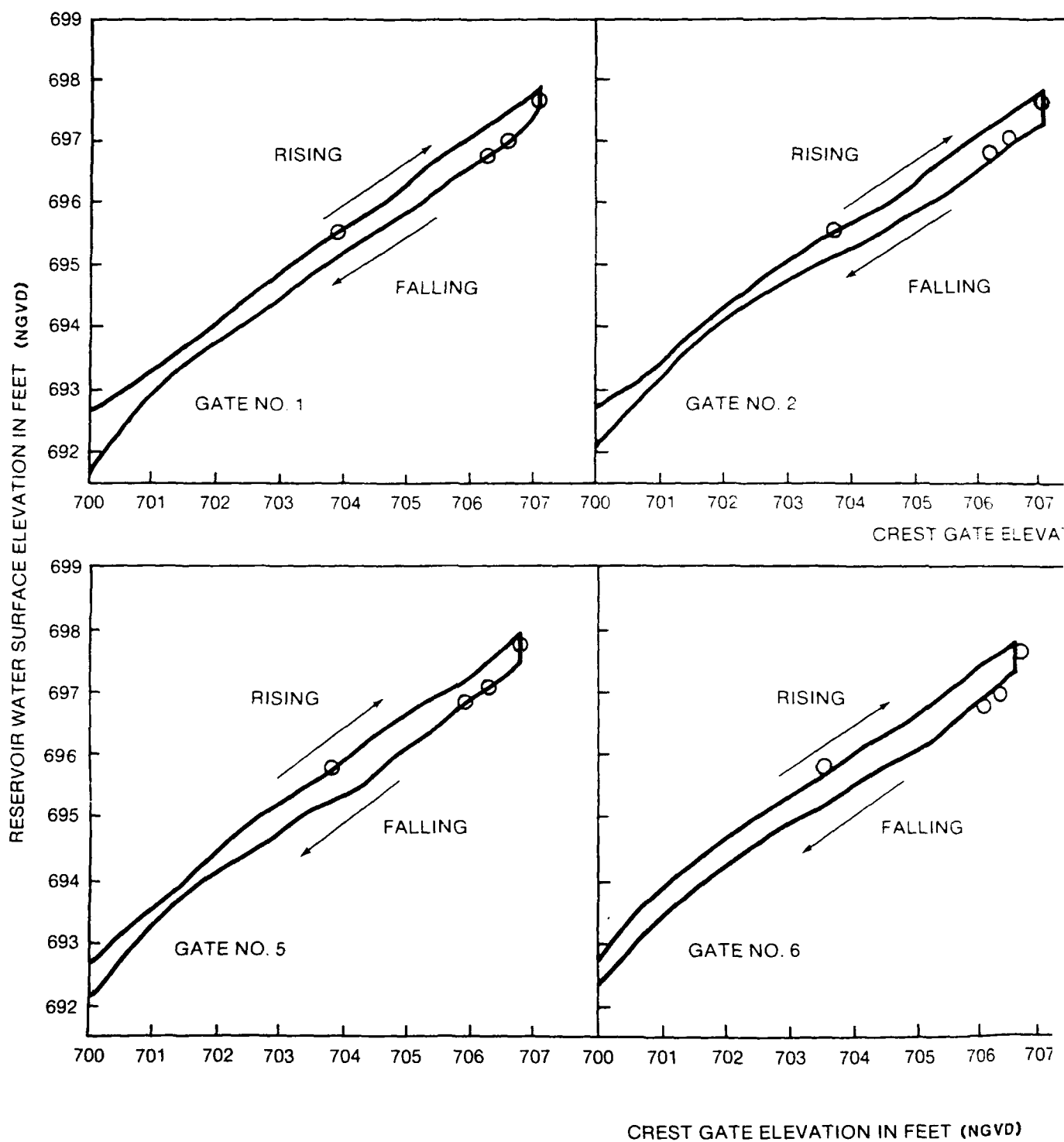


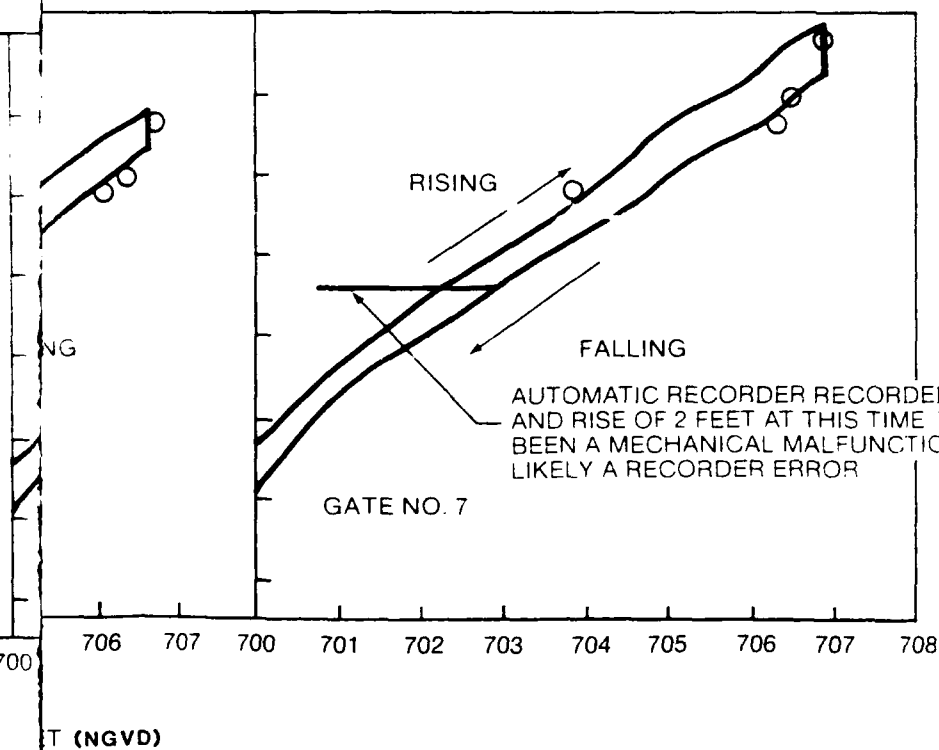
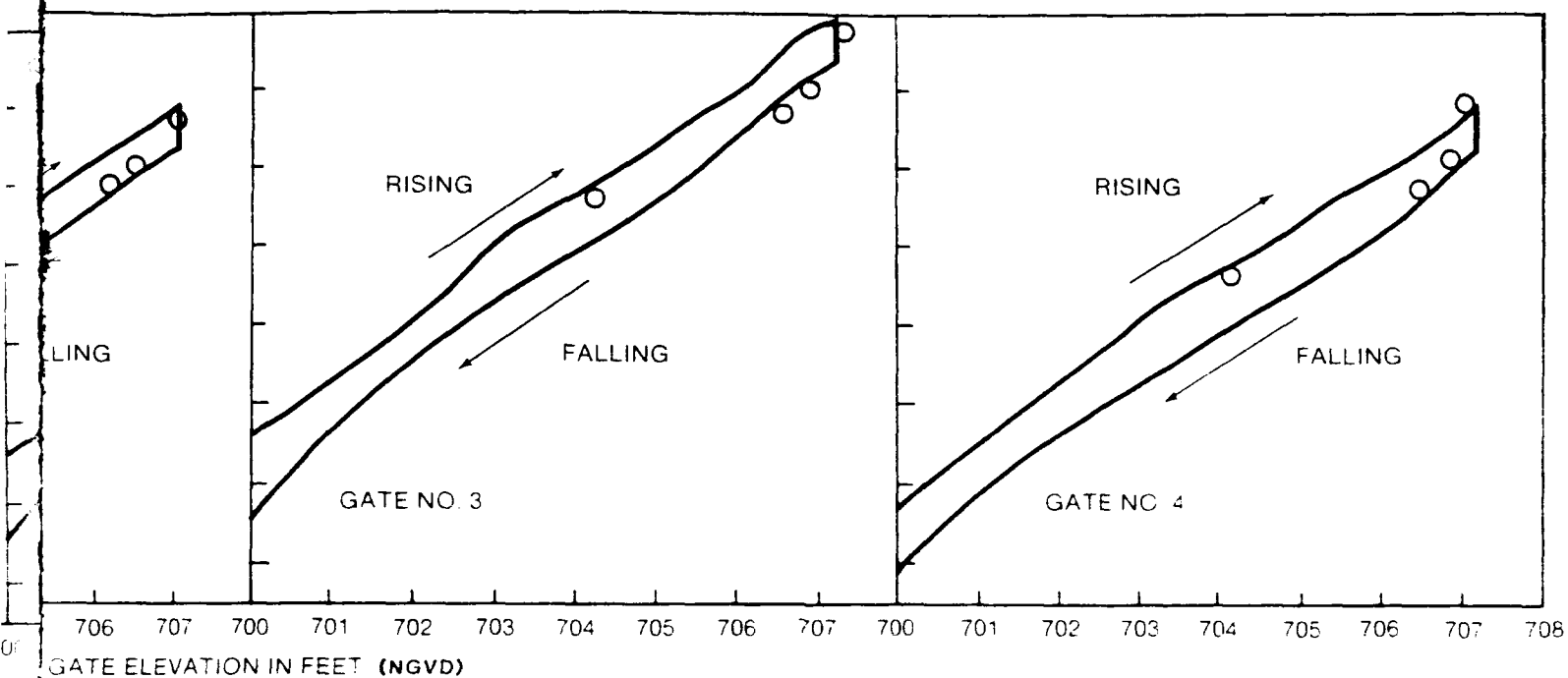


SEPULVEDA DAM  
LOS ANGELES RIVER  
CALIFORNIA

CREST GATE OPERATION  
FOR  
STORM OF 22 FEBRUARY 1944

U.S. ARMY CORPS OF ENGINEERS  
LOS ANGELES DISTRICT





○ CHECK OBSERVATIONS

AUTOMATIC RECORDER RECORDED A SUDDEN FALL AND RISE OF 2 FEET AT THIS TIME. THIS MAY HAVE BEEN A MECHANICAL MALFUNCTION, BUT WAS MORE LIKELY A RECORDER ERROR

SEPULVEDA DAM  
LOS ANGELES RIVER  
CALIFORNIA

CREST GATE OPERATION  
22 FEB 1944

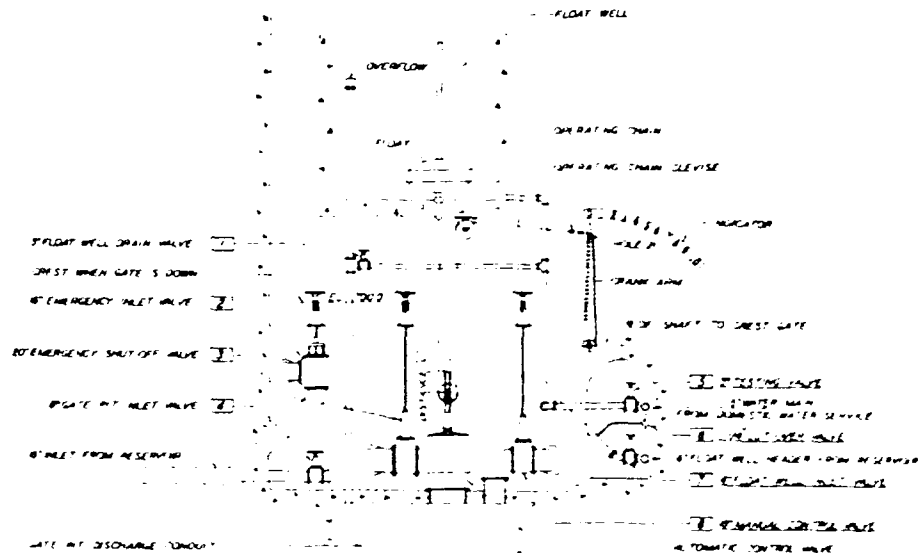
U.S. ARMY CORPS OF ENGINEERS  
LOS ANGELES DISTRICT

## GENERAL

THE CREST GATES ARE DESIGNED TO PERMIT STORAGE OF FLOOD WATERS TO ELEV 7100 WHEN THE GATES ARE FULLY RAISED, OR TO PERMIT DISCHARGE OF FLOOD WATERS DOWN TO ELEV 7000 WHEN THE GATES ARE LOWERED. THE FLOATS WHICH NORMALLY CONTROL THE ELEVATION OF THE CREST GATES, HAVE A WORKING RANGE BETWEEN RESERVOIR WATER SURFACE ELEVATION OF 7088 AND RESERVOIR WATER SURFACE ELEVATION OF 7180.

WITHIN THE LIMITS SET FORTH ABOVE AN INFINITELY LARGE NUMBER OF OPERATING CHARACTERISTICS ARE AVAILABLE.

THE INSTRUCTIONS ON THIS SHEET ARE INTENDED TO FACILITATE THE ADJUSTMENT OF THE MECHANISM TO MEET ANY OPERATING CHARACTERISTIC WITHIN THE LIMITS SET FORTH ABOVE.



SCHEMATIC SKETCH

THE ABOVE SCHEMATIC SKETCH SHOWS THE VALVES BY WHICH THE CREST GATES ARE CONTROLLED.

TESTING WITH DRAIN WATER TO TEST THE GATE DURING THE DRY SEASON CLOSE VALVES 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100.

TO RAISE GATE OPEN VALVE 1

TO RAISE FLOAT OPEN VALVE 2

TO DRAIN GATE AT OPEN VALVE 3

TO DRAIN FLOAT CHAMBER OPEN VALVE 4

**FULL AUTOMATIC CONTROL** THIS IS THE NORMAL OPERATING CONDITION FOR WHICH THE CREST GATES ARE DESIGNED TO PERMIT THE FULL AUTOMATIC MECHANISM TO FUNCTION. VALVES 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100.

**SEMI-AUTOMATIC CONTROL** TO ADJUST THE CONTROL MECHANISM TO MAINTAIN THE GATE CREST AT ANY CHOSEN ELEVATION REGARDLESS OF THE FLOOD STAGE —

(1) CLOSE VALVES 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100.

OR CONNECT THE OPERATING CHAIN CLEVIS TO HOLE H IN THE CRANK ARM

(2) IF THE INDICATOR READS ZERO CREST (ELEV 7000) ADJUST THE LENGTH

OF THE OPERATING CHAIN SO THAT DISTANCE C (SEE SKETCH ABOVE) IS 3'-0"

(3) IF THE INDICATOR READS 10 CREST (ELEV 7100) ADJUST THE LENGTH OF THE

OPERATING CHAIN SO THAT DISTANCE C (SEE SKETCH ABOVE) IS 3'-0"

4. CLOSE VALVE 1

THE CREST GATE IS NOW SET TO RISE IN ADVANCE OF A FLOOD TO REACH A MAXIMUM CREST OF 7100 TO LOWER THE CREST WITHIN ITS RANGE OPEN VALVE 2 UNTIL THE INDICATOR SHOWS THE DESIRED CREST SHOULD IT BE DESIRED TO RAISE THE CREST WHILE BEING MAINTAINED BELOW ELEVATION 7100 OPEN VALVE 1 UNTIL THE INDICATOR SHOWS THE DESIRED CREST THE MECHANISM WILL THEN MAINTAIN THIS CREST AT A VIRTUALLY CONSTANT ELEVATION WITHOUT FURTHER ATTENTION. NOTE UNDER CERTAIN CONDITIONS THERE WILL BE A TIME LAG WHILE ADJUSTING THE CREST FOR SEMI-AUTOMATIC CONTROL. HENCE ALLOW A FEW MINUTES FOR THE MECHANISM TO ATTAIN EQUILIBRIUM.

**EMERGENCY MANUAL OPERATION** SHOULD THE CONTROL MECHANISM BECOME INOPERATIVE, EMERGENCY MANUAL CONTROL MAY BE RESORTED TO. CLOSE VALVES 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100.

**OUT OF COMMISSION** SHOULD IT BE DESIRED TO PUT THE GATE OUT OF COMMISSION, CLOSE VALVES 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100.

## FUNCTION OF VALVES

**VALVE 1**—THIS VALVE DRAINS THE FLOAT CHAMBER UNDER SEMI-AUTOMATIC CONTROL. THIS ACTION RAISES THE GATE BY CLOSING THE AUTOMATIC CONTROL VALVE.

**VALVE 2**—THIS VALVE IS AN AUXILIARY VALVE TO VALVE 1. IT ADMITS WATER INTO THE GATE CHAMBER THEREBY TENDING TO RAISE THE GATE. THIS VALVE SHOULD BE OPENED ONLY IF VALVE 1 IS OF INSUFFICIENT CAPACITY TO RAISE THE GATE, WHICH MAY HAPPEN IF THE GATE SEALS SHOULD LEAK EXCESSIVELY, OR AN OUTLET VALVE SHOULD BECOME INOPERATIVE IN OPEN POSITION. THIS VALVE SHOULD BE LOCKED CLOSED.

**VALVE 3**—THIS VALVE IS IN SERIES WITH THE AUTOMATIC CONTROL VALVE AND MUST BE CLOSED ONLY IF THE AUTOMATIC CONTROL VALVE SHOULD BECOME INOPERATIVE IN OPEN POSITION.

**VALVE 4**—THIS VALVE ADMITS WATER INTO THE GATE CHAMBER THEREBY TENDING

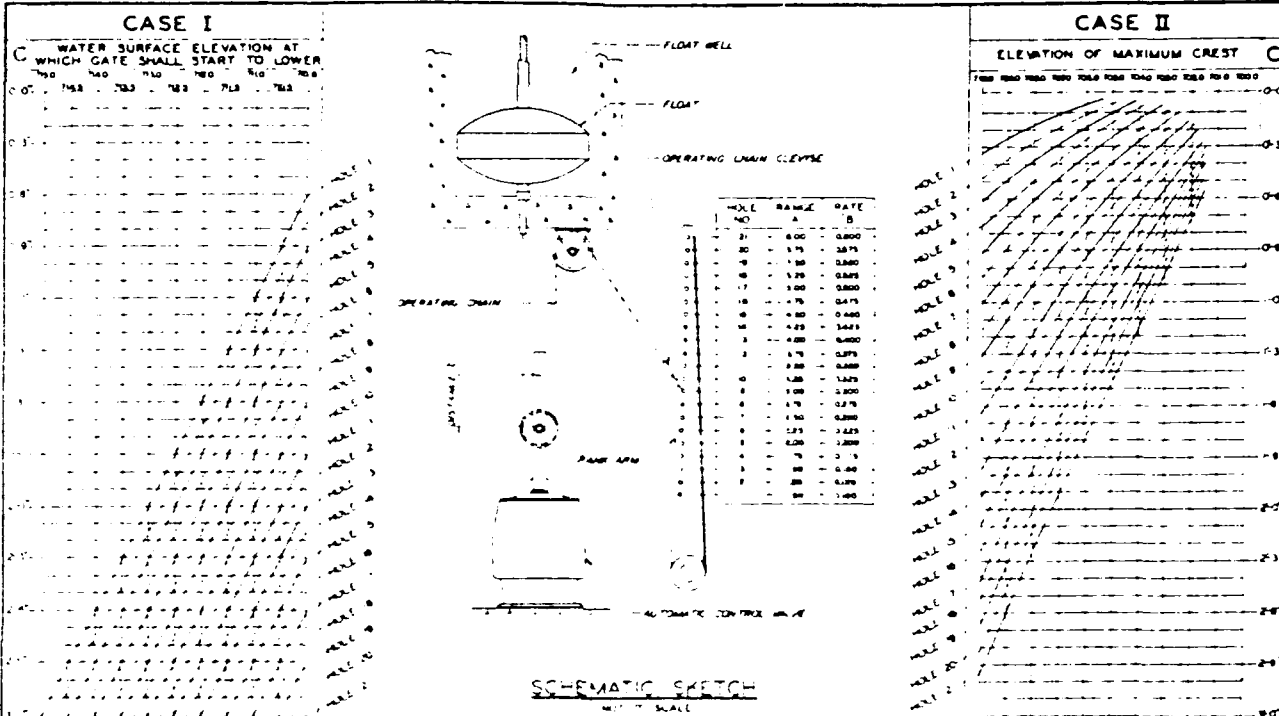
TO RAISE THE GATE.

**VALVE 5**—THIS VALVE ADMITS WATER FROM THE DOMESTIC WATER SUPPLY TO CHAMBER IN THIS WAY THE GATE MAY BE OPENED FOR TESTING DURING THE DRY SEASON.

**VALVE 6**—THIS VALVE ADMITS WATER FROM THE DOMESTIC WATER SUPPLY TO THE CONTROL FLOAT WELL. THIS VALVE IS USED IN SEMI-AUTOMATIC OPERATION.

**VALVE 7**—THIS VALVE ADMITS WATER FROM THE RESERVOIR INTO THE CONTROL WELL. THIS VALVE IS OPEN FOR AUTOMATIC OPERATION.

**VALVE 8**—THIS VALVE BYPASSES THE AUTOMATIC CONTROL VALVE. IT CAN BE USED TO RELEASE WATER FROM THE GATE CHAMBER AND THUS LOWER THE GATE.



**CASE I**—IN WHICH THE MAXIMUM CREST SHALL BE AT ELEVATION 710.0

NOTE: THIS CASE INCLUDES ALL NORMAL OPERATING REQUIREMENTS

1. TRACE THE WATER SURFACE ELEVATION AT WHICH THE GATE SHALL START TO LOWER, FROM THE WATER SURFACE ELEVATION AT WHICH THE GATE SHALL BE FULLY LOWERED THE REMAINDER SHALL BE DESIGNATED "RANGE A"

2. SELECT THE HOLE IN THE CRANK ARM (SEE SKETCH) WHICH MOST NEARLY AGREES WITH THE DESIRED "RANGE A" AND CONNECT THE OPERATING CHAIN CLEVIS THERE TO

3. ON THE CASE I CHART (ABOVE) TRACE THE LINE CORRESPONDING TO THE SELECTED CRANK ARM HOLE TO ITS INTERSECTION WITH THE W.S. ELEV. AT WHICH GATE SHALL START TO LOWER READ DISTANCE "C" TO THE LEFT

4. ADJUST THE LENGTH OF THE OPERATING CHAIN SO THAT DISTANCE "C" (SEE SKETCH) AGREES WITH DISTANCE "C" FROM THE CHART

#### EXAMPLE CASE I

**PROBLEM:** GATE SHALL START TO LOWER WHEN W.S. REACHES EL 711.0 AND SHALL BE FULLY LOWERED WHEN W.S. REACHES EL 714.0

**SOLUTION:**  $714.0 - 711.0 = 3.0 = \text{"RANGE A"}$  WHICH CORRESPONDS (SEE SKETCH) TO HOLE B FROM CASE I CHART, INTERSECTION OF HOLE B LINE AND W.S. EL 711.0 IS OPPOSITE C=8.0 WHICH IS USED

**CASE II**—IN WHICH THE MAXIMUM CREST SHALL BE LESS THAN ELEVATION 710.0

NOTE: IN THIS CASE THE RESERVOIR W.S. AT WHICH GATE STARTS TO LOWER IS ELEV 709.8

1. SUBTRACT 709.8 FROM THE W.S. ELEV. AT WHICH THE GATE SHALL BE FULLY LOWERED DIVIDE THE REMAINDER BY THE FINAL WHOLE DIGIT AND ITS DECIMAL FRACTION IN THE DESIRED MAXIMUM CREST THE QUOTIENT SHALL BE DESIGNATED "RATE B"

2. SELECT THE HOLE IN THE CRANK ARM (SEE SKETCH) WHICH MOST NEARLY AGREES WITH THE DESIRED "RATE B" AND CONNECT THE OPERATING CHAIN CLEVIS THERE TO

3. ON THE CASE II CHART (ABOVE) TRACE THE LINE CORRESPONDING TO THE SELECTED CRANK ARM HOLE TO ITS INTERSECTION WITH THE DESIRED MAXIMUM CREST READ DISTANCE "C" TO THE RIGHT

4. ADJUST THE LENGTH OF THE OPERATING CHAIN SO THAT DISTANCE "C" (SEE SKETCH) AGREES WITH DISTANCE "C" FROM THE CHART

#### EXAMPLE CASE II

**PROBLEM:** DESIRED MAXIMUM CREST = EL 707.0 AND GATE SHALL BE FULLY LOWERED WHEN W.S. REACHES EL 713.0

**SOLUTION:**  $713.0 - 707.0 = 6.0 \div 3.4 = 1.76 = \text{"RATE B"}$  WHICH CORRESPONDS (SEE SKETCH) TO HOLE H FROM CASE II CHART, INTERSECTION OF HOLE H LINE AND MAXIMUM CREST EL 707.0 IS OPPOSITE C=11.5 WHICH IS USED

NOTE: ALL ADJUSTMENTS COVERED ABOVE IN CASE I & II SHALL BE MADE WITH CREST GATE FULLY LOWERED AND WITH FLOAT WELL EMPTY

WATER SUPPLY TO THE GATE  
TESTING DURING THE DRY SEASON  
WATER SUPPLY TO THE  
GATE OPERATION  
WATER INTO THE CONTROL FLAT

IT CAN BE USED TO  
OPER THE GATE

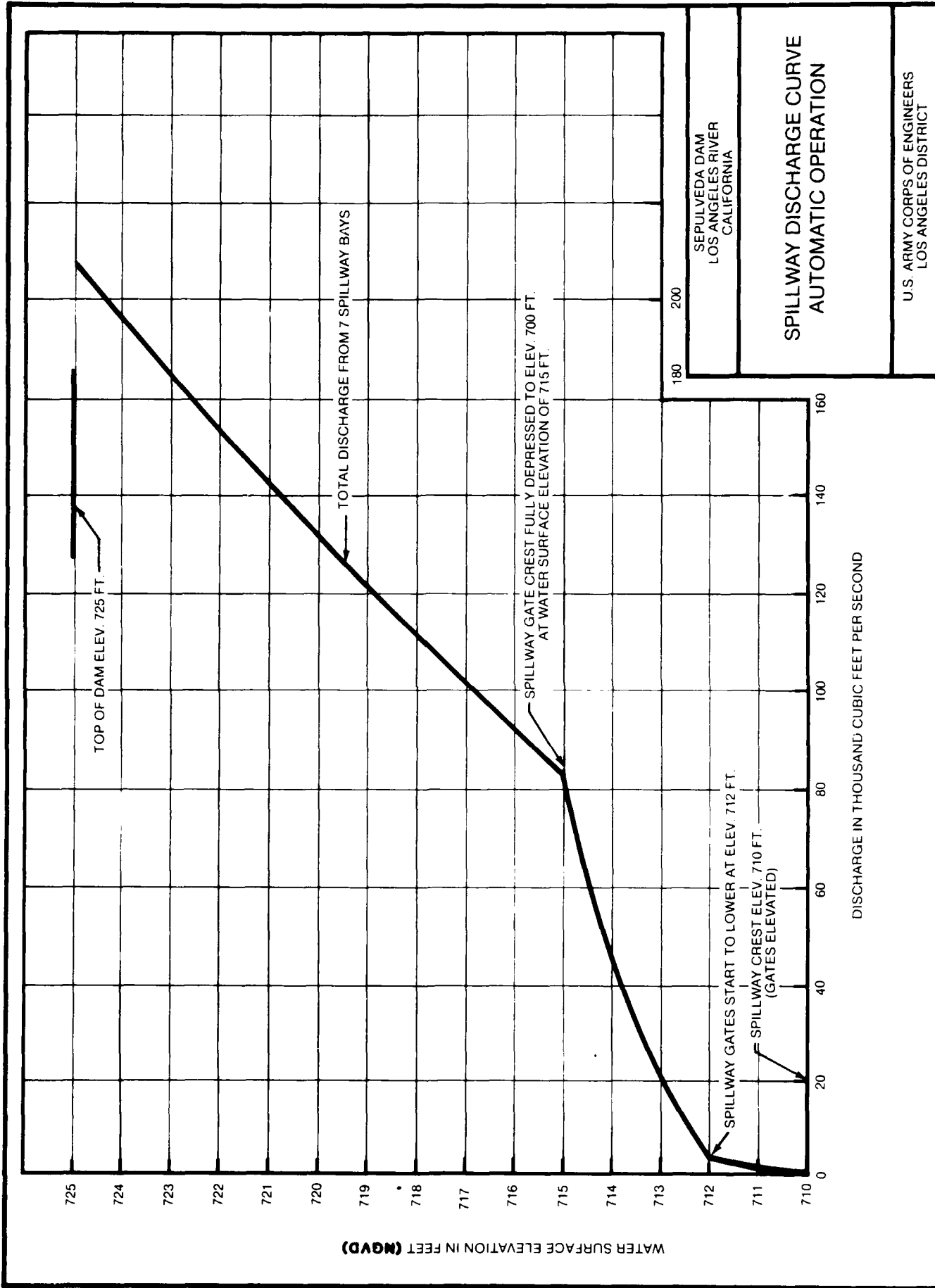
SEPULVEDA DAM  
LOS ANGELES RIVER  
CALIFORNIA

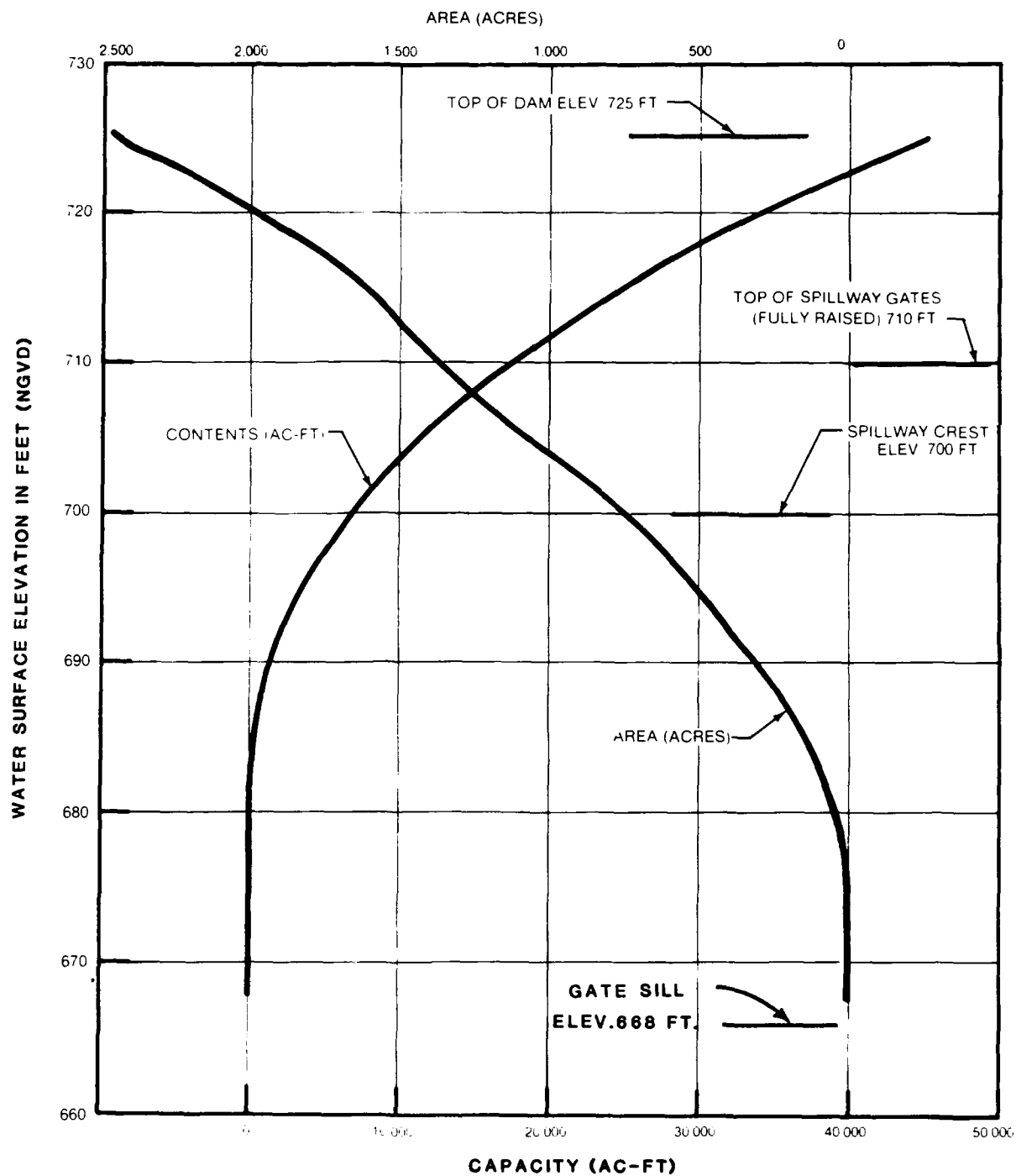
## OPERATING INSTRUCTIONS

## FOR CREST GATES

U.S. ARMY CORPS OF ENGINEERS  
LOS ANGELES DISTRICT



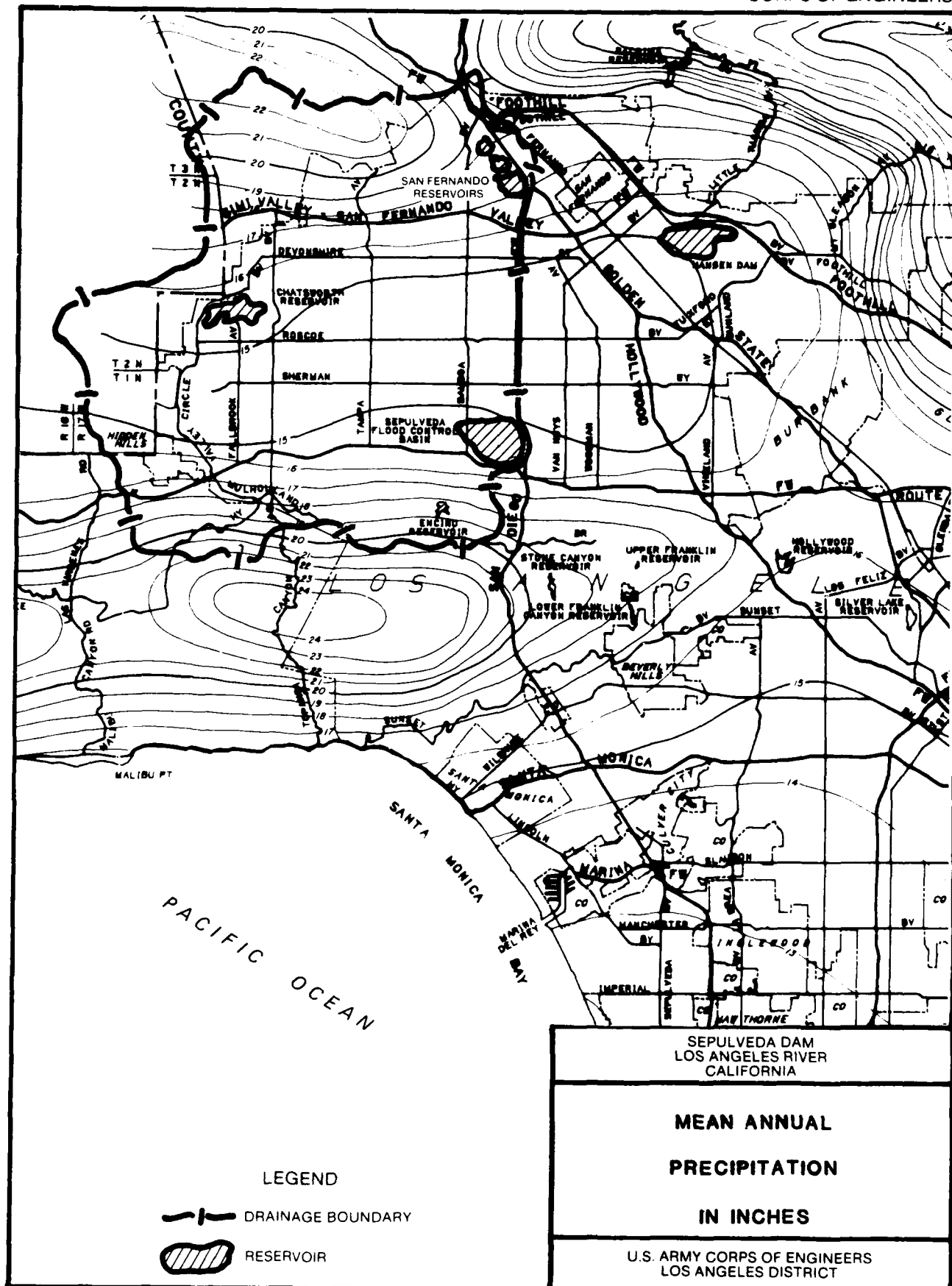


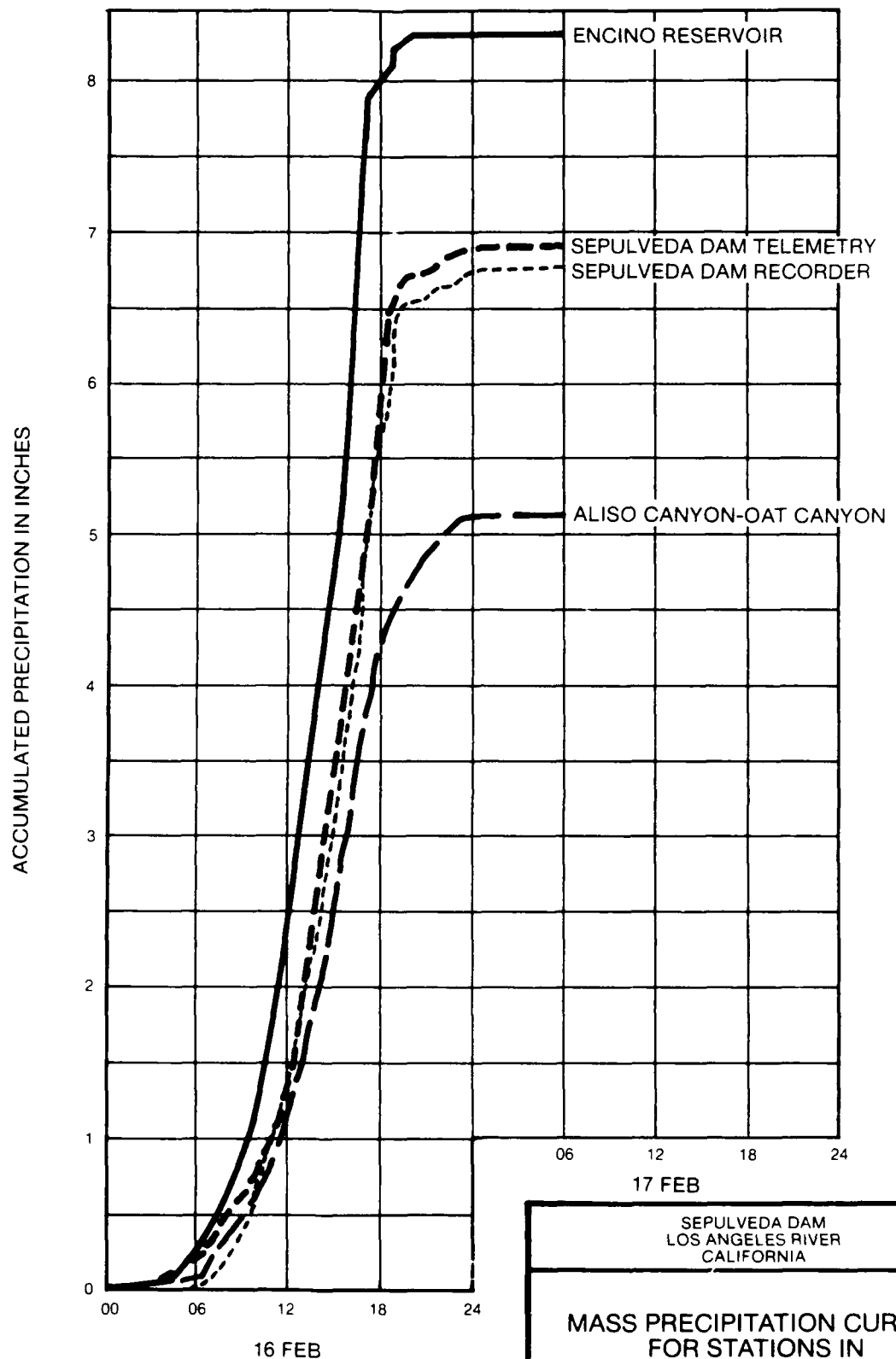


SEPULVEDA DAM  
LOS ANGELES RIVER  
CALIFORNIA

WATER SURFACE ELEVATION  
VS  
CAPACITY AND AREA

U.S. ARMY CORPS OF ENGINEERS  
LOS ANGELES DISTRICT

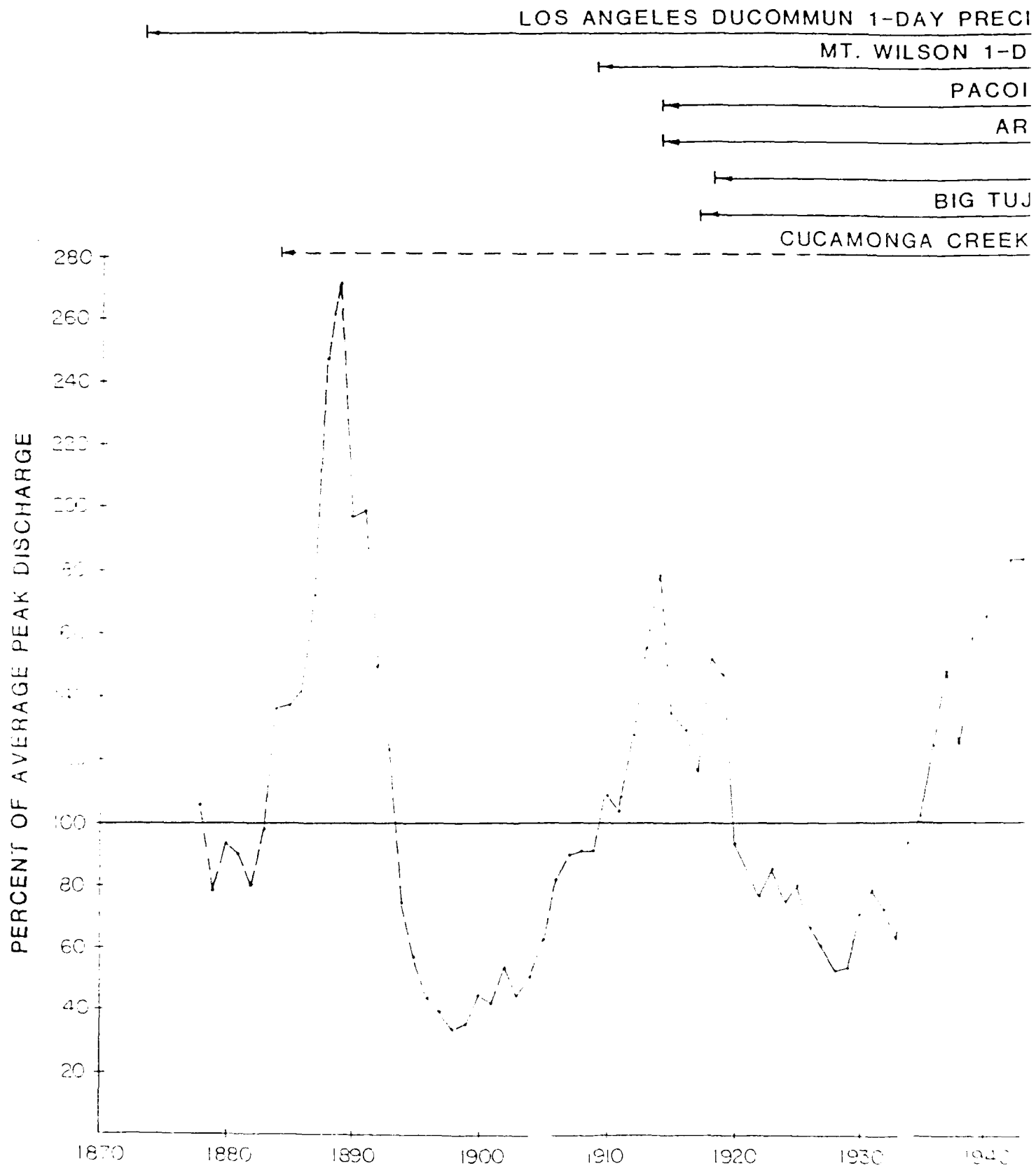




SEPULVEDA DAM  
LOS ANGELES RIVER  
CALIFORNIA

MASS PRECIPITATION CURVES  
FOR STATIONS IN  
SEPULVEDA BASIN  
16-17 FEB, 1980

U.S. ARMY CORPS OF ENGINEERS  
LOS ANGELES DISTRICT



1-DAY PRECIPITATION

WILSON 1-DAY PRECIPITATION

PACOIMA DAM INFLOW

ARROYO SECO

FISH CREEK

BIG TUJUNGA DAM INFLOW

ONGA CREEK

RAINFALL STATIONS

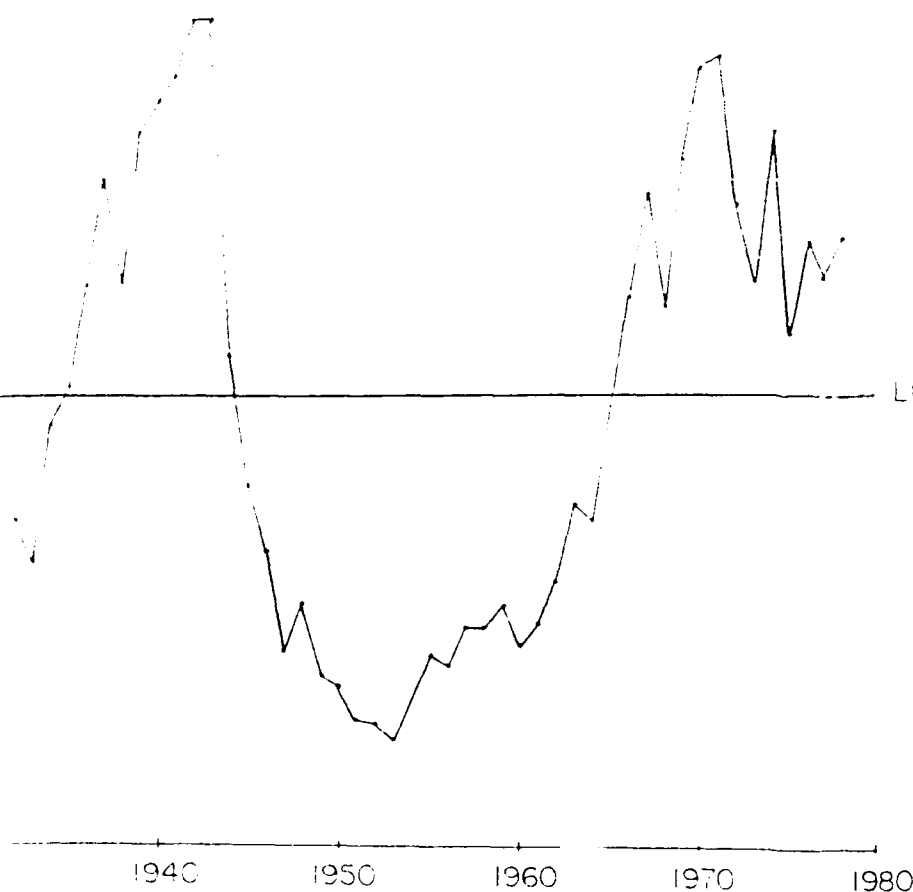
DISCHARGE STATIONS

RECORDED

ESTIMATED FROM  
CORRELATION WITH  
RAINFALL DATA

NOTE. GRAPH REPRESENTS  
10-YEAR RUNNING MEAN.  
PLOTTED AT THE MIDDLE  
OF EACH 10-YEAR PERIOD.

LONG-TERM AVERAGE



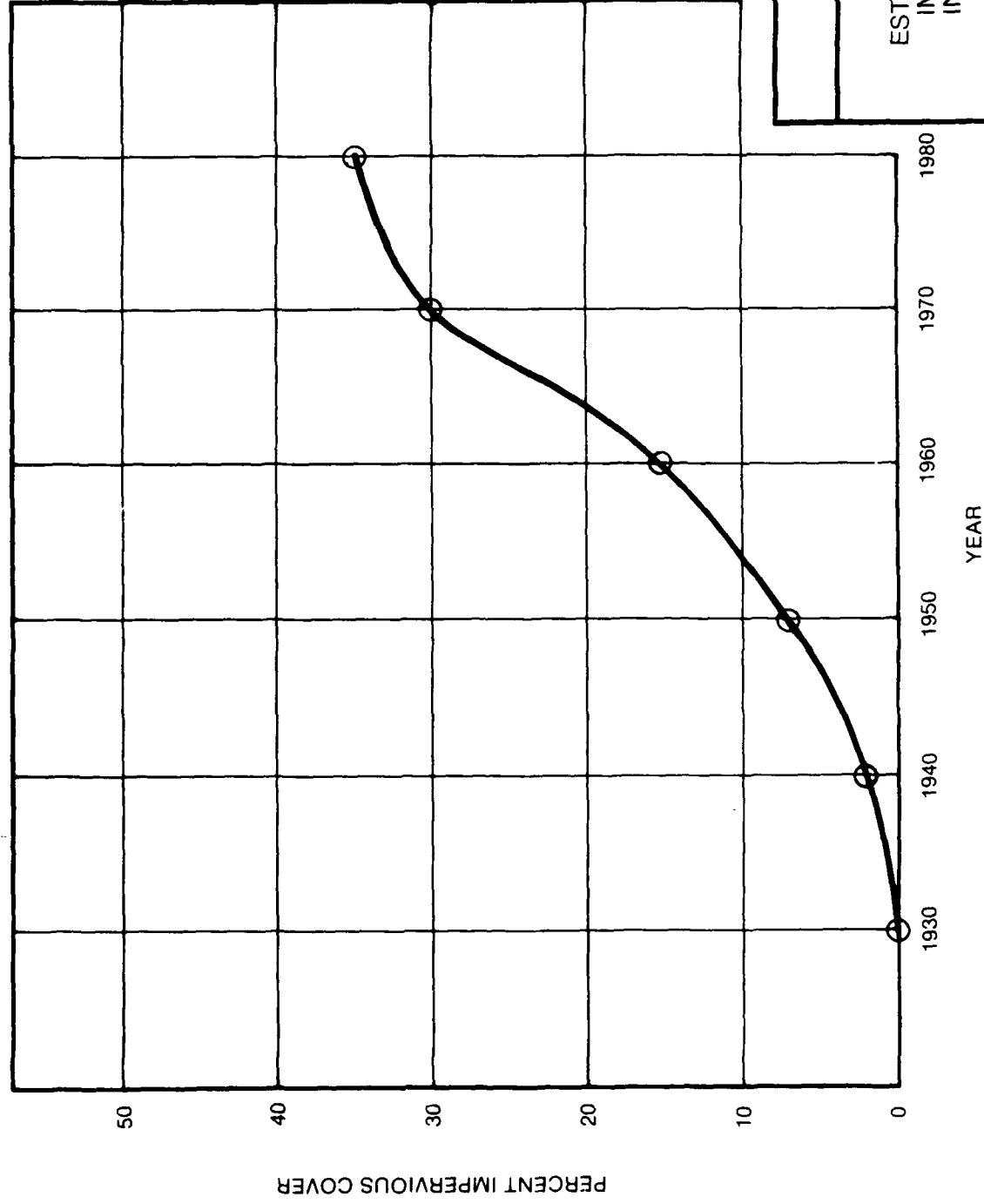
SEPULVEDA DAM  
LOS ANGELES RIVER  
CALIFORNIA

VARIATION IN 10-YEAR MEAN

PEAK DISCHARGE

LOS ANGELES COUNTY REGION

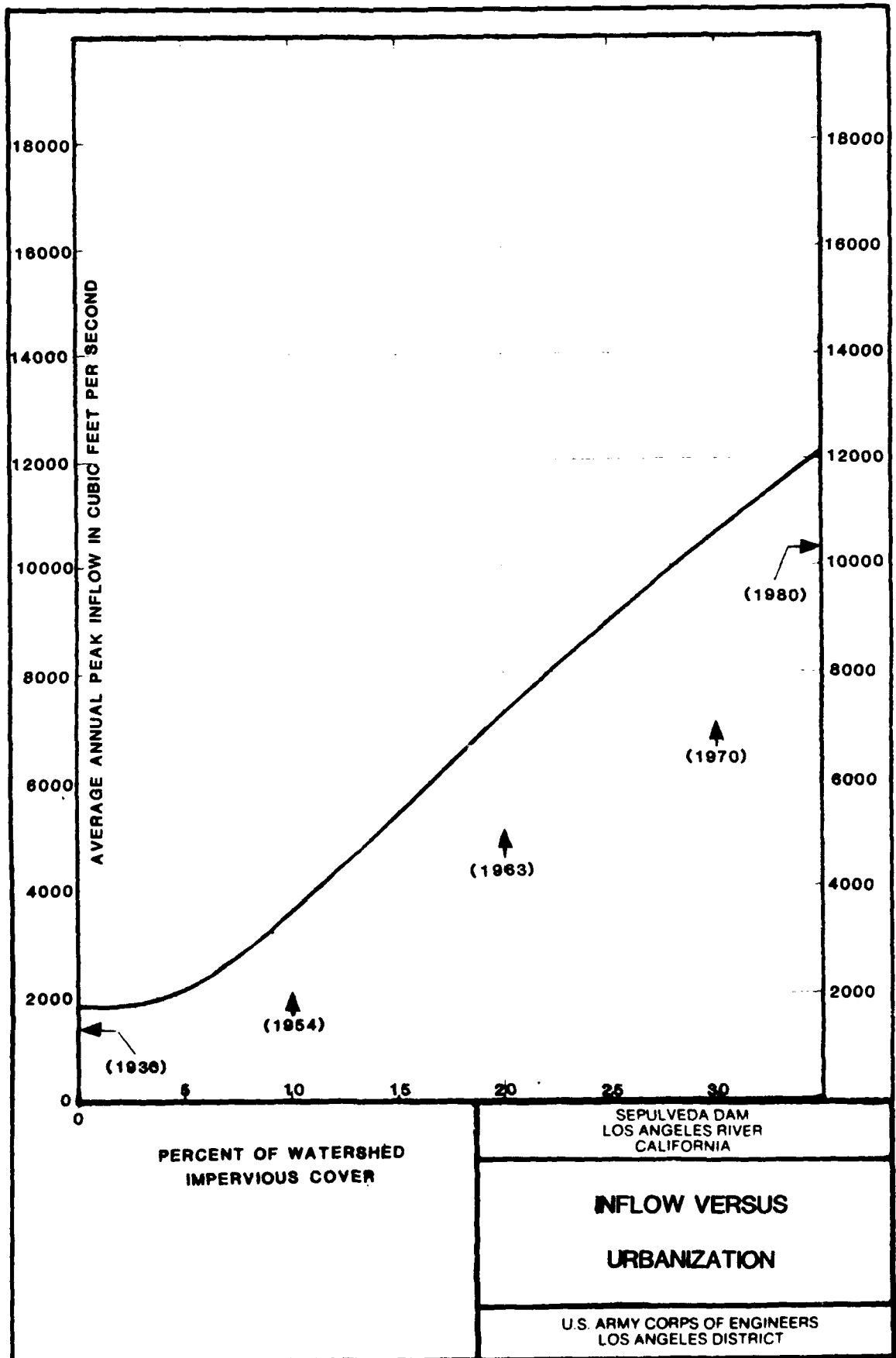
U.S. ARMY CORPS OF ENGINEERS  
LOS ANGELES DISTRICT



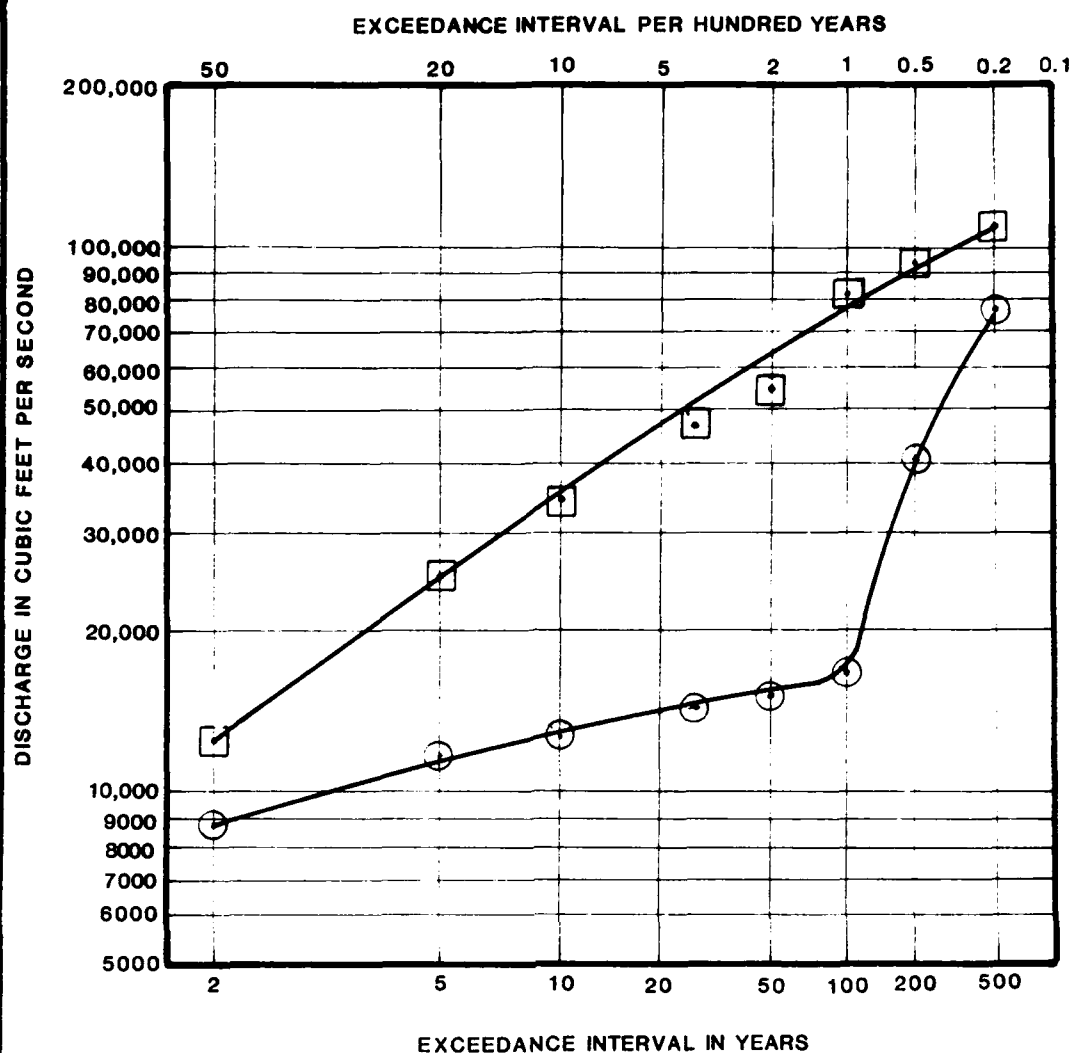
SEPULVEDA DAM  
LOS ANGELES RIVER  
CALIFORNIA

ESTIMATED PERCENT OF  
IMPERVIOUS COVER  
IN DRAINAGE BASIN

U.S. ARMY CORPS OF ENGINEERS  
LOS ANGELES DISTRICT







—□— INFLOW

—○— OUTFLOW

□, ○ Data points derived from a rainfall-runoff analysis as a part a 1986 Corps of Engineers review study. Frequency values from the curves of this plate are listed in Table 4-08.

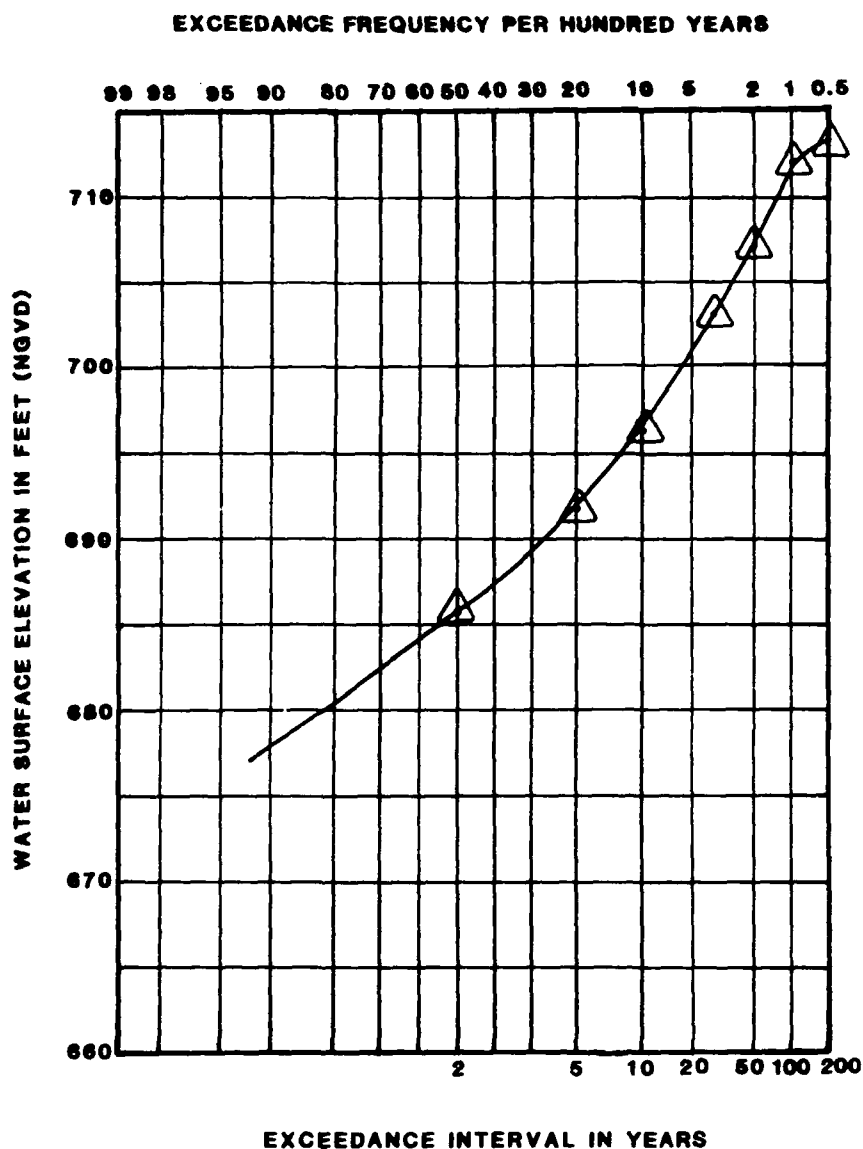
SEPULVEDA DAM  
LOS ANGELES RIVER  
CALIFORNIA

DISCHARGE FREQUENCY

CURVES

1980 CONDITIONS

U. S. ARMY ENGINEER DISTRICT  
LOS ANGELES, CORPS OF ENGINEERS  
TO ACCOMPANY REPORT DATED:



Data points derived from a rainfall-runoff analysis as part of a 1985 Corps of Engineers review study. Frequency values from the curves of this plate are listed in Table 4-06.

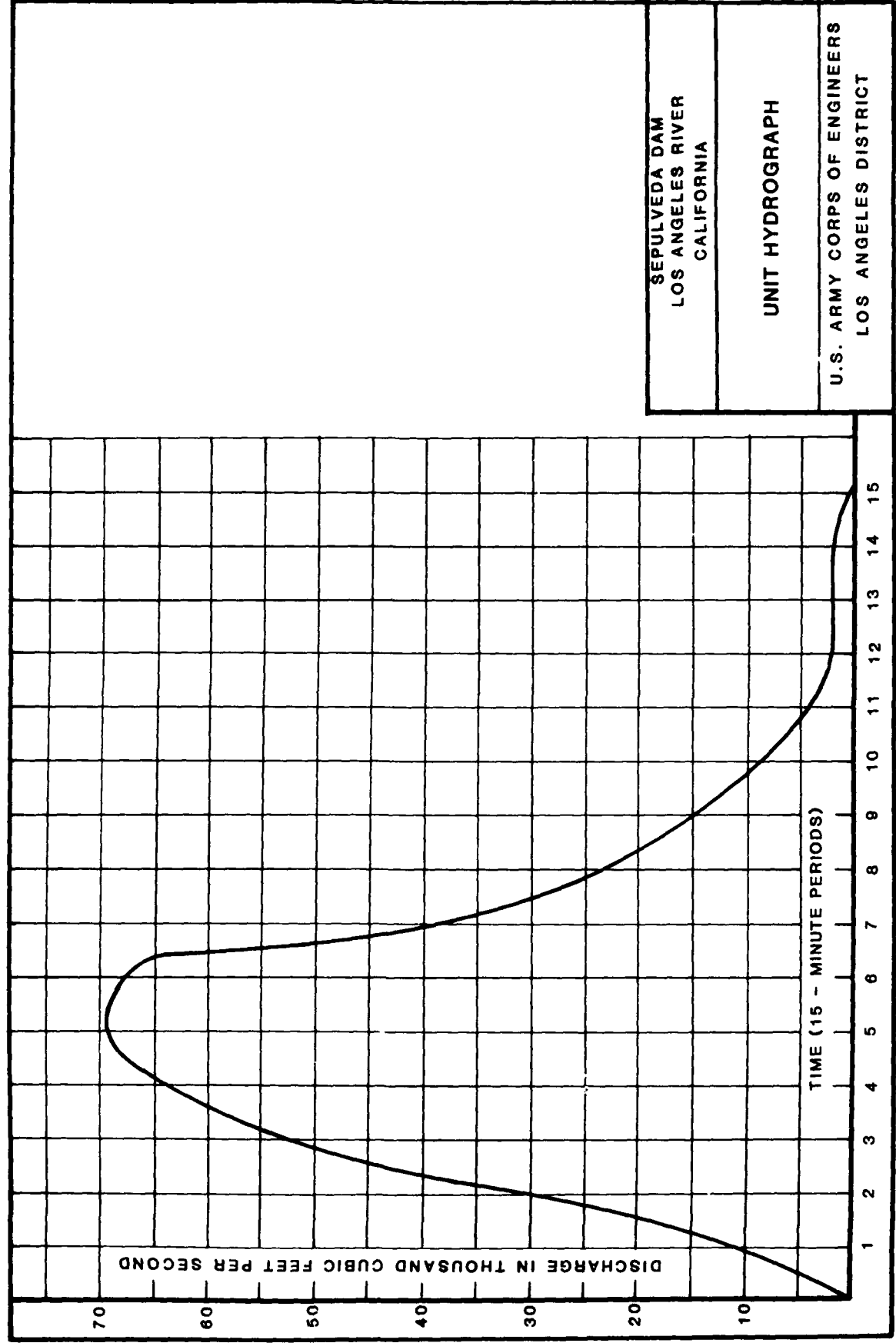
SEPULVEDA DAM  
LOS ANGELES RIVER  
CALIFORNIA

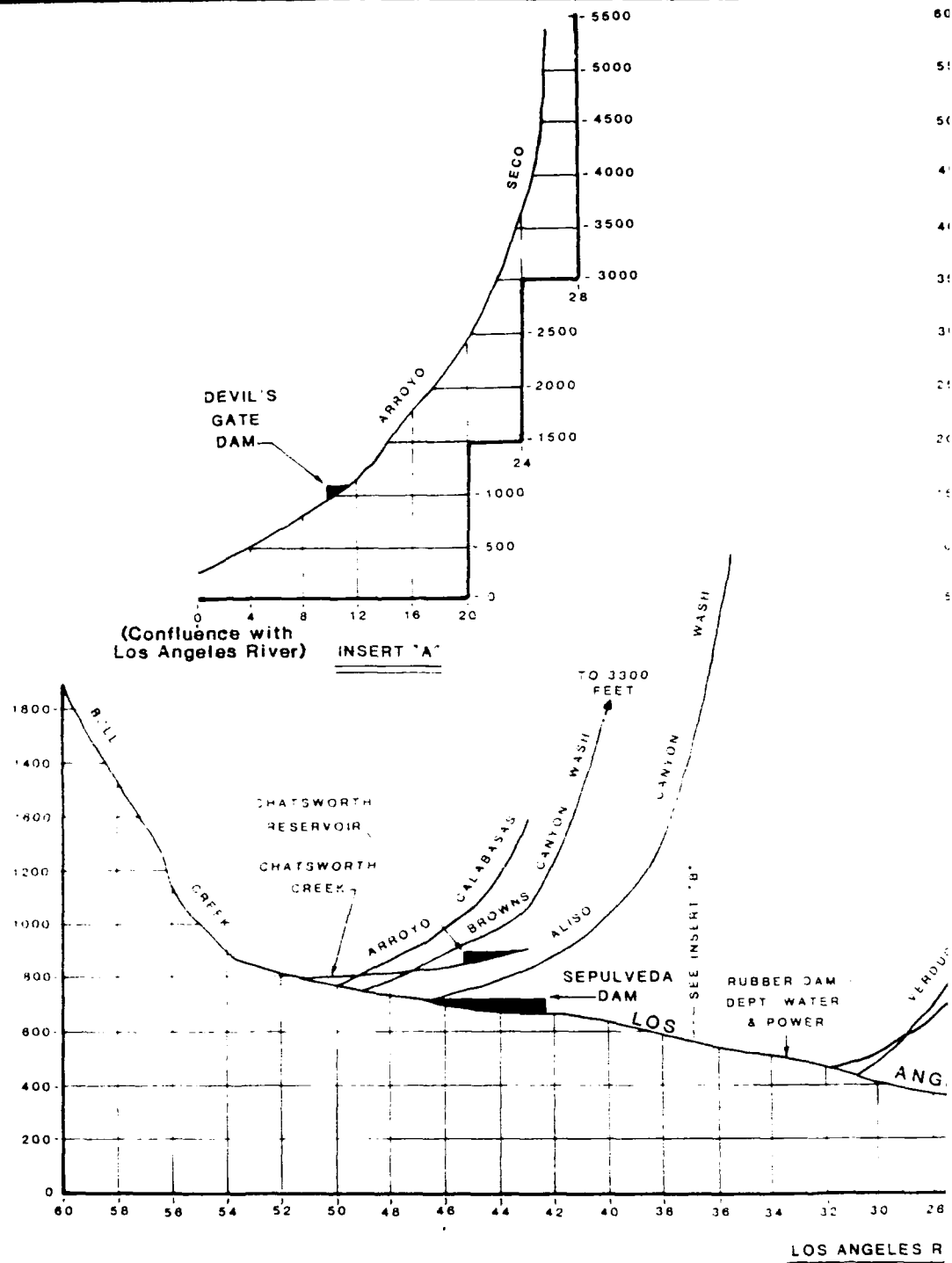
**ELEVATION FREQUENCY CURVE  
1980 CONDITIONS**

U. S. ARMY ENGINEER DISTRICT  
LOS ANGELES, CORPS OF ENGINEERS

U.S. ARMY ENGINEERING DISTRICT

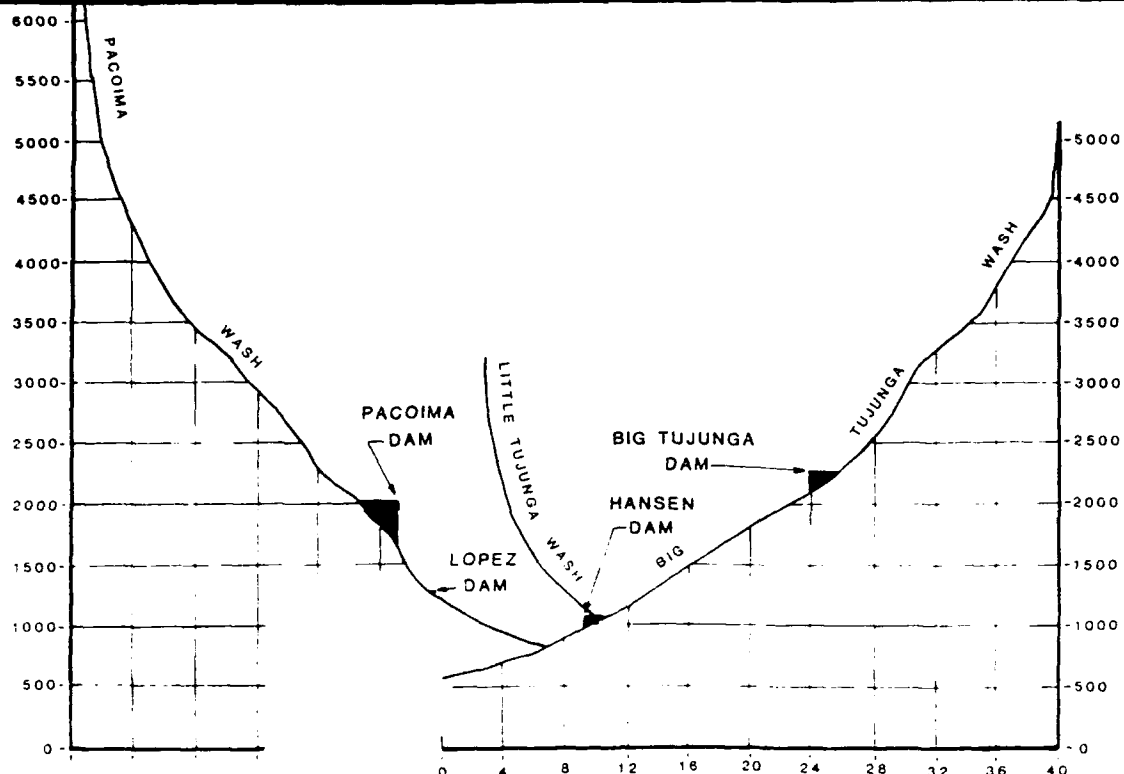
CORPS OF ENGINEERS





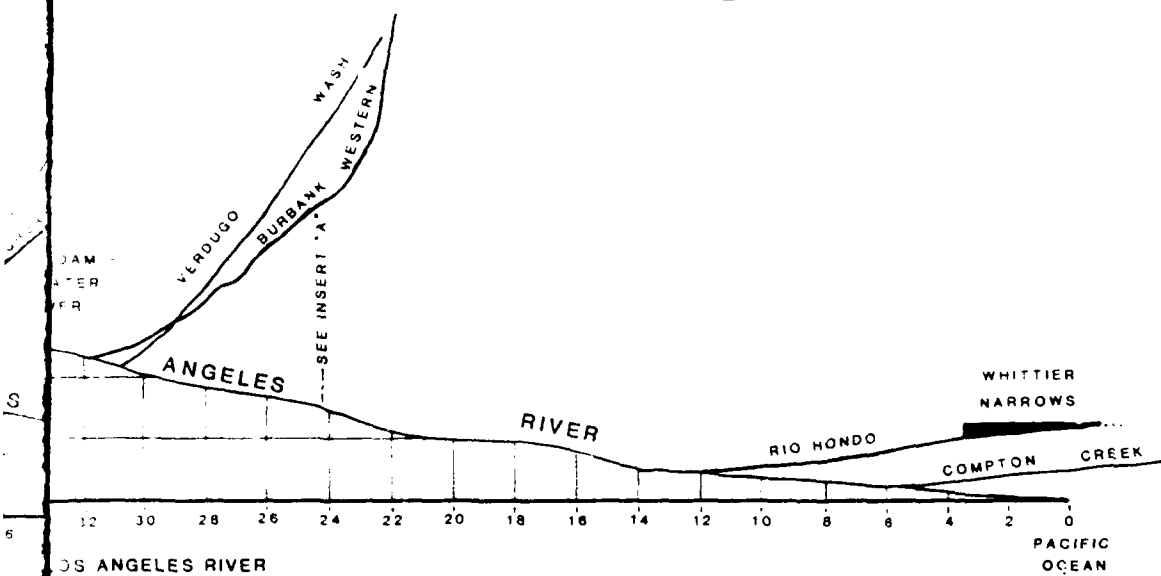
# NOTES:

1. HORIZONTAL SCALES INDICATE MILES
2. VERTICAL SCALES INDICATE FEET (NGVD)



(Confluence with  
Los Angeles River)

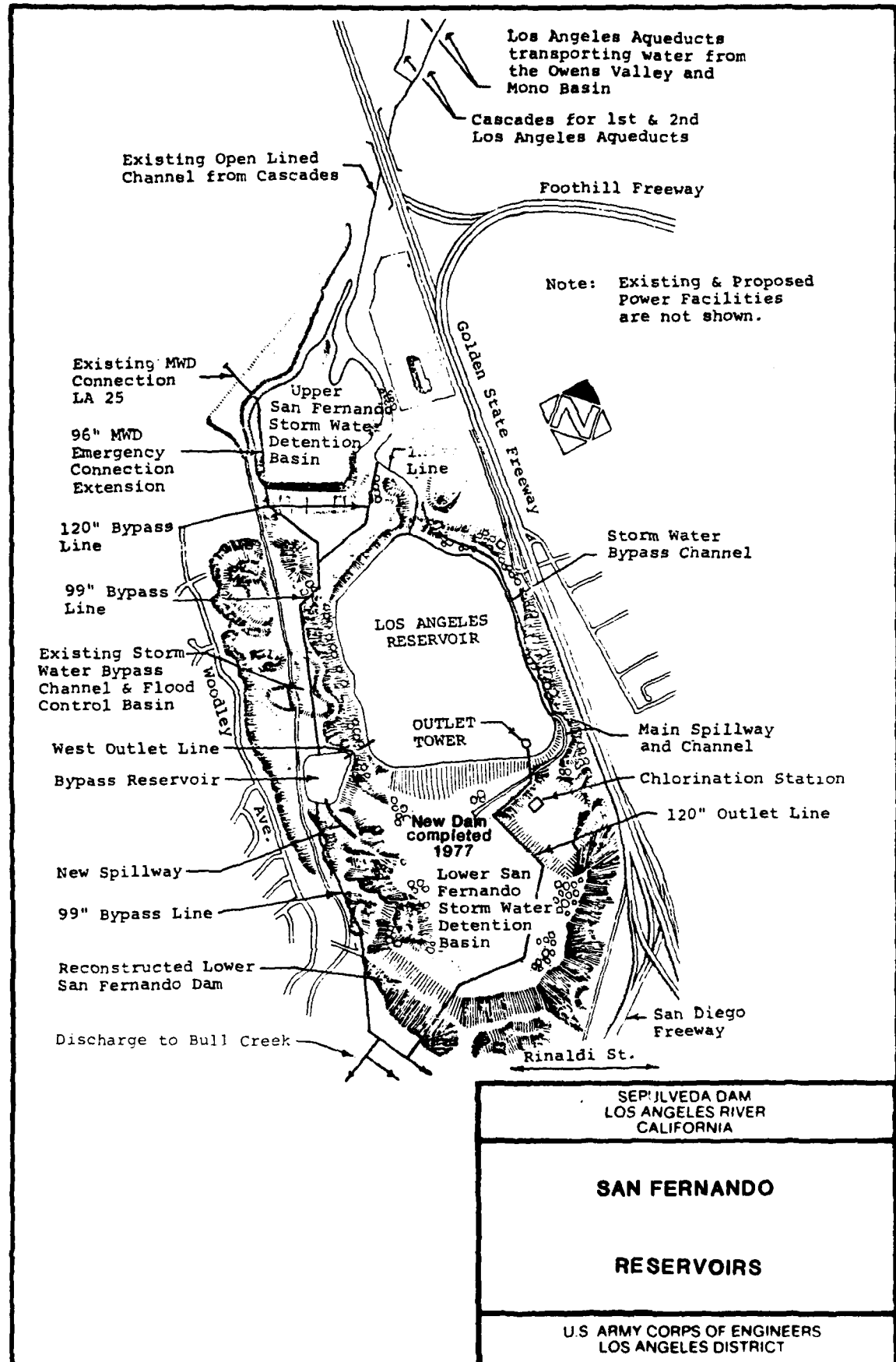
INSERT "B"

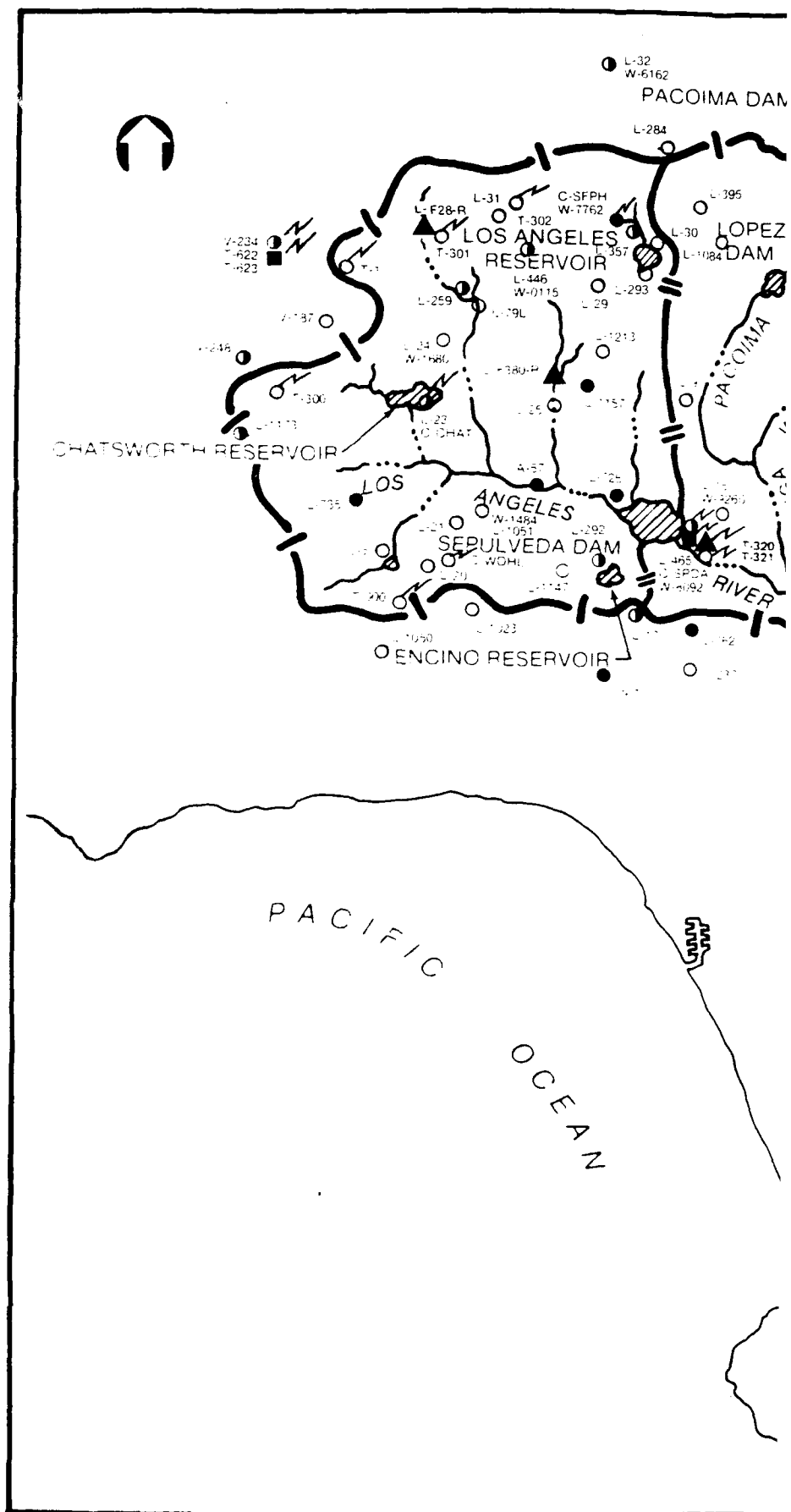


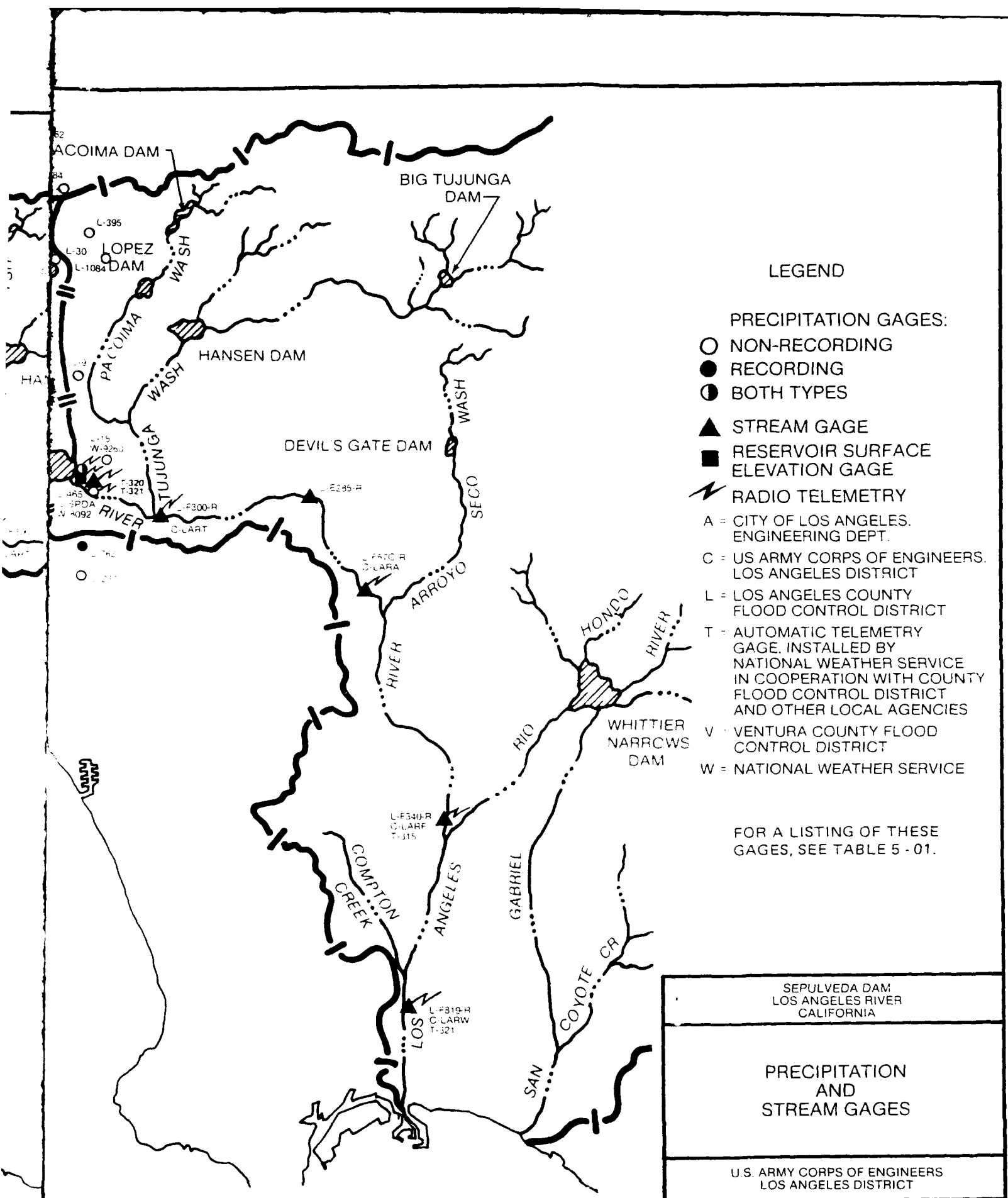
LOS ANGELES COUNTY  
DRAINAGE AREA (REVIEW)  
CALIFORNIA

LOS ANGELES RIVER  
& MAJOR TRIBUTARIES  
STREAMBED PROFILES

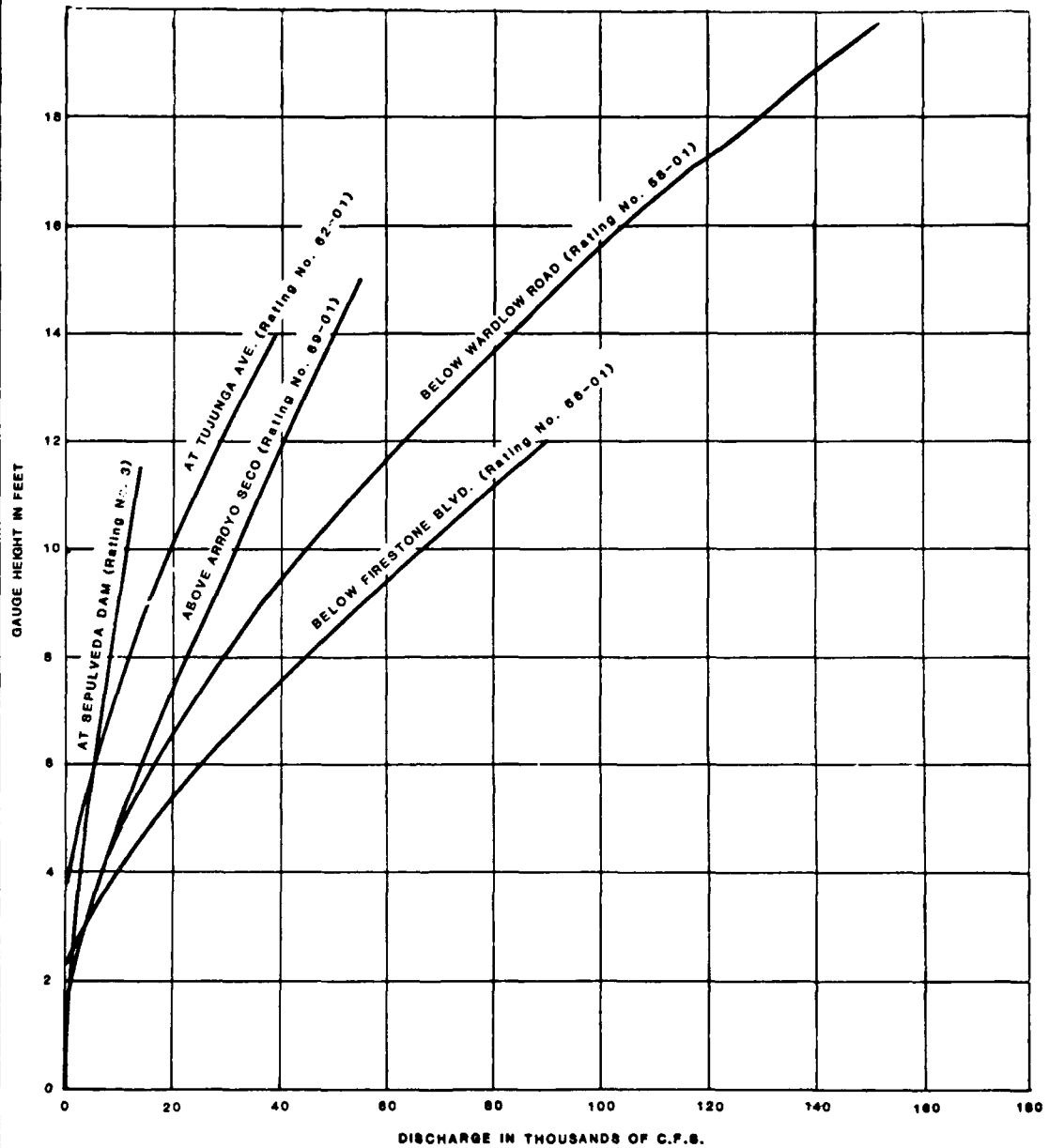
U.S. ARMY ENGINEERING DISTRICT  
LOS ANGELES, CORPS OF ENGINEERS











SEPULVEDA DAM  
LOS ANGELES RIVER  
CALIFORNIA

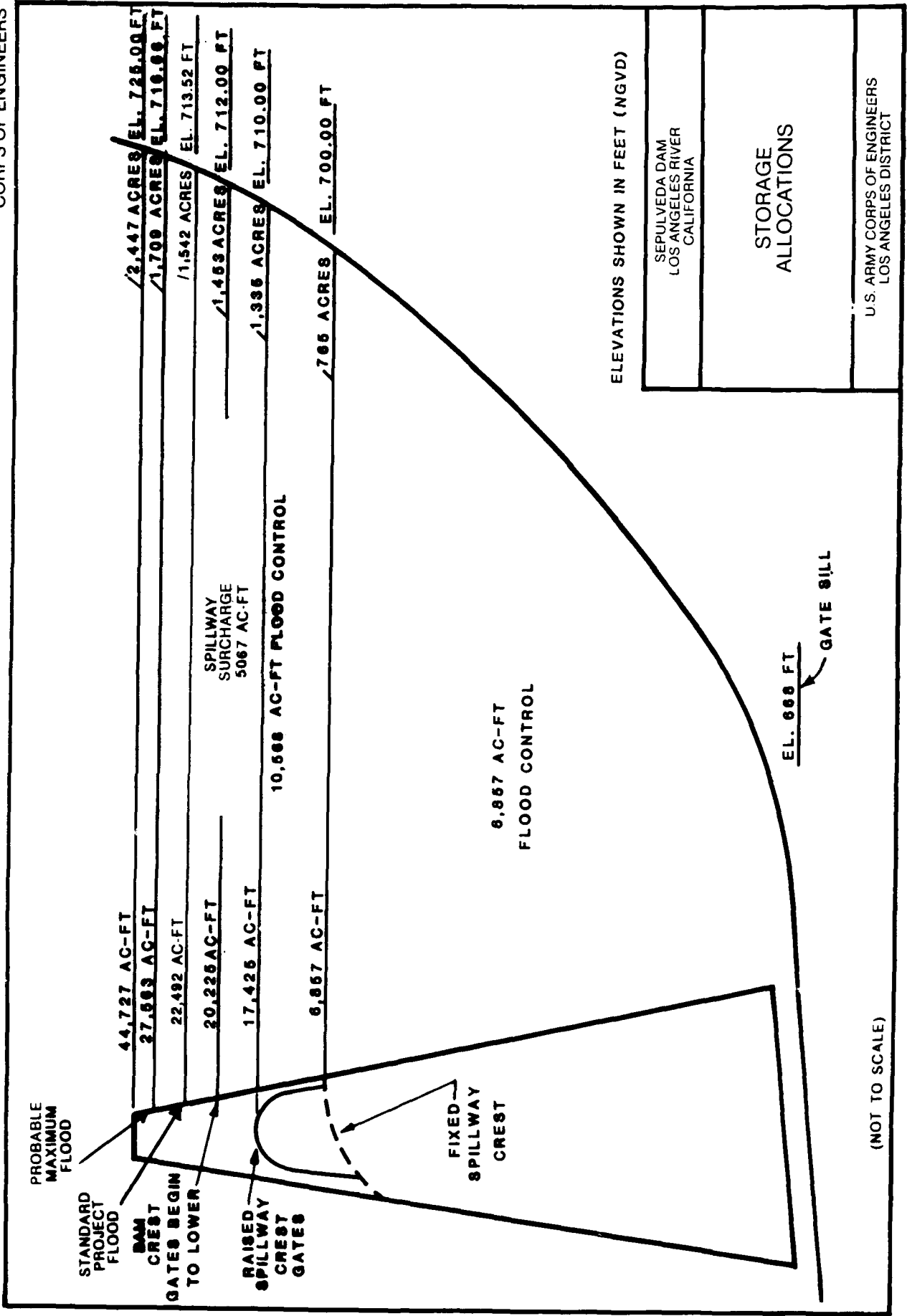
RATING CURVES FOR  
STREAM GAUGES  
ON THE LOS ANGELES RIVER

U. S. ARMY ENGINEER DISTRICT  
LOS ANGELES, CORPS OF ENGINEERS

ACCOMPANY REPORT DATED:

U.S. ARMY ENGINEER DISTRICT

CORPS OF ENGINEERS



Sepulveda Dam Reservoir Regulation Schedule  
(for rising and falling stages)

| Step<br>No | When reservoir<br>water surface is<br>between elevation | Gate setting for gates as indicated |                    |                    |                    | Computed<br>Discharge*   |
|------------|---------------------------------------------------------|-------------------------------------|--------------------|--------------------|--------------------|--------------------------|
|            |                                                         | No. 1                               | No. 2              | No. 3              | No. 4              |                          |
|            | Feet, NGVD                                              | Feet of<br>opening                  | Feet of<br>opening | Feet of<br>opening | Feet of<br>opening | Cubic feet<br>per second |
| 1....      | 668.0 & 710.2                                           | 9.0                                 | 9.0                | 9.0                | 9.0                | 0 to 16.780              |
| 2....      | 710.2 & 710.7                                           | 7.6                                 | 9.0                | 9.0                | 7.6                | 15.770 to 16.550         |
| 3....      | 710.7 & 711.3                                           | 7.6                                 | 7.6                | 7.6                | 7.6                | 15.530 to 16.830         |
| 4....      | 711.3 & 711.6                                           | 6.0                                 | 7.6                | 7.6                | 6.0                | 13,370 to 16.760         |
| 5....      | 711.6 & 712.0**                                         | 6.0                                 | 5.7                | 5.7                | 6.0                | 15.680 to 16.890         |
| 6....      | 712.0 & 712.2                                           | 0.0                                 | 4.5                | 4.5                | 0.0                | 13.420 to 16.620         |
| 7....      | Above 712.2                                             | 0.0                                 | 0.0                | 0.0                | 0.0                | 14.400+                  |

\*Includes discharge of ungated outlets. Crest gates in action above elevation 710.0 feet, NGVD (Vertical Datum).

\*\*At elevation 712.0 feet, NGVD, crest gates automatically begin to lower.

At elevation 712.2 feet, NGVD, crest gates are completely lowered.

DAM OPERATOR INSTRUCTIONS

1. Communication with the District Office is available.

- a. Notify the Reservoir Operations Center when a gate change will be required according to the schedule.
- b. Notify the Reservoir Operations Center if unable to set the gates as instructed.

2. Communication with the District Office is not available.

- a. Try to reestablish communications through the Los Angeles County Department of Public Works.

b. (i) Rising Stages. Allow a period of one half hour to pass to reestablish communication with District Office. If after one half hour communication is not reestablished follow the gate opening schedule.

(ii) Falling Stages. Maintain current downstream gage height until communication is reestablished.

c. If one of the gates cannot be operated, adjust the remaining gates gradually until the downstream gage height agrees with scheduled values. Keep a close check on gage height and change the gate openings as required. If the downstream gage height is not obtainable, adjust the gates that are functioning so that their openings are equal to the sum of the openings shown in the schedule.

|            |   |             |
|------------|---|-------------|
| Computed   | : | Downstream  |
| discharge* | : | gage height |

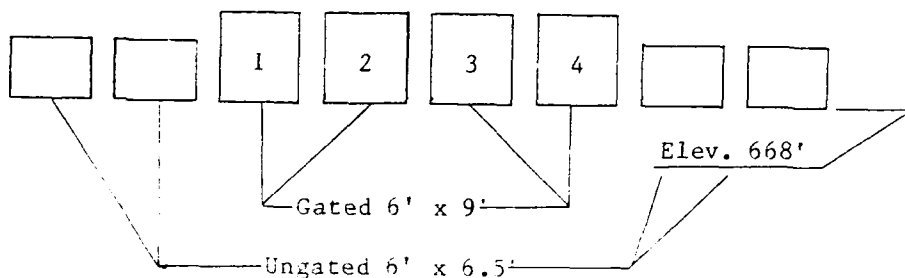
Cubic feet  
per second

Feet

|                 |   |               |
|-----------------|---|---------------|
| 0 to 16,780     | : | 0 - 13.61     |
| 5,770 to 16,550 | : | 13.14 - 13.48 |
| 5,530 to 16,830 | : | 13.04 - 13.66 |
| 5,370 to 16,760 | : | 13.18 - 13.60 |
| 5,680 to 16,890 | : | 13.09 - 13.67 |
| 3,420 to 16,620 | : | 11.95 - 13.52 |
| 4,400+          | : | 12.45         |

6.0 feet, NGVD (National Geodetic

OUTLETS  
(Looking Downstream)



according to the schedule.

ated.

nt of Public Works (WUK 4470).

communication with the  
the gate operation schedule.

ation is reestablished.

until the downstream gage  
the gate openings as often as  
functioning so that the gate

SEPULVEDA DAM  
LOS ANGELES RIVER  
CALIFORNIA

RESERVOIR REGULATION  
SCHEDULE

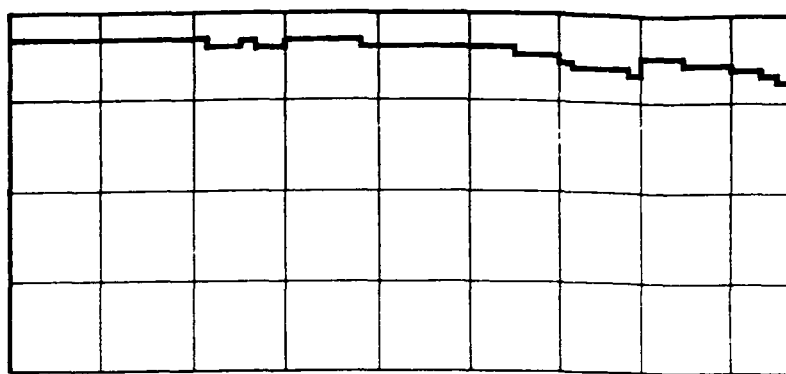
U. S. ARMY ENGINEER DISTRICT  
LOS ANGELES, CORPS OF ENGINEERS

PLATE 7-02

U.S. ARMY ENGINEER DISTRICT

HOURLY PRECIPITATION, INCHES

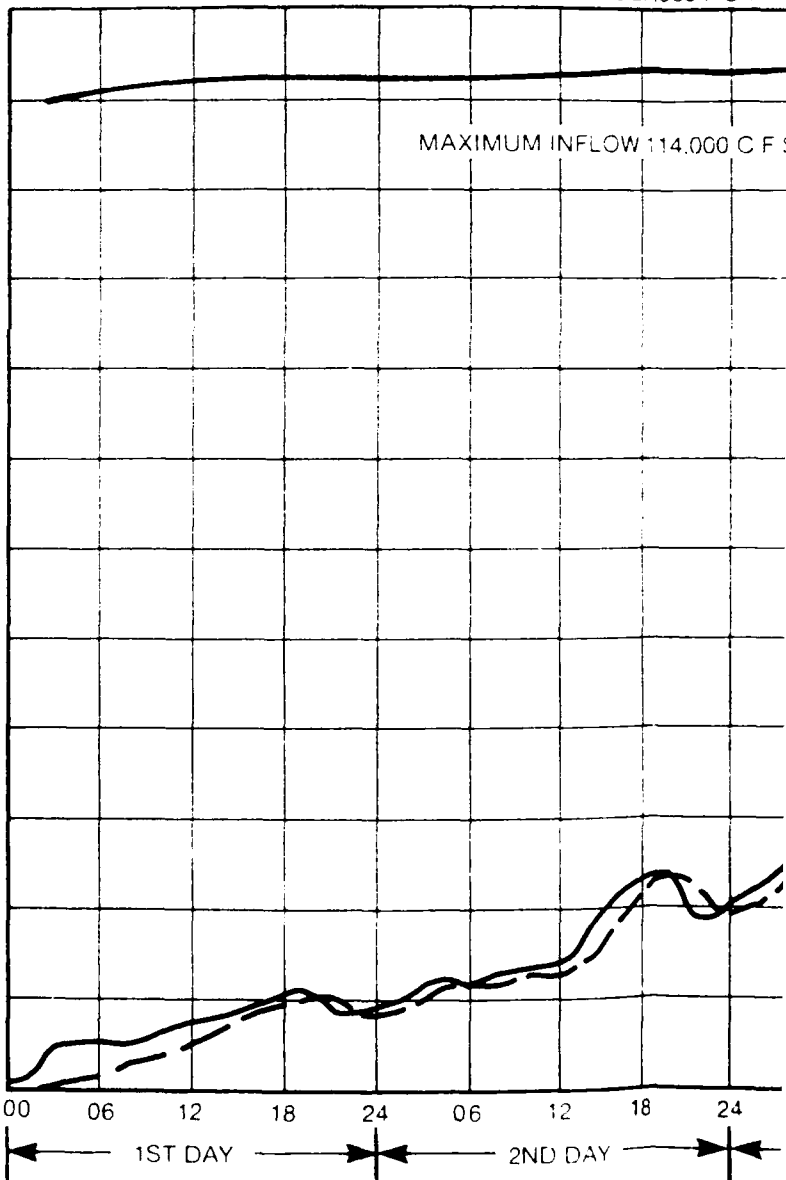
0  
0.5  
1.0  
1.5  
2.0



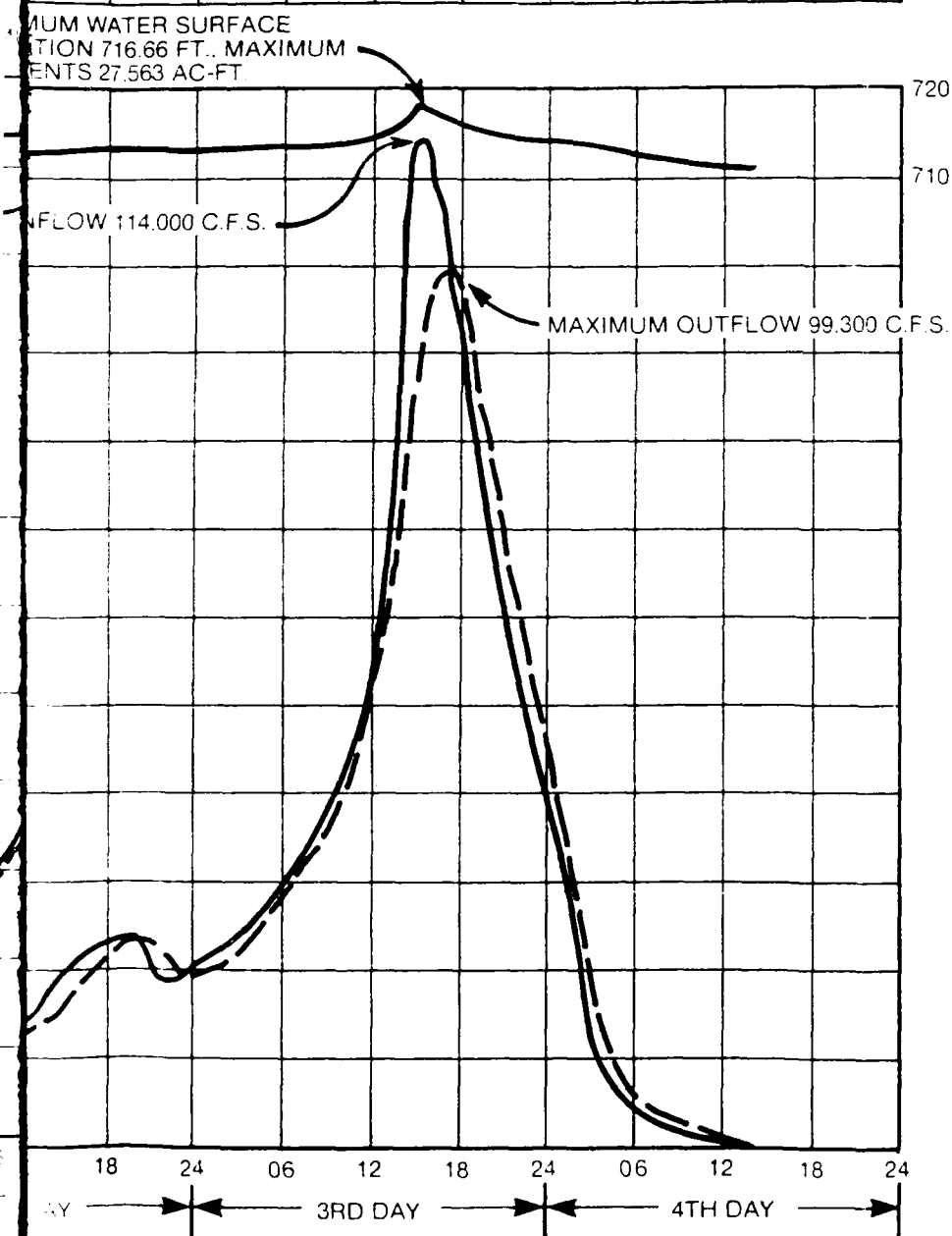
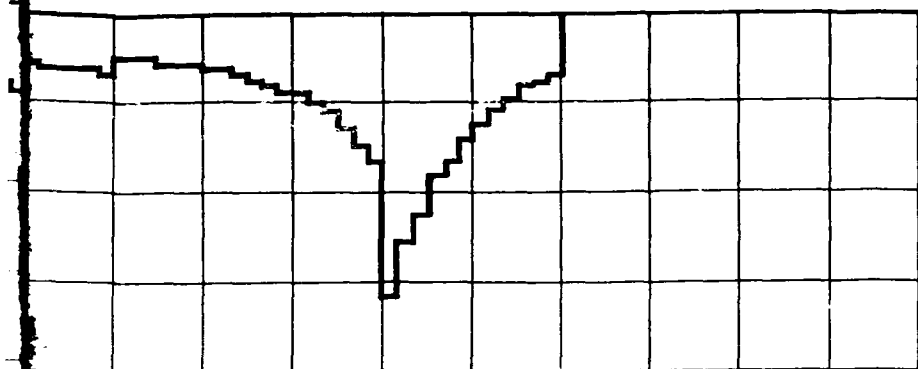
MAXIMUM WATER SURFACE  
ELEVATION 716.66 FT. M.A.S.L.  
CONTENTS 27,563 AC-FT.

DISCHARGE, THOUSANDS OF CFS

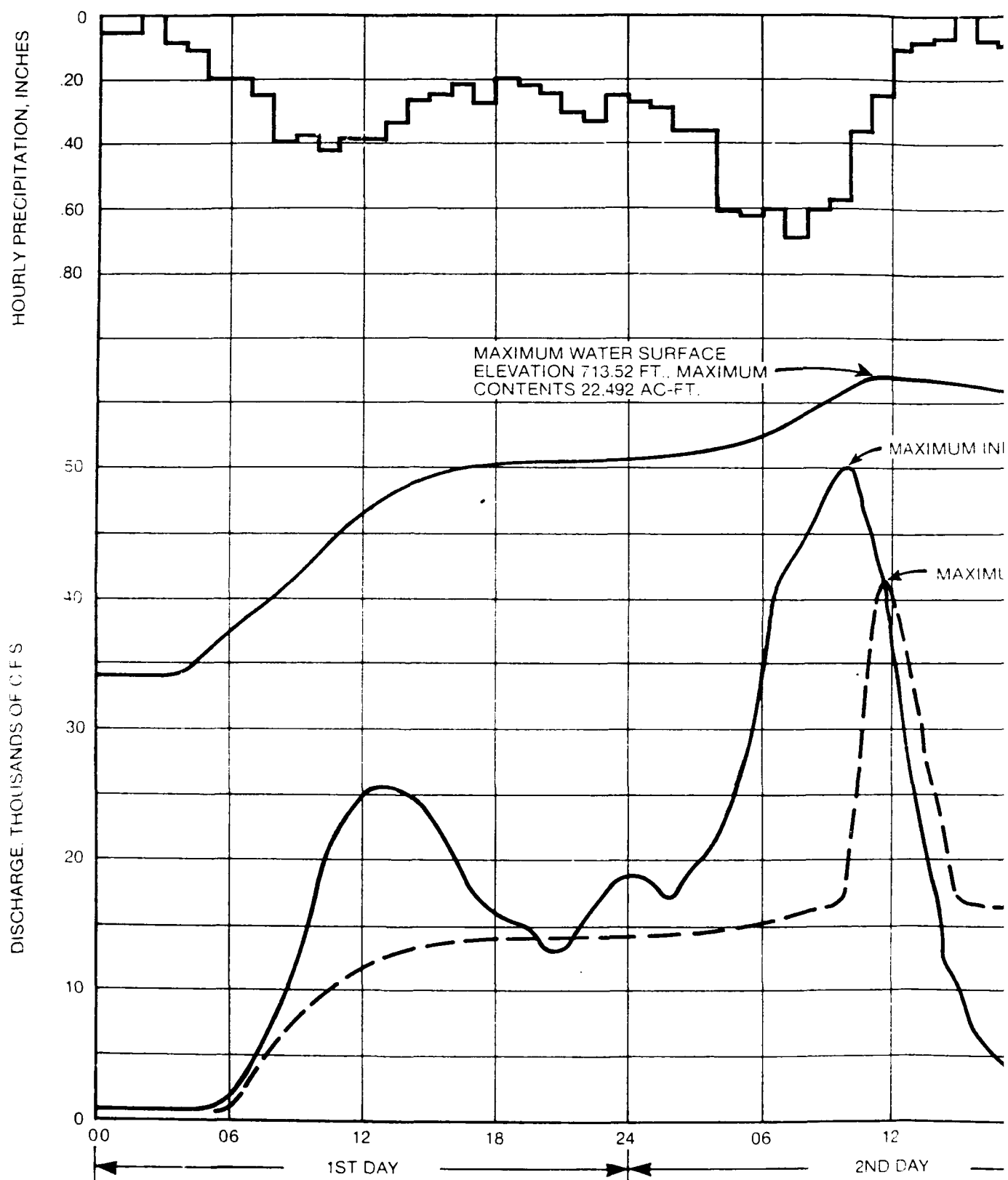
100  
30  
60  
40  
20  
0

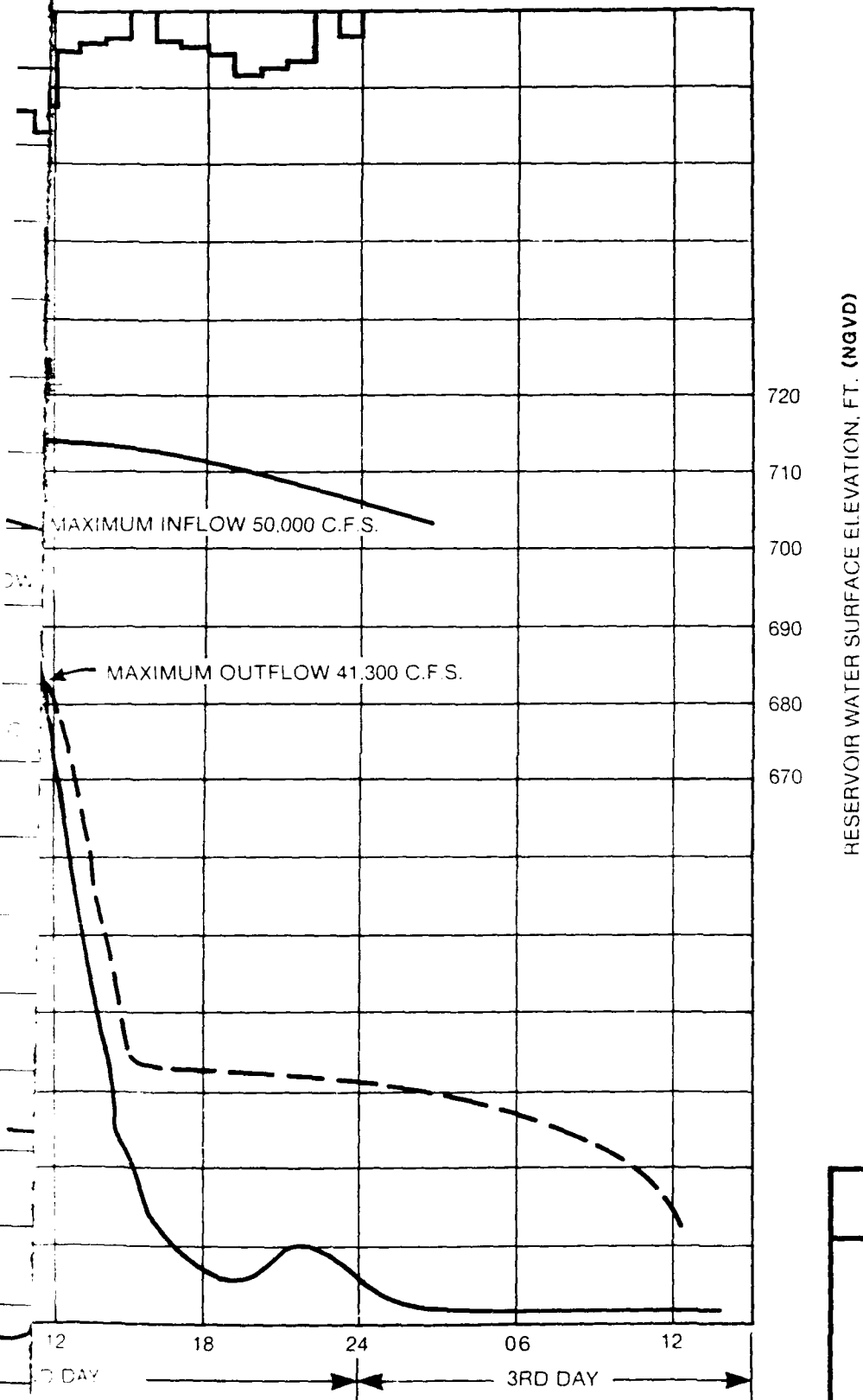


MAXIMUM INFLOW 114,000 CFS



|                                                      |
|------------------------------------------------------|
| SEPULVEDA DAM<br>LOS ANGELES RIVER<br>CALIFORNIA     |
| <b>PROBABLE MAXIMUM FLOOD<br/>ROUTING</b>            |
| U.S. ARMY CORPS OF ENGINEERS<br>LOS ANGELES DISTRICT |



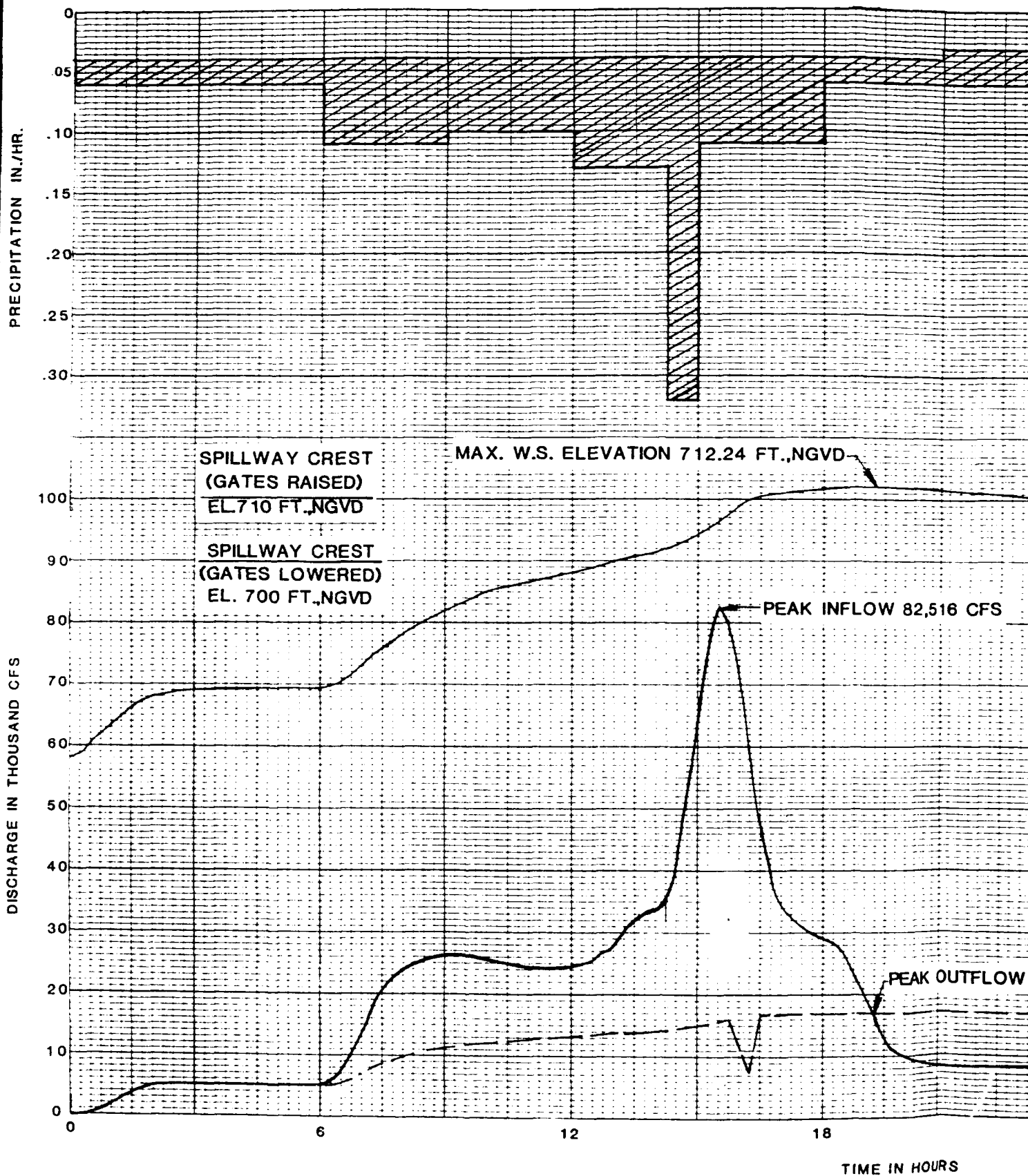


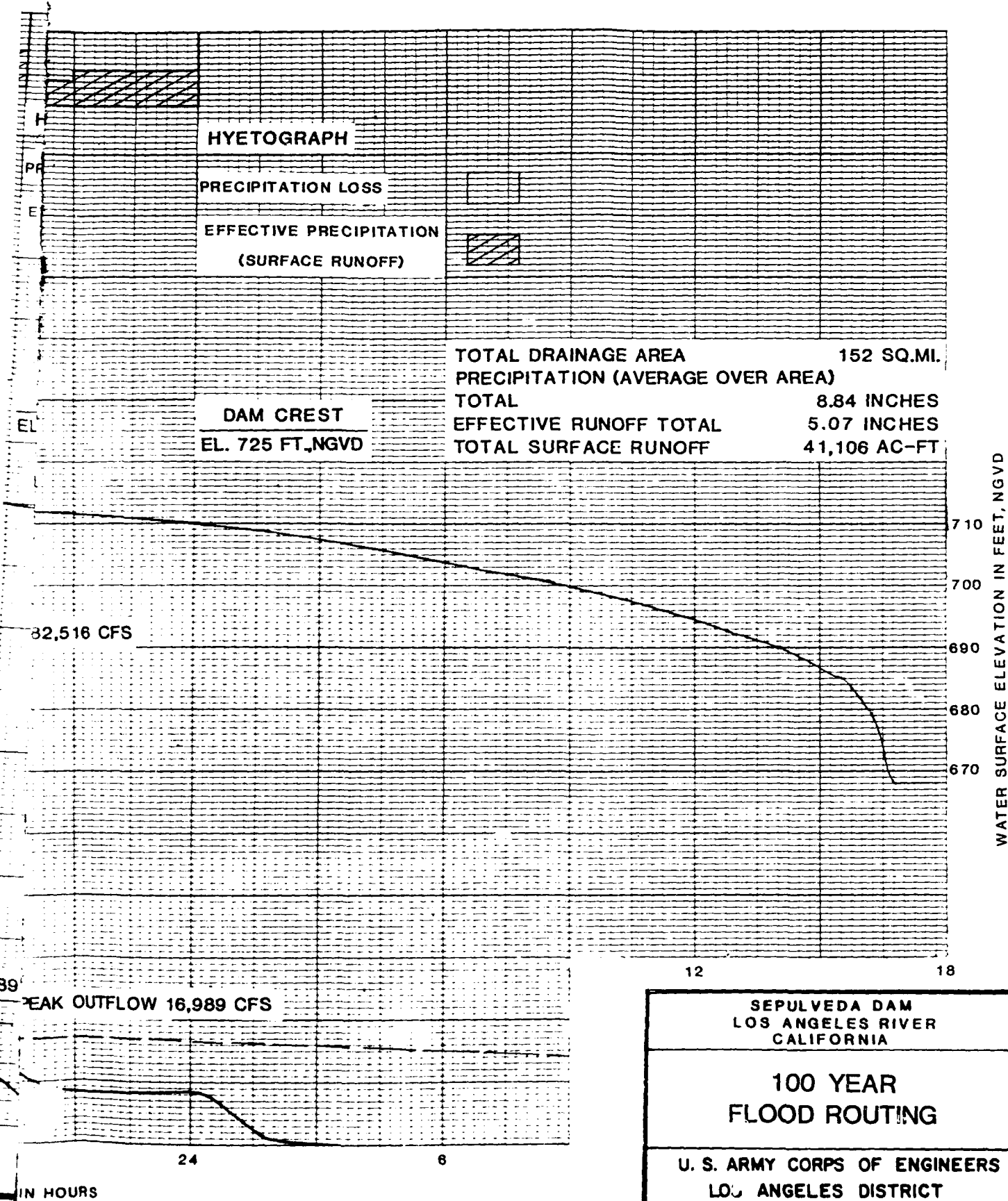
SEPULVEDA DAM  
LOS ANGELES RIVER  
CALIFORNIA

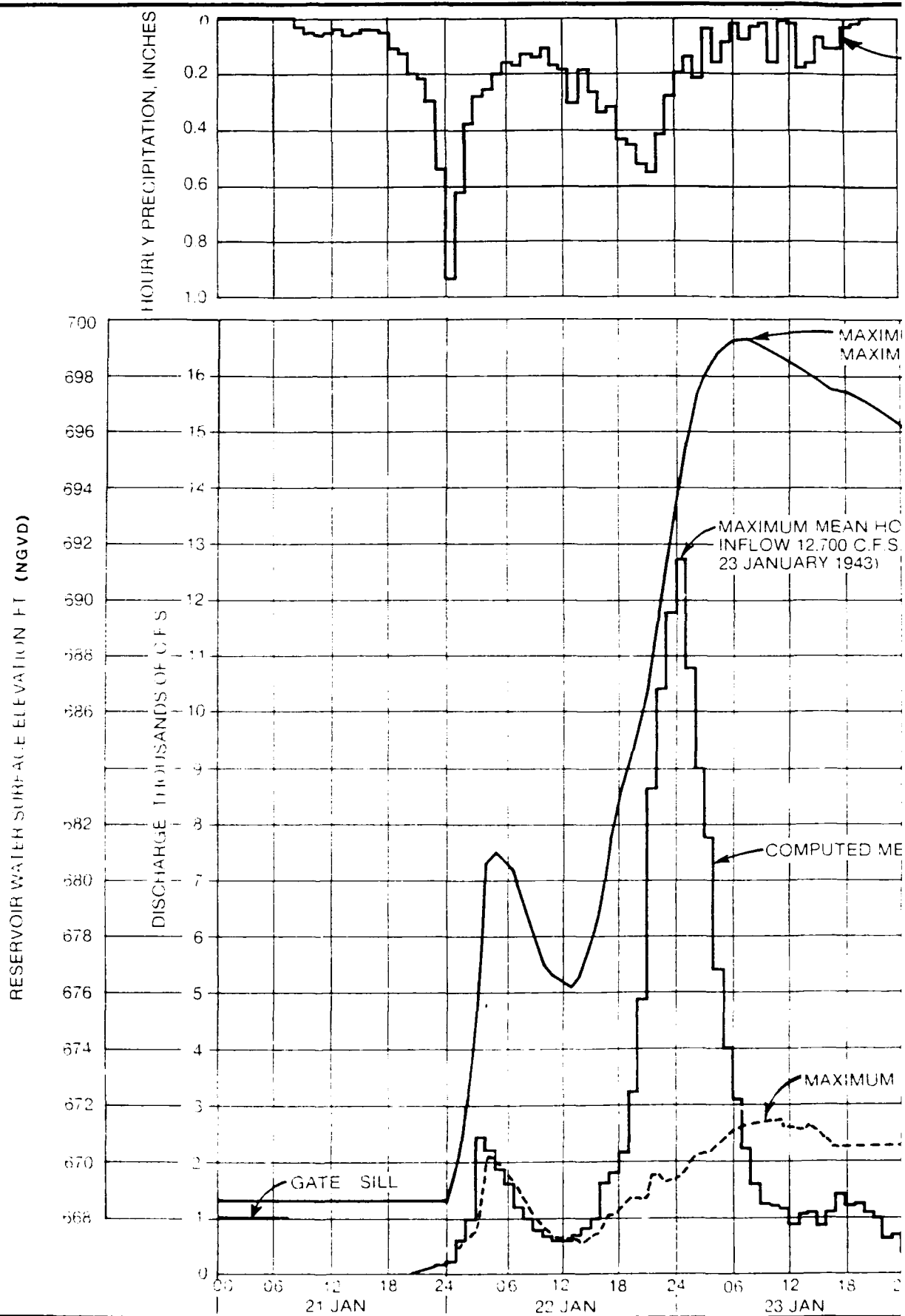
### STANDARD PROJECT FLOOD ROUTING

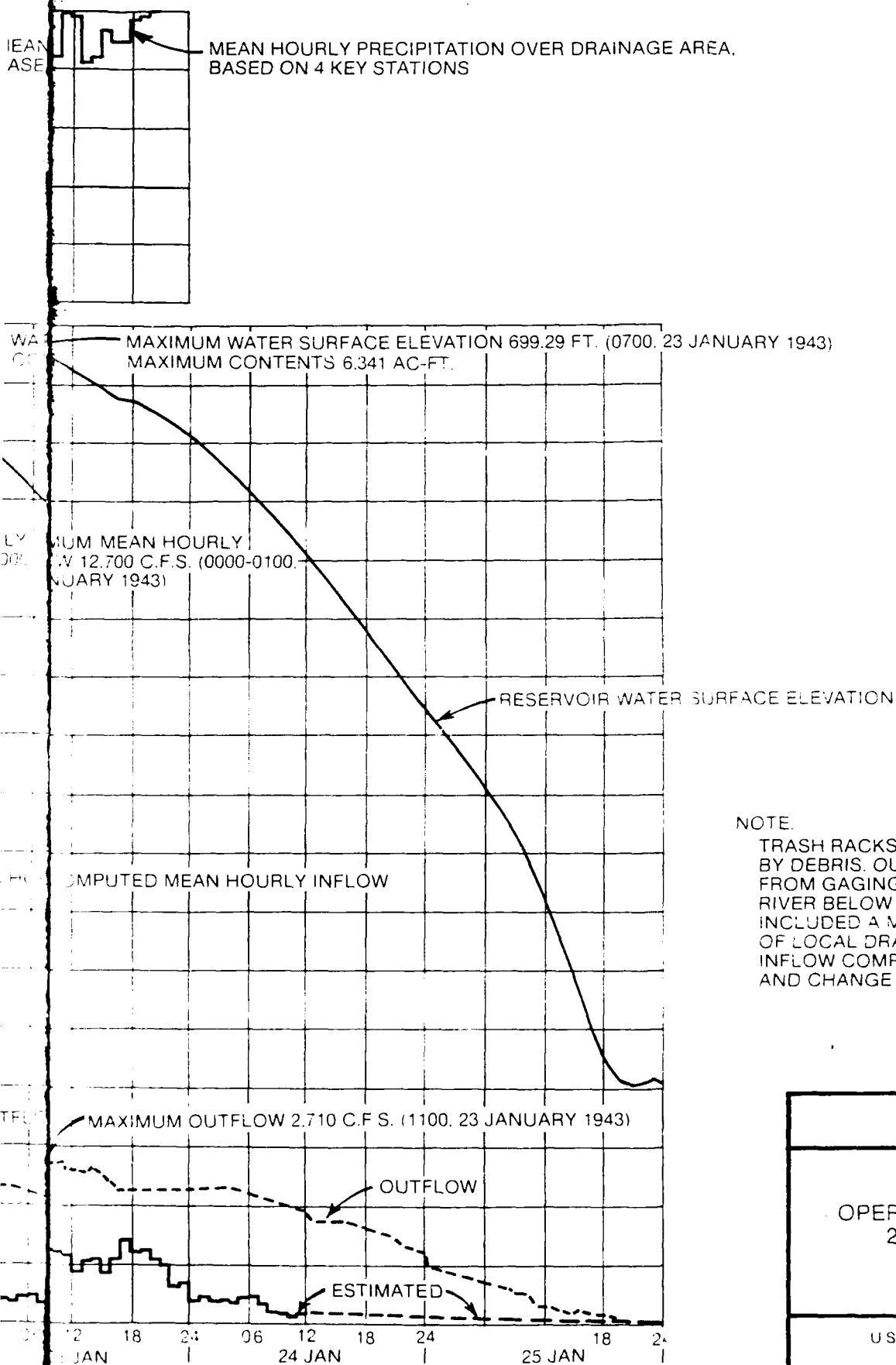
U.S. ARMY CORPS OF ENGINEERS  
LOS ANGELES DISTRICT











## NOTE.

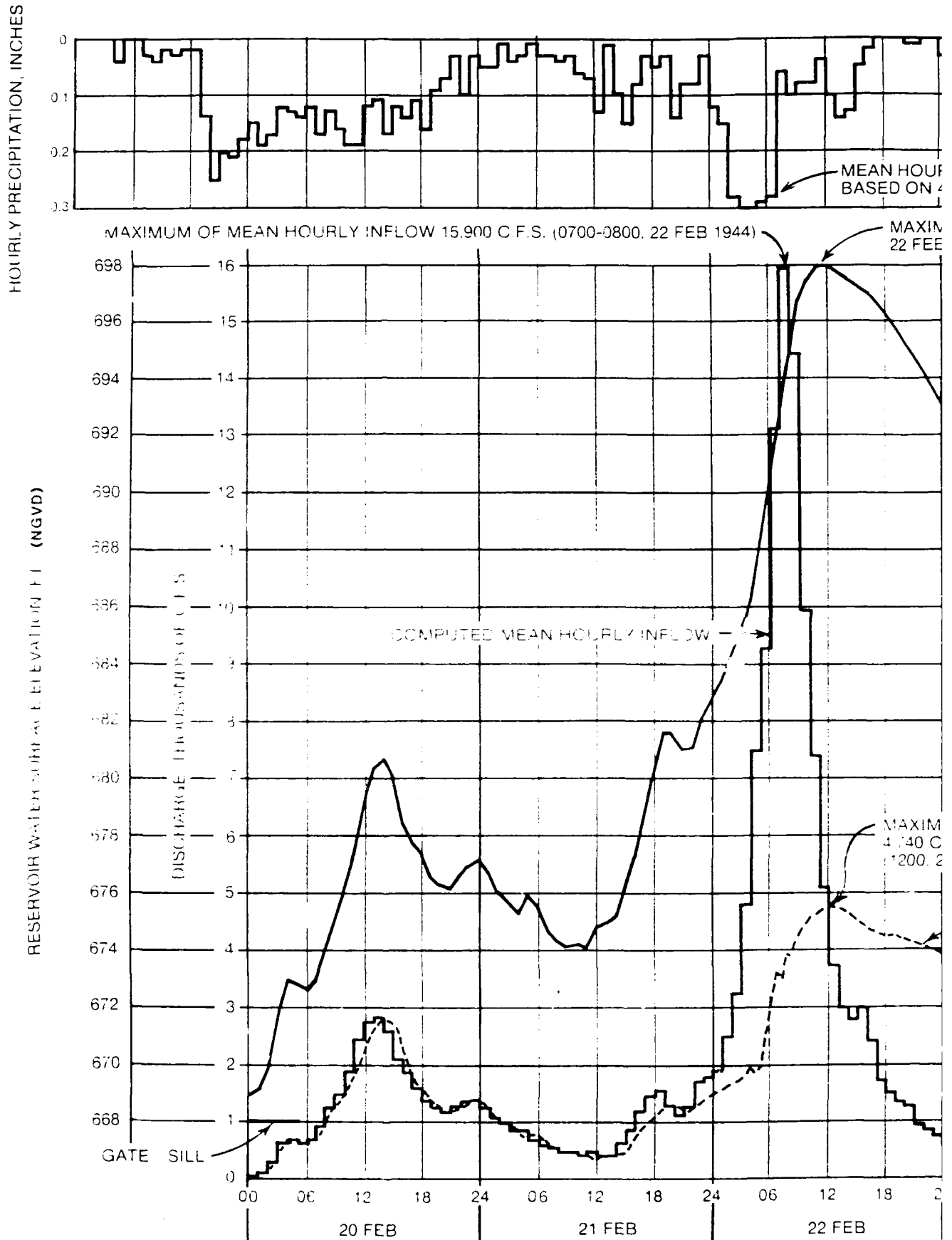
TRASH RACKS WERE PARTIALLY BLOCKED BY DEBRIS. OUTFLOW WAS DETERMINED FROM GAGING STATION ON LOS ANGELES RIVER BELOW SEPULVEDA BLVD WHICH INCLUDED A MAXIMUM OF SOME 100 C.F.S. OF LOCAL DRAINAGE BELOW THE DAM. INFLOW COMPUTED ON BASIS OF OUTFLOW AND CHANGE IN STORAGE.

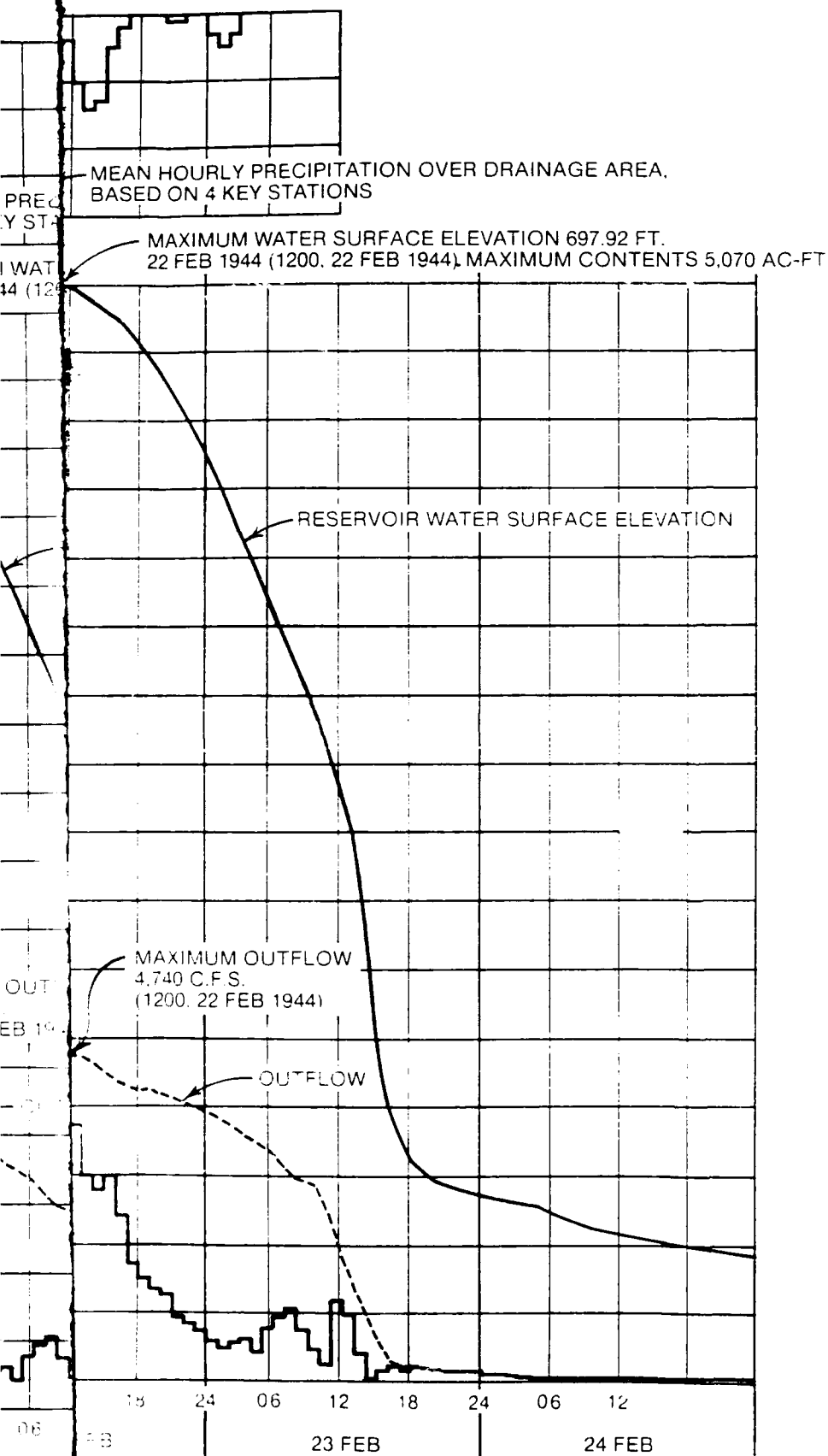
SEPULVEDA DAM  
LOS ANGELES RIVER  
CALIFORNIA

OPERATION HYDROGRAPHS  
21-25 JANUARY 1943

U.S. ARMY CORPS OF ENGINEERS  
LOS ANGELES DISTRICT

U.S. ARMY ENGINEER DISTRICT





## NOTES.

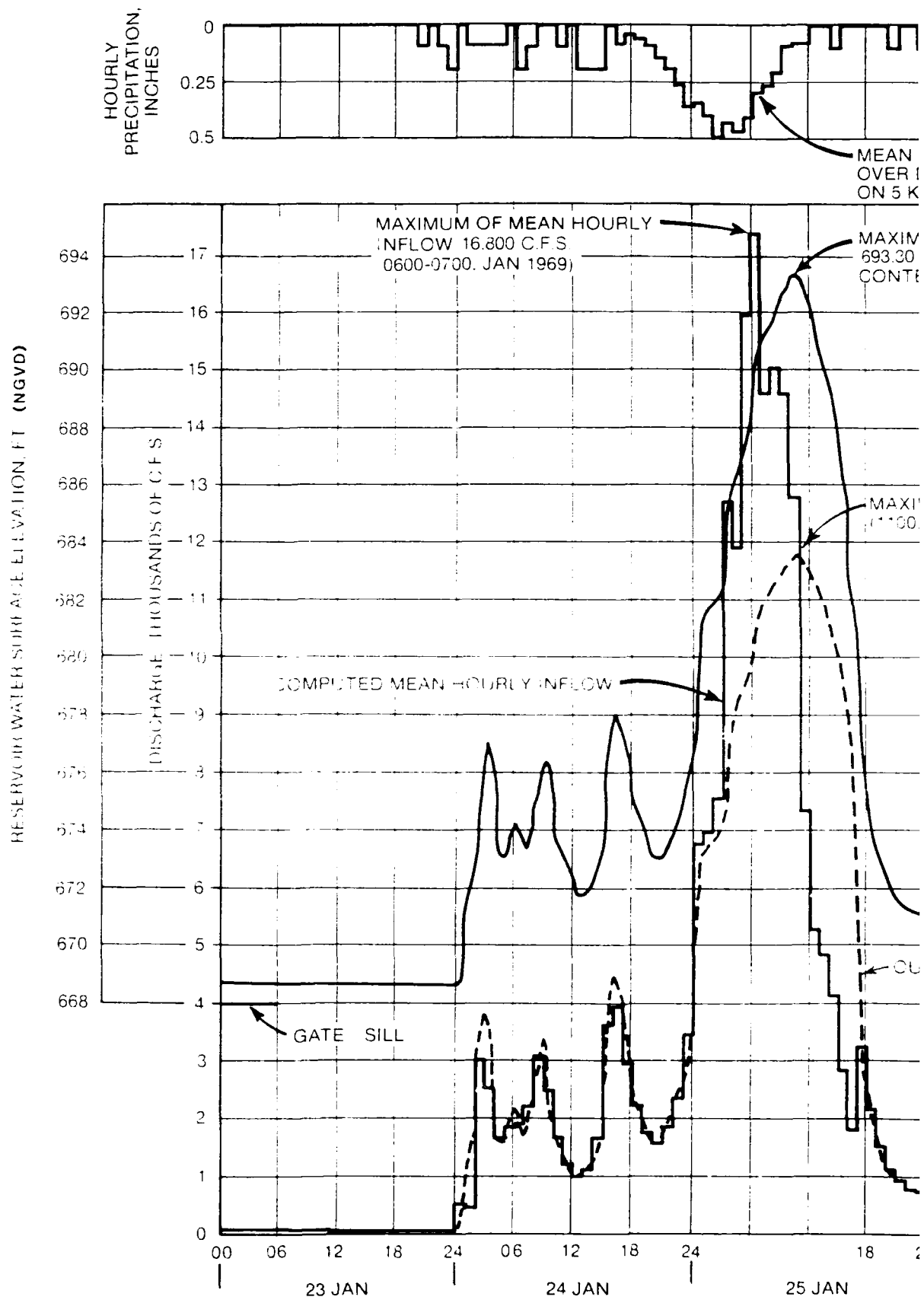
RAINFALL IN SOUTH PORTION OF DRAINAGE AREA OF CLOUDBURST INTENSITY PROBABLY CAUSED PEAK. OUTFLOW AFFECTED BY CLOGGING OF TRASH RACKS

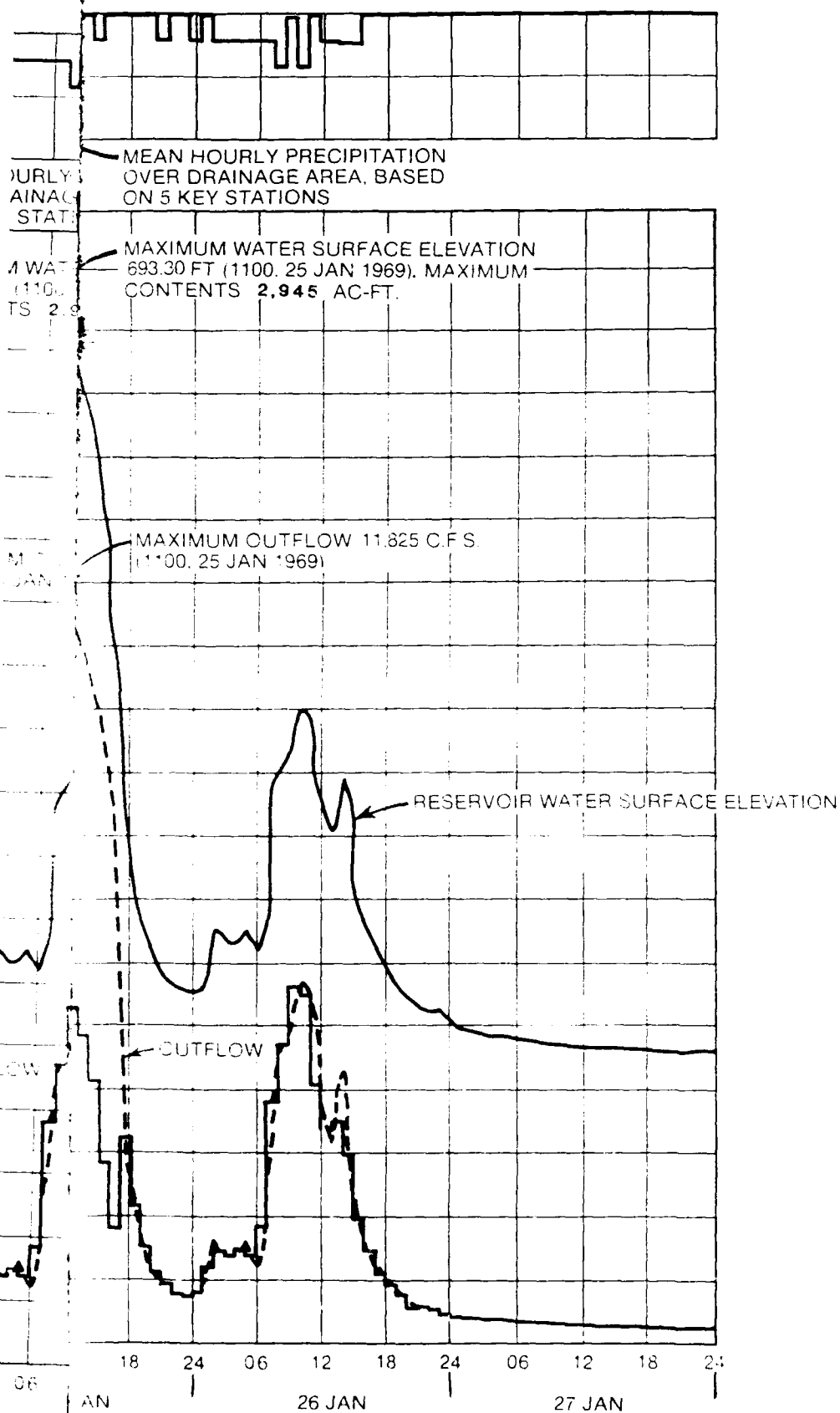
SEPULVEDA DAM  
LOS ANGELES RIVER  
CALIFORNIA

OPERATION HYDROGRAPHS  
20-24 FEBRUARY 1944

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SEPULVEDA DAM  
LOS ANGELES RIVER  
CALIFORNIA

OPERATION HYDROGRAPHS  
23-27 JANUARY 1969

U.S. ARMY CORPS OF ENGINEERS  
LOS ANGELES DISTRICT



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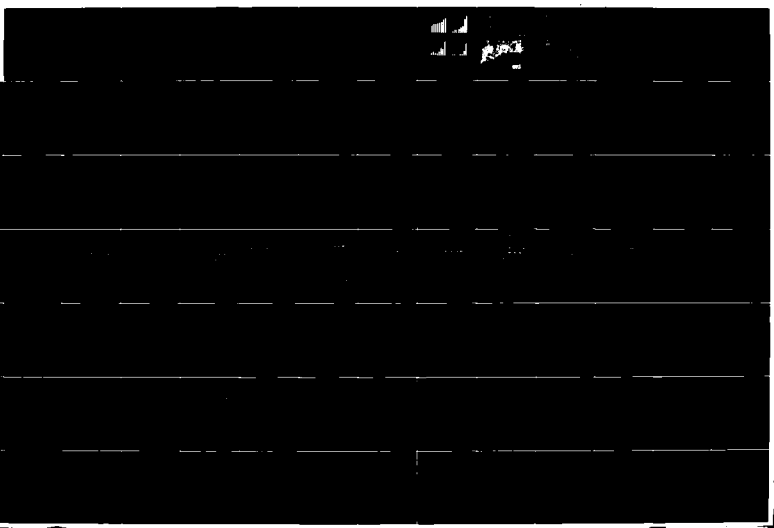
WATER CONTROL MANUAL: SEPULVEDA DAM AND RESERVOIR LOS  
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ANGELES CA MAY 89

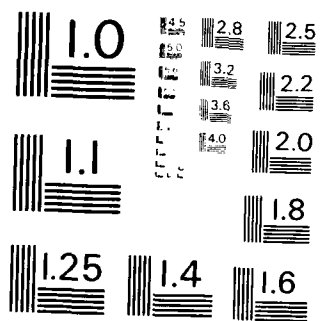
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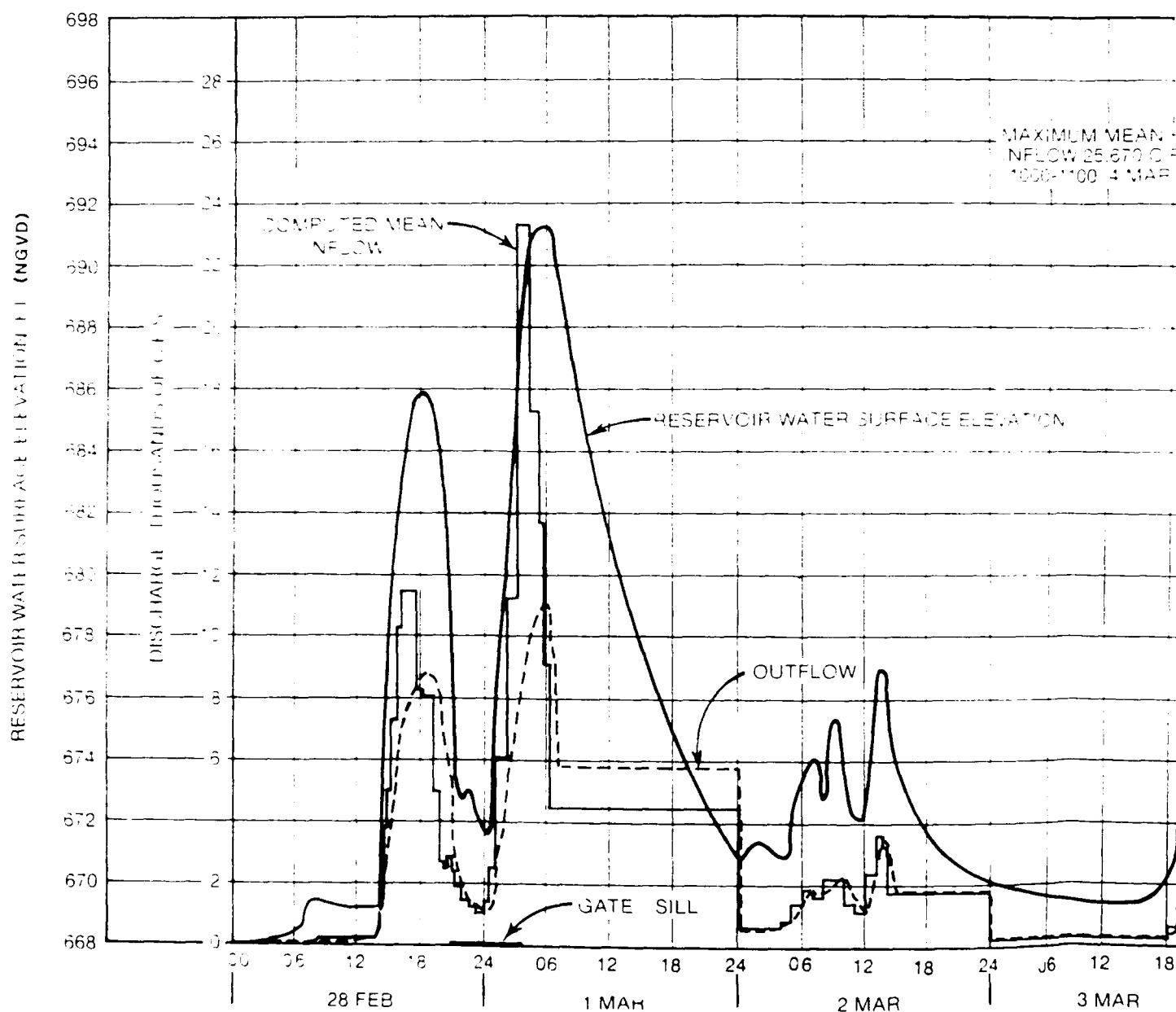
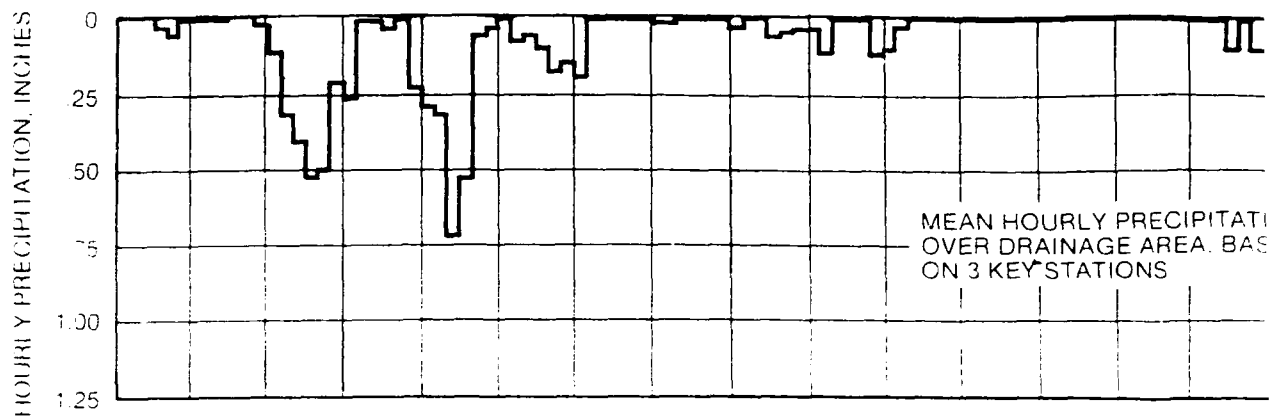
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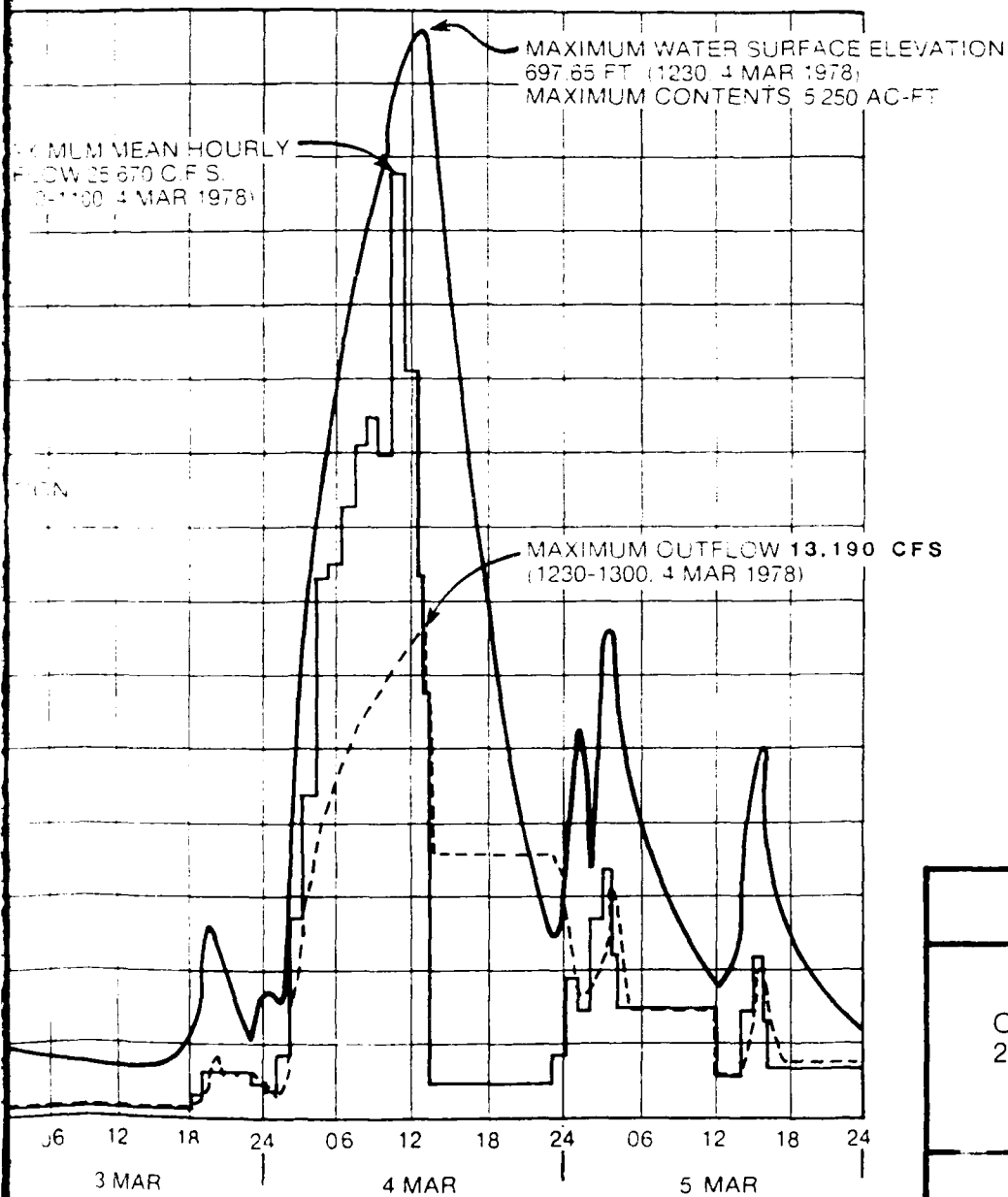
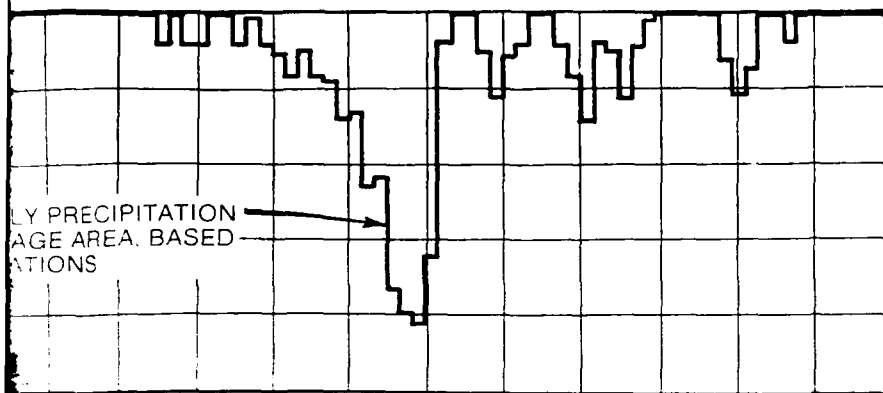
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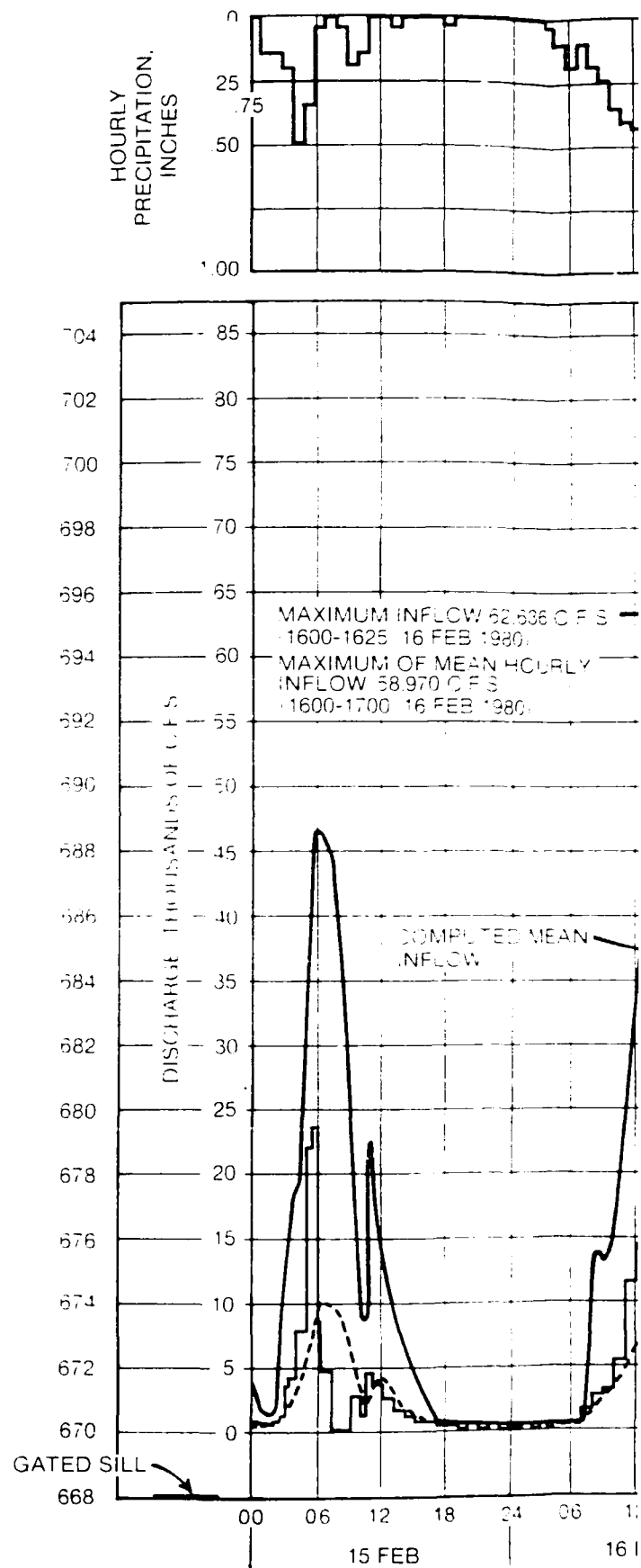


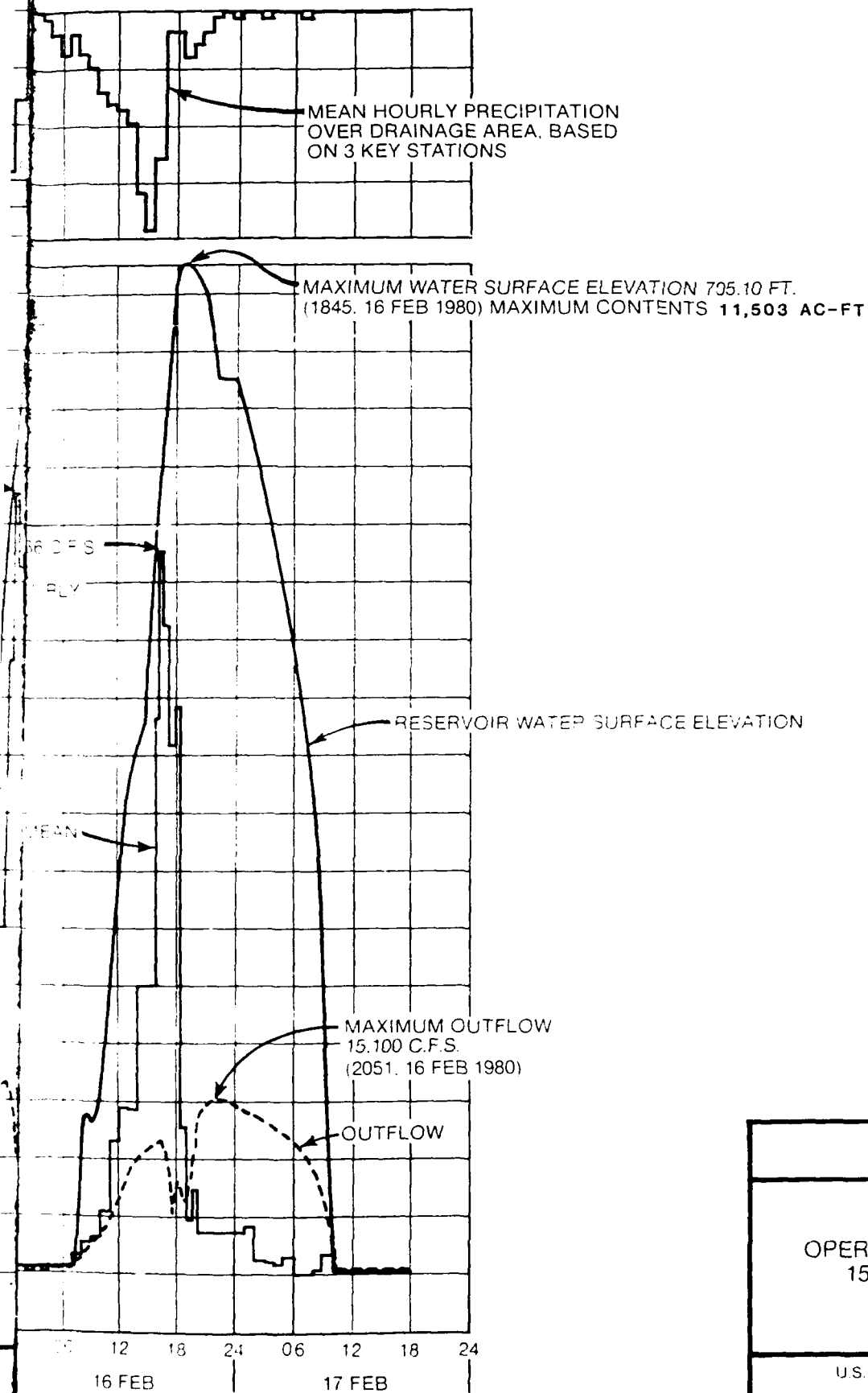
SEPULVEDA DAM  
LOS ANGELES RIVER  
CALIFORNIA

OPERATION HYDROGRAPHS  
28 FEBRUARY-5 MARCH 1978

U.S. ARMY CORPS OF ENGINEERS  
LOS ANGELES DISTRICT

RESERVOIR WATER SURFACE ELEVATION FT (NGVD)



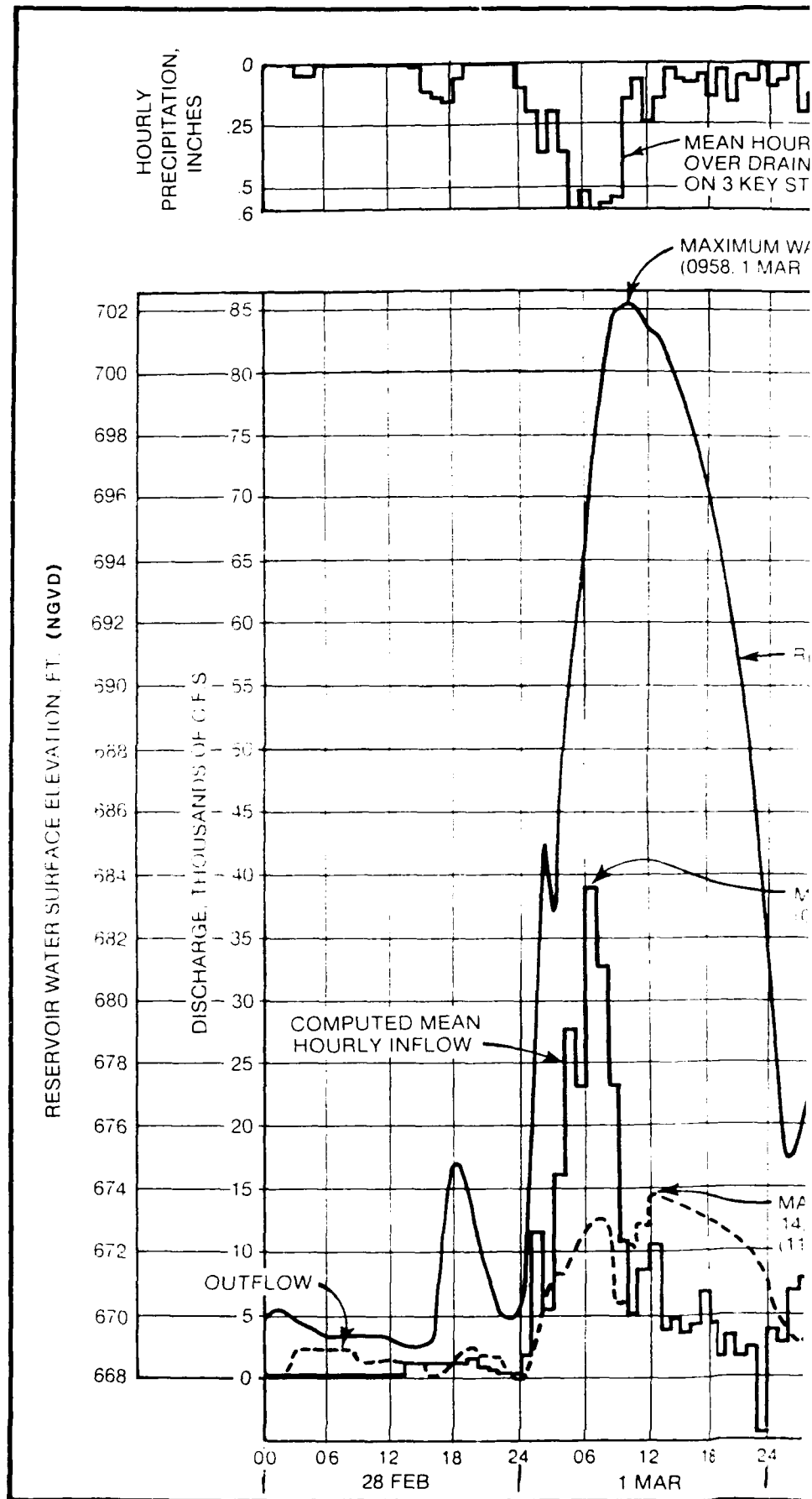


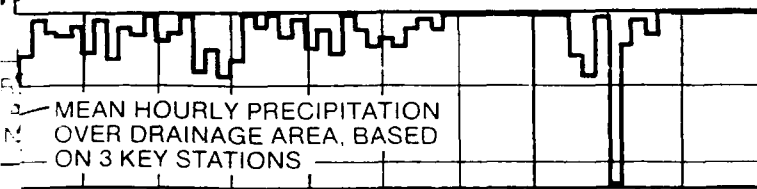
SEPULVEDA DAM  
LOS ANGELES RIVER  
CALIFORNIA

OPERATION HYDROGRAPHS  
15-17 FEBRUARY 1980

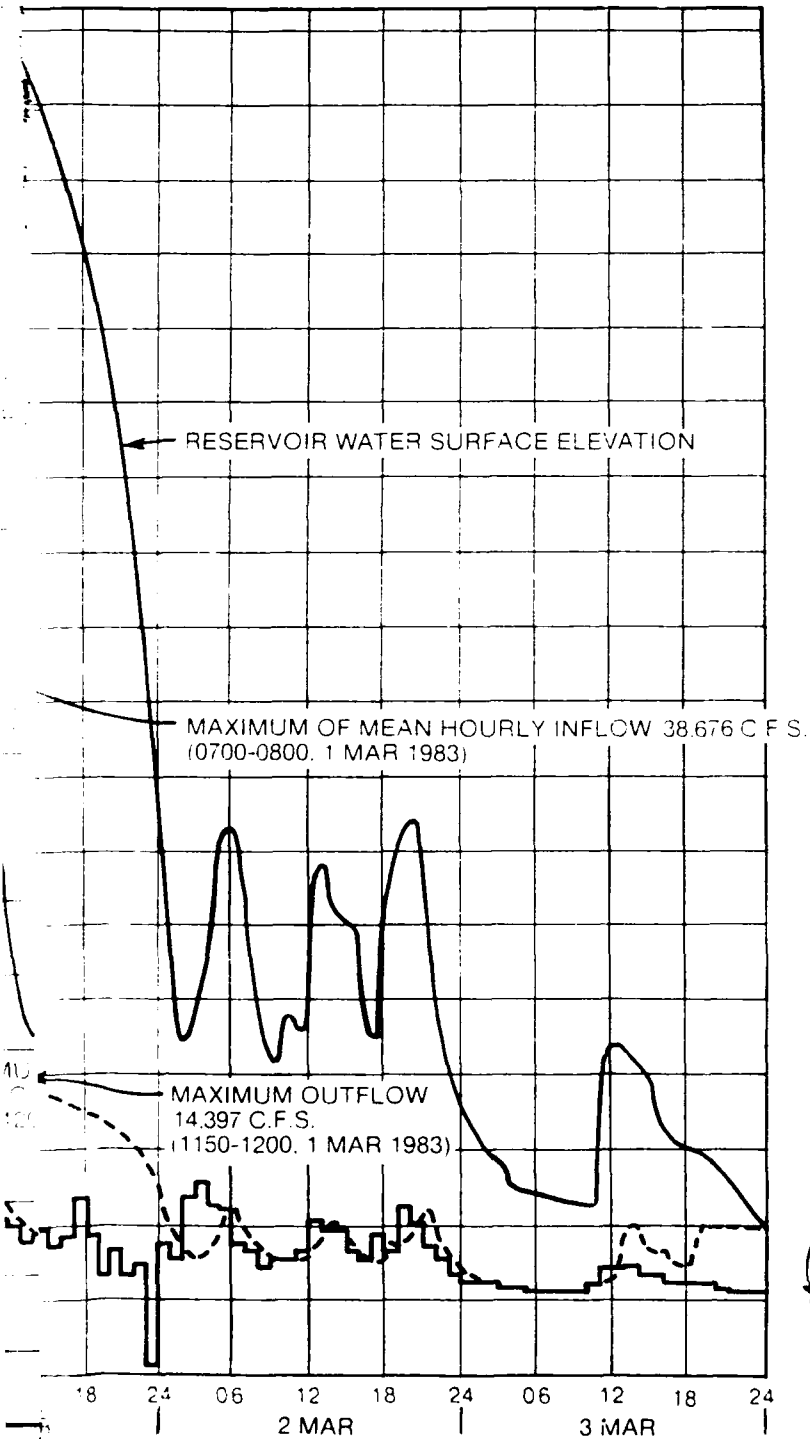
U.S. ARMY CORPS OF ENGINEERS  
LOS ANGELES DISTRICT

U.S. ARMY ENGINEER DISTRICT





MAXIMUM WATER SURFACE ELEVATION 702.53 FT.  
(0958, 1 MAR 1983) MAXIMUM CONTENTS 8,950 AC-FT.

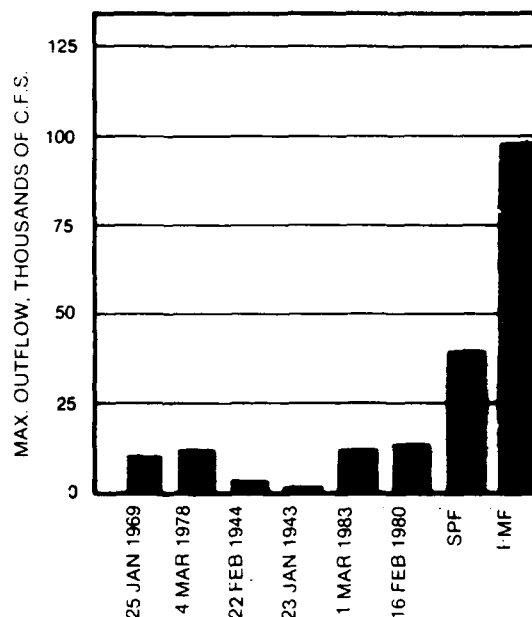
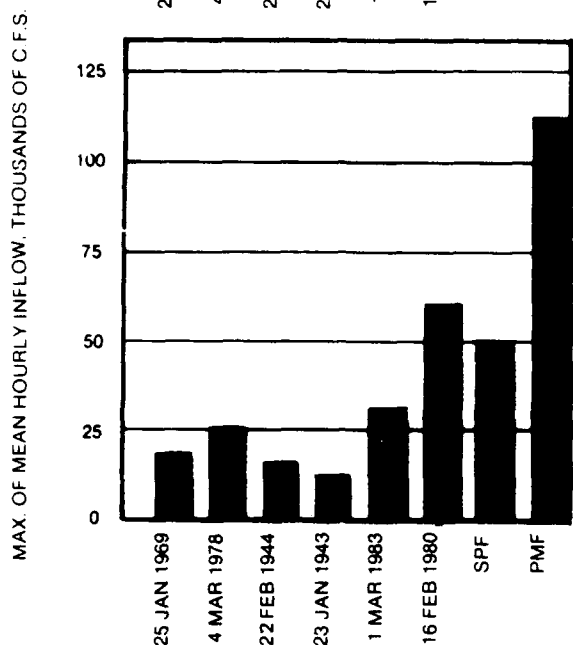
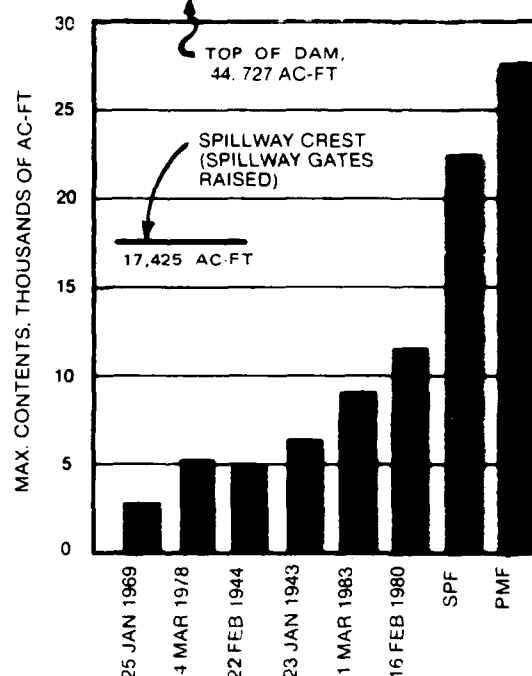
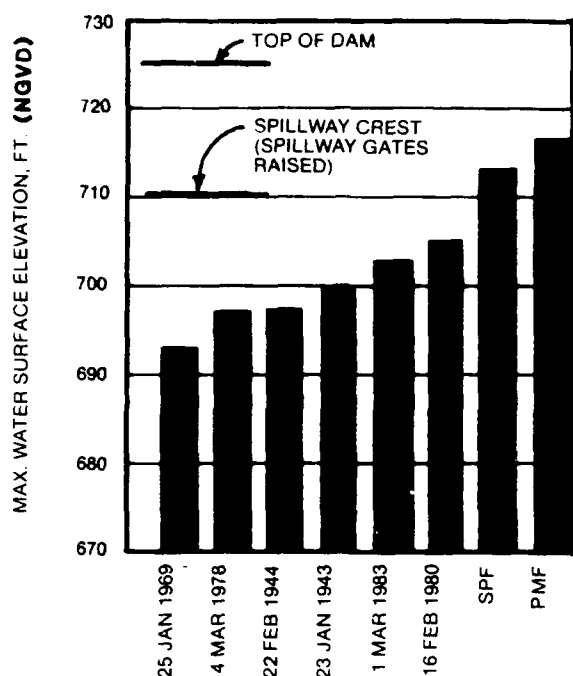


SEPULVEDA DAM  
LOS ANGELES RIVER  
CALIFORNIA

OPERATION HYDROGRAPHS  
28 FEBRUARY - 3 MAR 1983

U.S. ARMY CORPS OF ENGINEERS  
LOS ANGELES DISTRICT





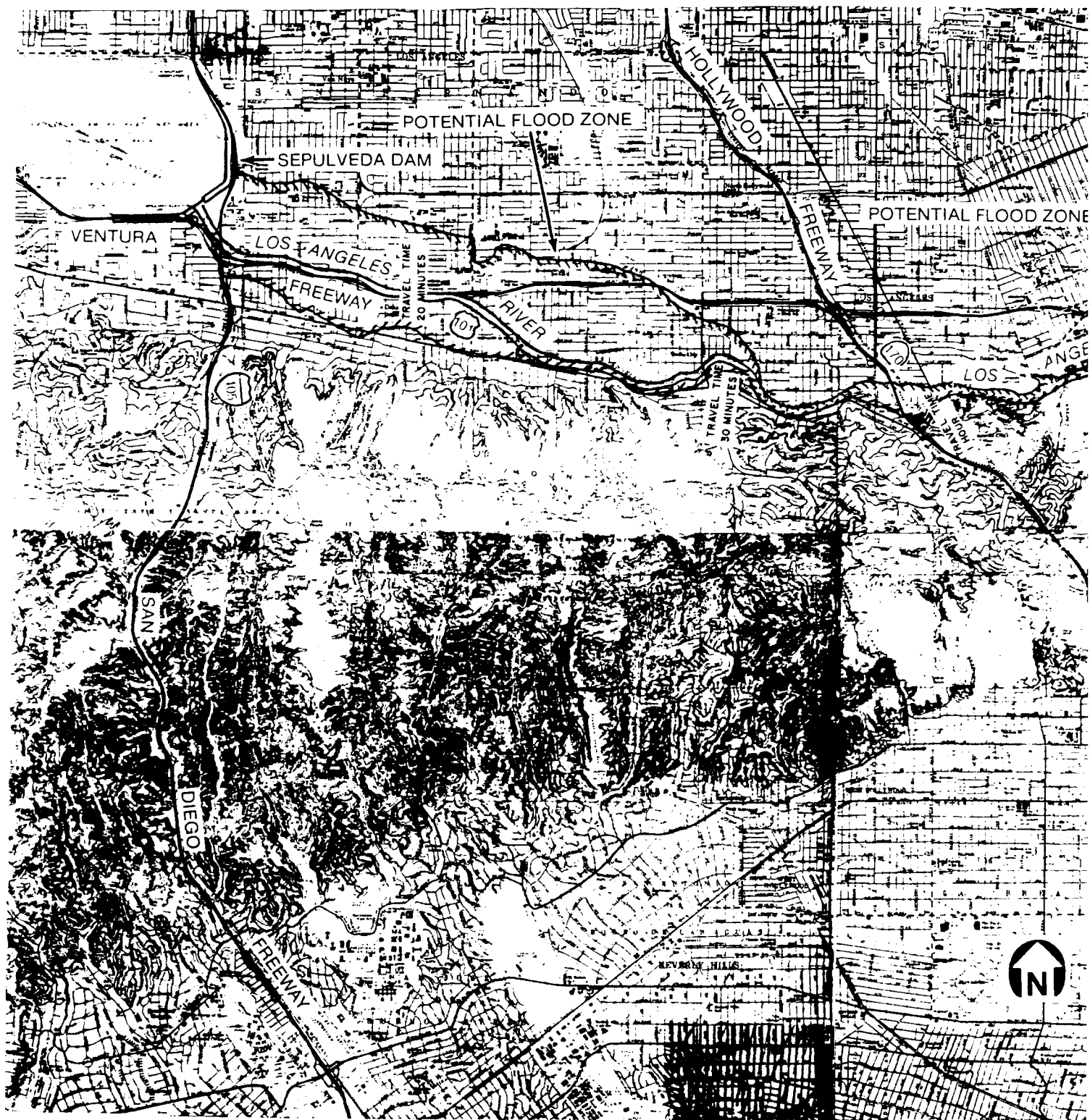
SPF = STANDARD PROJECT FLOOD  
PMF = PROBABLE MAXIMUM FLOOD

A listing of each of the values depicted here can be found in Table 8-01 and on Plates 8-01 through 8-08.

SEPULVEDA DAM  
LOS ANGELES RIVER  
CALIFORNIA

### COMPARISON OF HISTORICAL FLOODS AND DESIGN FLOODS

U.S. ARMY CORPS OF ENGINEERS  
LOS ANGELES DISTRICT



SCALE 0 1 2 3 4

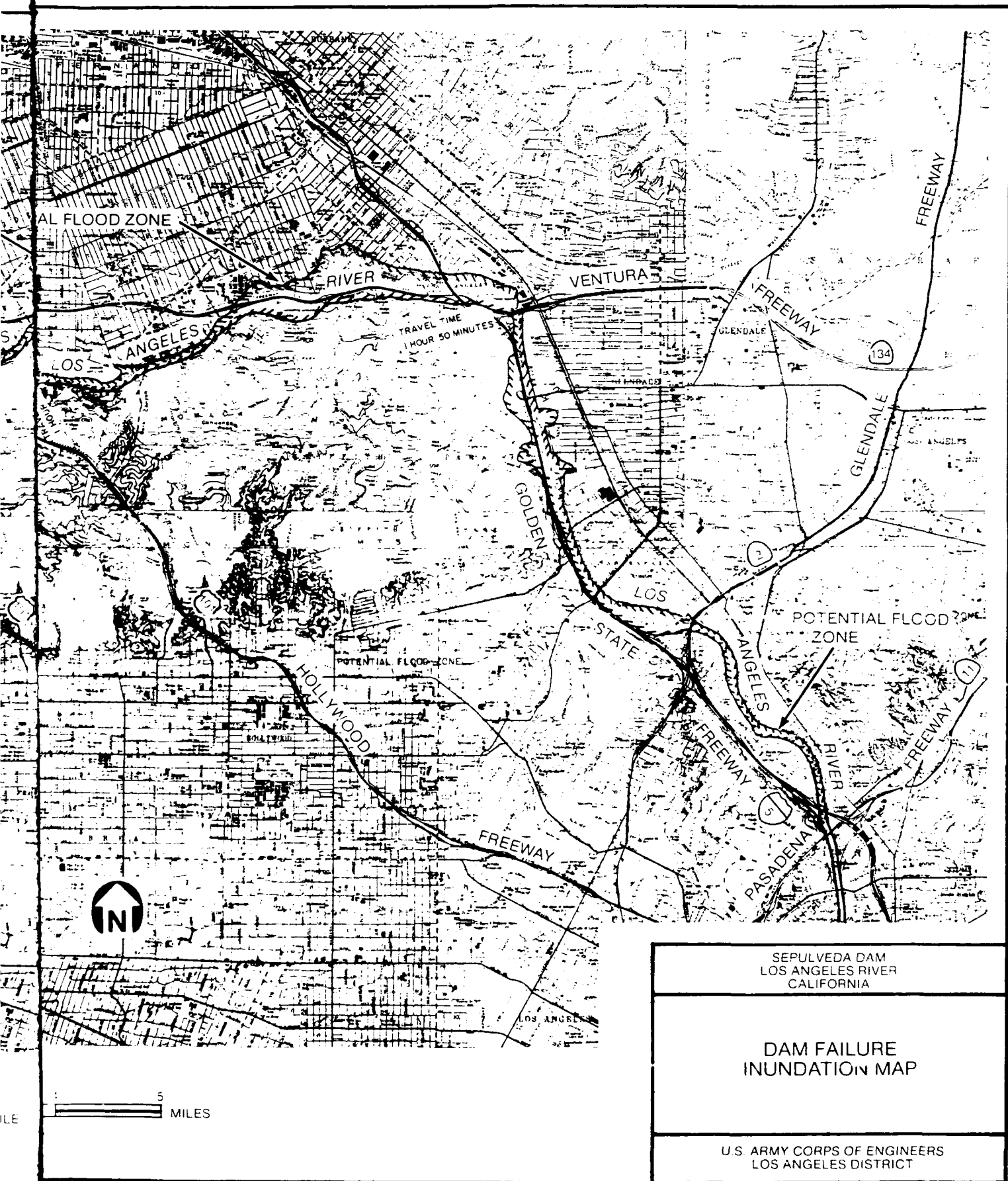


EXHIBIT A

STANDING OPERATING  
INSTRUCTIONS TO DAM TENDER

**STANDING OPERATING INSTRUCTIONS TO DAM TENDER**

EXHIBIT A

to the

WATER CONTROL MANUAL

for

**SEPULVEDA DAM AND RESERVOIR,  
LOS ANGELES RIVER**

Los Angeles District  
U.S. Army Corps of Engineers

September 1988

TABLE OF CONTENTS

| <u>Paragraph</u> |                                                   | <u>Page</u> |
|------------------|---------------------------------------------------|-------------|
| 1                | General                                           | A-1         |
| 2                | Reservoir Operation Requirements                  | A-1         |
| 3                | Operational Responsibilities                      | A-1         |
| 4                | Gate/Valve Operation                              | A-3         |
| 5                | Normal Operation Procedures                       | A-4         |
| 6                | Limitations on Storage                            | A-5         |
| 7                | Limitations on Release                            | A-5         |
| 8                | Standing Instructions During Communication Outage | A-5         |
| 9                | Emergency Deviation From Normal Regulation        | A-5         |
| 10               | Emergency Notifications                           | A-6         |
| 11               | Measurement of Hydrologic Data                    | A-6         |
| 12               | Reports                                           | A-7         |

Sepulveda Dam Reservoir Regulation Schedule  
(for rising and falling stages)

| Step<br>No | When reservoir<br>water surface is<br>between elevation | Gate setting for gates as indicated |                    |                    |                    | Comput<br>dischar  |
|------------|---------------------------------------------------------|-------------------------------------|--------------------|--------------------|--------------------|--------------------|
|            |                                                         | No. 1                               | No. 2              | No. 3              | No. 4              |                    |
|            | Feet, NGVD                                              | Feet of<br>opening                  | Feet of<br>opening | Feet of<br>opening | Feet of<br>opening | Cubic f<br>per sec |
| 1....      | 668.0 & 710.2                                           | 9.0                                 | 9.0                | 9.0                | 9.0                | 0 to               |
| 2....      | 710.2 & 710.7                                           | 7.6                                 | 9.0                | 9.0                | 7.6                | 15,770 to          |
| 3....      | 710.7 & 711.3                                           | 7.6                                 | 7.6                | 7.6                | 7.6                | 15,530 to          |
| 4....      | 711.3 & 711.6                                           | 6.0                                 | 7.6                | 7.6                | 6.0                | 15,870 to          |
| 5....      | 711.6 & 712.0**                                         | 6.0                                 | 5.7                | 5.7                | 6.0                | 15,680 to          |
| 6....      | 712.0 & 712.2                                           | 0.0                                 | 4.5                | 4.5                | 0.0                | 13,420 to          |
| 7....      | Above 712.2                                             | 0.0                                 | 0.0                | 0.0                | 0.0                | 14,400+            |

\*Includes discharge of ungated outlets. Crest gates in action above elevation 710.0 feet, Vertical Datum).

\*\*At elevation 712.0 feet, NGVD, crest gates automatically begin to lower.  
At elevation 715.0 feet, NGVD, crest gates are completely lowered.

DAM OPERATOR INSTRUCTIONS

1. Communication with the District Office is available.

- a. Notify the Reservoir Operations Center when a gate change will be required according to the schedule.
- b. Notify the Reservoir Operations Center if unable to get the gates as instructed.

2. Communication with the District Office is not available.

- a. Try to reestablish communications through the Los Angeles County Department of Public Works.
- b. (i) Rising Stages. Allow a period of one half hour to pass to reestablish communication with the District Office. If after one half hour communication is not reestablished follow the gate schedule.
- (ii) Falling Stages. Maintain current downstream gage height until communication is reestablished.
- c. If one of the gates cannot be operated, adjust the remaining gates gradually until the downstream gage height agrees with scheduled values. Keep a close check on gage height and change the gate openings as required. If the downstream gage height is not obtainable, adjust the gates that are functioning so that the sum of the gate openings is equal to the sum of the openings shown in the schedule.

| Computed<br>discharge* | : | Downstream<br>gage height |
|------------------------|---|---------------------------|
|                        | : |                           |
| <u>Cubic feet</u>      | : | <u>Feet</u>               |
| <u>per second</u>      | : |                           |
|                        | : |                           |
| 0 to 16,780            | : | 0 - 13.61                 |
| 70 to 16,550           | : | 13.14 - 13.48             |
|                        | : |                           |
| 30 to 16,830           | : | 13.04 - 13.66             |
| 70 to 16,760           | : | 13.18 - 13.60             |
|                        | : |                           |
| 80 to 16,890           | : | 13.09 - 13.67             |
| 20 to 16,620           | : | 11.95 - 13.52             |
|                        | : |                           |
| 00+                    | : | 12.45                     |
|                        | : |                           |

0 feet, NGVD (National Geodetic

according to the schedule.

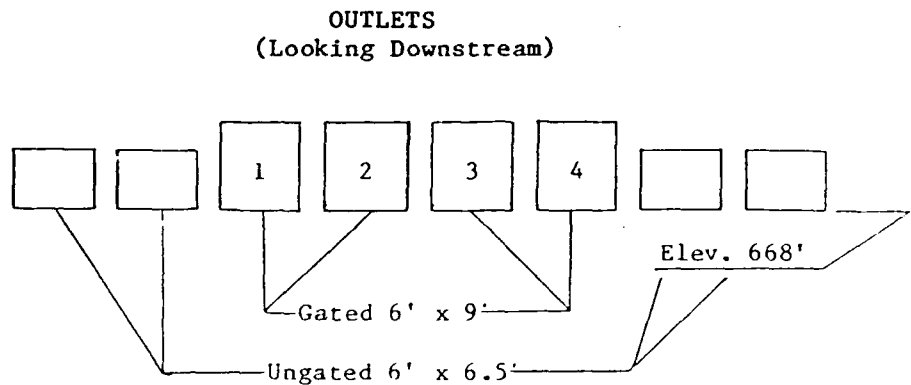
ted.

of Public Works (WUK 4470).

ommunication with the  
the gate operation schedule.

ation is reestablished.

until the downstream gage  
the gate openings as often as  
functioning so that the gate



## 1. GENERAL

a. This exhibit is prepared in accordance with instructions contained in EM 1110-2-3600, paragraph 9-02, (Standing Instructions to Project Operators for Water Control), and ETL 1110-2-251 and pertains to duties and responsibilities of the dam tender in connection with the operation of Sepulveda Dam and the reporting of required hydrologic data.

b. Operational instructions to the dam tender are outlined with specific emphasis on flood emergencies when communication facilities between the dam tender and the Reservoir Operation Center (ROC) have been disrupted. This exhibit is designed to be used in conjunction with the rest of the water control manual. Plates and tables referred to in this exhibit that are used in the main body of the water control manual are not duplicated. The only exception to this is the reservoir regulation schedule, which is duplicated in this exhibit. Other plates or tables such as chain of command for reservoir operations decisions, etc., that are in the main body of the manual are referenced in this exhibit as necessary. This avoids duplication of work and the possibility of two versions of one table in the same water control manual.

c. The dam tender is required to have available at the dam other pertinent books that complement these standing instructions. These books are the current year's Orange Book - "Instructions for Reservoir Operations Center Personnel," the "Sepulveda Dam Flood Emergency Plan" and the "Operation and Maintenance Manual for Sepulveda Dam."

## 2. RESERVOIR OPERATIONAL REQUIREMENTS

Sepulveda Dam should be operated for flood control according to the reservoir regulation schedule which is included at the front of this exhibit and is also shown on plate 7-02. The flood control objective for Sepulveda Dam is to minimize flood damage and the flood risk to public safety along the Los Angeles River downstream from the dam.

Plate 7-01, which depicts the storage allocations for the reservoir, shows that the entire space of the reservoir below the spillway crest (crest gates in raised position--710 feet, NGVD) is devoted to flood control.

## 3. OPERATIONAL RESPONSIBILITIES

The primary responsibilities for operating Sepulveda Dam are delegated to units of the Engineering Division and Construction-Operations Division of the Los Angeles District, U.S. Army Corps of Engineers, as outlined below. The chain of command for reservoir operations decisions is given in table 9-01.

a. The Reservoir Regulation Unit (Reservoir Regulation Section, H&H Branch, Engineering Division) responsibilities are:

(1) Obtain current hydrometeorological data and weather forecasts for the region.



(2) Establish and update water control criteria for flood and nonflood periods and document in water control manual.

(3) Monitor meteorologic conditions, activate the Reservoir Operations Center (ROC), analyze current reservoir and hydrologic data, and issue appropriate water control instructions to the dam tender.

(4) Initiate the call out of mobile channel observation teams.

(5) Coordinate the control of water with, and make notifications to pertinent organizations. Keep up to date on all temporary conditions and actions that are restrictive or that require a change to established water control practices.

(6) Prepare daily, monthly and other special reports relative to the control of water at the reservoir and keep district management and higher authority offices informed of ongoing water control activities.

(7) Advise the District Engineer, through the chain of command, whenever there is evidence that Sepulveda Dam will not be able to provide flood protection along the Los Angeles River.

b. The Water Control Data Unit (Reservoir Regulation Section, H&H Branch, Engineering Division) responsibilities are:

(1) Maintain and supervise the operation of all hydrologic recording and telemetry system equipment.

(2) Calculate and maintain a record of all hydrologic data including stage, inflows, outflows, storage, weather data, etc.

c. The Dam Tender's responsibilities are:

(1) Be present at the dam when rainfall or runoff occurs as requested by the Reservoir Regulation Unit through appropriate supervision.

(2) Ensure that all equipment at the project, including recording and indicating gauges, gate mechanisms, power units, radio, etc., are in good operating condition.

(3) Operate the gates in accordance with instructions from the Reservoir Regulation Unit, Engineering Division.

(4) Follow the reservoir regulation schedule provided at the front of this exhibit and also shown on plate 7-02, during communication outage with the Reservoir Operation Center (ROC), as outlined in the following paragraph 8.

(5) Reports all pertinent conditions at the dam on a real time basis such as the trash buildup on the trash rack, hydraulic connections of stage recorders, erosion problems, condition of the embankment,

hazardous public actions at the project, intensity of rainfall and any other conditions pertinent to the safe and successful operation of the dam.

(6) Maintain records, including water surface elevations, outflow gauge heights, precipitation amounts, gate openings, and log all radio and telephone calls on forms prescribed in paragraph 12.

(7) Periodically test/operate the gates and electrical facilities in the control house, and inspects all structures and equipment according to the preestablished schedule.

(8) Refer to the O&M manual for instructions on actual operating procedures for all mechanical equipment.

(9) Follow a preestablished plan to call in the alternate operator to continue staffing on the next shift as advised by the ROC.

#### 4. GATE/VALVE OPERATION

##### a. Outlet Slide Gates.

###### (1) General.

The four outlet slide gates are hydraulically controlled from a manually operated-valve manifold located in the control room. The dam tender should refer to O&M manual for instructions on actual operating procedures.

###### (2) Outlet Gate Change Procedure.

The Reservoir Regulation Unit (Reservoir Regulation Section-Engineering Division) will order the dam outlet gate changes via the District's voice radio system. The Reservoir Regulation Unit will provide settings for all four gated outlets whenever a gate change is necessary. The dam tender should implement gate changes immediately following acknowledgement of radio instructions. If the performance of other concurrent activities require a delay in implementation of a gate change, the dam tender should advise the ROC through radio call sign WUK 4ROC and wait for guidance. The concern is that delaying a gate change may have serious impacts on affected activities. Once the gate change is completed, the dam tender should radio back a report of the time that the change was completed, the staff and tape reading, and the setting of all four gates after the change was completed. All individuals involved should strive for complete clarity regarding gate settings. The dam tender should immediately alert the ROC through radio call sign WUK 4ROC whenever the requested gate change cannot be fully implemented due to mechanical or other physical problems. For example, trash occasionally prevents full closure of a gate. The problem should then be evaluated and further instructions provided to the dam tender by the ROC.

### (3) Coordination Between ROC and Dam Tender.

The Reservoir Operation Center should keep the dam tender appraised of operational objectives and critical operational constraints whenever possible. This will afford the dam tender with a greater opportunity to recognize and identify field problems. The dam tender shall notify the ROC whenever a water surface elevation level is reached corresponding to a gate setting step on the reservoir regulation schedule shown on the front of this exhibit. The ROC may also provide water surface elevation criteria, such that the dam tender shall call the ROC at radio call sign WUK 4ROC when the reservoir pool reaches the specific elevation. This action will normally be conducted during periods of intense storm runoff and will require the dam tender to stay at the control house.

ROC personnel should appraise dam tender when gate operations will be "off-schedule" or "non-routine". In turn, the dam tender should not delay implementation of the non-routine operations by asking informational questions. Such questions are better answered after the gate change is implemented. However, the dam tender should always question gate operations that pose obvious dangers to people or disruption to sanctioned activities in the reservoir or in the downstream channel. The objective is to avoid costly time delays to the gate change process. The resulting time delay to address the question could, in itself, generate unnecessary overtime. All dam tenders should seek clarification of the desired gate setting in feet of opening and the desired time of change whenever necessary.

#### b. Crest Gates.

(1) The crest gates control is a combination of manual and full automatic operation. The crest gates are normally operated in an automatic mode, and rise and fall in response to changes in the reservoir water surface elevation.

(2) The automatic operation mode may be overridden by manual control, however the process is cumbersome and slow (20-30 minutes per gate) and shall not be implemented unless the ROC determines it is necessary in order to minimize unusually high spillway flows.

### 5. NORMAL OPERATION PROCEDURES

Sepulveda Dam under normal operation procedures is operated for flood control on the Los Angeles River according to the reservoir regulation schedule provided at the front of this exhibit and on plate 7-02. According to this schedule the project should be regulated to pass all inflow through the dam as rapidly as possible. This is achieved by keeping the four gated outlets fully open until spillway flow occurs, and then by progressively closing the gated outlets such that the combined flow from the spillway and from the gated and ungated outlets does not exceed the downstream channel capacity of 16,900 cfs.

It is physically possible, however, and would be desirable, under certain circumstances, for the release rate from Sepulveda Dam to be decreased below what is called for in the schedule. In addition to Emergency Deviations described in paragraph 9, there are other possible reasons for deviation from the normal release plan such as downstream flooding, construction, maintenance, inspections and other planned or unplanned activities.

#### 6. LIMITATIONS ON STORAGE

There are no legal limitations on storage, as the project boundary is above the maximum operating water surface elevation of 712.2 feet, NGVD.

#### 7. LIMITATIONS ON RELEASES

The maximum discharge that can be released without exceeding downstream channel capacity is 16,900 cfs. This release would be achieved when all gated outlets are open (as they are supposed to be under normal operation) and the water surface elevation is just above 710 feet, NGVD. Gates at Sepulveda Dam can generally be adjusted in as rapid a manner as possible without concern over the rate of rise of the reservoir water surface elevation. This is possible because the ungated outlets will always be releasing large discharges at times when significant changes in outflow could be achieved through the gated outlets. Concrete lining of the downstream channel precludes concern over bank erosion or sloughing due to sudden gate changes.

#### 8. STANDING INSTRUCTIONS DURING COMMUNICATION OUTAGE

If communication is broken between the dam tender and the Reservoir Regulation Unit (ROC), initially continue releases in accordance with the last instructions from the Reservoir Regulation Unit and make every attempt to reestablish communications. During rising stages if after one half hour communication cannot be reestablished, make releases in accordance with the reservoir regulation schedule, shown at the front of this exhibit and plate 7-02, following dam operator instructions at the bottom of the schedule. During falling stages maintain current outflow until communication is reestablished.

#### 9. EMERGENCY DEVIATION FROM NORMAL REGULATION

Emergency departures from the regulation instructions issued by the Reservoir Regulations Unit may be required because of operating equipment failures, accidents such as drownings, or other emergencies that require immediate action. Under these situations the dam tender should contact the Reservoir Regulation Unit through radio call sign WUK 4ROC for instructions. When the communications are broken or when actions must be implemented within minutes, the dam tender may independently take appropriate actions. The Reservoir Regulation Unit should be notified of such departures as soon as possible. All other nonemergency deviations should be approved by the Reservoir Regulation Unit in advance.

## 10. EMERGENCY NOTIFICATIONS

Emergency notifications are normally made by the Reservoir Regulation Unit. However, if the dam tender loses communication with the District Office, and an emergency notification situation arises, such as an imminent dam failure possible from a major earthquake or a water surface level exceeding elevation 710 feet, NGVD, that will generate spillway flow and downstream channel overflow, the dam tender should make the necessary notifications himself, if possible.

The parties listed below are to be notified immediately upon declaration of an uncontrollable emergency. Notification should include: (a) description of the type and extent of emergency that exists or is impending; (b) advice to evacuate people from flood plains; (c) information on the time that the release of hazardous amounts of water began or is estimated to begin; and (d) the dam tender's name and telephone number.

- |                                                                          |                |
|--------------------------------------------------------------------------|----------------|
| a. Los Angeles Police Department,<br>Van Nuys Division                   | (818) 989-8383 |
| b. Los Angeles County Sheriff,<br>Disaster Communications Office         | (213) 946-7935 |
| c. California Office of Emergency<br>Services - Headquarters, Sacramento | (916) 427-4990 |
| d. California Highway Patrol<br>24 Hour Communications Center            | 911            |

Upon completing the above notifications, try to reestablish communications with the Los Angeles District Office. Document all notifications made and refer to Orange Book, "Instructions for Reservoir Operations Center Personnel", for more information on additional desirable emergency notifications. Also, refer to the "Sepulveda Dam Flood Emergency Plan" book for further instructions and information. The dam tender should not leave the dam unless his personal safety is in jeopardy.

## 11. MEASUREMENT OF HYDROLOGIC DATA

The dam tender should follow instructions as issued by the Reservoir Regulation Unit on what measurements should be taken and at what frequency. During normal conditions measurements should be taken daily at 8:00 a.m. During flood situations hourly measurements are usually sufficient. All measurements should be documented. Measurements should include the reservoir staff reading (water surface elevation), the "tape" reading, incremental precipitation since the last report, the downstream discharge gauge reading (if available), the time of these measurements and the settings of each outlet gate at the dam, elevation

of the top of the crest gates, and the initiation and termination of spillway flow. When calling, the dam tender should clearly describe the silt and debris situation at the trash racks and gates. When instruments are not working properly or are stuck in the silt, the dam tender should not call in the erroneous reading, but should rather state the instrument or staff problem. When debris or silt cause the flows to be deceptively perched above the invert or result in a loss of contact with a staff board, the dam tender should call in a descriptive message identifying the limitation and quantifying the average streamflow depth and width or estimated reservoir depth as appropriate.

## 12. REPORTS

Communication with the dam tender for reservoir status reporting and gate change instructions is made using the Los Angeles District's radio system. If the radio system including the dam tender's mobile unit malfunctions, the dam tender will be contacted by telephone. The Record of Calls Form (SPL 188) is to be used each time a message is transmitted by or received at the radio or telephone. Every call will be noted whether it is for a radio check, reservoir report, channel observation, etc. During nonflood situations the dam tender will report daily to the ROC using the Los Angeles District's radio system or by using the telephone. During storm conditions, the dam tender will be instructed on the desired radio reporting time interval by the Reservoir Regulation Unit.

Reservoir reports will be requested whenever appreciable inflow appears imminent and should continue through operation of the structure. Each report information is described in the previous paragraph 11.

In addition to the Record of Calls Form (SPL-188), the dam tender should also use the Flood Control Basin Operation Report Form (SPL-19), and the Rainfall Record Form (SPL-648) to log the rainfall and digital recorder information. These forms should be submitted to the Water Control Data Unit for archiving on a monthly basis. A copy of each of these forms is included in this Water Control Manual as figures 9-01, 9-03, 9-04 and 9-05.

EXHIBIT B

SUPPLEMENTARY PERTINENT DATA

EXHIBIT B  
SUPPLEMENTARY PERTINENT DATA

GENERAL INFORMATION

|                          |                                                                                                                                                                                                                                                                                                                                                                                                                     |
|--------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Name of Project          | Sepulveda Dam; Sepulveda Reservoir.                                                                                                                                                                                                                                                                                                                                                                                 |
| Other Names for Project  | Sepulveda Flood Control Basin.                                                                                                                                                                                                                                                                                                                                                                                      |
| Location                 | Los Angeles County Drainage Area, California.<br>On Los Angeles River, 43 miles above mouth, at<br>30°09'48"N, 118°27'59"W.                                                                                                                                                                                                                                                                                         |
| Type of Project          | Flood control reservoir.                                                                                                                                                                                                                                                                                                                                                                                            |
| Objectives of Regulation | Project authorized for single-purpose operation (flood control).                                                                                                                                                                                                                                                                                                                                                    |
| Project Owner            | U.S. Army Corps of Engineers, Los Angeles District.                                                                                                                                                                                                                                                                                                                                                                 |
| Operating Agency         | U.S. Army Corps of Engineers, Los Angeles District. Official business hours:<br>0730-1600, Monday through Friday.<br>Tel. (213) 894-4756, FTS 798-4756.                                                                                                                                                                                                                                                             |
| Regulating Agency        | U.S. Army Corps of Engineers, Los Angeles District.                                                                                                                                                                                                                                                                                                                                                                 |
| Inter-Agency Agreements  | Portion of the land within Sepulveda Reservoir is leased to the City of Los Angeles for recreational, wildlife management, and agricultural purposes. The Corps of Engineers reserves the right to inundate any portion of the reservoir at any time.<br><br>U.S. Army Corps of Engineers has a maintenance agreement with Los Angeles County Flood Control District for the improved channel of Los Angeles River. |
| Project Cost             | Real estate acquisition, 1939-1942:<br>\$1,497,595. Construction of dam, 1939-1941:<br>\$6,650,561.                                                                                                                                                                                                                                                                                                                 |
| Closure Date             | 30 December 1941.                                                                                                                                                                                                                                                                                                                                                                                                   |



## RESERVOIR

|                                                                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
|--------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Pertinent Elements                                                 | See table 1 (inside front cover).                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| Real Estate                                                        | <p>Depicted on plates 2-07 and 2-21. Elevation is approximately the top of the dam, elevation 725 feet, NGVD.</p> <p>Total purchased real estate in fee is 2,097 acres.</p> <p>Total purchased real estate in easement is 0 acres.</p> <p>Total purchased real estate below guide control line el. 725.0 feet (top of freeboard) is 1942.31 acres.</p> <p>Total purchased real estate below flood control pool el. 717.5 feet (bottom of freeboard) is 1808.26 acres.</p> <p>Total purchased real estate below spillway crest el. 710.0 feet is 1322.81 acres.</p> |
| Reservoir Elevation Corresponding to Maximum Non-Damaging Releases | Non-damaging release is approximately the capacity of the Los Angeles River channel immediately downstream of dam: 16,900 cfs.                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| Conservation Pool                                                  | None.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| Safety Aspects                                                     | The U.S. Army Corps of Engineers notifies Los Angeles County Flood Control District, the City of Los Angeles, and the California Department of Transportation of any significant impoundment behind, or release from, Sepulveda Dam.                                                                                                                                                                                                                                                                                                                               |
| Emergency Drawdown                                                 | Not applicable. Gate sill elevation is at 668 feet, NGVD, directly on the Los Angeles River channel, and is essentially the lowest elevation within the reservoir.                                                                                                                                                                                                                                                                                                                                                                                                 |
| Project Area Data                                                  | For locations and elevations of facilities within Sepulveda Reservoir, see table 2-02 and plate 2-07.                                                                                                                                                                                                                                                                                                                                                                                                                                                              |

## HYDROLOGY

|               |                                                         |
|---------------|---------------------------------------------------------|
| Drainage Area | 152 square miles.                                       |
| Design Floods | See Table 1 (inside front cover).                       |
| Climate       | Temperate, semi-arid, with wet winters and dry summers. |

|                                         |                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
|-----------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Flood Seasons                           | Flood Season is 15 November - 15 April.                                                                                                                                                                                                                                                                                                                                                                                                               |
| One Inch of Runoff                      | Over Sepulveda Basin drainage area (152 square miles) is equivalent to a volume of 8107 ac-ft.                                                                                                                                                                                                                                                                                                                                                        |
| Low-Flow Season                         | Reservoir remains dry, and the Los Angeles River remains in low flow entire year, except for occasional storms (mostly 15 November - 15 April). Driest season is normally June-August.                                                                                                                                                                                                                                                                |
| Maximum Annual Flow                     | 137,793 acre-feet, (Period of record: 1941-1984 (mostly January-March 1983)).                                                                                                                                                                                                                                                                                                                                                                         |
| Maximum Instantaneous Inflow            | 62,636 cfs, 1600-1625 hours, 16 February 1980.                                                                                                                                                                                                                                                                                                                                                                                                        |
| Maximum of Mean Hourly Inflow           | 58,970 cfs, 1600-1700 hours, 16 February 1980.                                                                                                                                                                                                                                                                                                                                                                                                        |
| Maximum Reservoir Elevation             | 705.10 feet msl (11,503 ac-ft impounded), 1845 hours, 16 February 1980.                                                                                                                                                                                                                                                                                                                                                                               |
| Maximum Outflow                         | 15,100 cfs, 2051 hours, 16 February 1980.                                                                                                                                                                                                                                                                                                                                                                                                             |
| Key Streamflow Stations                 | Los Angeles River at Tujunga Avenue; Los Angeles River Above Arroyo Seco; Los Angeles River Below Firestone Blvd.; and Los Angeles River Below Wardlow Road (see Table 5-01, Plate 5-01, and Exhibit F). The LADPW owns and operates 2 stream gaging stations upstream of the damsite. The Browns Creek at Variel Ave. (#F2B-R) and the Limekiln Creek (#F350-R) above Aliso, stream gauging stations. For details refer to Chapter 5 and table 5-02. |
| Type of Data at Dam                     | Manual, recording, and automatic telemetry gauges for precipitation, reservoir surface elevation, gate height, and outflow, plus automatic telemetry streamflow gauges downstream.                                                                                                                                                                                                                                                                    |
| Stations Used in Hydrologic Forecasting | None at this time. Hydrologic forecasting will soon be implemented. See Chapter 5.                                                                                                                                                                                                                                                                                                                                                                    |
| No. of Sediment Ranges                  | See table 4-11.                                                                                                                                                                                                                                                                                                                                                                                                                                       |

#### EMBANKMENT

|                  |                                                                                                                             |
|------------------|-----------------------------------------------------------------------------------------------------------------------------|
| Length           | 15,444 feet (2.93 miles).                                                                                                   |
| Height           | 57 feet; top of dam 725 feet msl.*                                                                                          |
| Streambed        | 668 feet, NGVD at gate sill.                                                                                                |
| Freeboard        | Top of dam is 8.34 feet above Probable Maximum Flood pool.                                                                  |
| Crest Width      | 30 feet.                                                                                                                    |
| Special Features | None. No special dikes, levees, or other flood barriers.                                                                    |
| Type of Fill     | Earthfill.                                                                                                                  |
| Slope Protection | Upstream slope is protected by grouted stone paving. Downstream slope is grassed, except 10-15 feet grouted toe protection. |

#### SPILLWAY

|                     |                                                                                |
|---------------------|--------------------------------------------------------------------------------|
| Location            | Near center of dam, just to left of Outlet Works (when looking downstream).    |
| Type                | Concrete ogee, with floatable crest gates.                                     |
| Crest Elevation     | 700 feet, NGVD (crest gates lowered);<br>710 feet, NGVD (crest gates raised).  |
| Net Overflow Length | 399 feet.                                                                      |
| Number of Gates     | Seven.                                                                         |
| Size of Gates       | 57 feet long x 10 feet wide (above the concrete ogee section of the spillway). |
| Types of Gates      | Submersible drum gates.                                                        |

- \* December 1980 topographic survey of reservoir shows variation in elevation of top of dam from as low as 723.7 feet in the northeastern portion of the embankment to as high as 725.5 feet in two locations along the southwestern portion of the embankment. An on-going Settlement Study, consisting of periodic elevation surveys of the dam from December 1941 through January 1985, shows settlement in portions of the embankment from 0.5 foot to more than 1.0 foot over the 43-year period.

|                                                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
|-------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Top of Crest Gate<br>Elevation in Open<br>Position                | 710 feet.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| Induced Surcharge,<br>Standard Project Flood                      | 3.52 feet (Standard Project Flood elevation 713.52 feet, compared to spillway crest with gates raised to 710.00 feet).                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| Maximum Spillway<br>Discharge Capacity                            | 190,020 cfs for spillway flow (independent of outlet works discharge) with reservoir at elevation 725 feet, NGVD (top of dam).                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| Bridge Deck Elevation                                             | Top of dam is 725 feet, NGVD.<br>Top of curb is 725.75 feet, NGVD.<br>Top at retaining wall is 729.25 feet, NGVD<br>(See pl. 2-10).                                                                                                                                                                                                                                                                                                                                                                                                                               |
| Type of Energy<br>Dissipator                                      | None.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| Time Required to open/<br>close all crest gates                   | Crest gates open/close automatically depending on the water surface elevation (see paragraph 2-03, d,(2)). The minimum required time to open/close all gates is 15 minutes.                                                                                                                                                                                                                                                                                                                                                                                       |
| Automatic Crest Gate<br>Operation                                 | Crest gates rise out of ogee crest, ahead of reservoir level, to maximum elevation 710 feet, NGVD. Gates remain at this elevation until reservoir surface reaches predetermined elevation (currently set at 712 feet). Gates then begin to lower automatically. Gates lower to elevation 700 feet (ogee crest) by the time that reservoir surface reaches a second predetermined elevation (currently set at 715 feet). Both predetermined elevations are adjustable. Crest gates can be placed into semi-automatic or emergency manual operation (see pl. 2-18). |
| Recurrence Interval for<br>Reservoir to Attain<br>Crest Elevation | Approximately 80 years, to reach elevation 710 feet, NGVD (spillway crest with crest gates raised). See plate 4-07 and table 4-08.                                                                                                                                                                                                                                                                                                                                                                                                                                |

#### OUTLET FACILITIES

|                 |                                                    |
|-----------------|----------------------------------------------------|
| Location        | In center of dam, on Los Angeles River.            |
| Purpose         | Flood control.                                     |
| Type of Outlets | Four gated, four ungated; all outlets rectangular. |

Size of Outlets            Gated: 6 feet wide, 9 feet high.  
                             Ungated: 6 feet wide, 6.5 feet high.

Entrance Invert            668 feet, NGVD.  
Elevation

HYDROELECTRIC POWER FACILITIES; LOCKS; DOWNSTREAM CONTROL POINTS

None.

EXHIBIT C

PERTINENT DATA FOR OTHER  
RESERVOIRS AFFECTING LOS ANGELES RIVER

EXHIBIT C

DAM DATA SHEET

Name Chatsworth, Embankment Nos. 2 and 3 Completed 1918

Location West end of the San Fernando Valley, City of Los Angeles, 25 miles northwest of the Los Angeles Civic Center.

GENERAL DATA

Purpose Domestic Water Storage Current max. storage 0\* A.F.

Max. height 48' Crest length Embankment No. 2: 1700', Embankment No. 3: 750' Crest width 21'

Crest elev. 900' USGS Datum Spillway lip elev. 889' USGS Datum

Drainage area 5.4 square miles

Drainage type Hydraulic fill; in 1931 the upstream face and crest were removed and replaced with compacted fill

Cutoff type and dimensions Cutoff wall 2' wide by 3' to 23' deep at the upstream toe of the dam

U.S. slope, angle and protection 2-1/2h:1v, 6" concrete slab

D.S. slope, angle and protection 3h:1v above berm, native brush

Designers LADWP

Constructed by LADWP

Consultants Information not available

FOUNDATION AND ABUTMENTS

Material Sandstone bedrock at abutments, alluvium foundation

Treatment Removed top soil

Drainage Embankment #2: Rock drain at the downstream toe of the dam  
Embankment #3: Subdrain at the downstream toe of the dam

SPILLWAY AND OUTLET

Spillway type, location, foundation Open channel on the right abutment of Embankment No. 3, sandstone bedrock

Outlet type, location, foundation Vertical tower w/72" tunnel northeast of Embankment No. 3, sandstone bedrock

Remarks: \* Chatsworth Reservoir has been out of service and empty since 1969.

WEDD May 1978

### DAM DATA SHEET

Name Encino Completed Original 1921;  
Existing 1962  
Location San Fernando Valley on the north slope of the  
Santa Monica Mountains

### GENERAL DATA

Purpose Domestic Water Storage Current max. storage 10,300 A.F.  
Max. height 168' Crest length 1,850' Crest width 30'  
Crest elev. 1,088' USGS Datum Spillway lip elev. 1,075' USGS Datum  
Drainage area 1.4 square miles  
Dam type Approximately 80% is sheepsfoot roller compacted soil on bedrock;  
downstream remainder is old fill on alluvium.  
Cutoff type and dimensions None, upstream two-thirds of the dam is on  
bedrock.  
U.S. slope, angle & protection 3h:1v; 3" asphaltic concrete  
D.S. slope, angle & protection 2h:1v above berm, 2h:1v below berm; berm 100'  
wide at elev. 1020'; native brush & grasses  
Designers LADWP  
Constructed by Contract  
Consultants No outside consultants for major alterations in 1962.

### FOUNDATION AND ABUTMENTS

Material Sandstone, siltstone, and shale  
Treatment Upstream two-thirds of foundation was stripped to bedrock  
Drainage Abutment and toe tile subdrain systems

### SPILLWAY AND OUTLET

Spillway type, location, foundation Operating spillway pipe located at left  
abutment. Auxiliary spillway open trapezoidal channel at same location.

Outlet type, location, foundation Vertical tower with 72" tunnel; west or  
left abutment; sandstone and shale bedrock

Remarks: \_\_\_\_\_

WEDD May 1978



# LOS ANGELES DAM AND RESERVOIR DATA

## DESIGN:

|                               |                                           |
|-------------------------------|-------------------------------------------|
| Embankment                    | Compacted earth                           |
| Crest Dam Elevation           | 1187 feet, USGS                           |
| Crest Length                  | 3072 feet                                 |
| Crest Width                   | 30 feet                                   |
| Maximum Height                | 155 feet                                  |
| Slope Upstream, Main Dam      | 3-1/2:1                                   |
| Slope Downstream              | 2-1/2:1 & 3:1                             |
| Compacted Fill, Dam Only      | 5,352,764 cubic yards*                    |
| Compacted Fill, North Dike    | 1,349,051 cubic yards<br>(including rock) |
| Compacted Fill, Total Project | 8,155,457 cubic yards                     |
| Reservoir Capacity            | 10,170 acre-feet**                        |
| Maximum Depth @ HW            | 75 feet                                   |
| Area @ HW                     | 176.2 acres                               |
| Spillway Lip Elevation        | 1,175 feet                                |
| Spillway Capacity             | 7,049 cfs*** (PMP storm)                  |
| Reservoir Inlet               | 90" WSP, 900 cfs capacity                 |
| Reservoir Outlet              | 120" WSP, 1,100 cfs capacity              |
| Reservoir West Outlet         | 84" WSP, 600 cfs capacity                 |
| Emergency Blowoff             | 2--48" outlets, 1,250 cfs<br>capacity     |
| Storm Water Bypass East Side  | 850 cfs (50-year storm)                   |

## DRAINAGE AREA:

8,374 acres

## RESERVOIR CONSTRUCTED:

1974-1977

## PROJECT COST:

Contracts 8860 & 9245 only,  
\$33,251,601

\*Includes 405,512 cubic yards of clay and 506,887 cubic yards rock and gravel.

\*\*The reservoir level can be lowered 10 feet in nine hours, and the total storage reduced by one-half in 30 hours.

\*\*\*Probable maximum precipitation (PMP) storm, as determined by the U.S. Weather Bureau, is greater than the 1,000-year storm.

LOPEZ DAM AND RESERVOIR  
LOS ANGELES COUNTY, CALIFORNIA

PERTINENT DATA  
JULY 1985

|                                                      |                 |
|------------------------------------------------------|-----------------|
| Stream system.....                                   | Pacoima Wash    |
| Drainage area.....sq. miles..                        | 34              |
| Reservoir:                                           |                 |
| Elevation                                            |                 |
| Streambed at Dam.....ft., m.s.l..                    | 1,253.72        |
| Flood control pool (spillway crest).....ft., m.s.l.. | 1,272.92        |
| Spillway design surcharge level.....ft., m.s.l..     | 1,293.48        |
| Top of dam.....ft., m.s.l..                          | 1,298.92        |
| Area                                                 |                 |
| Spillway crest.....acres..                           | 41.3            |
| Spillway design surcharge level.....acres..          | 70.7            |
| Top of dam.....acres..                               | 80.1            |
| Capacity, gross                                      |                 |
| Spillway crest.....acre-feet..                       | 441 (0.24*)     |
| Spillway design surcharge level.....acre-feet..      | 1,613.3 (0.89*) |
| Top of dam.....acre-feet..                           | 2,021.4 (1.12*) |
| Allowance for sediment (50-year).....acre-feet..     | 794 (0.44*)     |
| Dam: - type.....                                     | Earthfill       |
| Height above original streambed.....ft..             | 50              |
| Top length.....ft..                                  | 1,330           |
| Top width.....ft..                                   | 20              |
| Freeboard.....ft..                                   | 6.1             |
| Spillway: - type.....                                | Broad-crested   |
| Crest length.....ft..                                | 110             |
| Design surcharge.....ft..                            | 19.9            |
| Design discharge.....c.f.s..                         | 31,000          |
| Outlets:                                             |                 |
| Number and size-diameter.....ft..                    | 1-5' diameter   |
| Length.....ft..                                      | 428             |
| Entrance invert elevation.....ft., m.s.l..           | 1,253.92        |
| Standard project flood:                              |                 |
| Duration (inflow).....days..                         | 3               |
| Total volume.....acre-feet..                         | 14,000 (7.78*)  |
| Inflow peak.....c.f.s..                              | 11,200          |
| Probable maximum flood                               |                 |
| Duration (inflow).....days..                         | 1               |
| Total volume.....acre-feet..                         | 19,900 (10.97*) |
| Inflow peak.....c.f.s..                              | 30,400          |
| Historic maximums:                                   |                 |
| Maximum release.....c.f.s..                          | 3,900           |
| Date.....                                            | 3-1-83          |
| Maximum water surface elevation.....ft., m.s.l..     | 1,277.7         |
| Date.....                                            | 3-1-83          |

\*inches of runoff

HANSEN DAM  
LOS ANGELES COUNTY, CALIFORNIA

PERTINENT DATA  
SEPTEMBER 1988

|                                                      |                  |
|------------------------------------------------------|------------------|
| Completion date.....                                 | September 1940   |
| Stream system.....                                   | Tujunga Wash     |
| Drainage area.....mi <sup>2</sup> ..                 | 151.9            |
| Reservoir:                                           |                  |
| Elevation                                            |                  |
| Debris pool.....ft., MGV.D..                         | 1,010.5          |
| Flood control pool (spillway crest).....ft., MGV.D.. | 1,060            |
| Spillway design surcharge level.....ft., MGV.D..     | 1,081.22         |
| Top of dam.....ft., MGV.D..                          | 1,087            |
| Area                                                 |                  |
| Debris pool.....acre..                               | 142.4            |
| Spillway crest.....acre..                            | 781.4            |
| Spillway design surcharge level.....acre..           | 1,061.5          |
| Top of dam.....acre..                                | 1,136.0          |
| Capacity, gross                                      |                  |
| Debris pool.....acre-feet..                          | 1,329 (0.17%)    |
| Spillway crest.....acre-feet..                       | 25,446.1 (3.24%) |
| Spillway design surcharge level.....acre-feet..      | 44,990 (5.72%)   |
| Top of dam.....acre-feet..                           | 51,360 (6.53%)   |
| Allowance for sediment (50-year).....acre-feet..     | 10,500 (1.34%)   |
| Allowance for sediment (100-year).....acre-feet..    | 21,000 (2.67%)   |
| Dam:                                                 |                  |
| Type.....                                            | Earthfill        |
| Height above original streambed.....ft..             | 97               |
| Top length.....ft..                                  | 10,475           |
| Top width.....ft..                                   | 30               |
| Freeboard (Revised).....ft..                         | 5.8              |
| Spillway:                                            |                  |
| Type.....                                            | Ungated ogee     |
| Crest length.....ft..                                | 284              |
| Design surcharge (Revised June 1978).....ft..        | 21.2             |
| Design discharge (Original).....ft..                 | 21.8             |
| Design discharge (Revised June 1978).....c.f.s..     | 99,700           |
| Design discharge (Original).....c.f.s..              | 101,000          |
| Outlets:                                             |                  |
| Uncontrolled                                         |                  |
| Number and size.....                                 | 2 - 8'W x 6'H    |
| Entrance invert elevation.....ft., MGV.D..           | 1,011            |
| Controlled                                           |                  |
| Gates - Type.....                                    | Vertical lift    |
| Number and size.....                                 | 8 - 5'W x 8'H    |
| Entrance invert elevation.....ft., MGV.D..           | 990              |
| Conduits                                             |                  |
| Number and size.....ft..                             | 2 - 8'W x 6'H    |
| Length.....ft..                                      | 265              |
| Maximum capacity at spillway crest.....c.f.s..       | 22,000           |
| Regulated capacity at spillway crest.....c.f.s..     | 22,800           |
| Reservoir Design Flood (Original)                    |                  |
| Total volume (4-day).....acre-feet..                 | 70,700           |
| Inflow peak (4-day).....c.f.s..                      | 64,800           |
| Standard Project Flood (Current)                     |                  |
| Total volume (4-day).....acre-feet..                 | 57,200           |
| Inflow peak (4-day).....c.f.s..                      | 53,000           |
| Spillway Design Flood (Original)                     |                  |
| Total volume (1-day).....acre-feet..                 | 76,800           |
| Inflow peak (1-day).....c.f.s..                      | 129,600          |
| Probable Maximum Flood (Current)                     |                  |
| Total volume (5-day).....acre-feet..                 | 246,000          |
| Inflow peak (5-day).....c.f.s..                      | 105,000          |
| Historic maximums:                                   |                  |
| Maximum release.....c.f.s..                          | 12,371           |
| Date.....                                            | 3-3-83           |
| Maximum water storage elevation.....ft., MGV.D..     | 1,039.70         |
| Maximum storage.....acre-feet..                      |                  |
| Date.....                                            | 3-2-83           |
| Maximum inflow peak (1 hour).....c.f.s..             | 27,800           |
| Date.....                                            | 3-2-83           |

\*inches of runoff

SANTA FE DAM AND RESERVOIR  
LOS ANGELES COUNTY, CALIFORNIA

PERTINENT DATA  
MAY 1983

|                                                           |                                |
|-----------------------------------------------------------|--------------------------------|
| Stream System.....                                        | San Gabriel River              |
| Drainage area.....sq. miles..                             | 236                            |
| Reservoir:                                                |                                |
| Elevation                                                 |                                |
| Debris pool.....ft., m.s.l..                              | 456                            |
| Water supply pool.....ft., m.s.l..                        | 466                            |
| Flood control pool (spillway crest).....ft., m.s.l..      | 496                            |
| Spillway design surcharge level.....ft., m.s.l..          | 508.4                          |
| Top of dam.....ft. m.s.l..                                | 513                            |
| Area                                                      |                                |
| Debris pool.....acres..                                   | 331.2                          |
| Water supply pool.....acres..                             | 73.9                           |
| Spillway crest.....acres..                                | 1,284                          |
| Spillway design surcharge level.....acres..               | 1,258                          |
| Top of dam.....acres..                                    | 1,298                          |
| Capacity, gross                                           |                                |
| Debris pool.....acre-feet..                               | 4,351.1 (0.35*)                |
| Water supply pool.....acre-feet..                         | 8,291.4 (0.66*)                |
| Spillway crest.....acre-feet..                            | 32,109 (2.55*)                 |
| Spillway design surcharge level.....acre-feet..           | 46,712 (3.71*)                 |
| Top of dam.....acre-feet..                                | 53,068 (4.22*)                 |
| June 1978                                                 |                                |
| Allowance for sediment (50-year).....acre-feet..          | 8,000 (0.64*)                  |
| June 1978                                                 |                                |
| Allowance for sediment (100-year).....acre-feet..         | 16,000 (1.27*)                 |
| 1969 Reduction in storage due to sediment.....acre-feet.. | 4222                           |
| Dam: - Type.....                                          | Earthfill                      |
| Height above original streambed.....ft..                  | 92                             |
| Top length.....ft..                                       | 23,800                         |
| Top width.....ft..                                        | 30                             |
| Freeboard.....ft..                                        | 4.6                            |
| Spillway: - type.....                                     | Ungated overflow concrete ogee |
| Crest length.....ft..                                     | 1,200                          |
| Design surcharge.....ft..                                 | 221,800                        |
| Design Discharge.....c.f.s..                              | 13.21                          |
| Outlets:                                                  |                                |
| Gates - Type.....                                         | Vertical lift                  |
| Number and size.....ft..                                  | 16 - 6'W x 9'H                 |
| Gate sill elevation.....ft., m.s.l..                      | 421                            |
| Conduits                                                  |                                |
| Number and size.....                                      | 76 - 7.33'W x 7.33'H           |
| Length.....ft..                                           | 515                            |
| Maximum capacity at spillway crest.....c.f.s..            | 41,000                         |
| Regulated discharge at spillway crest.....c.f.s..         | 41,000                         |
| Standard project flood:                                   |                                |
| Duration (inflow).....days..                              | 3.5                            |
| Total volume.....acre-feet..                              | 171,400 (13.62*)               |
| Inflow peak.....c.f.s..                                   | 96,000                         |
| Probable maximum flood:                                   |                                |
| Duration (inflow).....days..                              | 4                              |
| Total volume.....acre-feet..                              | 556,000 (44.17*)               |
| Inflow peak.....c.f.s..                                   | 222,000                        |
| Historic maximums:                                        |                                |
| Maximum discharge on record.....c.f.s..                   | 30,900                         |
| Date.....                                                 | 1-26-69                        |
| Maximum water surface elevation.....ft., m.s.l..          | 473.97                         |
| Date.....                                                 | 12-19-66                       |

\*inches of runoff

WHITTIER NARROW DAM AND RESERVOIR  
LOS ANGELES COUNTY, CALIFORNIA

PERTINENT DATA  
JUNE 1987

|                                                |                                  |                 |
|------------------------------------------------|----------------------------------|-----------------|
| Stream System.....                             | Rio Hondo and San Gabriel Rivers |                 |
| Drainage area.....                             | sq. miles..                      | 554             |
| Reservoir:                                     |                                  |                 |
| Elevation                                      |                                  |                 |
| Water supply pool (Rio Hondo).....             | ft., m.s.l..                     | 201.6           |
| Water supply pool (San Gabriel).....           | ft., m.s.l..                     | 213.5           |
| Flood control pool.....                        | ft., m.s.l..                     | 228.5           |
| Top of gates (gates closed).....               | ft., m.s.l..                     | 229             |
| Spillway design surcharge level.....           | ft., m.s.l..                     | 238.9           |
| Top of Dam.....                                | ft., m.s.l..                     | 239             |
| Area                                           |                                  |                 |
| Water supply (Rio Hondo).....                  | acres..                          | 252.0           |
| Water supply (San Gabriel).....                | acres..                          | 89              |
| Flood Control.....                             | acres..                          | 2,411           |
| Top of gates (gates closed).....               | acres..                          | 2,470           |
| Spillway design surcharge level.....           | acres..                          | 3,622.8         |
| Top of dam.....                                | acres..                          | 3,630           |
| Capacity, gross                                |                                  |                 |
| Water supply (Rio Hondo).....                  | acre-feet..                      | 2,498 (0.09*)   |
| Water supply (San Gabriel).....                | acre-feet..                      | 532 (0.02*)     |
| Flood control pool.....                        | acre-feet..                      | 34,947 (1.18*)  |
| Top of gates (gates closed).....               | acre-feet..                      | 36,160 (1.22*)  |
| Spillway design surcharge level.....           | acre-feet..                      | 66,702 (2.26*)  |
| Top of dam.....                                | acre-feet..                      | 67,060 (2.27*)  |
| Allowance for sediment.....                    | acre-feet..                      | 0               |
| Dam: - Type.....                               |                                  | Earthfill       |
| Height above original streambed.....           | ft..                             | 56.0            |
| Top length.....                                | ft..                             | 16,960          |
| Top width.....                                 | ft..                             | 16              |
| Freeboard.....                                 | ft..                             | 0.1             |
| Outlets: (Rio Hondo)                           |                                  |                 |
| Type of gates.....                             |                                  | Tainter         |
| Number and size of gates.....                  |                                  | 4 - 30'W x 20'H |
| Size of outlets.....                           |                                  | 30'W x 19'H     |
| Gate sill elevation.....                       | ft., m.s.l..                     | 184.0           |
| Regulated outflow.....                         | c.f.s..                          | 40,000          |
| Maximum capacity (el. 229.0).....              | c.f.s..                          | 74,700          |
| Spillway: (San Gabriel)                        |                                  |                 |
| Type of gates.....                             |                                  | Tainter         |
| Number and size of gates.....                  |                                  | 9 - 50' x 29'   |
| Gate sill elevation.....                       | ft., m.s.l..                     | 200.0           |
| Top of gates (gates closed) elevation.....     | ft., m.s.l..                     | 229             |
| Discharge at design surcharge (el. 234.0)..... | c.f.s..                          | 251,000         |
| Maximum discharge capacity (el. 239.0).....    | c.f.s..                          | 307,900         |
| Standard project flood:                        |                                  |                 |
| Duration (inflow).....                         | days..                           | 4               |
| Total volume.....                              | acre-feet..                      | 198,000 (6.70*) |
| Inflow peak.....                               | c.f.s..                          | 40,000          |
| Probable maximum flood:                        |                                  |                 |
| Duration (inflow).....                         | days..                           | 4               |
| Total volume.....                              | acre-feet..                      | 910,000 (3.80*) |
| Inflow peak.....                               | c.f.s..                          | 365,000         |
| Historic maximums:                             |                                  |                 |
| San Gabriel:                                   |                                  |                 |
| Maximum release.....                           | c.f.s..                          | 11,500          |
| Date.....                                      |                                  | 1-25-69         |
| Maximum water surface elevation.....           | ft. m.s.l..                      | 216.5           |
| Date.....                                      |                                  | 1-25-69         |
| Rio Hondo:                                     |                                  |                 |
| Maximum release.....                           | c.f.s..                          | 38,800          |
| Date.....                                      |                                  | 2-17-82         |
| Maximum water surface elevation.....           | ft. m.s.l..                      | 213.5           |
| Date.....                                      |                                  | 1-25-69         |

\*inches of runoff

| PROJECT       |                             |                            | DAM   |                 |                              |                          |                 | SPILLWAY |                              |         |
|---------------|-----------------------------|----------------------------|-------|-----------------|------------------------------|--------------------------|-----------------|----------|------------------------------|---------|
| NAME OF DAM   | STREAM                      | DRAINAGE AREA<br>(sq. mi.) | TYPE  | HEIGHT<br>(ft.) | CREST ELEVATION<br>(ft. msl) | OUTLET SILL<br>(ft. msl) | LENGTH<br>(ft.) | TYPE     | CREST ELEVATION<br>(ft. msl) | D CA    |
| Big Dalton    | Big Dalton Creek            | 4.49                       | C,A,G | 146.0           | 1711.0                       | 1613.0**                 | 480.0           | U        | 1706.0                       |         |
| Big Tujunga   | Big Tujunga Creek           | 82.30                      | C,A   | 200.0           | 2304.0                       | 2160.0**                 | 505.0           | U        | 2290.0                       | 2       |
| Cogswell      | San Gabriel River-West Fork | 39.20                      | R     | 265.0           | 2405.0                       | 2148.0                   | 585.0           | U        | 2385.0                       | 2       |
| Devil's Gate  | Arroyo Seco                 | 31.90                      | C,A,G | 100.0           | 1070.0                       | 1058.8**<br>1085.5       | 310.0           | U        | 1054.0<br>1065.5             | 1       |
| Eaton Wash    | Eaton Creek                 | 12.42                      | E     | 62.0            | 902.0                        | 841.0                    | 1525.0          | U        | 987.5                        | 3       |
| Live Oak      | Live Oak Creek              | 2.28                       | C,A,G | 70.0            | 1500.1                       | 1429.8**                 | 303.0           | U        | 1496.4<br>1497.0             |         |
| Morris        | San Gabriel River           | 217.0                      | C,G   | 245.0           | 1175.0                       | 960.0                    | 600.0           | U        | 1152.0<br>1170.0             | 3<br>10 |
| Pacoima       | Pacoima Creek               | 28.20                      | C,A,G | 160.0           | 2010.0                       | 1700.1**                 | 640.0           | U        | 1850.0<br>1859.0             | 1       |
| Quilley Creek | Quilley Creek               | 1.10                       | C,G   | 40.0            | 102.0                        | 101.0                    | 100.0           | U        | 101.0                        |         |
| Quilley Creek | San Gabriel River           | 0.10                       | C,G   | 4.0             | 1100.0                       | 100.0                    | 100.0           | U        | 100.0                        |         |
| Quilley Creek | San Gabriel River           | 0.10                       | C,G   | 4.0             | 1100.0                       | 100.0                    | 100.0           | U        | 100.0                        |         |
| Quilley Creek | San Gabriel River           | 0.10                       | C,G   | 4.0             | 1100.0                       | 100.0                    | 100.0           | U        | 100.0                        |         |
| Quilley Creek | San Gabriel River           | 0.10                       | C,G   | 4.0             | 1100.0                       | 100.0                    | 100.0           | U        | 100.0                        |         |
| Santa Anita   | Big Santa Anita Creek       | 10.82                      | C,A,G | 224.8           | 1324.8                       | 1161.2**                 | 612.0           | U        | 1316.0<br>1324.8             |         |
| Sawpit        | Sawpit Creek                | 3.24                       | C,A   | 147.0           | 1375.18                      | 1235.7**                 | 527.0           | U        | 1260.0<br>1270.0             |         |
| Thompson Cr.  | Thompson Creek              | 3.51                       | C,GL  | 66.0            | 1648.0                       | 1579.4                   | 1500.0          | U        | 1634.1                       |         |

## Dam Types

Material      Structure  
 E - Earthfill    A - Arch  
 R - Rockfill    G - Gravity  
 C - Concrete    GL - Gravel  
 M - Masonry

Outlet Types  
 1. Slide Gates  
 2. Valves

Spillway Types  
 U - Ungated  
 G - Gated

\* Assumed at H.W.L.

\*\* Center Line of Outlet Sill

CHARACTERISTICS OF MAJOR STORAGE PROJECTS  
LOS ANGELES COUNTY

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| SPILLWAY                        |                             |                       | RESERVOIR                           |                                      |                                   |                                 |                                      |                                       |                                                     |
|---------------------------------|-----------------------------|-----------------------|-------------------------------------|--------------------------------------|-----------------------------------|---------------------------------|--------------------------------------|---------------------------------------|-----------------------------------------------------|
| CREST<br>ELEVATION<br>(ft. msl) | DESIGN<br>CAPACITY<br>(cfs) | PRIMARY<br>PURPOSE(S) | ELEVATION                           |                                      | STORAGE                           |                                 | DAM<br>CREST<br>ELEVATION<br>(ac-ft) | MAX.<br>SCHEDULE<br>RELEASES<br>(cfs) | MAX.<br>RELEASES<br>INCLUDING<br>SPILLWAY<br>(cfs)* |
|                                 |                             |                       | MAX.<br>NORMAL<br>POOL<br>(ft. msl) | MAX.<br>DESIGN<br>POOL<br>(ft. msl)* | MAX.<br>NORMAL<br>POOL<br>(ac-ft) | DESIGN<br>SURCHARGE<br>(ac-ft)* |                                      |                                       |                                                     |
| 1706.0                          | 5310.0                      | FC, WS                | 1706.0                              | 1711.0                               | 915.0                             | 119.2                           | 1037.0                               | 888.0                                 | 6198.0                                              |
| 2290.0                          | 24,250.0                    | FC, WS                | 2290.0                              | 2304.0                               | 5750.0                            | 1186.0                          | 6906.0                               | 2900.0                                | 27,150.0                                            |
| 2385.0                          | 29,500.0                    | FC, WS                | 2385.0                              | 2398.0                               | 8853.0                            | 2031.0                          | N/A                                  | 8725.0                                | 38,225.0                                            |
| 1054.0                          | 14,800.0                    | FC, WS                | 1054.0                              | 1072.0                               | 2869.0                            | OT                              | 2820                                 | 5637.0                                | 20,937.0                                            |
| 1065.5                          | 1000.0                      |                       | 1065.5                              |                                      | 4787.0                            | OT                              | 5683.0                               |                                       |                                                     |
| 387.5                           | 33,500.0                    | FC, WS                | 387.5                               | 897.5                                | 721.0                             | 457.0                           | N/A                                  | 5040.0                                | 38,540.0                                            |
| 1496.4                          | 2400.0                      | FC, WS                | 1496.4                              | 1500.0                               | 239.0                             | 6.5                             | 282.3                                | 368.0                                 | 2768.0                                              |
| 1497.0                          | (COMB.)                     |                       | 1497.0                              |                                      | 245.0                             | N/A                             |                                      |                                       |                                                     |
| 1175.0                          | 34,200.0                    | FC, WS                | 1175.0                              | 1175.0                               | 22,758.0                          | N/A                             | N/A                                  | 5280.0                                | 100,000                                             |
| 1170.0                          | 100,000                     |                       | (GR)                                |                                      | N/A                               | N/A                             |                                      |                                       |                                                     |
| 1950.0                          | 10,780.0                    | FC, WS                | 1950.0                              | 2025.0                               | 3115.0                            | 5204.0                          | 3981.0                               | 1048.0                                | 11,828.0                                            |
| 1989.0                          |                             |                       | 1989.0                              |                                      | 6589.0                            | N/A                             |                                      |                                       |                                                     |
| 1648.0                          | 6480.0                      | FC, WS                | 1648.0                              | 1775.0                               | 16,468.0                          | 2504.0                          | N/A                                  | 850.0                                 | 7,710.0                                             |
| 1184.0                          | 1600.0                      | FC, DISPERSED         | 1184.0                              | 1184.0                               | 191.0                             | 116.0                           | N/A                                  | 2180.0                                | 14,200.0                                            |
| 1470.0                          | 17,490.0                    | FC, WS                | 1470.0                              | 1470.0                               | 1306.0                            | 315.0                           | 1630.0                               | 2060.0                                | 28,500.0                                            |
| 1453.0                          | 92,000.0                    | FC, WS                | 1453.0                              | 1466.0                               | 44,226.0                          | 7412.0                          | N/A                                  | 13,470.0                              | 110,470.0                                           |
| 1124.3                          | 2900.0                      | FC, WS                | 1124.3                              | 1124.3                               | 776.5                             | 129.2                           | 905.7                                | 647.0                                 | 3533.0                                              |
| 1375.18                         | 1450.0                      | FC, WS                | 1375.18                             | 1375.18                              | 354.0                             | 152.6                           | 506.5                                | 457.0                                 | 2534.0                                              |
| 1375.18                         | 510                         |                       |                                     |                                      | 506.6                             | N/A                             |                                      |                                       |                                                     |
| 1634.1                          | 4520.0                      | FC, WS                | 1634.1                              | 1645.0                               | 543.0                             | 369.7                           | N/A                                  | 320.0                                 | 4955.0                                              |

Project Purposes  
FC - Flood Control  
P - Power  
WS - Water Supply

OT - Overtop the Dam  
GR - Gated in Raised Position  
LS - Less Spillway

JANUARY 1986

C-8

EXHIBIT D

RESERVOIR WATER SURFACE ELEVATION VS.  
CAPACITY (STORAGE) FOR SEPULVEDA DAM



| SEPULVEDA DAM<br>SURVEYED DEC 1980 |    | CORPS OF ENGINEERS |     |     |     |     |     |     |     |     |  | ELEV (FT) |    | VS |    | STORAGE (AC-FT) |    |
|------------------------------------|----|--------------------|-----|-----|-----|-----|-----|-----|-----|-----|--|-----------|----|----|----|-----------------|----|
| ELEV                               | 0  | .01                | .02 | .03 | .04 | .05 | .06 | .07 | .08 | .09 |  |           |    |    |    |                 |    |
| 668.0                              | 0  | 0                  | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   |  | 0         | 0  | 0  | 0  | 0               | 0  |
| 668.1                              | 0  | 0                  | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   |  | 0         | 0  | 0  | 0  | 0               | 0  |
| 668.2                              | 0  | 0                  | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   |  | 0         | 0  | 0  | 0  | 0               | 0  |
| 668.3                              | 0  | 0                  | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   |  | 0         | 0  | 0  | 0  | 0               | 0  |
| 668.4                              | 0  | 0                  | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   |  | 0         | 0  | 0  | 0  | 0               | 0  |
| 668.5                              | 1  | 1                  | 1   | 1   | 1   | 1   | 1   | 1   | 1   | 1   |  | 1         | 1  | 1  | 1  | 1               | 1  |
| 668.6                              | 2  | 2                  | 2   | 2   | 2   | 2   | 2   | 2   | 2   | 2   |  | 2         | 2  | 2  | 2  | 2               | 2  |
| 668.7                              | 2  | 2                  | 2   | 2   | 2   | 2   | 2   | 2   | 2   | 2   |  | 2         | 2  | 2  | 2  | 2               | 2  |
| 668.8                              | 3  | 3                  | 3   | 3   | 3   | 3   | 3   | 3   | 3   | 3   |  | 3         | 3  | 3  | 3  | 3               | 3  |
| 668.9                              | 3  | 3                  | 3   | 3   | 3   | 3   | 3   | 3   | 3   | 3   |  | 3         | 3  | 3  | 3  | 3               | 3  |
| 669.0                              | 4  | 4                  | 4   | 4   | 4   | 4   | 4   | 4   | 4   | 4   |  | 4         | 4  | 4  | 4  | 4               | 4  |
| 669.1                              | 4  | 4                  | 4   | 4   | 4   | 4   | 4   | 4   | 4   | 4   |  | 4         | 4  | 4  | 4  | 4               | 4  |
| 669.2                              | 4  | 4                  | 4   | 4   | 4   | 4   | 4   | 4   | 4   | 4   |  | 4         | 4  | 4  | 4  | 4               | 4  |
| 669.3                              | 4  | 4                  | 4   | 4   | 4   | 4   | 4   | 4   | 4   | 4   |  | 4         | 4  | 4  | 4  | 4               | 4  |
| 669.4                              | 5  | 5                  | 5   | 5   | 5   | 5   | 5   | 5   | 5   | 5   |  | 5         | 5  | 5  | 5  | 5               | 5  |
| 669.5                              | 5  | 5                  | 5   | 5   | 5   | 5   | 5   | 5   | 5   | 5   |  | 5         | 5  | 5  | 5  | 5               | 5  |
| 669.6                              | 6  | 6                  | 6   | 6   | 6   | 6   | 6   | 6   | 6   | 6   |  | 6         | 6  | 6  | 6  | 6               | 6  |
| 669.7                              | 6  | 6                  | 6   | 6   | 6   | 6   | 6   | 6   | 6   | 6   |  | 6         | 6  | 6  | 6  | 6               | 6  |
| 669.8                              | 7  | 7                  | 7   | 7   | 7   | 7   | 7   | 7   | 7   | 7   |  | 7         | 7  | 7  | 7  | 7               | 7  |
| 669.9                              | 7  | 7                  | 7   | 7   | 7   | 7   | 7   | 7   | 7   | 7   |  | 7         | 7  | 7  | 7  | 7               | 7  |
| 670.0                              | 8  | 8                  | 8   | 8   | 8   | 8   | 8   | 8   | 8   | 8   |  | 8         | 8  | 8  | 8  | 8               | 8  |
| 670.1                              | 8  | 8                  | 8   | 8   | 8   | 8   | 8   | 8   | 8   | 8   |  | 8         | 8  | 8  | 8  | 8               | 8  |
| 670.2                              | 9  | 9                  | 9   | 9   | 9   | 9   | 9   | 9   | 9   | 9   |  | 9         | 9  | 9  | 9  | 9               | 9  |
| 670.3                              | 9  | 9                  | 9   | 9   | 9   | 9   | 9   | 9   | 9   | 9   |  | 9         | 9  | 9  | 9  | 9               | 9  |
| 670.4                              | 9  | 9                  | 9   | 9   | 9   | 9   | 9   | 9   | 9   | 9   |  | 9         | 9  | 9  | 9  | 9               | 9  |
| 670.5                              | 10 | 10                 | 10  | 10  | 10  | 10  | 10  | 10  | 10  | 10  |  | 10        | 10 | 10 | 10 | 10              | 10 |
| 670.6                              | 10 | 10                 | 10  | 10  | 10  | 10  | 10  | 10  | 10  | 10  |  | 10        | 10 | 10 | 10 | 10              | 10 |
| 670.7                              | 10 | 10                 | 10  | 10  | 10  | 10  | 10  | 10  | 10  | 10  |  | 10        | 10 | 10 | 10 | 10              | 10 |
| 670.8                              | 10 | 10                 | 10  | 10  | 10  | 10  | 10  | 10  | 10  | 10  |  | 10        | 10 | 10 | 10 | 10              | 10 |
| 670.9                              | 10 | 10                 | 10  | 10  | 10  | 10  | 10  | 10  | 10  | 10  |  | 10        | 10 | 10 | 10 | 10              | 10 |
| 671.0                              | 11 | 11                 | 11  | 11  | 11  | 11  | 11  | 11  | 11  | 11  |  | 11        | 11 | 11 | 11 | 11              | 11 |
| 671.1                              | 11 | 11                 | 11  | 11  | 11  | 11  | 11  | 11  | 11  | 11  |  | 11        | 11 | 11 | 11 | 11              | 11 |
| 671.2                              | 11 | 11                 | 11  | 11  | 11  | 11  | 11  | 11  | 11  | 11  |  | 11        | 11 | 11 | 11 | 11              | 11 |
| 671.3                              | 11 | 11                 | 11  | 11  | 11  | 11  | 11  | 11  | 11  | 11  |  | 11        | 11 | 11 | 11 | 11              | 11 |
| 671.4                              | 11 | 11                 | 11  | 11  | 11  | 11  | 11  | 11  | 11  | 11  |  | 11        | 11 | 11 | 11 | 11              | 11 |
| 671.5                              | 12 | 12                 | 12  | 12  | 12  | 12  | 12  | 12  | 12  | 12  |  | 12        | 12 | 12 | 12 | 12              | 12 |
| 671.6                              | 12 | 12                 | 12  | 12  | 12  | 12  | 12  | 12  | 12  | 12  |  | 12        | 12 | 12 | 12 | 12              | 12 |
| 671.7                              | 12 | 12                 | 12  | 12  | 12  | 12  | 12  | 12  | 12  | 12  |  | 12        | 12 | 12 | 12 | 12              | 12 |
| 671.8                              | 12 | 12                 | 12  | 12  | 12  | 12  | 12  | 12  | 12  | 12  |  | 12        | 12 | 12 | 12 | 12              | 12 |
| 671.9                              | 12 | 12                 | 12  | 12  | 12  | 12  | 12  | 12  | 12  | 12  |  | 12        | 12 | 12 | 12 | 12              | 12 |

| SEMPULVEDA DAM<br>SURVEYED DEC 1940 |      | CORPS OF ENGINEERS |      |      |      | ELEV (FT) |      | VS   | STORAGE (AC-FT) |      |
|-------------------------------------|------|--------------------|------|------|------|-----------|------|------|-----------------|------|
| ELEV                                | 0    | .01                | .02  | .03  | .04  | .05       | .06  | .07  | .08             | .09  |
| 672:0                               | 3:4  | 3:4                | 3:4  | 4:0  | 4:0  | 4:0       | 4:0  | 4:0  | 4:0             | 4:0  |
| 672:1                               | 4:1  | 4:1                | 4:2  | 4:2  | 4:2  | 4:2       | 4:3  | 4:3  | 4:3             | 4:3  |
| 672:2                               | 4:3  | 4:4                | 4:4  | 4:4  | 4:4  | 4:5       | 4:5  | 4:5  | 4:5             | 4:6  |
| 672:3                               | 4:6  | 4:6                | 4:6  | 4:7  | 4:7  | 4:7       | 4:8  | 4:8  | 4:8             | 4:8  |
| 672:4                               | 5:1  | 5:2                | 5:2  | 5:2  | 5:2  | 5:3       | 5:3  | 5:3  | 5:3             | 5:4  |
| 672:5                               | 5:4  | 5:5                | 5:5  | 5:5  | 5:5  | 5:6       | 5:6  | 5:6  | 5:6             | 5:7  |
| 672:6                               | 5:7  | 5:8                | 5:8  | 5:8  | 5:8  | 5:9       | 5:9  | 5:9  | 5:9             | 5:10 |
| 672:7                               | 6:0  | 6:1                | 6:1  | 6:1  | 6:1  | 6:2       | 6:2  | 6:2  | 6:2             | 6:3  |
| 672:8                               | 6:4  | 6:4                | 6:4  | 6:4  | 6:4  | 6:5       | 6:5  | 6:5  | 6:5             | 6:6  |
| 672:9                               | 6:7  | 6:7                | 6:7  | 6:7  | 6:7  | 6:8       | 6:8  | 6:8  | 6:8             | 6:9  |
| 673:0                               | 7:1  | 7:1                | 7:1  | 7:1  | 7:1  | 7:2       | 7:2  | 7:2  | 7:2             | 7:3  |
| 673:1                               | 7:5  | 7:5                | 7:5  | 7:5  | 7:5  | 7:6       | 7:6  | 7:6  | 7:6             | 7:7  |
| 673:2                               | 7:9  | 7:9                | 7:9  | 7:9  | 7:9  | 8:0       | 8:0  | 8:0  | 8:0             | 8:1  |
| 673:3                               | 8:3  | 8:3                | 8:3  | 8:3  | 8:3  | 8:4       | 8:4  | 8:4  | 8:4             | 8:5  |
| 673:4                               | 8:7  | 8:7                | 8:7  | 8:7  | 8:7  | 8:8       | 8:8  | 8:8  | 8:8             | 8:9  |
| 673:5                               | 9:1  | 9:1                | 9:1  | 9:1  | 9:1  | 9:2       | 9:2  | 9:2  | 9:2             | 9:3  |
| 673:6                               | 9:5  | 9:5                | 9:5  | 9:5  | 9:5  | 9:6       | 9:6  | 9:6  | 9:6             | 9:7  |
| 673:7                               | 10:0 | 10:0               | 10:0 | 10:0 | 10:0 | 10:1      | 10:1 | 10:1 | 10:1            | 10:2 |
| 673:8                               | 10:5 | 10:5               | 10:5 | 10:5 | 10:5 | 10:6      | 10:6 | 10:6 | 10:6            | 10:7 |
| 673:9                               | 11:0 | 11:0               | 11:0 | 11:0 | 11:0 | 11:1      | 11:1 | 11:1 | 11:1            | 11:2 |
| 674:0                               | 11:5 | 11:5               | 11:5 | 11:5 | 11:5 | 11:6      | 11:6 | 11:6 | 11:6            | 11:7 |
| 674:1                               | 12:0 | 12:0               | 12:0 | 12:0 | 12:0 | 12:1      | 12:1 | 12:1 | 12:1            | 12:2 |
| 674:2                               | 12:4 | 12:4               | 12:4 | 12:4 | 12:4 | 12:5      | 12:5 | 12:5 | 12:5            | 12:6 |
| 674:3                               | 13:0 | 13:0               | 13:0 | 13:0 | 13:0 | 13:1      | 13:1 | 13:1 | 13:1            | 13:2 |
| 674:4                               | 14:0 | 14:0               | 14:0 | 14:0 | 14:0 | 14:1      | 14:1 | 14:1 | 14:1            | 14:2 |
| 674:5                               | 14:7 | 14:7               | 14:7 | 14:7 | 14:7 | 14:8      | 14:8 | 14:8 | 14:8            | 14:9 |
| 674:6                               | 15:4 | 15:4               | 15:4 | 15:4 | 15:4 | 15:5      | 15:5 | 15:5 | 15:5            | 15:6 |
| 674:7                               | 16:3 | 16:3               | 16:3 | 16:3 | 16:3 | 16:4      | 16:4 | 16:4 | 16:4            | 16:5 |
| 674:8                               | 17:1 | 17:1               | 17:1 | 17:1 | 17:1 | 17:2      | 17:2 | 17:2 | 17:2            | 17:3 |
| 674:9                               | 18:0 | 18:0               | 18:0 | 18:0 | 18:0 | 18:1      | 18:1 | 18:1 | 18:1            | 18:2 |
| 675:0                               | 19:0 | 19:0               | 19:0 | 19:0 | 19:0 | 19:1      | 19:1 | 19:1 | 19:1            | 19:2 |
| 675:1                               | 20:0 | 20:0               | 20:0 | 20:0 | 20:0 | 20:1      | 20:1 | 20:1 | 20:1            | 20:2 |
| 675:2                               | 21:0 | 21:0               | 21:0 | 21:0 | 21:0 | 21:1      | 21:1 | 21:1 | 21:1            | 21:2 |
| 675:3                               | 22:0 | 22:0               | 22:0 | 22:0 | 22:0 | 22:1      | 22:1 | 22:1 | 22:1            | 22:2 |
| 675:4                               | 23:1 | 23:1               | 23:1 | 23:1 | 23:1 | 23:2      | 23:2 | 23:2 | 23:2            | 23:3 |
| 675:5                               | 24:2 | 24:2               | 24:2 | 24:2 | 24:2 | 24:3      | 24:3 | 24:3 | 24:3            | 24:4 |
| 675:6                               | 25:4 | 25:4               | 25:4 | 25:4 | 25:4 | 25:5      | 25:5 | 25:5 | 25:5            | 25:6 |
| 675:7                               | 26:0 | 26:0               | 26:0 | 26:0 | 26:0 | 26:1      | 26:1 | 26:1 | 26:1            | 26:2 |
| 675:8                               | 27:0 | 27:0               | 27:0 | 27:0 | 27:0 | 27:1      | 27:1 | 27:1 | 27:1            | 27:2 |
| 675:9                               | 28:1 | 28:1               | 28:1 | 28:1 | 28:1 | 28:2      | 28:2 | 28:2 | 28:2            | 28:3 |

SEPULVEDA DAM  
SURVEYED DEC 1980

| ELEV  | 0     | .01   | .02   | .03   | .04   | .05   | ELEV (FT) | VS    | STORAGE (AC-FT) |
|-------|-------|-------|-------|-------|-------|-------|-----------|-------|-----------------|
| 676.0 | 29.3  | 29.4  | 29.5  | 29.7  | 29.8  | 29.9  | 30.1      | 30.2  | 30.3            |
| 676.1 | 30.6  | 30.7  | 30.9  | 31.0  | 31.2  | 31.3  | 31.4      | 31.6  | 31.7            |
| 676.2 | 32.0  | 32.2  | 32.3  | 32.4  | 32.6  | 32.7  | 32.9      | 33.0  | 33.1            |
| 676.3 | 33.5  | 33.6  | 33.8  | 33.9  | 34.1  | 34.2  | 34.4      | 34.5  | 34.6            |
| 676.4 | 35.0  | 35.1  | 35.3  | 35.4  | 35.6  | 35.7  | 35.9      | 36.0  | 36.1            |
| 676.5 | 36.5  | 36.7  | 36.8  | 37.0  | 37.2  | 37.3  | 37.5      | 37.6  | 37.8            |
| 676.6 | 38.1  | 38.3  | 38.5  | 38.6  | 38.8  | 39.0  | 39.1      | 39.3  | 39.4            |
| 676.7 | 39.9  | 39.9  | 40.1  | 40.3  | 40.4  | 40.6  | 40.8      | 41.0  | 41.1            |
| 676.8 | 41.5  | 41.6  | 41.8  | 42.0  | 42.2  | 42.3  | 42.5      | 42.7  | 42.8            |
| 676.9 | 43.2  | 43.4  | 43.6  | 43.7  | 43.9  | 44.1  | 44.3      | 44.5  | 44.6            |
| 677.0 | 45.0  | 45.2  | 45.4  | 45.6  | 45.7  | 45.9  | 46.1      | 46.3  | 46.5            |
| 677.1 | 46.7  | 47.0  | 47.2  | 47.4  | 47.5  | 47.7  | 47.9      | 48.1  | 48.3            |
| 677.2 | 48.7  | 48.9  | 49.1  | 49.3  | 49.5  | 49.7  | 49.9      | 50.1  | 50.3            |
| 677.3 | 50.7  | 50.9  | 51.1  | 51.3  | 51.5  | 51.7  | 51.9      | 52.1  | 52.3            |
| 677.4 | 52.7  | 52.9  | 53.1  | 53.3  | 53.5  | 53.7  | 53.9      | 54.1  | 54.3            |
| 677.5 | 54.7  | 54.9  | 55.1  | 55.3  | 55.5  | 55.7  | 55.9      | 56.1  | 56.3            |
| 677.6 | 56.8  | 57.0  | 57.2  | 57.4  | 57.6  | 57.8  | 58.0      | 58.2  | 58.4            |
| 677.7 | 58.1  | 58.3  | 58.5  | 58.7  | 58.9  | 59.1  | 59.3      | 59.5  | 59.7            |
| 677.8 | 61.3  | 61.5  | 61.7  | 61.9  | 62.1  | 62.3  | 62.5      | 62.7  | 62.9            |
| 677.9 | 63.5  | 63.7  | 63.9  | 64.0  | 64.2  | 64.4  | 64.6      | 64.8  | 65.0            |
| 678.0 | 65.6  | 65.8  | 66.0  | 66.3  | 66.5  | 66.7  | 66.9      | 67.1  | 67.3            |
| 678.1 | 67.9  | 68.1  | 68.4  | 68.6  | 68.8  | 69.1  | 69.3      | 69.5  | 69.7            |
| 678.2 | 70.3  | 70.6  | 70.8  | 71.1  | 71.3  | 71.6  | 71.8      | 72.1  | 72.3            |
| 678.3 | 72.5  | 72.8  | 73.0  | 73.3  | 73.5  | 73.8  | 74.1      | 74.3  | 74.6            |
| 678.4 | 75.5  | 75.8  | 76.0  | 76.3  | 76.5  | 76.8  | 77.1      | 77.3  | 77.6            |
| 678.5 | 78.2  | 78.5  | 78.8  | 79.0  | 79.3  | 79.6  | 79.9      | 80.2  | 80.5            |
| 678.6 | 81.0  | 81.3  | 81.6  | 81.9  | 82.2  | 82.5  | 82.8      | 83.1  | 83.4            |
| 678.7 | 83.9  | 84.2  | 84.5  | 84.8  | 85.1  | 85.4  | 85.7      | 86.0  | 86.3            |
| 678.8 | 86.9  | 87.2  | 87.5  | 87.8  | 88.1  | 88.4  | 88.7      | 89.0  | 89.3            |
| 678.9 | 90.0  | 90.3  | 90.7  | 91.0  | 91.3  | 91.6  | 91.9      | 92.2  | 92.5            |
| 679.0 | 93.2  | 93.5  | 93.9  | 94.2  | 94.5  | 94.8  | 95.1      | 95.4  | 95.7            |
| 679.1 | 96.5  | 96.8  | 97.2  | 97.5  | 97.8  | 98.1  | 98.4      | 98.7  | 99.0            |
| 679.2 | 99.9  | 100.2 | 100.6 | 100.9 | 101.3 | 101.6 | 101.9     | 102.2 | 102.5           |
| 679.3 | 103.4 | 103.7 | 104.1 | 104.4 | 104.8 | 105.1 | 105.4     | 105.7 | 106.0           |
| 679.4 | 106.9 | 107.3 | 107.6 | 108.0 | 108.4 | 108.7 | 109.1     | 109.4 | 109.7           |
| 679.5 | 110.4 | 110.7 | 111.1 | 111.5 | 111.9 | 112.3 | 112.6     | 112.9 | 113.2           |
| 679.6 | 114.3 | 114.6 | 115.0 | 115.4 | 115.8 | 116.2 | 116.5     | 116.9 | 117.2           |
| 679.7 | 118.2 | 118.5 | 118.9 | 119.3 | 119.7 | 120.1 | 120.4     | 120.8 | 121.1           |
| 679.8 | 122.1 | 122.4 | 122.8 | 123.2 | 123.6 | 124.0 | 124.3     | 124.7 | 125.0           |
| 679.9 | 126.0 | 126.3 | 126.7 | 127.1 | 127.5 | 127.8 | 128.2     | 128.5 | 128.9           |

| SELPULVEDA DAM<br>SURVEYED DEC 1960 |       | CORPS OF ENGINEERS |       |       |       |       | ELEV (FT) | VS    | STORAGE (AC-FT) |
|-------------------------------------|-------|--------------------|-------|-------|-------|-------|-----------|-------|-----------------|
| ELEV                                | 0     | 01                 | 02    | 03    | 04    | 05    | 06        | 07    | 08              |
| 680.0                               | 130.3 | 130.7              | 131.1 | 131.6 | 132.0 | 132.4 | 132.8     | 133.3 | 133.7           |
| 680.1                               | 134.5 | 135.0              | 135.4 | 135.8 | 136.3 | 136.7 | 137.1     | 137.6 | 138.0           |
| 680.2                               | 138.9 | 139.3              | 139.7 | 140.2 | 140.7 | 141.1 | 141.6     | 142.0 | 142.5           |
| 680.3                               | 143.4 | 143.8              | 144.2 | 144.6 | 145.0 | 145.4 | 145.8     | 146.3 | 146.7           |
| 680.4                               | 148.0 | 148.5              | 148.9 | 149.4 | 149.9 | 150.4 | 150.8     | 151.3 | 151.8           |
| 680.5                               | 152.7 | 153.2              | 153.7 | 154.2 | 154.7 | 155.2 | 155.6     | 156.1 | 156.6           |
| 680.6                               | 157.6 | 158.1              | 158.6 | 159.1 | 159.6 | 160.1 | 160.6     | 161.1 | 161.6           |
| 680.7                               | 162.6 | 163.1              | 163.6 | 164.1 | 164.6 | 165.1 | 165.6     | 166.1 | 166.6           |
| 680.8                               | 167.7 | 168.2              | 168.7 | 169.2 | 169.7 | 170.2 | 170.7     | 171.2 | 171.7           |
| 680.9                               | 172.9 | 173.4              | 174.0 | 174.5 | 175.0 | 175.6 | 176.1     | 176.6 | 177.2           |
| 681.0                               | 178.3 | 178.8              | 179.4 | 179.9 | 180.4 | 181.0 | 181.5     | 182.1 | 182.6           |
| 681.1                               | 183.7 | 184.3              | 184.9 | 185.4 | 186.0 | 186.5 | 187.1     | 187.7 | 188.2           |
| 681.2                               | 189.3 | 189.9              | 190.5 | 191.0 | 191.6 | 192.2 | 192.8     | 193.3 | 193.9           |
| 681.3                               | 195.1 | 195.6              | 196.2 | 196.8 | 197.4 | 198.0 | 198.6     | 199.1 | 199.7           |
| 681.4                               | 200.9 | 201.5              | 202.1 | 202.7 | 203.3 | 203.9 | 204.5     | 205.1 | 205.7           |
| 681.5                               | 206.9 | 207.5              | 208.1 | 208.7 | 209.3 | 209.9 | 210.5     | 211.1 | 211.7           |
| 681.6                               | 213.0 | 213.6              | 214.2 | 214.8 | 215.4 | 216.0 | 216.6     | 217.2 | 217.8           |
| 681.7                               | 219.5 | 219.9              | 220.6 | 221.1 | 221.7 | 222.3 | 222.9     | 223.5 | 224.1           |
| 681.8                               | 223.2 | 223.5              | 223.9 | 224.4 | 224.9 | 225.3 | 225.8     | 226.3 | 226.8           |
| 681.9                               | 227.0 | 227.3              | 227.7 | 228.1 | 228.5 | 229.0 | 229.4     | 229.9 | 230.3           |
| 682.0                               | 230.6 | 230.9              | 231.3 | 231.7 | 232.1 | 232.5 | 232.9     | 233.3 | 233.7           |
| 682.1                               | 234.5 | 234.8              | 235.2 | 235.6 | 236.0 | 236.4 | 236.8     | 237.2 | 237.6           |
| 682.2                               | 238.3 | 238.6              | 239.0 | 239.4 | 239.8 | 240.2 | 240.6     | 241.0 | 241.4           |
| 682.3                               | 242.1 | 242.4              | 242.8 | 243.2 | 243.6 | 244.0 | 244.4     | 244.8 | 245.2           |
| 682.4                               | 245.9 | 246.2              | 246.6 | 247.0 | 247.4 | 247.8 | 248.2     | 248.6 | 249.0           |
| 682.5                               | 249.7 | 249.9              | 250.3 | 250.7 | 251.1 | 251.5 | 251.9     | 252.3 | 252.7           |
| 682.6                               | 253.4 | 253.7              | 254.1 | 254.5 | 254.9 | 255.3 | 255.7     | 256.1 | 256.5           |
| 682.7                               | 257.1 | 257.4              | 257.8 | 258.2 | 258.6 | 259.0 | 259.4     | 259.8 | 260.2           |
| 682.8                               | 260.9 | 261.2              | 261.6 | 262.0 | 262.4 | 262.8 | 263.2     | 263.6 | 264.0           |
| 682.9                               | 264.7 | 265.0              | 265.4 | 265.8 | 266.2 | 266.6 | 267.0     | 267.4 | 267.8           |
| 683.0                               | 269.5 | 269.8              | 270.2 | 270.6 | 271.0 | 271.4 | 271.8     | 272.2 | 272.6           |
| 683.1                               | 273.2 | 273.5              | 273.9 | 274.3 | 274.7 | 275.1 | 275.5     | 275.9 | 276.3           |
| 683.2                               | 277.9 | 278.2              | 278.6 | 279.0 | 279.4 | 279.8 | 280.2     | 280.6 | 281.0           |
| 683.3                               | 282.7 | 283.0              | 283.4 | 283.8 | 284.2 | 284.6 | 285.0     | 285.4 | 285.8           |
| 683.4                               | 289.5 | 289.8              | 290.2 | 290.6 | 291.0 | 291.4 | 291.8     | 292.2 | 292.6           |
| 683.5                               | 294.3 | 294.6              | 295.0 | 295.4 | 295.8 | 296.2 | 296.6     | 297.0 | 297.4           |
| 683.6                               | 299.1 | 299.4              | 299.8 | 300.2 | 300.6 | 301.0 | 301.4     | 301.8 | 302.2           |
| 683.7                               | 303.9 | 304.2              | 304.6 | 305.0 | 305.4 | 305.8 | 306.2     | 306.6 | 307.0           |
| 683.8                               | 308.7 | 309.0              | 309.4 | 309.8 | 310.2 | 310.6 | 311.0     | 311.4 | 311.8           |
| 683.9                               | 314.5 | 314.8              | 315.2 | 315.6 | 316.0 | 316.4 | 316.8     | 317.2 | 317.6           |
| 684.0                               | 320.3 | 320.6              | 321.0 | 321.4 | 321.8 | 322.2 | 322.6     | 323.0 | 323.4           |
| 684.1                               | 326.1 | 326.4              | 326.8 | 327.2 | 327.6 | 328.0 | 328.4     | 328.8 | 329.2           |
| 684.2                               | 331.9 | 332.2              | 332.6 | 333.0 | 333.4 | 333.8 | 334.2     | 334.6 | 335.0           |
| 684.3                               | 339.7 | 339.9              | 340.3 | 340.7 | 341.1 | 341.5 | 341.9     | 342.3 | 342.7           |
| 684.4                               | 344.5 | 344.8              | 345.2 | 345.6 | 346.0 | 346.4 | 346.8     | 347.2 | 347.6           |
| 684.5                               | 350.3 | 350.6              | 351.0 | 351.4 | 351.8 | 352.2 | 352.6     | 353.0 | 353.4           |
| 684.6                               | 356.1 | 356.4              | 356.8 | 357.2 | 357.6 | 358.0 | 358.4     | 358.8 | 359.2           |
| 684.7                               | 361.9 | 362.2              | 362.6 | 363.0 | 363.4 | 363.8 | 364.2     | 364.6 | 365.0           |
| 684.8                               | 367.7 | 368.0              | 368.4 | 368.8 | 369.2 | 369.6 | 370.0     | 370.4 | 370.8           |
| 684.9                               | 373.5 | 373.8              | 374.2 | 374.6 | 375.0 | 375.4 | 375.8     | 376.2 | 376.6           |
| 685.0                               | 381.3 | 381.6              | 382.0 | 382.4 | 382.8 | 383.2 | 383.6     | 384.0 | 384.4           |
| 685.1                               | 387.1 | 387.4              | 387.8 | 388.2 | 388.6 | 389.0 | 389.4     | 389.8 | 390.2           |
| 685.2                               | 392.9 | 393.2              | 393.6 | 394.0 | 394.4 | 394.8 | 395.2     | 395.6 | 396.0           |
| 685.3                               | 398.7 | 399.0              | 399.4 | 399.8 | 400.2 | 400.6 | 401.0     | 401.4 | 401.8           |

SEPULVEDA DAM  
SURVEYED DEC 1940

| ELEV  | CORPS OF ENGINEERS |        |        |        |        |        |        |        |        |        | ELEV (FT) | VS | STORAGE (AC-FT) |  |
|-------|--------------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|-----------|----|-----------------|--|
|       | 0                  | .01    | .02    | .03    | .04    | .05    | .06    | .07    | .08    | .09    |           |    |                 |  |
| 684.0 | 410.6              | 411.6  | 412.7  | 413.8  | 414.8  | 415.9  | 417.0  | 418.1  | 419.1  | 420.2  |           |    |                 |  |
| 684.1 | 421.3              | 422.4  | 423.5  | 424.6  | 425.7  | 426.8  | 427.9  | 429.0  | 430.1  | 431.2  |           |    |                 |  |
| 684.2 | 431.3              | 432.4  | 433.5  | 434.6  | 435.7  | 436.8  | 437.9  | 439.0  | 440.1  | 441.2  |           |    |                 |  |
| 684.3 | 442.4              | 443.5  | 444.6  | 445.7  | 446.8  | 447.9  | 449.0  | 450.1  | 451.2  | 452.3  |           |    |                 |  |
| 684.4 | 452.5              | 453.6  | 454.7  | 455.8  | 456.9  | 458.0  | 459.1  | 460.2  | 461.3  | 462.4  |           |    |                 |  |
| 684.5 | 467.9              | 469.1  | 470.4  | 471.6  | 472.9  | 474.1  | 475.4  | 476.6  | 477.9  | 479.2  |           |    |                 |  |
| 684.6 | 480.4              | 481.7  | 483.0  | 484.3  | 485.5  | 486.8  | 488.1  | 489.4  | 490.7  | 492.0  |           |    |                 |  |
| 684.7 | 493.3              | 494.6  | 496.0  | 497.3  | 498.6  | 499.9  | 501.3  | 502.6  | 503.9  | 505.3  |           |    |                 |  |
| 684.8 | 506.6              | 507.9  | 509.3  | 510.7  | 512.0  | 513.4  | 514.7  | 516.1  | 517.5  | 518.8  |           |    |                 |  |
| 684.9 | 520.2              | 521.6  | 523.0  | 524.4  | 525.8  | 527.2  | 528.6  | 530.0  | 531.4  | 532.8  |           |    |                 |  |
| 685.0 | 534.2              | 535.7  | 537.1  | 538.5  | 539.9  | 541.4  | 542.8  | 544.2  | 545.7  | 547.1  |           |    |                 |  |
| 685.1 | 546.6              | 548.1  | 550.0  | 551.4  | 552.9  | 554.3  | 555.8  | 557.3  | 558.7  | 560.2  |           |    |                 |  |
| 685.2 | 553.3              | 554.8  | 556.3  | 557.8  | 559.3  | 560.8  | 562.3  | 563.8  | 565.3  | 566.8  |           |    |                 |  |
| 685.3 | 567.4              | 568.9  | 570.0  | 571.6  | 573.0  | 574.5  | 576.0  | 577.5  | 579.0  | 580.5  |           |    |                 |  |
| 685.4 | 583.9              | 585.4  | 587.0  | 588.6  | 590.1  | 591.7  | 593.3  | 594.9  | 596.5  | 598.1  |           |    |                 |  |
| 685.5 | 609.7              | 611.3  | 612.9  | 614.5  | 616.1  | 617.7  | 619.3  | 621.0  | 622.6  | 624.2  |           |    |                 |  |
| 685.6 | 625.6              | 627.2  | 628.8  | 630.4  | 632.0  | 633.6  | 635.2  | 636.8  | 638.4  | 640.0  |           |    |                 |  |
| 685.7 | 645.3              | 646.9  | 648.5  | 650.1  | 651.7  | 653.3  | 654.9  | 656.5  | 658.1  | 659.7  |           |    |                 |  |
| 685.8 | 656.5              | 658.1  | 660.0  | 661.8  | 663.6  | 665.4  | 667.1  | 668.9  | 670.7  | 672.4  |           |    |                 |  |
| 685.9 | 676.5              | 678.3  | 680.0  | 681.8  | 683.6  | 685.4  | 687.1  | 688.9  | 690.7  | 692.4  |           |    |                 |  |
| 686.0 | 694.2              | 696.0  | 697.7  | 699.5  | 701.3  | 703.1  | 704.9  | 706.7  | 708.5  | 710.3  |           |    |                 |  |
| 686.1 | 712.1              | 713.9  | 715.6  | 717.4  | 719.2  | 721.0  | 722.8  | 724.6  | 726.4  | 728.2  |           |    |                 |  |
| 686.2 | 730.4              | 732.2  | 734.1  | 735.9  | 737.8  | 739.6  | 741.5  | 743.3  | 745.2  | 747.1  |           |    |                 |  |
| 686.3 | 749.0              | 750.7  | 752.6  | 754.5  | 756.4  | 758.3  | 760.2  | 762.1  | 764.0  | 765.9  |           |    |                 |  |
| 686.4 | 767.8              | 769.7  | 771.6  | 773.5  | 775.4  | 777.3  | 779.2  | 781.1  | 783.0  | 784.9  |           |    |                 |  |
| 686.5 | 787.0              | 788.9  | 790.9  | 792.8  | 794.7  | 796.7  | 798.6  | 800.6  | 802.5  | 804.5  |           |    |                 |  |
| 686.6 | 806.5              | 808.4  | 810.4  | 812.3  | 814.3  | 816.2  | 818.2  | 820.1  | 822.1  | 824.0  |           |    |                 |  |
| 686.7 | 826.0              | 827.9  | 829.9  | 831.8  | 833.8  | 835.7  | 837.7  | 839.6  | 841.6  | 843.5  |           |    |                 |  |
| 686.8 | 846.7              | 848.6  | 850.6  | 852.5  | 854.5  | 856.4  | 858.4  | 860.3  | 862.3  | 864.2  |           |    |                 |  |
| 686.9 | 866.7              | 868.6  | 870.6  | 872.5  | 874.5  | 876.4  | 878.4  | 880.3  | 882.3  | 884.2  |           |    |                 |  |
| 687.0 | 887.4              | 889.3  | 891.3  | 893.2  | 895.2  | 897.1  | 899.1  | 901.0  | 902.9  | 904.9  |           |    |                 |  |
| 687.1 | 907.4              | 909.3  | 911.3  | 913.2  | 915.2  | 917.1  | 919.1  | 921.0  | 922.9  | 924.9  |           |    |                 |  |
| 687.2 | 929.7              | 931.6  | 933.6  | 935.5  | 937.5  | 939.4  | 941.4  | 943.3  | 945.3  | 947.2  |           |    |                 |  |
| 687.3 | 951.3              | 953.2  | 955.2  | 957.1  | 959.1  | 961.0  | 962.9  | 964.9  | 966.8  | 968.8  |           |    |                 |  |
| 687.4 | 973.2              | 975.1  | 977.1  | 979.0  | 981.0  | 982.9  | 984.9  | 986.8  | 988.8  | 990.7  |           |    |                 |  |
| 687.5 | 997.4              | 999.3  | 1001.3 | 1003.2 | 1005.2 | 1007.1 | 1009.1 | 1011.0 | 1013.0 | 1014.9 |           |    |                 |  |
| 687.6 | 1017.9             | 1019.8 | 1021.8 | 1023.7 | 1025.7 | 1027.6 | 1029.6 | 1031.5 | 1033.5 | 1035.4 |           |    |                 |  |
| 687.7 | 1040.0             | 1041.9 | 1043.9 | 1045.8 | 1047.8 | 1049.7 | 1051.7 | 1053.6 | 1055.6 | 1057.5 |           |    |                 |  |
| 687.8 | 1063.2             | 1065.1 | 1067.1 | 1069.0 | 1071.0 | 1072.9 | 1074.9 | 1076.8 | 1078.8 | 1080.7 |           |    |                 |  |
| 687.9 | 1087.2             | 1089.1 | 1091.1 | 1093.0 | 1095.0 | 1096.9 | 1098.9 | 1100.8 | 1102.8 | 1104.7 |           |    |                 |  |

SEPULVEDA DAM  
SURVEYED DEC 1980

| ELEV  | CORPS OF ENGINEERS |        |        |        |        |        |        |        |        |        | VS | STORAGF (AC-FT) | (AC-FT) |
|-------|--------------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|----|-----------------|---------|
|       | 0                  | 01     | 02     | 03     | 04     | 05     | 06     | 07     | 08     | 09     |    |                 |         |
| 688.0 | 1110.9             | 1113.3 | 1115.7 | 1118.1 | 1120.5 | 1122.9 | 1125.3 | 1127.7 | 1130.1 | 1132.5 |    |                 |         |
| 688.1 | 1115.0             | 1117.4 | 1119.8 | 1122.2 | 1124.6 | 1127.0 | 1129.4 | 1131.8 | 1134.2 | 1136.6 |    |                 |         |
| 688.2 | 1119.1             | 1121.5 | 1123.9 | 1126.3 | 1128.7 | 1131.1 | 1133.5 | 1135.9 | 1138.3 | 1140.7 |    |                 |         |
| 688.3 | 1123.2             | 1125.6 | 1128.0 | 1130.4 | 1132.8 | 1135.2 | 1137.6 | 1140.0 | 1142.4 | 1144.8 |    |                 |         |
| 688.4 | 1127.3             | 1129.7 | 1132.1 | 1134.5 | 1136.9 | 1139.3 | 1141.7 | 1144.1 | 1146.5 | 1148.9 |    |                 |         |
| 688.5 | 1131.4             | 1133.8 | 1136.2 | 1138.6 | 1141.0 | 1143.4 | 1145.8 | 1148.2 | 1150.6 | 1153.0 |    |                 |         |
| 688.6 | 1135.5             | 1137.9 | 1140.3 | 1142.7 | 1145.1 | 1147.5 | 1149.9 | 1152.3 | 1154.7 | 1157.1 |    |                 |         |
| 688.7 | 1139.6             | 1142.0 | 1144.4 | 1146.8 | 1149.2 | 1151.6 | 1154.0 | 1156.4 | 1158.8 | 1161.2 |    |                 |         |
| 688.8 | 1143.7             | 1146.1 | 1148.5 | 1150.9 | 1153.3 | 1155.7 | 1158.1 | 1160.5 | 1162.9 | 1165.3 |    |                 |         |
| 688.9 | 1147.8             | 1150.2 | 1152.6 | 1155.0 | 1157.4 | 1159.8 | 1162.2 | 1164.6 | 1167.0 | 1169.4 |    |                 |         |
| 689.0 | 1151.9             | 1154.3 | 1156.7 | 1159.1 | 1161.5 | 1163.9 | 1166.3 | 1168.7 | 1171.1 | 1173.5 |    |                 |         |
| 689.1 | 1156.0             | 1158.4 | 1160.8 | 1163.2 | 1165.6 | 1168.0 | 1170.4 | 1172.8 | 1175.2 | 1177.6 |    |                 |         |
| 689.2 | 1160.1             | 1162.5 | 1164.9 | 1167.3 | 1169.7 | 1172.1 | 1174.5 | 1176.9 | 1179.3 | 1181.7 |    |                 |         |
| 689.3 | 1164.2             | 1166.6 | 1169.0 | 1171.4 | 1173.8 | 1176.2 | 1178.6 | 1181.0 | 1183.4 | 1185.8 |    |                 |         |
| 689.4 | 1168.3             | 1170.7 | 1173.1 | 1175.5 | 1177.9 | 1180.3 | 1182.7 | 1185.1 | 1187.5 | 1189.9 |    |                 |         |
| 689.5 | 1172.4             | 1174.8 | 1177.2 | 1179.6 | 1182.0 | 1184.4 | 1186.8 | 1189.2 | 1191.6 | 1194.0 |    |                 |         |
| 689.6 | 1176.5             | 1178.9 | 1181.3 | 1183.7 | 1186.1 | 1188.5 | 1190.9 | 1193.3 | 1195.7 | 1198.1 |    |                 |         |
| 689.7 | 1180.6             | 1183.0 | 1185.4 | 1187.8 | 1190.2 | 1192.6 | 1195.0 | 1197.4 | 1199.8 | 1202.2 |    |                 |         |
| 689.8 | 1184.7             | 1187.1 | 1189.5 | 1191.9 | 1194.3 | 1196.7 | 1199.1 | 1201.5 | 1203.9 | 1206.3 |    |                 |         |
| 689.9 | 1188.8             | 1191.2 | 1193.6 | 1196.0 | 1198.4 | 1200.8 | 1203.2 | 1205.6 | 1208.0 | 1210.4 |    |                 |         |
| 690.0 | 1192.9             | 1195.3 | 1197.7 | 1200.1 | 1202.5 | 1204.9 | 1207.3 | 1209.7 | 1212.1 | 1214.5 |    |                 |         |
| 690.1 | 1197.0             | 1199.4 | 1201.8 | 1204.2 | 1206.6 | 1209.0 | 1211.4 | 1213.8 | 1216.2 | 1218.6 |    |                 |         |
| 690.2 | 1201.1             | 1203.5 | 1205.9 | 1208.3 | 1210.7 | 1213.1 | 1215.5 | 1217.9 | 1220.3 | 1222.7 |    |                 |         |
| 690.3 | 1205.2             | 1207.6 | 1210.0 | 1212.4 | 1214.8 | 1217.2 | 1219.6 | 1222.0 | 1224.4 | 1226.8 |    |                 |         |
| 690.4 | 1209.3             | 1211.7 | 1214.1 | 1216.5 | 1218.9 | 1221.3 | 1223.7 | 1226.1 | 1228.5 | 1230.9 |    |                 |         |
| 690.5 | 1213.4             | 1215.8 | 1218.2 | 1220.6 | 1223.0 | 1225.4 | 1227.8 | 1230.2 | 1232.6 | 1235.0 |    |                 |         |
| 690.6 | 1217.5             | 1219.9 | 1222.3 | 1224.7 | 1227.1 | 1229.5 | 1231.9 | 1234.3 | 1236.7 | 1239.1 |    |                 |         |
| 690.7 | 1221.6             | 1224.0 | 1226.4 | 1228.8 | 1231.2 | 1233.6 | 1236.0 | 1238.4 | 1240.8 | 1243.2 |    |                 |         |
| 690.8 | 1225.7             | 1228.1 | 1230.5 | 1232.9 | 1235.3 | 1237.7 | 1240.1 | 1242.5 | 1244.9 | 1247.3 |    |                 |         |
| 690.9 | 1229.8             | 1232.2 | 1234.6 | 1237.0 | 1239.4 | 1241.8 | 1244.2 | 1246.6 | 1249.0 | 1251.4 |    |                 |         |
| 691.0 | 1233.9             | 1236.3 | 1238.7 | 1241.1 | 1243.5 | 1245.9 | 1248.3 | 1250.7 | 1253.1 | 1255.5 |    |                 |         |
| 691.1 | 1238.0             | 1240.4 | 1242.8 | 1245.2 | 1247.6 | 1250.0 | 1252.4 | 1254.8 | 1257.2 | 1259.6 |    |                 |         |
| 691.2 | 1242.1             | 1244.5 | 1246.9 | 1249.3 | 1251.7 | 1254.1 | 1256.5 | 1258.9 | 1261.3 | 1263.7 |    |                 |         |
| 691.3 | 1246.2             | 1248.6 | 1251.0 | 1253.4 | 1255.8 | 1258.2 | 1260.6 | 1263.0 | 1265.4 | 1267.8 |    |                 |         |
| 691.4 | 1250.3             | 1252.7 | 1255.1 | 1257.5 | 1259.9 | 1262.3 | 1264.7 | 1267.1 | 1269.5 | 1271.9 |    |                 |         |
| 691.5 | 1254.4             | 1256.8 | 1259.2 | 1261.6 | 1264.0 | 1266.4 | 1268.8 | 1271.2 | 1273.6 | 1276.0 |    |                 |         |
| 691.6 | 1258.5             | 1260.9 | 1263.3 | 1265.7 | 1268.1 | 1270.5 | 1272.9 | 1275.3 | 1277.7 | 1280.1 |    |                 |         |
| 691.7 | 1262.6             | 1265.0 | 1267.4 | 1269.8 | 1272.2 | 1274.6 | 1277.0 | 1279.4 | 1281.8 | 1284.2 |    |                 |         |
| 691.8 | 1266.7             | 1269.1 | 1271.5 | 1273.9 | 1276.3 | 1278.7 | 1281.1 | 1283.5 | 1285.9 | 1288.3 |    |                 |         |
| 691.9 | 1270.8             | 1273.2 | 1275.6 | 1278.0 | 1280.4 | 1282.8 | 1285.2 | 1287.6 | 1290.0 | 1292.4 |    |                 |         |

SEPULVEDA DAM  
SURVEYED DEC 1980

| ELEV  | 0      | 01     | 02     | 03     | 04     | 05     | 06     | 07     | 08     | 09     |
|-------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 692.0 | 2359.5 | 2363.4 | 2367.3 | 2371.2 | 2375.2 | 2379.1 | 2383.0 | 2386.9 | 2390.9 | 2394.8 |
| 692.1 | 2398.6 | 2402.7 | 2406.6 | 2410.6 | 2414.6 | 2418.6 | 2422.5 | 2426.5 | 2430.5 | 2434.5 |
| 692.2 | 2438.5 | 2442.4 | 2446.4 | 2450.4 | 2454.4 | 2458.4 | 2462.3 | 2466.3 | 2470.3 | 2474.3 |
| 692.3 | 2518.9 | 2523.0 | 2527.0 | 2531.1 | 2535.2 | 2539.2 | 2543.3 | 2547.4 | 2551.5 | 2555.6 |
| 692.4 | 2559.7 | 2563.8 | 2567.9 | 2572.0 | 2576.1 | 2580.2 | 2584.3 | 2588.4 | 2592.5 | 2596.7 |
| 692.5 | 2600.3 | 2604.4 | 2608.5 | 2612.6 | 2616.7 | 2620.8 | 2624.9 | 2629.0 | 2633.1 | 2637.2 |
| 692.6 | 2642.2 | 2646.3 | 2650.4 | 2654.5 | 2658.6 | 2662.7 | 2666.8 | 2670.9 | 2675.0 | 2679.1 |
| 692.7 | 2684.4 | 2688.5 | 2692.6 | 2696.7 | 2700.8 | 2704.9 | 2709.0 | 2713.1 | 2717.2 | 2721.3 |
| 692.8 | 2726.4 | 2730.7 | 2734.9 | 2739.2 | 2743.3 | 2747.7 | 2751.9 | 2756.2 | 2760.5 | 2764.7 |
| 692.9 | 2769.0 | 2773.3 | 2777.6 | 2781.9 | 2786.2 | 2790.5 | 2794.7 | 2799.1 | 2803.4 | 2807.7 |
| 693.0 | 2812.3 | 2816.7 | 2821.0 | 2825.4 | 2829.7 | 2834.1 | 2838.5 | 2842.9 | 2847.3 | 2851.6 |
| 693.1 | 2855.3 | 2859.7 | 2864.0 | 2868.4 | 2872.7 | 2877.1 | 2881.5 | 2885.9 | 2890.3 | 2894.6 |
| 693.2 | 2899.0 | 2903.4 | 2907.7 | 2912.2 | 2916.6 | 2921.0 | 2925.4 | 2929.8 | 2934.2 | 2938.6 |
| 693.3 | 2943.1 | 2947.5 | 2951.9 | 2956.3 | 2960.7 | 2965.1 | 2969.5 | 2973.9 | 2978.3 | 2982.7 |
| 693.4 | 2987.5 | 2991.9 | 2996.3 | 3000.7 | 3005.1 | 3009.5 | 3013.9 | 3018.3 | 3022.7 | 3027.1 |
| 693.5 | 3032.0 | 3036.4 | 3040.8 | 3045.2 | 3049.6 | 3054.0 | 3058.4 | 3062.8 | 3067.2 | 3071.6 |
| 693.6 | 3077.0 | 3081.4 | 3085.8 | 3090.2 | 3094.6 | 3099.0 | 3103.4 | 3107.8 | 3112.2 | 3116.6 |
| 693.7 | 3123.0 | 3127.4 | 3131.8 | 3136.2 | 3140.6 | 3145.0 | 3149.4 | 3153.8 | 3158.2 | 3162.6 |
| 693.8 | 3168.0 | 3172.4 | 3176.8 | 3181.2 | 3185.6 | 3190.0 | 3194.4 | 3198.8 | 3203.2 | 3207.6 |
| 693.9 | 3215.1 | 3219.5 | 3223.9 | 3228.3 | 3232.7 | 3237.1 | 3241.5 | 3245.9 | 3250.3 | 3254.7 |
| 694.0 | 3260.1 | 3264.5 | 3268.9 | 3273.3 | 3277.7 | 3282.1 | 3286.5 | 3290.9 | 3295.3 | 3299.7 |
| 694.1 | 3304.1 | 3308.5 | 3312.9 | 3317.3 | 3321.7 | 3326.1 | 3330.5 | 3334.9 | 3339.3 | 3343.7 |
| 694.2 | 3356.4 | 3360.8 | 3365.2 | 3369.6 | 3374.0 | 3378.4 | 3382.8 | 3387.2 | 3391.6 | 3396.0 |
| 694.3 | 3404.3 | 3408.7 | 3413.1 | 3417.5 | 3421.9 | 3426.3 | 3430.7 | 3435.1 | 3439.5 | 3443.9 |
| 694.4 | 3452.8 | 3457.2 | 3461.6 | 3466.0 | 3470.4 | 3474.8 | 3479.2 | 3483.6 | 3488.0 | 3492.4 |
| 694.5 | 3501.6 | 3506.0 | 3510.4 | 3514.8 | 3519.2 | 3523.6 | 3528.0 | 3532.4 | 3536.8 | 3541.2 |
| 694.6 | 3550.7 | 3555.1 | 3559.5 | 3563.9 | 3568.3 | 3572.7 | 3577.1 | 3581.5 | 3585.9 | 3590.3 |
| 694.7 | 3600.7 | 3605.1 | 3609.5 | 3613.9 | 3618.3 | 3622.7 | 3627.1 | 3631.5 | 3635.9 | 3640.3 |
| 694.8 | 3650.8 | 3655.2 | 3659.6 | 3664.0 | 3668.4 | 3672.8 | 3677.2 | 3681.6 | 3686.0 | 3690.4 |
| 694.9 | 3701.4 | 3705.8 | 3710.2 | 3714.6 | 3719.0 | 3723.4 | 3727.8 | 3732.2 | 3736.6 | 3741.0 |
| 695.0 | 3752.5 | 3756.9 | 3761.3 | 3765.7 | 3770.1 | 3774.5 | 3778.9 | 3783.3 | 3787.7 | 3792.1 |
| 695.1 | 3804.0 | 3808.4 | 3812.8 | 3817.2 | 3821.6 | 3826.0 | 3830.4 | 3834.8 | 3839.2 | 3843.6 |
| 695.2 | 3855.9 | 3860.3 | 3864.7 | 3869.1 | 3873.5 | 3877.9 | 3882.3 | 3886.7 | 3891.1 | 3895.5 |
| 695.3 | 3908.3 | 3912.7 | 3917.1 | 3921.5 | 3925.9 | 3930.3 | 3934.7 | 3939.1 | 3943.5 | 3947.9 |
| 695.4 | 3961.1 | 3965.5 | 3969.9 | 3974.3 | 3978.7 | 3983.1 | 3987.5 | 3991.9 | 3996.3 | 4000.7 |
| 695.5 | 4014.1 | 4018.5 | 4022.9 | 4027.3 | 4031.7 | 4036.1 | 4040.5 | 4044.9 | 4049.3 | 4053.7 |
| 695.6 | 4066.1 | 4070.5 | 4074.9 | 4079.3 | 4083.7 | 4088.1 | 4092.5 | 4096.9 | 4101.3 | 4105.7 |
| 695.7 | 4122.2 | 4126.6 | 4131.0 | 4135.4 | 4139.8 | 4144.2 | 4148.6 | 4153.0 | 4157.4 | 4161.8 |
| 695.8 | 4176.4 | 4180.8 | 4185.2 | 4189.6 | 4194.0 | 4198.4 | 4202.8 | 4207.2 | 4211.6 | 4216.0 |
| 695.9 | 4227.3 | 4231.7 | 4236.1 | 4240.5 | 4244.9 | 4249.3 | 4253.7 | 4258.1 | 4262.5 | 4266.9 |

SEPULVEDA DAM  
SURVEYED DEC 1960

| ELEV  | CORPS OF ENGINEERS |        |        |        |        |        |        |        |        |        | ELEV (FT) | VS | STORAGE (AC-FT) |  |
|-------|--------------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|-----------|----|-----------------|--|
|       | 0                  | 01     | 02     | 03     | 04     | 05     | 06     | 07     | 08     | 09     |           |    | DM              |  |
| 696.0 | 4231.0             | 4237.3 | 4242.9 | 4248.4 | 4254.0 | 4259.5 | 4265.1 | 4270.6 | 4276.2 | 4281.7 |           |    |                 |  |
| 696.1 | 4231.3             | 4237.6 | 4243.1 | 4248.6 | 4254.1 | 4259.6 | 4265.1 | 4270.6 | 4276.1 | 4281.6 |           |    |                 |  |
| 696.2 | 4231.6             | 4237.9 | 4243.4 | 4248.9 | 4254.4 | 4259.9 | 4265.4 | 4270.9 | 4276.4 | 4281.9 |           |    |                 |  |
| 696.3 | 4231.9             | 4238.2 | 4243.7 | 4249.2 | 4254.7 | 4260.2 | 4265.7 | 4271.2 | 4276.7 | 4282.2 |           |    |                 |  |
| 696.4 | 4232.2             | 4238.5 | 4244.0 | 4249.5 | 4255.0 | 4260.5 | 4266.0 | 4271.5 | 4277.0 | 4282.5 |           |    |                 |  |
| 696.5 | 4232.5             | 4238.8 | 4244.3 | 4249.8 | 4255.3 | 4260.8 | 4266.3 | 4271.8 | 4277.3 | 4282.8 |           |    |                 |  |
| 696.6 | 4232.8             | 4239.1 | 4244.6 | 4250.1 | 4255.6 | 4261.1 | 4266.6 | 4272.1 | 4277.6 | 4283.1 |           |    |                 |  |
| 696.7 | 4233.1             | 4239.4 | 4244.9 | 4250.4 | 4255.9 | 4261.4 | 4266.9 | 4272.4 | 4277.9 | 4283.4 |           |    |                 |  |
| 696.8 | 4233.4             | 4239.7 | 4245.2 | 4250.7 | 4256.2 | 4261.7 | 4267.2 | 4272.7 | 4278.2 | 4283.7 |           |    |                 |  |
| 696.9 | 4233.7             | 4240.0 | 4245.5 | 4251.0 | 4256.5 | 4262.0 | 4267.5 | 4273.0 | 4278.5 | 4284.0 |           |    |                 |  |
| 697.0 | 4234.0             | 4240.3 | 4245.8 | 4251.3 | 4256.8 | 4262.3 | 4267.8 | 4273.3 | 4278.8 | 4284.3 |           |    |                 |  |
| 697.1 | 4234.3             | 4240.6 | 4246.1 | 4251.6 | 4257.1 | 4262.6 | 4268.1 | 4273.6 | 4279.1 | 4284.6 |           |    |                 |  |
| 697.2 | 4234.6             | 4240.9 | 4246.4 | 4251.9 | 4257.4 | 4262.9 | 4268.4 | 4273.9 | 4279.4 | 4284.9 |           |    |                 |  |
| 697.3 | 4234.9             | 4241.2 | 4246.7 | 4252.2 | 4257.7 | 4263.2 | 4268.7 | 4274.2 | 4279.7 | 4285.2 |           |    |                 |  |
| 697.4 | 4235.2             | 4241.5 | 4247.0 | 4252.5 | 4258.0 | 4263.5 | 4269.0 | 4274.5 | 4280.0 | 4285.5 |           |    |                 |  |
| 697.5 | 4235.5             | 4241.8 | 4247.3 | 4252.8 | 4258.3 | 4263.8 | 4269.3 | 4274.8 | 4280.3 | 4285.8 |           |    |                 |  |
| 697.6 | 4235.8             | 4242.1 | 4247.6 | 4253.1 | 4258.6 | 4264.1 | 4269.6 | 4275.1 | 4280.6 | 4286.1 |           |    |                 |  |
| 697.7 | 4236.1             | 4242.4 | 4247.9 | 4253.4 | 4258.9 | 4264.4 | 4269.9 | 4275.4 | 4280.9 | 4286.4 |           |    |                 |  |
| 697.8 | 4236.4             | 4242.7 | 4248.2 | 4253.7 | 4259.2 | 4264.7 | 4270.2 | 4275.7 | 4281.2 | 4286.7 |           |    |                 |  |
| 697.9 | 4236.7             | 4243.0 | 4248.5 | 4254.0 | 4259.5 | 4265.0 | 4270.5 | 4276.0 | 4281.5 | 4287.0 |           |    |                 |  |
| 698.0 | 4237.0             | 4243.3 | 4248.8 | 4254.3 | 4259.8 | 4265.3 | 4270.8 | 4276.3 | 4281.8 | 4287.3 |           |    |                 |  |
| 698.1 | 4237.3             | 4243.6 | 4249.1 | 4254.6 | 4260.1 | 4265.6 | 4271.1 | 4276.6 | 4282.1 | 4287.6 |           |    |                 |  |
| 698.2 | 4237.6             | 4243.9 | 4249.4 | 4254.9 | 4260.4 | 4265.9 | 4271.4 | 4276.9 | 4282.4 | 4287.9 |           |    |                 |  |
| 698.3 | 4237.9             | 4244.2 | 4249.7 | 4255.2 | 4260.7 | 4266.2 | 4271.7 | 4277.2 | 4282.7 | 4288.2 |           |    |                 |  |
| 698.4 | 4238.2             | 4244.5 | 4250.0 | 4255.5 | 4261.0 | 4266.5 | 4272.0 | 4277.5 | 4283.0 | 4288.5 |           |    |                 |  |
| 698.5 | 4238.5             | 4244.8 | 4250.3 | 4255.8 | 4261.3 | 4266.8 | 4272.3 | 4277.8 | 4283.3 | 4288.8 |           |    |                 |  |
| 698.6 | 4238.8             | 4245.1 | 4250.6 | 4256.1 | 4261.6 | 4267.1 | 4272.6 | 4278.1 | 4283.6 | 4289.1 |           |    |                 |  |
| 698.7 | 4239.1             | 4245.4 | 4250.9 | 4256.4 | 4261.9 | 4267.4 | 4272.9 | 4278.4 | 4283.9 | 4289.4 |           |    |                 |  |
| 698.8 | 4239.4             | 4245.7 | 4251.2 | 4256.7 | 4262.2 | 4267.7 | 4273.2 | 4278.7 | 4284.2 | 4289.7 |           |    |                 |  |
| 698.9 | 4239.7             | 4246.0 | 4251.5 | 4257.0 | 4262.5 | 4268.0 | 4273.5 | 4279.0 | 4284.5 | 4290.0 |           |    |                 |  |
| 699.0 | 4240.0             | 4246.3 | 4251.8 | 4257.3 | 4262.8 | 4268.3 | 4273.8 | 4279.3 | 4284.8 | 4290.3 |           |    |                 |  |
| 699.1 | 4240.3             | 4246.6 | 4252.1 | 4257.6 | 4263.1 | 4268.6 | 4274.1 | 4279.6 | 4285.1 | 4290.6 |           |    |                 |  |
| 699.2 | 4240.6             | 4246.9 | 4252.4 | 4257.9 | 4263.4 | 4268.9 | 4274.4 | 4279.9 | 4285.4 | 4290.9 |           |    |                 |  |
| 699.3 | 4240.9             | 4247.2 | 4252.7 | 4258.2 | 4263.7 | 4269.2 | 4274.7 | 4280.2 | 4285.7 | 4291.2 |           |    |                 |  |
| 699.4 | 4241.2             | 4247.5 | 4253.0 | 4258.5 | 4264.0 | 4269.5 | 4275.0 | 4280.5 | 4286.0 | 4291.5 |           |    |                 |  |
| 699.5 | 4241.5             | 4247.8 | 4253.3 | 4258.8 | 4264.3 | 4269.8 | 4275.3 | 4280.8 | 4286.3 | 4291.8 |           |    |                 |  |
| 699.6 | 4241.8             | 4248.1 | 4253.6 | 4259.1 | 4264.6 | 4270.1 | 4275.6 | 4281.1 | 4286.6 | 4292.1 |           |    |                 |  |
| 699.7 | 4242.1             | 4248.4 | 4253.9 | 4259.4 | 4264.9 | 4270.4 | 4275.9 | 4281.4 | 4286.9 | 4292.4 |           |    |                 |  |
| 699.8 | 4242.4             | 4248.7 | 4254.2 | 4259.7 | 4265.2 | 4270.7 | 4276.2 | 4281.7 | 4287.2 | 4292.7 |           |    |                 |  |
| 699.9 | 4242.7             | 4249.0 | 4254.5 | 4260.0 | 4265.5 | 4271.0 | 4276.5 | 4282.0 | 4287.5 | 4293.0 |           |    |                 |  |



| SEPULVEDA DAM<br>SURVEYED DEC 1980 |         | CORPS OF ENGINEERS |         |         |         | FLEV (FT) | VS      | STORAGE (AC-FT) |         |
|------------------------------------|---------|--------------------|---------|---------|---------|-----------|---------|-----------------|---------|
| ELEV                               | 0       | 01                 | 02      | 03      | 04      | 05        | 06      | 07              | 08      |
| 700.0                              | 6857.0  | 7064.6             | 6872.3  | 6880.0  | 6887.7  | 6895.4    | 6903.1  | 6910.8          | 6918.6  |
| 700.1                              | 6934.0  | 6941.7             | 6949.5  | 6957.2  | 6965.0  | 6972.7    | 6980.5  | 6988.2          | 6996.0  |
| 700.2                              | 7011.5  | 7019.3             | 7027.1  | 7034.9  | 7042.7  | 7050.5    | 7058.3  | 7066.1          | 7073.9  |
| 700.3                              | 7089.5  | 7097.3             | 7105.1  | 7113.0  | 7120.8  | 7128.7    | 7136.5  | 7144.3          | 7152.2  |
| 700.4                              | 7167.9  | 7175.8             | 7183.7  | 7191.5  | 7199.4  | 7207.3    | 7215.2  | 7223.1          | 7231.0  |
| 700.5                              | 7246.8  | 7254.7             | 7262.6  | 7270.6  | 7278.5  | 7286.4    | 7294.4  | 7302.3          | 7310.3  |
| 700.6                              | 7326.2  | 7334.1             | 7342.1  | 7350.1  | 7358.0  | 7366.0    | 7374.0  | 7382.0          | 7390.0  |
| 700.7                              | 7406.0  | 7414.0             | 7422.0  | 7430.0  | 7438.0  | 7446.0    | 7454.1  | 7462.1          | 7470.1  |
| 700.8                              | 7486.2  | 7494.3             | 7502.3  | 7510.4  | 7518.5  | 7526.5    | 7534.6  | 7542.7          | 7550.8  |
| 700.9                              | 7566.4  | 7575.0             | 7583.1  | 7591.2  | 7599.4  | 7607.5    | 7615.6  | 7623.7          | 7631.8  |
| 701.0                              | 7648.1  | 7656.3             | 7664.4  | 7672.6  | 7680.7  | 7688.9    | 7697.0  | 7705.2          | 7713.4  |
| 701.1                              | 7729.8  | 7737.9             | 7746.1  | 7754.3  | 7762.5  | 7770.7    | 7779.0  | 7787.2          | 7795.4  |
| 701.2                              | 7811.9  | 7820.1             | 7828.3  | 7836.6  | 7844.8  | 7853.1    | 7861.3  | 7869.6          | 7877.9  |
| 701.3                              | 7899.4  | 7907.7             | 7916.0  | 7924.3  | 7932.6  | 7940.9    | 7949.2  | 7957.5          | 7965.8  |
| 701.4                              | 7977.4  | 7985.7             | 7994.1  | 8002.4  | 8010.7  | 8019.1    | 8027.4  | 8035.8          | 8044.2  |
| 701.5                              | 8060.9  | 8069.3             | 8077.7  | 8086.0  | 8094.4  | 8102.8    | 8111.2  | 8119.6          | 8128.0  |
| 701.6                              | 8144.8  | 8153.2             | 8161.7  | 8170.1  | 8178.5  | 8186.9    | 8195.4  | 8203.8          | 8212.3  |
| 701.7                              | 8229.2  | 8237.7             | 8246.1  | 8254.6  | 8263.1  | 8271.6    | 8280.0  | 8288.5          | 8297.0  |
| 701.8                              | 8314.0  | 8322.5             | 8331.1  | 8339.6  | 8348.1  | 8356.6    | 8365.2  | 8373.7          | 8382.2  |
| 701.9                              | 8399.3  | 8407.9             | 8416.5  | 8425.0  | 8433.6  | 8442.2    | 8450.7  | 8459.3          | 8467.9  |
| 702.0                              | 8495.1  | 8493.7             | 8502.3  | 8510.9  | 8519.5  | 8528.2    | 8536.8  | 8545.5          | 8554.1  |
| 702.1                              | 8571.4  | 8580.1             | 8588.8  | 8597.4  | 8606.1  | 8614.8    | 8623.5  | 8632.2          | 8641.0  |
| 702.2                              | 8658.4  | 8667.1             | 8675.9  | 8684.6  | 8693.4  | 8702.1    | 8710.9  | 8719.7          | 8728.5  |
| 702.3                              | 8746.0  | 8754.9             | 8763.7  | 8772.5  | 8781.3  | 8790.1    | 8799.0  | 8807.8          | 8816.6  |
| 702.4                              | 8834.4  | 8843.2             | 8852.1  | 8861.0  | 8869.9  | 8878.8    | 8887.7  | 8896.6          | 8905.5  |
| 702.5                              | 8923.3  | 8932.0             | 8941.2  | 8950.2  | 8959.1  | 8968.1    | 8977.0  | 8986.0          | 8995.0  |
| 702.6                              | 9013.0  | 9022.0             | 9031.0  | 9040.0  | 9049.0  | 9058.0    | 9067.1  | 9076.1          | 9085.2  |
| 702.7                              | 9103.3  | 9112.3             | 9121.4  | 9130.5  | 9139.6  | 9148.7    | 9157.8  | 9166.9          | 9176.0  |
| 702.8                              | 9194.2  | 9203.4             | 9212.5  | 9221.6  | 9230.7  | 9239.8    | 9249.1  | 9258.3          | 9267.5  |
| 702.9                              | 9285.8  | 9295.0             | 9304.4  | 9313.5  | 9322.7  | 9331.9    | 9341.1  | 9350.4          | 9359.6  |
| 703.0                              | 9378.1  | 9387.4             | 9396.7  | 9405.9  | 9415.2  | 9424.5    | 9433.8  | 9443.1          | 9452.4  |
| 703.1                              | 9471.1  | 9480.4             | 9489.8  | 9499.1  | 9508.4  | 9517.7    | 9527.1  | 9536.4          | 9545.9  |
| 703.2                              | 9556.4  | 9565.7             | 9575.1  | 9584.4  | 9593.8  | 9603.1    | 9612.5  | 9621.9          | 9631.3  |
| 703.3                              | 9659.0  | 9668.4             | 9677.9  | 9687.4  | 9696.8  | 9706.3    | 9715.8  | 9725.4          | 9734.9  |
| 703.4                              | 9753.9  | 9763.4             | 9773.0  | 9782.5  | 9792.1  | 9801.6    | 9811.2  | 9820.8          | 9830.3  |
| 703.5                              | 9869.5  | 9879.1             | 9888.7  | 9898.3  | 9907.9  | 9917.6    | 9927.2  | 9936.8          | 9946.5  |
| 703.6                              | 9945.8  | 9955.4             | 9965.1  | 9974.8  | 9984.5  | 9994.1    | 10003.8 | 10013.5         | 10023.3 |
| 703.7                              | 10042.7 | 10052.4            | 10062.2 | 10071.9 | 10081.7 | 10091.4   | 10101.2 | 10111.0         | 10120.7 |
| 703.8                              | 10140.3 | 10150.1            | 10159.9 | 10169.7 | 10179.5 | 10189.3   | 10199.2 | 10209.0         | 10218.8 |
| 703.9                              | 10238.5 | 10248.4            | 10258.3 | 10268.1 | 10278.0 | 10287.9   | 10297.8 | 10307.7         | 10317.6 |
|                                    |         |                    |         |         |         |           |         |                 | 10327.5 |

| SEPULVEDA DAM     |         | CORPS OF ENGINEERS |         |         |         |         |         |         |         |         |         | ELEV (FT) |  | VS |  | STORAGE (AC-FT) |  |
|-------------------|---------|--------------------|---------|---------|---------|---------|---------|---------|---------|---------|---------|-----------|--|----|--|-----------------|--|
| SURVEYED DEC 1980 |         |                    |         |         |         |         |         |         |         |         |         |           |  |    |  |                 |  |
| ELEV              | 0       | .01                | .02     | .03     | .04     | .05     | .06     | .07     | .08     | .09     | .10     |           |  |    |  |                 |  |
| 704.0             | 10337.5 | 10347.4            | 10357.3 | 10367.3 | 10377.2 | 10387.2 | 10397.1 | 10407.1 | 10417.1 | 10427.0 | 10437.0 |           |  |    |  |                 |  |
| 704.1             | 10437.0 | 10447.0            | 10457.0 | 10467.0 | 10477.1 | 10487.1 | 10497.1 | 10507.1 | 10517.2 | 10527.2 | 10537.2 |           |  |    |  |                 |  |
| 704.2             | 10537.0 | 10547.0            | 10557.0 | 10567.0 | 10577.1 | 10587.1 | 10597.1 | 10607.1 | 10617.2 | 10627.2 | 10637.2 |           |  |    |  |                 |  |
| 704.3             | 10637.0 | 10647.0            | 10657.0 | 10667.0 | 10677.1 | 10687.1 | 10697.1 | 10707.1 | 10717.2 | 10727.2 | 10737.2 |           |  |    |  |                 |  |
| 704.4             | 10740.0 | 10750.0            | 10760.0 | 10770.0 | 10781.0 | 10791.0 | 10801.0 | 10811.0 | 10822.0 | 10832.0 | 10842.0 |           |  |    |  |                 |  |
| 704.5             | 10842.0 | 10852.0            | 10863.0 | 10873.0 | 10883.0 | 10894.0 | 10904.0 | 10914.0 | 10925.0 | 10935.0 | 10945.0 |           |  |    |  |                 |  |
| 704.6             | 10945.0 | 10955.0            | 10965.0 | 10976.0 | 10987.0 | 10997.0 | 11007.0 | 11017.0 | 11028.0 | 11038.0 | 11048.0 |           |  |    |  |                 |  |
| 704.7             | 11049.0 | 11059.0            | 11070.0 | 11080.0 | 11090.0 | 11101.0 | 11111.0 | 11121.0 | 11132.0 | 11142.0 | 11152.0 |           |  |    |  |                 |  |
| 704.8             | 11153.0 | 11164.0            | 11174.0 | 11185.0 | 11195.0 | 11206.0 | 11216.0 | 11227.0 | 11237.0 | 11248.0 | 11258.0 |           |  |    |  |                 |  |
| 704.9             | 11258.0 | 11269.0            | 11279.0 | 11290.0 | 11300.0 | 11311.0 | 11322.0 | 11332.0 | 11343.0 | 11353.0 | 11363.0 |           |  |    |  |                 |  |
| 705.0             | 11364.0 | 11375.0            | 11385.0 | 11396.0 | 11406.0 | 11417.0 | 11428.0 | 11438.0 | 11449.0 | 11460.0 | 11470.0 |           |  |    |  |                 |  |
| 705.1             | 11470.0 | 11481.0            | 11492.0 | 11502.0 | 11513.0 | 11524.0 | 11534.0 | 11545.0 | 11556.0 | 11567.0 | 11577.0 |           |  |    |  |                 |  |
| 705.2             | 11577.0 | 11588.0            | 11599.0 | 11610.0 | 11620.0 | 11631.0 | 11642.0 | 11653.0 | 11664.0 | 11674.0 | 11685.0 |           |  |    |  |                 |  |
| 705.3             | 11685.0 | 11696.0            | 11707.0 | 11718.0 | 11728.0 | 11739.0 | 11750.0 | 11761.0 | 11772.0 | 11783.0 | 11793.0 |           |  |    |  |                 |  |
| 705.4             | 11794.0 | 11804.0            | 11815.0 | 11826.0 | 11837.0 | 11848.0 | 11859.0 | 11870.0 | 11881.0 | 11892.0 | 11902.0 |           |  |    |  |                 |  |
| 705.5             | 11903.0 | 11914.0            | 11925.0 | 11936.0 | 11947.0 | 11957.0 | 11968.0 | 11979.0 | 11990.0 | 12001.0 | 12011.0 |           |  |    |  |                 |  |
| 705.6             | 12012.0 | 12023.0            | 12034.0 | 12046.0 | 12057.0 | 12068.0 | 12079.0 | 12090.0 | 12101.0 | 12112.0 | 12123.0 |           |  |    |  |                 |  |
| 705.7             | 12123.0 | 12134.0            | 12145.0 | 12156.0 | 12167.0 | 12178.0 | 12190.0 | 12201.0 | 12212.0 | 12223.0 | 12233.0 |           |  |    |  |                 |  |
| 705.8             | 12234.0 | 12245.0            | 12256.0 | 12268.0 | 12279.0 | 12290.0 | 12301.0 | 12312.0 | 12323.0 | 12333.0 | 12343.0 |           |  |    |  |                 |  |
| 705.9             | 12346.0 | 12357.0            | 12368.0 | 12380.0 | 12391.0 | 12402.0 | 12413.0 | 12425.0 | 12436.0 | 12447.0 | 12457.0 |           |  |    |  |                 |  |
| 706.0             | 12458.0 | 12470.0            | 12481.0 | 12492.0 | 12504.0 | 12515.0 | 12526.0 | 12538.0 | 12549.0 | 12560.0 | 12571.0 |           |  |    |  |                 |  |
| 706.1             | 12572.0 | 12583.0            | 12594.0 | 12606.0 | 12617.0 | 12628.0 | 12640.0 | 12651.0 | 12662.0 | 12674.0 | 12685.0 |           |  |    |  |                 |  |
| 706.2             | 12685.0 | 12697.0            | 12708.0 | 12720.0 | 12731.0 | 12742.0 | 12754.0 | 12765.0 | 12777.0 | 12788.0 | 12799.0 |           |  |    |  |                 |  |
| 706.3             | 12800.0 | 12811.0            | 12823.0 | 12834.0 | 12845.0 | 12857.0 | 12868.0 | 12879.0 | 12890.0 | 12901.0 | 12911.0 |           |  |    |  |                 |  |
| 706.4             | 12914.0 | 12926.0            | 12938.0 | 12949.0 | 12961.0 | 12972.0 | 12984.0 | 12995.0 | 13007.0 | 13018.0 | 13028.0 |           |  |    |  |                 |  |
| 706.5             | 13030.0 | 13042.0            | 13053.0 | 13065.0 | 13076.0 | 13088.0 | 13100.0 | 13111.0 | 13123.0 | 13134.0 | 13145.0 |           |  |    |  |                 |  |
| 706.6             | 13146.0 | 13158.0            | 13169.0 | 13181.0 | 13193.0 | 13204.0 | 13216.0 | 13227.0 | 13239.0 | 13251.0 | 13262.0 |           |  |    |  |                 |  |
| 706.7             | 13267.0 | 13279.0            | 13290.0 | 13302.0 | 13313.0 | 13324.0 | 13336.0 | 13347.0 | 13358.0 | 13369.0 | 13380.0 |           |  |    |  |                 |  |
| 706.8             | 13380.0 | 13392.0            | 13403.0 | 13415.0 | 13427.0 | 13438.0 | 13450.0 | 13462.0 | 13474.0 | 13486.0 | 13497.0 |           |  |    |  |                 |  |
| 706.9             | 13499.0 | 13511.0            | 13521.0 | 13533.0 | 13545.0 | 13557.0 | 13569.0 | 13580.0 | 13592.0 | 13604.0 | 13615.0 |           |  |    |  |                 |  |
| 707.0             | 13616.0 | 13628.0            | 13640.0 | 13652.0 | 13664.0 | 13675.0 | 13687.0 | 13699.0 | 13711.0 | 13723.0 | 13734.0 |           |  |    |  |                 |  |
| 707.1             | 13735.0 | 13747.0            | 13759.0 | 13771.0 | 13783.0 | 13795.0 | 13807.0 | 13819.0 | 13831.0 | 13843.0 | 13854.0 |           |  |    |  |                 |  |
| 707.2             | 13855.0 | 13867.0            | 13879.0 | 13891.0 | 13903.0 | 13915.0 | 13927.0 | 13939.0 | 13951.0 | 13963.0 | 13974.0 |           |  |    |  |                 |  |
| 707.3             | 13975.0 | 13987.0            | 13999.0 | 14011.0 | 14023.0 | 14035.0 | 14047.0 | 14059.0 | 14071.0 | 14083.0 | 14094.0 |           |  |    |  |                 |  |
| 707.4             | 14095.0 | 14107.0            | 14120.0 | 14132.0 | 14144.0 | 14155.0 | 14168.0 | 14179.0 | 14191.0 | 14205.0 | 14216.0 |           |  |    |  |                 |  |
| 707.5             | 14217.0 | 14229.0            | 14241.0 | 14253.0 | 14265.0 | 14278.0 | 14290.0 | 14302.0 | 14314.0 | 14326.0 | 14337.0 |           |  |    |  |                 |  |
| 707.6             | 14339.0 | 14351.0            | 14363.0 | 14375.0 | 14388.0 | 14400.0 | 14412.0 | 14424.0 | 14437.0 | 14449.0 | 14461.0 |           |  |    |  |                 |  |
| 707.7             | 14461.0 | 14473.0            | 14486.0 | 14498.0 | 14510.0 | 14523.0 | 14535.0 | 14547.0 | 14559.0 | 14572.0 | 14584.0 |           |  |    |  |                 |  |
| 707.8             | 14584.0 | 14596.0            | 14609.0 | 14621.0 | 14633.0 | 14646.0 | 14658.0 | 14671.0 | 14683.0 | 14695.0 | 14707.0 |           |  |    |  |                 |  |
| 707.9             | 14708.0 | 14720.0            | 14733.0 | 14745.0 | 14757.0 | 14770.0 | 14782.0 | 14795.0 | 14807.0 | 14820.0 | 14832.0 |           |  |    |  |                 |  |

| SERULVEDA DAM<br>SURVEYED DEC 1940 |        | CORPS OF ENGINEERS |        |        |        |        | ELEV (FT) | VS     | STORAGE (AC-FT) |        |
|------------------------------------|--------|--------------------|--------|--------|--------|--------|-----------|--------|-----------------|--------|
| ELEV                               | 0      | .01                | .02    | .03    | .04    | .05    | .06       | .07    | .08             | .09    |
| 708.0                              | 14832. | 14844.             | 14857. | 14869. | 14882. | 14894. | 14907.    | 14919. | 14932.          | 14944. |
| 708.1                              | 14957. | 14969.             | 14982. | 14994. | 15007. | 15019. | 15032.    | 15044. | 15057.          | 15069. |
| 708.2                              | 15082. | 15095.             | 15107. | 15120. | 15132. | 15145. | 15157.    | 15170. | 15183.          | 15195. |
| 708.3                              | 15208. | 15220.             | 15233. | 15246. | 15258. | 15271. | 15283.    | 15296. | 15309.          | 15321. |
| 708.4                              | 15334. | 15347.             | 15359. | 15372. | 15385. | 15397. | 15410.    | 15423. | 15435.          | 15448. |
| 708.5                              | 15461. | 15474.             | 15486. | 15499. | 15512. | 15524. | 15537.    | 15550. | 15563.          | 15575. |
| 708.6                              | 15588. | 15601.             | 15614. | 15626. | 15639. | 15652. | 15665.    | 15678. | 15690.          | 15703. |
| 708.7                              | 15716. | 15729.             | 15742. | 15754. | 15767. | 15780. | 15793.    | 15806. | 15819.          | 15832. |
| 708.8                              | 15844. | 15857.             | 15870. | 15883. | 15896. | 15909. | 15922.    | 15935. | 15947.          | 15960. |
| 708.9                              | 15973. | 15986.             | 15999. | 16012. | 16025. | 16038. | 16051.    | 16064. | 16077.          | 16090. |
| 709.0                              | 16103. | 16116.             | 16129. | 16142. | 16155. | 16167. | 16180.    | 16193. | 16206.          | 16219. |
| 709.1                              | 16232. | 16246.             | 16259. | 16272. | 16285. | 16298. | 16311.    | 16324. | 16337.          | 16350. |
| 709.2                              | 16363. | 16376.             | 16389. | 16402. | 16415. | 16428. | 16441.    | 16454. | 16468.          | 16481. |
| 709.3                              | 16494. | 16507.             | 16520. | 16533. | 16546. | 16559. | 16571.    | 16586. | 16599.          | 16612. |
| 709.4                              | 16625. | 16638.             | 16652. | 16665. | 16678. | 16691. | 16704.    | 16718. | 16731.          | 16744. |
| 709.5                              | 16757. | 16770.             | 16784. | 16797. | 16810. | 16823. | 16837.    | 16850. | 16863.          | 16876. |
| 709.6                              | 16890. | 16903.             | 16916. | 16929. | 16943. | 16956. | 16969.    | 16983. | 16996.          | 17009. |
| 709.7                              | 17023. | 17036.             | 17049. | 17063. | 17076. | 17089. | 17103.    | 17116. | 17129.          | 17143. |
| 709.8                              | 17156. | 17169.             | 17183. | 17196. | 17210. | 17223. | 17236.    | 17250. | 17263.          | 17277. |
| 709.9                              | 17290. | 17303.             | 17317. | 17330. | 17344. | 17357. | 17371.    | 17384. | 17398.          | 17411. |
| 710.0                              | 17425. | 17438.             | 17452. | 17465. | 17478. | 17492. | 17505.    | 17519. | 17533.          | 17546. |
| 710.1                              | 17560. | 17573.             | 17587. | 17600. | 17614. | 17627. | 17641.    | 17654. | 17668.          | 17682. |
| 710.2                              | 17695. | 17709.             | 17722. | 17736. | 17749. | 17763. | 17777.    | 17790. | 17804.          | 17818. |
| 710.3                              | 17831. | 17845.             | 17858. | 17872. | 17886. | 17899. | 17913.    | 17927. | 17940.          | 17954. |
| 710.4                              | 17968. | 17981.             | 17995. | 18009. | 18023. | 18036. | 18050.    | 18064. | 18077.          | 18091. |
| 710.5                              | 18105. | 18119.             | 18132. | 18146. | 18160. | 18174. | 18187.    | 18201. | 18215.          | 18229. |
| 710.6                              | 18243. | 18256.             | 18270. | 18284. | 18298. | 18312. | 18325.    | 18339. | 18353.          | 18367. |
| 710.7                              | 18381. | 18395.             | 18409. | 18422. | 18436. | 18450. | 18464.    | 18478. | 18492.          | 18506. |
| 710.8                              | 18520. | 18533.             | 18547. | 18561. | 18575. | 18589. | 18603.    | 18617. | 18631.          | 18645. |
| 710.9                              | 18659. | 18673.             | 18687. | 18701. | 18715. | 18729. | 18743.    | 18757. | 18771.          | 18785. |
| 711.0                              | 18799. | 18813.             | 18827. | 18841. | 18855. | 18869. | 18883.    | 18897. | 18911.          | 18925. |
| 711.1                              | 18939. | 18953.             | 18967. | 18981. | 18995. | 19009. | 19023.    | 19037. | 19051.          | 19066. |
| 711.2                              | 19080. | 19094.             | 19108. | 19122. | 19136. | 19150. | 19164.    | 19179. | 19193.          | 19207. |
| 711.3                              | 19221. | 19235.             | 19249. | 19264. | 19278. | 19292. | 19306.    | 19320. | 19335.          | 19349. |
| 711.4                              | 19363. | 19377.             | 19391. | 19406. | 19420. | 19434. | 19448.    | 19463. | 19477.          | 19491. |
| 711.5                              | 19505. | 19520.             | 19534. | 19548. | 19562. | 19577. | 19591.    | 19605. | 19620.          | 19634. |
| 711.6                              | 19648. | 19663.             | 19677. | 19691. | 19706. | 19720. | 19734.    | 19749. | 19763.          | 19777. |
| 711.7                              | 19792. | 19806.             | 19821. | 19835. | 19849. | 19864. | 19878.    | 19893. | 19907.          | 19921. |
| 711.8                              | 19936. | 19950.             | 19965. | 19979. | 19994. | 20008. | 20023.    | 20037. | 20051.          | 20066. |
| 711.9                              | 20080. | 20095.             | 20109. | 20124. | 20138. | 20153. | 20167.    | 20182. | 20196.          | 20211. |

SEMPULVEUA DAM  
SURVEYED DEC 1980

| ELEV  | 0     | 01    | 02    | 03    | 04    | 05    | ELEV (FT) | VS    | STORAGE (AC-FT) |
|-------|-------|-------|-------|-------|-------|-------|-----------|-------|-----------------|
| 712.0 | 20225 | 20240 | 20254 | 20269 | 20284 | 20298 | 20313     | 20327 | 20342           |
| 712.1 | 20371 | 20386 | 20400 | 20415 | 20429 | 20444 | 20459     | 20473 | 20488           |
| 712.3 | 20517 | 20532 | 20546 | 20561 | 20576 | 20590 | 20605     | 20619 | 20634           |
| 712.4 | 20664 | 20678 | 20693 | 20708 | 20722 | 20737 | 20752     | 20767 | 20782           |
| 712.5 | 20811 | 20825 | 20840 | 20855 | 20870 | 20884 | 20899     | 20914 | 20929           |
| 712.6 | 20958 | 20973 | 20988 | 21003 | 21017 | 21032 | 21047     | 21062 | 21077           |
| 712.7 | 21105 | 21121 | 21136 | 21151 | 21166 | 21181 | 21195     | 21210 | 21225           |
| 712.8 | 21252 | 21267 | 21282 | 21297 | 21312 | 21327 | 21342     | 21357 | 21372           |
| 712.9 | 21400 | 21415 | 21430 | 21445 | 21460 | 21475 | 21490     | 21505 | 21520           |
| 713.0 | 21554 | 21569 | 21584 | 21599 | 21614 | 21629 | 21644     | 21659 | 21674           |
| 713.1 | 21704 | 21719 | 21734 | 21749 | 21764 | 21779 | 21794     | 21809 | 21824           |
| 713.2 | 21854 | 21869 | 21884 | 21899 | 21915 | 21930 | 21945     | 21960 | 21975           |
| 713.3 | 22005 | 22021 | 22036 | 22051 | 22066 | 22081 | 22096     | 22111 | 22127           |
| 713.4 | 22157 | 22172 | 22187 | 22203 | 22218 | 22233 | 22248     | 22263 | 22279           |
| 713.5 | 22309 | 22324 | 22340 | 22355 | 22370 | 22385 | 22401     | 22416 | 22431           |
| 713.6 | 22462 | 22477 | 22492 | 22508 | 22523 | 22538 | 22554     | 22569 | 22584           |
| 713.7 | 22615 | 22630 | 22645 | 22661 | 22676 | 22692 | 22707     | 22722 | 22738           |
| 713.8 | 22768 | 22783 | 22799 | 22815 | 22830 | 22845 | 22861     | 22876 | 22892           |
| 713.9 | 22923 | 22938 | 22953 | 22969 | 22984 | 22999 | 23015     | 23031 | 23046           |
| 714.0 | 23077 | 23093 | 23108 | 23124 | 23139 | 23155 | 23170     | 23186 | 23201           |
| 714.1 | 23232 | 23248 | 23263 | 23279 | 23294 | 23310 | 23326     | 23341 | 23357           |
| 714.2 | 23388 | 23403 | 23419 | 23435 | 23450 | 23466 | 23482     | 23497 | 23513           |
| 714.3 | 23544 | 23560 | 23575 | 23591 | 23607 | 23622 | 23638     | 23654 | 23669           |
| 714.4 | 23701 | 23717 | 23732 | 23748 | 23764 | 23779 | 23795     | 23811 | 23827           |
| 714.5 | 23858 | 23874 | 23890 | 23905 | 23921 | 23937 | 23953     | 23969 | 23984           |
| 714.6 | 24016 | 24032 | 24048 | 24063 | 24079 | 24095 | 24111     | 24127 | 24143           |
| 714.7 | 24174 | 24190 | 24206 | 24222 | 24238 | 24254 | 24270     | 24286 | 24301           |
| 714.8 | 24332 | 24349 | 24365 | 24381 | 24397 | 24413 | 24429     | 24445 | 24461           |
| 714.9 | 24503 | 24519 | 24535 | 24551 | 24567 | 24583 | 24599     | 24615 | 24631           |
| 715.0 | 24713 | 24730 | 24746 | 24762 | 24778 | 24794 | 24810     | 24826 | 24842           |
| 715.1 | 24975 | 24991 | 25007 | 25023 | 25039 | 25055 | 25071     | 25087 | 25104           |
| 715.2 | 25139 | 25155 | 25171 | 25187 | 25203 | 25219 | 25235     | 25251 | 25267           |
| 715.3 | 25401 | 25417 | 25433 | 25449 | 25465 | 25481 | 25497     | 25513 | 25529           |
| 715.4 | 25625 | 25641 | 25657 | 25674 | 25690 | 25707 | 25723     | 25739 | 25756           |
| 715.5 | 25805 | 25821 | 25838 | 25854 | 25871 | 25887 | 25904     | 25920 | 25937           |
| 715.6 | 25970 | 25986 | 25999 | 26012 | 26029 | 26045 | 26062     | 26078 | 26095           |
| 715.7 | 26144 | 26151 | 26164 | 26178 | 26194 | 26209 | 26225     | 26240 | 26256           |
| 715.8 | 26300 | 26317 | 26333 | 26349 | 26365 | 26381 | 26397     | 26413 | 26429           |

SEPULVEDA DAM  
SURVEYED DEC 1900

| ELEV  | CORPS OF ENGINEERS |        |        |        |        |        |        |        |        |        | ELEV (FT) | VS | STORAGE (AC-FT) |
|-------|--------------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|-----------|----|-----------------|
|       | 0.                 | .01    | .02    | .03    | .04    | .05    | .06    | .07    | .08    | .09    |           |    |                 |
| 716.0 | 26450.             | 26466. | 26483. | 26500. | 26516. | 26533. | 26550. | 26566. | 26583. | 26600. |           |    |                 |
| 716.1 | 26616.             | 26633. | 26650. | 26667. | 26683. | 26700. | 26717. | 26734. | 26750. | 26767. |           |    |                 |
| 716.2 | 26734.             | 26751. | 26768. | 26785. | 26801. | 26817. | 26834. | 26851. | 26868. | 26885. |           |    |                 |
| 716.3 | 26952.             | 26969. | 26986. | 27002. | 27019. | 27036. | 27053. | 27070. | 27087. | 27104. |           |    |                 |
| 716.4 | 27121.             | 27138. | 27154. | 27171. | 27188. | 27205. | 27222. | 27239. | 27256. | 27273. |           |    |                 |
| 716.5 | 27290.             | 27307. | 27324. | 27341. | 27358. | 27375. | 27392. | 27409. | 27426. | 27443. |           |    |                 |
| 716.6 | 27460.             | 27477. | 27494. | 27511. | 27528. | 27545. | 27561. | 27578. | 27595. | 27612. |           |    |                 |
| 716.7 | 27631.             | 27648. | 27665. | 27682. | 27699. | 27717. | 27734. | 27751. | 27768. | 27785. |           |    |                 |
| 716.8 | 27802.             | 27820. | 27837. | 27854. | 27871. | 27888. | 27906. | 27923. | 27941. | 27957. |           |    |                 |
| 716.9 | 27974.             | 27992. | 28009. | 28026. | 28043. | 28061. | 28078. | 28095. | 28113. | 28130. |           |    |                 |
| 717.0 | 28147.             | 28165. | 28182. | 28199. | 28217. | 28234. | 28251. | 28269. | 28286. | 28303. |           |    |                 |
| 717.1 | 28321.             | 28338. | 28355. | 28373. | 28390. | 28408. | 28425. | 28442. | 28460. | 28477. |           |    |                 |
| 717.2 | 28445.             | 28462. | 28480. | 28497. | 28515. | 28532. | 28550. | 28567. | 28585. | 28602. |           |    |                 |
| 717.3 | 28670.             | 28687. | 28705. | 28722. | 28740. | 28757. | 28775. | 28792. | 28810. | 28827. |           |    |                 |
| 717.4 | 28845.             | 28863. | 28880. | 28898. | 28915. | 28933. | 28951. | 28968. | 28986. | 29004. |           |    |                 |
| 717.5 | 29021.             | 29039. | 29056. | 29074. | 29092. | 29109. | 29127. | 29145. | 29163. | 29180. |           |    |                 |
| 717.6 | 29144.             | 29162. | 29179. | 29197. | 29215. | 29232. | 29250. | 29268. | 29286. | 29304. |           |    |                 |
| 717.7 | 29375.             | 29393. | 29411. | 29429. | 29447. | 29464. | 29482. | 29500. | 29518. | 29536. |           |    |                 |
| 717.8 | 29554.             | 29571. | 29589. | 29607. | 29625. | 29643. | 29661. | 29679. | 29697. | 29715. |           |    |                 |
| 717.9 | 29732.             | 29750. | 29768. | 29786. | 29804. | 29822. | 29840. | 29858. | 29876. | 29894. |           |    |                 |
| 718.0 | 29912.             | 29930. | 29948. | 29966. | 29984. | 30002. | 30020. | 30038. | 30056. | 30074. |           |    |                 |
| 718.1 | 30092.             | 30110. | 30128. | 30146. | 30164. | 30183. | 30201. | 30219. | 30237. | 30255. |           |    |                 |
| 718.2 | 30273.             | 30291. | 30309. | 30328. | 30346. | 30364. | 30382. | 30400. | 30418. | 30437. |           |    |                 |
| 718.3 | 30455.             | 30473. | 30491. | 30509. | 30528. | 30546. | 30564. | 30582. | 30601. | 30619. |           |    |                 |
| 718.4 | 30637.             | 30655. | 30674. | 30692. | 30710. | 30729. | 30747. | 30765. | 30784. | 30802. |           |    |                 |
| 718.5 | 30820.             | 30839. | 30857. | 30875. | 30894. | 30912. | 30931. | 30949. | 30967. | 30986. |           |    |                 |
| 718.6 | 31004.             | 31023. | 31041. | 31060. | 31078. | 31097. | 31115. | 31133. | 31152. | 31170. |           |    |                 |
| 718.7 | 31189.             | 31207. | 31226. | 31245. | 31263. | 31282. | 31300. | 31319. | 31337. | 31356. |           |    |                 |
| 718.8 | 31374.             | 31393. | 31412. | 31430. | 31449. | 31467. | 31486. | 31505. | 31523. | 31542. |           |    |                 |
| 718.9 | 31561.             | 31579. | 31598. | 31617. | 31635. | 31654. | 31673. | 31691. | 31710. | 31729. |           |    |                 |
| 719.0 | 31747.             | 31766. | 31785. | 31804. | 31822. | 31841. | 31860. | 31879. | 31897. | 31916. |           |    |                 |
| 719.1 | 31955.             | 31973. | 31991. | 32010. | 32028. | 32047. | 32065. | 32084. | 32102. | 32120. |           |    |                 |
| 719.2 | 32161.             | 32179. | 32197. | 32216. | 32234. | 32252. | 32270. | 32288. | 32306. | 32324. |           |    |                 |
| 719.3 | 32361.             | 32379. | 32397. | 32415. | 32433. | 32451. | 32469. | 32487. | 32505. | 32523. |           |    |                 |
| 719.4 | 32562.             | 32580. | 32598. | 32616. | 32634. | 32652. | 32670. | 32688. | 32706. | 32724. |           |    |                 |
| 719.5 | 32693.             | 32712. | 32731. | 32750. | 32768. | 32786. | 32804. | 32822. | 32840. | 32858. |           |    |                 |
| 719.6 | 32884.             | 32903. | 32921. | 32940. | 32958. | 32976. | 32994. | 33012. | 33030. | 33048. |           |    |                 |
| 719.7 | 33077.             | 33096. | 33115. | 33134. | 33152. | 33170. | 33188. | 33206. | 33224. | 33242. |           |    |                 |
| 719.8 | 33269.             | 33289. | 33308. | 33327. | 33345. | 33363. | 33381. | 33399. | 33417. | 33435. |           |    |                 |
| 719.9 | 33463.             | 33482. | 33502. | 33521. | 33541. | 33560. | 33579. | 33599. | 33618. | 33638. |           |    |                 |

SEPULVEDA DAM  
SURVEYED DEC 1980

| ELEV  | CORPS OF ENGINEERS |        |        |        |        |        |        |        |        |        | ELEV (FT) | VS | STORAGE (AC-FT) |
|-------|--------------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|-----------|----|-----------------|
|       | 0                  | 01     | 02     | 03     | 04     | 05     | 06     | 07     | 08     | 09     |           |    |                 |
| 720.0 | 33657.             | 33677. | 33696. | 33716. | 33735. | 33755. | 33774. | 33794. | 33813. | 33833. |           |    |                 |
| 720.1 | 33652.             | 33672. | 33692. | 33711. | 33731. | 33750. | 33770. | 33790. | 33809. | 33829. |           |    |                 |
| 720.2 | 34049.             | 34068. | 34088. | 34108. | 34125. | 34145. | 34167. | 34187. | 34204. | 34226. |           |    |                 |
| 720.3 | 34246.             | 34266. | 34285. | 34305. | 34325. | 34345. | 34365. | 34384. | 34404. | 34424. |           |    |                 |
| 720.4 | 34444.             | 34464. | 34484. | 34504. | 34524. | 34543. | 34563. | 34583. | 34603. | 34623. |           |    |                 |
| 720.5 | 34643.             | 34663. | 34683. | 34703. | 34723. | 34743. | 34763. | 34783. | 34803. | 34823. |           |    |                 |
| 720.6 | 35044.             | 35063. | 35083. | 35103. | 35123. | 35143. | 35164. | 35184. | 35204. | 35224. |           |    |                 |
| 720.7 | 35246.             | 35267. | 35287. | 35307. | 35328. | 35348. | 35368. | 35389. | 35409. | 35429. |           |    |                 |
| 720.8 | 35450.             | 35470. | 35490. | 35511. | 35531. | 35552. | 35572. | 35592. | 35613. | 35633. |           |    |                 |
| 721.0 | 35654.             | 35674. | 35695. | 35715. | 35736. | 35756. | 35777. | 35797. | 35818. | 35838. |           |    |                 |
| 721.1 | 35859.             | 35879. | 35900. | 35920. | 35941. | 35962. | 35982. | 36003. | 36024. | 36044. |           |    |                 |
| 721.2 | 36065.             | 36085. | 36106. | 36127. | 36148. | 36168. | 36189. | 36210. | 36230. | 36251. |           |    |                 |
| 721.3 | 36272.             | 36293. | 36313. | 36334. | 36355. | 36376. | 36397. | 36417. | 36438. | 36459. |           |    |                 |
| 721.4 | 36480.             | 36501. | 36522. | 36543. | 36563. | 36584. | 36605. | 36626. | 36647. | 36668. |           |    |                 |
| 721.5 | 36689.             | 36710. | 36731. | 36752. | 36773. | 36794. | 36815. | 36836. | 36857. | 36878. |           |    |                 |
| 721.6 | 36899.             | 36920. | 36941. | 36962. | 36983. | 37004. | 37025. | 37047. | 37068. | 37089. |           |    |                 |
| 721.7 | 37110.             | 37131. | 37152. | 37173. | 37195. | 37216. | 37237. | 37258. | 37279. | 37301. |           |    |                 |
| 721.8 | 37322.             | 37343. | 37364. | 37386. | 37407. | 37428. | 37450. | 37471. | 37492. | 37514. |           |    |                 |
| 721.9 | 37535.             | 37556. | 37578. | 37599. | 37620. | 37642. | 37663. | 37685. | 37706. | 37727. |           |    |                 |
| 722.0 | 37749.             | 37770. | 37792. | 37813. | 37835. | 37856. | 37878. | 37899. | 37921. | 37942. |           |    |                 |
| 722.1 | 37964.             | 37986. | 38007. | 38029. | 38050. | 38072. | 38094. | 38115. | 38137. | 38159. |           |    |                 |
| 722.2 | 38180.             | 38202. | 38224. | 38245. | 38267. | 38289. | 38311. | 38332. | 38354. | 38376. |           |    |                 |
| 722.3 | 38398.             | 38420. | 38441. | 38463. | 38485. | 38507. | 38529. | 38551. | 38573. | 38594. |           |    |                 |
| 722.4 | 38616.             | 38638. | 38660. | 38682. | 38704. | 38726. | 38748. | 38770. | 38792. | 38814. |           |    |                 |
| 722.5 | 38836.             | 38858. | 38880. | 38903. | 38925. | 38947. | 38969. | 38991. | 39013. | 39035. |           |    |                 |
| 722.6 | 39057.             | 39080. | 39102. | 39124. | 39146. | 39168. | 39191. | 39213. | 39235. | 39257. |           |    |                 |
| 722.7 | 39280.             | 39302. | 39324. | 39347. | 39369. | 39391. | 39414. | 39436. | 39458. | 39481. |           |    |                 |
| 722.8 | 39503.             | 39526. | 39548. | 39571. | 39593. | 39616. | 39638. | 39660. | 39683. | 39706. |           |    |                 |
| 722.9 | 39728.             | 39751. | 39773. | 39796. | 39818. | 39841. | 39863. | 39886. | 39909. | 39931. |           |    |                 |
| 723.0 | 39954.             | 39977. | 39999. | 40022. | 40045. | 40067. | 40090. | 40113. | 40136. | 40158. |           |    |                 |
| 723.1 | 40181.             | 40204. | 40227. | 40250. | 40272. | 40295. | 40318. | 40341. | 40364. | 40387. |           |    |                 |
| 723.2 | 40410.             | 40432. | 40455. | 40478. | 40501. | 40524. | 40547. | 40570. | 40593. | 40616. |           |    |                 |
| 723.3 | 40639.             | 40662. | 40685. | 40708. | 40731. | 40754. | 40777. | 40801. | 40824. | 40847. |           |    |                 |
| 723.4 | 40870.             | 40893. | 40916. | 40939. | 40963. | 40986. | 41009. | 41032. | 41055. | 41079. |           |    |                 |
| 723.5 | 41102.             | 41125. | 41148. | 41172. | 41195. | 41218. | 41242. | 41265. | 41288. | 41312. |           |    |                 |
| 723.6 | 41335.             | 41359. | 41382. | 41405. | 41429. | 41452. | 41476. | 41499. | 41523. | 41546. |           |    |                 |
| 723.7 | 41570.             | 41593. | 41617. | 41640. | 41664. | 41687. | 41711. | 41734. | 41758. | 41782. |           |    |                 |
| 723.8 | 41805.             | 41829. | 41852. | 41876. | 41900. | 41924. | 41947. | 41971. | 41995. | 42018. |           |    |                 |
| 723.9 | 42042.             | 42066. | 42090. | 42113. | 42137. | 42161. | 42185. | 42209. | 42232. | 42256. |           |    |                 |

11-11-4

| SEMULVEUA DAM<br>SURVEYED DEC 1980 |        | CORPS OF ENGINEERS |        |        |        | FLEV (FT) | VS     | STORAGE (AC.-FT) |        |        |
|------------------------------------|--------|--------------------|--------|--------|--------|-----------|--------|------------------|--------|--------|
| ELEV                               | 0.     | .01                | .02    | .03    | .04    | .05       | .06    | .07              | .08    | .09    |
| 724.0                              | 42280. | 42304.             | 42328. | 42352. | 42376. | 42400.    | 42424. | 42447.           | 42471. | 42495. |
| 724.1                              | 42519. | 42543.             | 42567. | 42591. | 42615. | 42639.    | 42664. | 42688.           | 42712. | 42736. |
| 724.2                              | 42760. | 42784.             | 42808. | 42832. | 42856. | 42881.    | 42905. | 42929.           | 42953. | 42977. |
| 724.3                              | 43002. | 43026.             | 43050. | 43074. | 43099. | 43123.    | 43147. | 43171.           | 43196. | 43220. |
| 724.4                              | 43244. | 43269.             | 43293. | 43318. | 43342. | 43366.    | 43391. | 43415.           | 43440. | 43464. |
| 724.5                              | 43489. | 43513.             | 43538. | 43562. | 43587. | 43611.    | 43636. | 43660.           | 43685. | 43709. |
| 724.6                              | 43734. | 43758.             | 43783. | 43808. | 43832. | 43857.    | 43882. | 43906.           | 43931. | 43956. |
| 724.7                              | 43980. | 44005.             | 44030. | 44055. | 44079. | 44104.    | 44129. | 44154.           | 44178. | 44203. |
| 724.8                              | 44228. | 44253.             | 44278. | 44303. | 44328. | 44352.    | 44377. | 44402.           | 44427. | 44452. |
| 724.9                              | 44477. | 44502.             | 44527. | 44552. | 44577. | 44602.    | 44627. | 44652.           | 44677. | 44702. |
| 725.0                              | 44727. |                    |        |        |        |           |        |                  |        |        |

EXHIBIT E

WATER SURFACE ELEVATION VS.  
OUTFLOW (ALL OUTLET GATES OPEN) FOR SEPULVEDA DAM



SEPULVEDA DAM & GATED AND UNGATED) CORPS OF ENGINEERS ELEV (FT) VS OUTFLOW (CFS)

| ELEV  | 0.00 | 0.01 | 0.02 | 0.03 | 0.04 | 0.05 | 0.06 | 0.07 | 0.08 | 0.09 |
|-------|------|------|------|------|------|------|------|------|------|------|
| 668.0 | 0    | 2    | 3    | 5    | 6    | 8    | 10   | 11   | 13   | 14   |
| 668.1 | 14   | 18   | 19   | 21   | 22   | 24   | 26   | 27   | 29   | 30   |
| 668.2 | 32   | 34   | 35   | 37   | 38   | 40   | 42   | 43   | 45   | 46   |
| 668.3 | 48   | 50   | 51   | 53   | 54   | 56   | 58   | 59   | 61   | 62   |
| 668.4 | 64   | 66   | 67   | 69   | 70   | 72   | 74   | 75   | 77   | 78   |
| 668.5 | 80   | 82   | 83   | 85   | 86   | 88   | 90   | 91   | 93   | 94   |
| 668.6 | 96   | 98   | 99   | 101  | 102  | 104  | 106  | 107  | 109  | 110  |
| 668.7 | 112  | 114  | 115  | 117  | 118  | 120  | 122  | 123  | 125  | 126  |
| 668.8 | 128  | 130  | 131  | 133  | 134  | 136  | 138  | 139  | 141  | 142  |
| 668.9 | 144  | 146  | 147  | 149  | 150  | 152  | 154  | 155  | 157  | 158  |
| 669.0 | 160  | 162  | 165  | 167  | 170  | 172  | 174  | 177  | 179  | 182  |
| 669.1 | 184  | 186  | 189  | 191  | 194  | 196  | 198  | 201  | 203  | 206  |
| 669.2 | 208  | 210  | 213  | 215  | 218  | 220  | 222  | 225  | 227  | 230  |
| 669.3 | 232  | 234  | 237  | 239  | 242  | 244  | 246  | 249  | 251  | 254  |
| 669.4 | 256  | 258  | 261  | 263  | 266  | 268  | 270  | 273  | 275  | 278  |
| 669.5 | 280  | 282  | 285  | 287  | 290  | 292  | 294  | 297  | 299  | 302  |
| 669.6 | 304  | 306  | 309  | 311  | 314  | 316  | 318  | 321  | 323  | 326  |
| 669.7 | 328  | 330  | 333  | 335  | 338  | 340  | 342  | 345  | 347  | 350  |
| 669.8 | 352  | 354  | 357  | 359  | 362  | 364  | 366  | 369  | 371  | 374  |
| 669.9 | 376  | 378  | 381  | 383  | 386  | 388  | 390  | 393  | 395  | 398  |
| 670.0 | 400  | 403  | 406  | 409  | 412  | 415  | 418  | 421  | 424  | 428  |
| 670.1 | 431  | 434  | 437  | 440  | 443  | 446  | 449  | 452  | 455  | 458  |
| 670.2 | 461  | 464  | 467  | 470  | 473  | 476  | 480  | 483  | 486  | 489  |
| 670.3 | 492  | 495  | 498  | 501  | 504  | 507  | 510  | 513  | 516  | 519  |
| 670.4 | 522  | 525  | 529  | 532  | 535  | 538  | 541  | 544  | 547  | 550  |
| 670.5 | 553  | 556  | 559  | 562  | 565  | 568  | 571  | 574  | 577  | 581  |
| 670.6 | 584  | 587  | 590  | 593  | 596  | 599  | 602  | 605  | 608  | 611  |
| 670.7 | 614  | 617  | 620  | 623  | 626  | 629  | 633  | 636  | 639  | 642  |
| 670.8 | 645  | 648  | 651  | 654  | 657  | 660  | 663  | 666  | 669  | 672  |
| 670.9 | 675  | 678  | 682  | 685  | 688  | 691  | 694  | 697  | 700  | 703  |

SEPIULVENA DAM 4 GATED AND 4 UNGATED) CORPS OF ENGINEERS ELEV (FT) VS OUTFLOW (CF8)

| ELEV  | 0.00 | 0.01 | 0.02 | 0.03 | 0.04 | 0.05 | 0.06 | 0.07 | 0.08 | 0.09 |
|-------|------|------|------|------|------|------|------|------|------|------|
| 671.0 | 706  | 710  | 714  | 718  | 722  | 726  | 730  | 733  | 737  | 741  |
| 671.1 | 703  | 709  | 713  | 717  | 721  | 725  | 729  | 733  | 737  | 741  |
| 671.2 | 700  | 706  | 710  | 714  | 718  | 722  | 726  | 730  | 734  | 738  |
| 671.3 | 697  | 703  | 707  | 711  | 715  | 719  | 723  | 727  | 731  | 735  |
| 671.4 | 694  | 700  | 704  | 708  | 712  | 716  | 720  | 724  | 728  | 732  |
| 671.5 | 691  | 697  | 701  | 705  | 709  | 713  | 717  | 721  | 725  | 729  |
| 671.6 | 688  | 694  | 698  | 702  | 706  | 710  | 714  | 718  | 722  | 726  |
| 671.7 | 685  | 691  | 695  | 699  | 703  | 707  | 711  | 715  | 719  | 723  |
| 671.8 | 682  | 688  | 692  | 696  | 700  | 704  | 708  | 712  | 716  | 720  |
| 671.9 | 679  | 685  | 689  | 693  | 697  | 701  | 705  | 709  | 713  | 717  |
| 672.0 | 676  | 682  | 686  | 690  | 694  | 698  | 702  | 706  | 710  | 714  |
| 672.1 | 673  | 679  | 683  | 687  | 691  | 695  | 699  | 703  | 707  | 711  |
| 672.2 | 670  | 676  | 680  | 684  | 688  | 692  | 696  | 700  | 704  | 708  |
| 672.3 | 667  | 673  | 677  | 681  | 685  | 689  | 693  | 697  | 701  | 705  |
| 672.4 | 664  | 670  | 674  | 678  | 682  | 686  | 690  | 694  | 698  | 702  |
| 672.5 | 661  | 667  | 671  | 675  | 679  | 683  | 687  | 691  | 695  | 699  |
| 672.6 | 658  | 664  | 668  | 672  | 676  | 680  | 684  | 688  | 692  | 696  |
| 672.7 | 655  | 661  | 665  | 669  | 673  | 677  | 681  | 685  | 689  | 693  |
| 672.8 | 652  | 658  | 662  | 666  | 670  | 674  | 678  | 682  | 686  | 690  |
| 672.9 | 649  | 655  | 659  | 663  | 667  | 671  | 675  | 679  | 683  | 687  |
| 673.0 | 646  | 652  | 656  | 660  | 664  | 668  | 672  | 676  | 680  | 684  |
| 673.1 | 643  | 649  | 653  | 657  | 661  | 665  | 669  | 673  | 677  | 681  |
| 673.2 | 640  | 646  | 650  | 654  | 658  | 662  | 666  | 670  | 674  | 678  |
| 673.3 | 637  | 643  | 647  | 651  | 655  | 659  | 663  | 667  | 671  | 675  |
| 673.4 | 634  | 640  | 644  | 648  | 652  | 656  | 660  | 664  | 668  | 672  |
| 673.5 | 631  | 637  | 641  | 645  | 649  | 653  | 657  | 661  | 665  | 669  |
| 673.6 | 628  | 634  | 638  | 642  | 646  | 650  | 654  | 658  | 662  | 666  |
| 673.7 | 625  | 631  | 635  | 639  | 643  | 647  | 651  | 655  | 659  | 663  |
| 673.8 | 622  | 628  | 632  | 636  | 640  | 644  | 648  | 652  | 656  | 660  |
| 673.9 | 619  | 625  | 629  | 633  | 637  | 641  | 645  | 649  | 653  | 657  |

SEPIULVEDA DAM & GATED AND & UNGATED) CORPS OF ENGINEERS ELEV (FT) VS OUTFLOW (CFS)

| ELEV  | 0.00 | 0.01 | 0.02 | 0.03 | 0.04 | 0.05 | 0.06 | 0.07 | 0.08 | 0.09 |
|-------|------|------|------|------|------|------|------|------|------|------|
| 674.0 | 2044 | 2050 | 2055 | 2061 | 2066 | 2072 | 2077 | 2083 | 2088 | 2094 |
| 674.1 | 2100 | 2105 | 2111 | 2116 | 2122 | 2127 | 2133 | 2139 | 2144 | 2150 |
| 674.2 | 2155 | 2161 | 2166 | 2172 | 2177 | 2183 | 2189 | 2194 | 2200 | 2205 |
| 674.3 | 2211 | 2216 | 2222 | 2227 | 2233 | 2239 | 2244 | 2250 | 2255 | 2261 |
| 674.4 | 2266 | 2272 | 2278 | 2283 | 2289 | 2294 | 2300 | 2305 | 2311 | 2316 |
| 674.5 | 2322 | 2328 | 2333 | 2339 | 2344 | 2350 | 2355 | 2361 | 2364 | 2372 |
| 674.6 | 2378 | 2383 | 2389 | 2394 | 2400 | 2405 | 2411 | 2417 | 2422 | 2428 |
| 674.7 | 2433 | 2438 | 2444 | 2450 | 2455 | 2461 | 2467 | 2472 | 2478 | 2483 |
| 674.8 | 2489 | 2494 | 2500 | 2505 | 2511 | 2517 | 2522 | 2528 | 2533 | 2539 |
| 674.9 | 2544 | 2550 | 2556 | 2561 | 2567 | 2572 | 2578 | 2583 | 2589 | 2594 |
| 675.0 | 2600 | 2606 | 2611 | 2617 | 2622 | 2628 | 2633 | 2639 | 2644 | 2650 |
| 675.1 | 2656 | 2661 | 2667 | 2672 | 2678 | 2683 | 2689 | 2695 | 2700 | 2706 |
| 675.2 | 2711 | 2717 | 2722 | 2728 | 2733 | 2739 | 2745 | 2750 | 2756 | 2761 |
| 675.3 | 2767 | 2772 | 2778 | 2783 | 2789 | 2795 | 2800 | 2806 | 2811 | 2817 |
| 675.4 | 2822 | 2828 | 2834 | 2839 | 2845 | 2850 | 2856 | 2861 | 2867 | 2872 |
| 675.5 | 2878 | 2884 | 2889 | 2895 | 2900 | 2906 | 2911 | 2917 | 2922 | 2928 |
| 675.6 | 2930 | 2939 | 2945 | 2950 | 2956 | 2961 | 2967 | 2973 | 2978 | 2984 |
| 675.7 | 2989 | 2995 | 3000 | 3006 | 3011 | 3017 | 3023 | 3028 | 3034 | 3039 |
| 675.8 | 3045 | 3050 | 3056 | 3061 | 3067 | 3073 | 3078 | 3084 | 3089 | 3095 |
| 675.9 | 3100 | 3106 | 3112 | 3117 | 3123 | 3128 | 3134 | 3139 | 3145 | 3150 |
| 676.0 | 3156 | 3162 | 3168 | 3174 | 3180 | 3187 | 3193 | 3199 | 3205 | 3211 |
| 676.1 | 3217 | 3223 | 3229 | 3236 | 3242 | 3248 | 3254 | 3260 | 3266 | 3272 |
| 676.2 | 3278 | 3285 | 3291 | 3297 | 3303 | 3309 | 3315 | 3321 | 3327 | 3333 |
| 676.3 | 3340 | 3346 | 3352 | 3358 | 3364 | 3370 | 3376 | 3382 | 3389 | 3395 |
| 676.4 | 3401 | 3407 | 3413 | 3419 | 3425 | 3431 | 3438 | 3444 | 3450 | 3456 |
| 676.5 | 3462 | 3468 | 3474 | 3480 | 3486 | 3493 | 3499 | 3505 | 3511 | 3517 |
| 676.6 | 3523 | 3529 | 3535 | 3542 | 3548 | 3554 | 3560 | 3566 | 3572 | 3578 |
| 676.7 | 3584 | 3591 | 3597 | 3603 | 3609 | 3615 | 3621 | 3627 | 3633 | 3639 |
| 676.8 | 3644 | 3652 | 3658 | 3664 | 3670 | 3676 | 3682 | 3688 | 3695 | 3701 |
| 676.9 | 3707 | 3713 | 3719 | 3725 | 3731 | 3737 | 3744 | 3750 | 3756 | 3762 |

# SEPULVEDA DAM & GATED AND UNGATED) CORPS OF ENGINEERS ELEV (FT) VS OUTFLOW (CFS)

| ELEV  | 0.00 | 0.01 | 0.02 | 0.03 | 0.04 | 0.05 | 0.06 | 0.07 | 0.08 | 0.09 |
|-------|------|------|------|------|------|------|------|------|------|------|
| 677.0 | 374A | 377A | 37A1 | 37A7 | 3793 | 3800 | 3806 | 3812 | 3819 | 3825 |
| 677.1 | 3831 | 383A | 384A | 3850 | 3856 | 3863 | 3869 | 3875 | 3882 | 388A |
| 677.2 | 3894 | 3901 | 3907 | 3913 | 3920 | 3926 | 3932 | 3939 | 3945 | 3951 |
| 677.3 | 395A | 396A | 3970 | 3977 | 3983 | 3989 | 3996 | 4002 | 4008 | 4014 |
| 677.4 | 4021 | 4027 | 4033 | 4040 | 4046 | 4052 | 4059 | 4065 | 4071 | 407A |
| 677.5 | 4084 | 4090 | 4097 | 4103 | 4109 | 4116 | 4122 | 412A | 4135 | 4141 |
| 677.6 | 4147 | 4154 | 4160 | 4166 | 4172 | 4179 | 4185 | 4191 | 419A | 4204 |
| 677.7 | 4210 | 4217 | 4223 | 4229 | 4236 | 4242 | 424A | 4255 | 4261 | 4267 |
| 677.8 | 4274 | 4280 | 4286 | 4293 | 4299 | 4305 | 4312 | 431A | 4324 | 4330 |
| 677.9 | 4337 | 4343 | 4349 | 4356 | 4362 | 436A | 4375 | 4381 | 4387 | 4394 |
| 678.0 | 4400 | 4407 | 4413 | 4420 | 4427 | 4433 | 4440 | 4447 | 4454 | 4460 |
| 678.1 | 4467 | 4474 | 4480 | 4487 | 4494 | 4500 | 4507 | 4514 | 4521 | 4527 |
| 678.2 | 4534 | 4541 | 4547 | 4554 | 4561 | 4567 | 4574 | 4581 | 458A | 4594 |
| 678.3 | 4601 | 460A | 4614 | 4621 | 462A | 4634 | 4641 | 4648 | 4654 | 4661 |
| 678.4 | 466A | 4675 | 4681 | 468A | 4695 | 4701 | 470A | 4715 | 4722 | 4728 |
| 678.5 | 4735 | 4742 | 474A | 4755 | 4762 | 476A | 4775 | 4782 | 4789 | 4795 |
| 678.6 | 4802 | 4809 | 4815 | 4822 | 4829 | 4835 | 4842 | 4849 | 485A | 4862 |
| 678.7 | 4869 | 487A | 4882 | 4889 | 4896 | 4902 | 4909 | 4916 | 4923 | 4929 |
| 678.8 | 4936 | 4943 | 4949 | 4956 | 4963 | 4969 | 4976 | 4983 | 4990 | 499A |
| 678.9 | 5003 | 5010 | 5016 | 5023 | 5030 | 5036 | 5043 | 5050 | 5057 | 5063 |
| 679.0 | 5070 | 507A | 5082 | 508A | 5094 | 5100 | 5107 | 5113 | 5119 | 5125 |
| 679.1 | 5131 | 5137 | 5143 | 5149 | 5155 | 5161 | 516A | 5174 | 5180 | 518A |
| 679.2 | 5192 | 519A | 5204 | 5210 | 5216 | 5222 | 5229 | 5235 | 5241 | 5247 |
| 679.3 | 5253 | 5259 | 5265 | 5271 | 5277 | 5283 | 5290 | 5296 | 5302 | 530A |
| 679.4 | 5314 | 5320 | 5326 | 5332 | 533A | 5344 | 5351 | 5357 | 5363 | 5369 |
| 679.5 | 5375 | 5381 | 5387 | 5393 | 5399 | 5405 | 5412 | 5418 | 5424 | 5430 |
| 679.6 | 5436 | 5442 | 5448 | 5454 | 5460 | 5466 | 5473 | 5479 | 5485 | 5491 |
| 679.7 | 5497 | 5503 | 5509 | 5515 | 5521 | 5527 | 5534 | 5540 | 5546 | 5552 |
| 679.8 | 5558 | 5564 | 5570 | 5576 | 5582 | 558A | 5595 | 5601 | 5607 | 5613 |
| 679.9 | 5619 | 5625 | 5631 | 5637 | 5643 | 5649 | 565A | 5662 | 5668 | 5674 |

# SEPIULVEDA DAM & GATED AND UNGATED CORPS OF ENGINEERS ELEV (FT) VS OUTFLOW (CFS)

| ELEV  | 0.00 | 0.01 | 0.02 | 0.03 | 0.04 | 0.05 | 0.06 | 0.07 | 0.08 | 0.09 |
|-------|------|------|------|------|------|------|------|------|------|------|
| 600.0 | 5680 | 5686 | 5693 | 5699 | 5706 | 5712 | 5719 | 5725 | 5732 | 5738 |
| 600.1 | 5700 | 5751 | 5757 | 5764 | 5770 | 5777 | 5783 | 5789 | 5796 | 5802 |
| 600.2 | 5809 | 5818 | 5822 | 5828 | 5835 | 5841 | 5847 | 5854 | 5860 | 5867 |
| 600.3 | 5873 | 5880 | 5886 | 5893 | 5899 | 5905 | 5912 | 5918 | 5925 | 5931 |
| 600.4 | 5938 | 5944 | 5950 | 5957 | 5963 | 5970 | 5976 | 5983 | 5989 | 5996 |
| 600.5 | 6002 | 6008 | 6015 | 6021 | 6028 | 6034 | 6041 | 6047 | 6054 | 6060 |
| 600.6 | 6066 | 6073 | 6079 | 6086 | 6092 | 6099 | 6105 | 6111 | 6118 | 6124 |
| 600.7 | 6131 | 6137 | 6144 | 6150 | 6157 | 6163 | 6169 | 6176 | 6182 | 6189 |
| 600.8 | 6195 | 6202 | 6208 | 6215 | 6221 | 6227 | 6234 | 6240 | 6247 | 6253 |
| 600.9 | 6260 | 6266 | 6272 | 6279 | 6285 | 6292 | 6298 | 6305 | 6311 | 6318 |
| 601.0 | 6324 | 6330 | 6336 | 6342 | 6349 | 6355 | 6361 | 6367 | 6373 | 6379 |
| 601.1 | 6385 | 6392 | 6398 | 6404 | 6410 | 6416 | 6422 | 6428 | 6435 | 6441 |
| 601.2 | 6447 | 6453 | 6459 | 6465 | 6471 | 6477 | 6484 | 6490 | 6496 | 6502 |
| 601.3 | 6508 | 6514 | 6520 | 6527 | 6533 | 6539 | 6545 | 6551 | 6557 | 6563 |
| 601.4 | 6570 | 6576 | 6582 | 6588 | 6594 | 6600 | 6606 | 6613 | 6619 | 6625 |
| 601.5 | 6631 | 6637 | 6643 | 6649 | 6656 | 6662 | 6668 | 6674 | 6680 | 6686 |
| 601.6 | 6692 | 6699 | 6705 | 6711 | 6717 | 6723 | 6729 | 6735 | 6742 | 6748 |
| 601.7 | 6754 | 6760 | 6766 | 6772 | 6778 | 6784 | 6791 | 6797 | 6803 | 6809 |
| 601.8 | 6815 | 6821 | 6827 | 6834 | 6840 | 6846 | 6852 | 6858 | 6864 | 6870 |
| 601.9 | 6877 | 6883 | 6889 | 6895 | 6901 | 6907 | 6913 | 6920 | 6926 | 6932 |
| 602.0 | 6938 | 6944 | 6949 | 6955 | 6960 | 6966 | 6971 | 6977 | 6982 | 6988 |
| 602.1 | 6993 | 6999 | 7004 | 7010 | 7016 | 7021 | 7027 | 7032 | 7038 | 7043 |
| 602.2 | 7049 | 7054 | 7060 | 7065 | 7071 | 7076 | 7082 | 7088 | 7093 | 7099 |
| 602.3 | 7104 | 7110 | 7115 | 7121 | 7126 | 7132 | 7137 | 7143 | 7149 | 7154 |
| 602.4 | 7160 | 7165 | 7171 | 7176 | 7182 | 7187 | 7193 | 7198 | 7204 | 7209 |
| 602.5 | 7215 | 7221 | 7226 | 7232 | 7237 | 7243 | 7248 | 7254 | 7259 | 7265 |
| 602.6 | 7270 | 7276 | 7281 | 7287 | 7293 | 7298 | 7304 | 7309 | 7315 | 7320 |
| 602.7 | 7326 | 7331 | 7337 | 7342 | 7348 | 7353 | 7359 | 7365 | 7370 | 7376 |
| 602.8 | 7381 | 7387 | 7392 | 7398 | 7403 | 7409 | 7414 | 7420 | 7426 | 7431 |
| 602.9 | 7437 | 7442 | 7448 | 7453 | 7459 | 7464 | 7470 | 7475 | 7481 | 7486 |

| SEPHULVEDA DAM A GATED AND 4 UNGATED |      |      |      |      |      |      |      |      |      | CORPS OF ENGINEERS |  | ELEV (FT) |  | VS |  | OUTFLOW (CFS) |  |
|--------------------------------------|------|------|------|------|------|------|------|------|------|--------------------|--|-----------|--|----|--|---------------|--|
| ELEV                                 | 0.00 | 0.01 | 0.02 | 0.03 | 0.04 | 0.05 | 0.06 | 0.07 | 0.08 | 0.09               |  |           |  |    |  |               |  |
| 6A3.0                                | 7092 | 7097 | 7503 | 7504 | 7513 | 7519 | 7524 | 7529 | 7535 | 7540               |  |           |  |    |  |               |  |
| 6A3.1                                | 7505 | 7551 | 7556 | 7561 | 7567 | 7572 | 7577 | 7583 | 7588 | 7593               |  |           |  |    |  |               |  |
| 6A3.2                                | 7599 | 7604 | 7609 | 7615 | 7620 | 7625 | 7631 | 7636 | 7642 | 7647               |  |           |  |    |  |               |  |
| 6A3.3                                | 7652 | 7658 | 7663 | 7668 | 7674 | 7679 | 7684 | 7690 | 7695 | 7700               |  |           |  |    |  |               |  |
| 6A3.4                                | 7706 | 7711 | 7716 | 7722 | 7727 | 7732 | 7738 | 7743 | 7748 | 7754               |  |           |  |    |  |               |  |
| 6A3.5                                | 7759 | 7764 | 7770 | 7775 | 7780 | 7786 | 7791 | 7796 | 7802 | 7807               |  |           |  |    |  |               |  |
| 6A3.6                                | 7812 | 7818 | 7823 | 7828 | 7834 | 7839 | 7844 | 7850 | 7855 | 7860               |  |           |  |    |  |               |  |
| 6A3.7                                | 7866 | 7871 | 7876 | 7882 | 7887 | 7892 | 7898 | 7903 | 7909 | 7914               |  |           |  |    |  |               |  |
| 6A3.8                                | 7919 | 7925 | 7930 | 7935 | 7941 | 7946 | 7951 | 7957 | 7962 | 7967               |  |           |  |    |  |               |  |
| 6A3.9                                | 7973 | 7978 | 7983 | 7989 | 7994 | 7999 | 8005 | 8010 | 8015 | 8021               |  |           |  |    |  |               |  |
| 6A4.0                                | 8024 | 8031 | 8036 | 8041 | 8046 | 8050 | 8055 | 8060 | 8065 | 8070               |  |           |  |    |  |               |  |
| 6A4.1                                | 8075 | 8080 | 8085 | 8089 | 8094 | 8099 | 8104 | 8109 | 8114 | 8119               |  |           |  |    |  |               |  |
| 6A4.2                                | 8124 | 8128 | 8133 | 8138 | 8143 | 8148 | 8153 | 8158 | 8163 | 8168               |  |           |  |    |  |               |  |
| 6A4.3                                | 8172 | 8177 | 8182 | 8187 | 8192 | 8197 | 8202 | 8207 | 8211 | 8216               |  |           |  |    |  |               |  |
| 6A4.4                                | 8221 | 8226 | 8231 | 8236 | 8241 | 8246 | 8250 | 8255 | 8260 | 8265               |  |           |  |    |  |               |  |
| 6A4.5                                | 8270 | 8275 | 8280 | 8285 | 8290 | 8294 | 8299 | 8304 | 8309 | 8314               |  |           |  |    |  |               |  |
| 6A4.6                                | 8319 | 8324 | 8329 | 8333 | 8338 | 8343 | 8348 | 8353 | 8358 | 8363               |  |           |  |    |  |               |  |
| 6A4.7                                | 8368 | 8372 | 8377 | 8382 | 8387 | 8392 | 8397 | 8402 | 8407 | 8412               |  |           |  |    |  |               |  |
| 6A4.8                                | 8416 | 8421 | 8426 | 8431 | 8436 | 8441 | 8446 | 8451 | 8455 | 8460               |  |           |  |    |  |               |  |
| 6A4.9                                | 8465 | 8470 | 8475 | 8480 | 8485 | 8490 | 8494 | 8499 | 8504 | 8509               |  |           |  |    |  |               |  |
| 6A5.0                                | 8514 | 8519 | 8523 | 8528 | 8533 | 8537 | 8542 | 8547 | 8551 | 8556               |  |           |  |    |  |               |  |
| 6A5.1                                | 8561 | 8565 | 8570 | 8575 | 8580 | 8584 | 8589 | 8594 | 8598 | 8603               |  |           |  |    |  |               |  |
| 6A5.2                                | 8608 | 8612 | 8617 | 8622 | 8626 | 8631 | 8636 | 8640 | 8645 | 8650               |  |           |  |    |  |               |  |
| 6A5.3                                | 8654 | 8659 | 8664 | 8668 | 8673 | 8678 | 8682 | 8687 | 8692 | 8697               |  |           |  |    |  |               |  |
| 6A5.4                                | 8701 | 8706 | 8711 | 8715 | 8720 | 8725 | 8729 | 8734 | 8739 | 8743               |  |           |  |    |  |               |  |
| 6A5.5                                | 8748 | 8753 | 8757 | 8762 | 8767 | 8771 | 8776 | 8781 | 8785 | 8790               |  |           |  |    |  |               |  |
| 6A5.6                                | 8795 | 8799 | 8804 | 8809 | 8814 | 8818 | 8823 | 8828 | 8832 | 8837               |  |           |  |    |  |               |  |
| 6A5.7                                | 8842 | 8846 | 8851 | 8856 | 8860 | 8865 | 8870 | 8874 | 8879 | 8884               |  |           |  |    |  |               |  |
| 6A5.8                                | 8888 | 8893 | 8898 | 8902 | 8907 | 8912 | 8916 | 8921 | 8926 | 8931               |  |           |  |    |  |               |  |
| 6A5.9                                | 8935 | 8940 | 8945 | 8949 | 8954 | 8959 | 8963 | 8968 | 8972 | 8977               |  |           |  |    |  |               |  |

SEPUVEDA DAM 4 GATED AND 4 UNGATED

CORPS OF ENGINEERS

ELEV (FT) VS  
DN - 20 FEB 78

OUTFLW (CFS)

| ELEV  | 0.00 | 0.01 | 0.02 | 0.03 | 0.04 | 0.05 | 0.06 | 0.07 | 0.08 | 0.09 |
|-------|------|------|------|------|------|------|------|------|------|------|
| 686.0 | 8982 | 8986 | 8991 | 8995 | 8999 | 9004 | 9008 | 9012 | 9017 | 9021 |
| 686.1 | 9025 | 9030 | 9034 | 9038 | 9042 | 9047 | 9051 | 9055 | 9060 | 9064 |
| 686.2 | 9068 | 9073 | 9077 | 9081 | 9086 | 9090 | 9094 | 9099 | 9103 | 9107 |
| 686.3 | 9112 | 9116 | 9120 | 9125 | 9129 | 9133 | 9138 | 9142 | 9146 | 9150 |
| 686.4 | 9155 | 9159 | 9163 | 9168 | 9172 | 9176 | 9181 | 9185 | 9189 | 9194 |
| 686.5 | 9198 | 9202 | 9207 | 9211 | 9215 | 9220 | 9224 | 9228 | 9233 | 9237 |
| 686.6 | 9241 | 9246 | 9250 | 9254 | 9258 | 9263 | 9267 | 9271 | 9276 | 9280 |
| 686.7 | 9284 | 9289 | 9293 | 9297 | 9302 | 9306 | 9310 | 9315 | 9319 | 9323 |
| 686.8 | 9328 | 9332 | 9336 | 9341 | 9345 | 9349 | 9354 | 9358 | 9362 | 9366 |
| 686.9 | 9371 | 9375 | 9379 | 9384 | 9388 | 9392 | 9397 | 9401 | 9405 | 9410 |
| 687.0 | 9414 | 9418 | 9422 | 9427 | 9431 | 9435 | 9439 | 9444 | 9448 | 9452 |
| 687.1 | 9456 | 9460 | 9465 | 9469 | 9473 | 9477 | 9482 | 9486 | 9490 | 9494 |
| 687.2 | 9498 | 9503 | 9507 | 9511 | 9515 | 9519 | 9524 | 9528 | 9532 | 9536 |
| 687.3 | 9541 | 9545 | 9549 | 9553 | 9557 | 9562 | 9566 | 9570 | 9574 | 9579 |
| 687.4 | 9583 | 9587 | 9591 | 9595 | 9600 | 9604 | 9608 | 9612 | 9617 | 9621 |
| 687.5 | 9625 | 9629 | 9633 | 9638 | 9642 | 9646 | 9650 | 9655 | 9659 | 9663 |
| 687.6 | 9667 | 9671 | 9676 | 9680 | 9684 | 9688 | 9693 | 9697 | 9701 | 9705 |
| 687.7 | 9709 | 9714 | 9718 | 9722 | 9726 | 9730 | 9735 | 9739 | 9743 | 9747 |
| 687.8 | 9752 | 9756 | 9760 | 9764 | 9768 | 9773 | 9777 | 9781 | 9785 | 9790 |
| 687.9 | 9794 | 9798 | 9802 | 9806 | 9811 | 9815 | 9819 | 9823 | 9828 | 9832 |

SEPULVEDA DAM 4 GATED AND 4 UNGATED) CORPS OF ENGINEERS ELEV (FT) VS OUTFLOW (CFS)

| ELEV  | 0-00  | 0-01  | 0-02  | 0-03  | 0-04  | 0-05  | 0-06  | 0-07  | 0-08  | 0-09  |
|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| 688.0 | 9836  | 9840  | 9844  | 9845  | 9852  | 9856  | 9860  | 9864  | 9868  | 9872  |
| 688.1 | 9876  | 9880  | 9884  | 9885  | 9892  | 9896  | 9900  | 9904  | 9908  | 9912  |
| 688.2 | 9916  | 9920  | 9924  | 9923  | 9932  | 9935  | 9939  | 9943  | 9947  | 9951  |
| 688.3 | 9955  | 9959  | 9963  | 9967  | 9971  | 9975  | 9979  | 9983  | 9987  | 9991  |
| 688.4 | 9995  | 9999  | 10003 | 10007 | 10011 | 10015 | 10019 | 10023 | 10027 | 10031 |
| 688.5 | 10035 | 10039 | 10043 | 10047 | 10051 | 10055 | 10059 | 10063 | 10067 | 10071 |
| 688.6 | 10075 | 10079 | 10083 | 10087 | 10091 | 10095 | 10099 | 10103 | 10107 | 10111 |
| 688.7 | 10115 | 10119 | 10123 | 10127 | 10131 | 10134 | 10138 | 10142 | 10146 | 10150 |
| 688.8 | 10154 | 10158 | 10162 | 10165 | 10170 | 10174 | 10178 | 10182 | 10186 | 10190 |
| 688.9 | 10194 | 10198 | 10202 | 10205 | 10210 | 10214 | 10218 | 10222 | 10226 | 10230 |
| 689.0 | 10234 | 10238 | 10242 | 10245 | 10249 | 10253 | 10257 | 10260 | 10264 | 10268 |
| 689.1 | 10272 | 10276 | 10279 | 10283 | 10287 | 10291 | 10294 | 10298 | 10302 | 10306 |
| 689.2 | 10310 | 10313 | 10317 | 10321 | 10325 | 10328 | 10332 | 10336 | 10340 | 10344 |
| 689.3 | 10347 | 10351 | 10355 | 10359 | 10363 | 10366 | 10370 | 10374 | 10378 | 10381 |
| 689.4 | 10365 | 10389 | 10393 | 10397 | 10400 | 10404 | 10408 | 10412 | 10415 | 10419 |
| 689.5 | 10423 | 10427 | 10431 | 10434 | 10438 | 10442 | 10446 | 10449 | 10453 | 10457 |
| 689.6 | 10461 | 10465 | 10468 | 10472 | 10476 | 10480 | 10483 | 10487 | 10491 | 10495 |
| 689.7 | 10499 | 10502 | 10506 | 10510 | 10514 | 10517 | 10521 | 10525 | 10529 | 10533 |
| 689.8 | 10536 | 10540 | 10544 | 10548 | 10552 | 10555 | 10559 | 10563 | 10567 | 10570 |
| 689.9 | 10574 | 10578 | 10582 | 10585 | 10589 | 10593 | 10597 | 10601 | 10604 | 10608 |
| 690.0 | 10612 | 10616 | 10619 | 10623 | 10627 | 10630 | 10634 | 10638 | 10642 | 10645 |
| 690.1 | 10649 | 10653 | 10656 | 10660 | 10664 | 10667 | 10671 | 10675 | 10679 | 10682 |
| 690.2 | 10686 | 10690 | 10693 | 10697 | 10701 | 10704 | 10708 | 10712 | 10715 | 10719 |
| 690.3 | 10723 | 10727 | 10730 | 10734 | 10738 | 10741 | 10745 | 10749 | 10752 | 10756 |
| 690.4 | 10760 | 10764 | 10767 | 10771 | 10775 | 10778 | 10782 | 10786 | 10789 | 10793 |
| 690.5 | 10797 | 10800 | 10804 | 10808 | 10812 | 10815 | 10819 | 10823 | 10826 | 10830 |
| 690.6 | 10834 | 10837 | 10841 | 10845 | 10849 | 10852 | 10856 | 10860 | 10863 | 10867 |
| 690.7 | 10871 | 10874 | 10878 | 10882 | 10886 | 10889 | 10893 | 10897 | 10900 | 10904 |
| 690.8 | 10908 | 10911 | 10915 | 10919 | 10922 | 10926 | 10930 | 10934 | 10937 | 10941 |
| 690.9 | 10945 | 10948 | 10952 | 10955 | 10959 | 10963 | 10967 | 10971 | 10974 | 10978 |



SPHULVERA DAM 4 GATED AND 4 UNGATED) CORPS OF ENGINEERS FLEV (FT) VS OUTFLOW (CFS)

| ELEV  | 0.00  | 0.01  | 0.02  | 0.03  | 0.04  | 0.05  | 0.06  | 0.07  | 0.08  | 0.09  |
|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| 691.0 | 10942 | 10985 | 10948 | 10992 | 10995 | 10994 | 11002 | 11005 | 11009 | 11012 |
| 691.1 | 11016 | 11019 | 11022 | 11025 | 11029 | 11033 | 11036 | 11039 | 11043 | 11046 |
| 691.2 | 11050 | 11053 | 11056 | 11050 | 11063 | 11066 | 11070 | 11073 | 11077 | 11080 |
| 691.3 | 11083 | 11087 | 11090 | 11094 | 11097 | 11100 | 11104 | 11107 | 11111 | 11114 |
| 691.4 | 11117 | 11121 | 11124 | 11128 | 11131 | 11134 | 11138 | 11141 | 11145 | 11148 |
| 691.5 | 11151 | 11155 | 11158 | 11162 | 11165 | 11168 | 11172 | 11175 | 11179 | 11182 |
| 691.6 | 11185 | 11189 | 11192 | 11195 | 11199 | 11202 | 11206 | 11209 | 11213 | 11216 |
| 691.7 | 11219 | 11223 | 11226 | 11230 | 11233 | 11236 | 11240 | 11243 | 11246 | 11250 |
| 691.8 | 11253 | 11257 | 11260 | 11263 | 11267 | 11270 | 11274 | 11277 | 11280 | 11284 |
| 691.9 | 11287 | 11291 | 11294 | 11297 | 11301 | 11304 | 11308 | 11311 | 11314 | 11318 |
| 692.0 | 11321 | 11325 | 11328 | 11332 | 11336 | 11339 | 11343 | 11346 | 11350 | 11354 |
| 692.1 | 11357 | 11361 | 11364 | 11368 | 11372 | 11375 | 11379 | 11382 | 11386 | 11390 |
| 692.2 | 11393 | 11397 | 11400 | 11404 | 11408 | 11411 | 11415 | 11418 | 11422 | 11425 |
| 692.3 | 11429 | 11433 | 11436 | 11440 | 11443 | 11447 | 11451 | 11454 | 11459 | 11461 |
| 692.4 | 11465 | 11469 | 11472 | 11475 | 11479 | 11483 | 11487 | 11490 | 11494 | 11497 |
| 692.5 | 11501 | 11505 | 11508 | 11512 | 11515 | 11519 | 11523 | 11526 | 11530 | 11533 |
| 692.6 | 11537 | 11541 | 11544 | 11548 | 11551 | 11555 | 11559 | 11562 | 11566 | 11569 |
| 692.7 | 11573 | 11577 | 11580 | 11584 | 11587 | 11591 | 11594 | 11598 | 11602 | 11605 |
| 692.8 | 11609 | 11612 | 11616 | 11620 | 11623 | 11627 | 11630 | 11634 | 11638 | 11641 |
| 692.9 | 11645 | 11648 | 11652 | 11655 | 11659 | 11663 | 11666 | 11670 | 11674 | 11677 |
| 693.0 | 11681 | 11684 | 11688 | 11691 | 11694 | 11698 | 11701 | 11705 | 11708 | 11711 |
| 693.1 | 11715 | 11718 | 11722 | 11725 | 11728 | 11732 | 11735 | 11739 | 11742 | 11745 |
| 693.2 | 11749 | 11752 | 11756 | 11759 | 11762 | 11766 | 11769 | 11772 | 11776 | 11779 |
| 693.3 | 11783 | 11786 | 11789 | 11793 | 11796 | 11800 | 11803 | 11806 | 11810 | 11813 |
| 693.4 | 11817 | 11820 | 11823 | 11827 | 11830 | 11834 | 11837 | 11840 | 11844 | 11847 |
| 693.5 | 11851 | 11854 | 11857 | 11861 | 11864 | 11868 | 11871 | 11874 | 11878 | 11881 |
| 693.6 | 11885 | 11888 | 11891 | 11895 | 11898 | 11902 | 11905 | 11908 | 11912 | 11915 |
| 693.7 | 11919 | 11922 | 11925 | 11929 | 11932 | 11935 | 11939 | 11942 | 11946 | 11949 |
| 693.8 | 11952 | 11956 | 11959 | 11963 | 11966 | 11969 | 11973 | 11976 | 11980 | 11983 |
| 693.9 | 11986 | 11990 | 11993 | 11997 | 12000 | 12003 | 12007 | 12010 | 12014 | 12017 |

SEPIULVEDA DAM 4 GATED AND 4 UNGATED) CORPS OF ENGINEERS ELFV (F1) VS OUTFLOW (CF5)

| ELEV  | 0.00  | 0.01  | 0.02  | 0.03  | 0.04  | 0.05  | 0.06  | 0.07  | 0.08  | 0.09  |
|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| 694.0 | 12020 | 12024 | 12027 | 12031 | 12034 | 12038 | 12041 | 12045 | 12048 | 12052 |
| 694.1 | 12055 | 12059 | 12062 | 12065 | 12069 | 12073 | 12076 | 12080 | 12083 | 12087 |
| 694.2 | 12090 | 12094 | 12097 | 12101 | 12104 | 12108 | 12111 | 12115 | 12118 | 12122 |
| 694.3 | 12125 | 12129 | 12132 | 12135 | 12139 | 12143 | 12146 | 12150 | 12153 | 12157 |
| 694.4 | 12160 | 12164 | 12167 | 12171 | 12174 | 12178 | 12181 | 12185 | 12189 | 12192 |
| 694.5 | 12195 | 12199 | 12202 | 12205 | 12209 | 12213 | 12216 | 12220 | 12223 | 12227 |
| 694.6 | 12230 | 12234 | 12237 | 12241 | 12244 | 12248 | 12251 | 12255 | 12258 | 12262 |
| 694.7 | 12265 | 12269 | 12272 | 12275 | 12279 | 12283 | 12286 | 12290 | 12293 | 12297 |
| 694.8 | 12300 | 12304 | 12307 | 12311 | 12314 | 12318 | 12321 | 12325 | 12328 | 12332 |
| 694.9 | 12335 | 12339 | 12342 | 12345 | 12349 | 12353 | 12356 | 12360 | 12363 | 12367 |
| 695.0 | 12370 | 12373 | 12376 | 12379 | 12383 | 12386 | 12389 | 12392 | 12395 | 12398 |
| 695.1 | 12401 | 12405 | 12408 | 12411 | 12414 | 12417 | 12420 | 12423 | 12427 | 12430 |
| 695.2 | 12433 | 12436 | 12439 | 12442 | 12445 | 12448 | 12452 | 12455 | 12458 | 12461 |
| 695.3 | 12464 | 12467 | 12470 | 12474 | 12477 | 12480 | 12483 | 12486 | 12489 | 12492 |
| 695.4 | 12496 | 12499 | 12502 | 12505 | 12508 | 12511 | 12514 | 12518 | 12521 | 12524 |
| 695.5 | 12527 | 12530 | 12533 | 12535 | 12540 | 12543 | 12546 | 12549 | 12552 | 12555 |
| 695.6 | 12558 | 12562 | 12565 | 12569 | 12571 | 12574 | 12577 | 12580 | 12584 | 12587 |
| 695.7 | 12590 | 12593 | 12596 | 12599 | 12602 | 12605 | 12609 | 12612 | 12615 | 12618 |
| 695.8 | 12621 | 12624 | 12627 | 12631 | 12634 | 12637 | 12640 | 12643 | 12646 | 12649 |
| 695.9 | 12651 | 12654 | 12659 | 12662 | 12665 | 12668 | 12671 | 12675 | 12678 | 12681 |
| 696.0 | 12684 | 12687 | 12690 | 12693 | 12696 | 12699 | 12702 | 12705 | 12708 | 12711 |
| 696.1 | 12714 | 12717 | 12720 | 12724 | 12727 | 12730 | 12733 | 12736 | 12739 | 12742 |
| 696.2 | 12745 | 12748 | 12751 | 12754 | 12757 | 12760 | 12763 | 12766 | 12769 | 12772 |
| 696.3 | 12775 | 12778 | 12781 | 12784 | 12787 | 12790 | 12793 | 12796 | 12800 | 12803 |
| 696.4 | 12806 | 12809 | 12812 | 12815 | 12818 | 12821 | 12824 | 12827 | 12830 | 12833 |
| 696.5 | 12836 | 12839 | 12842 | 12845 | 12848 | 12851 | 12854 | 12857 | 12860 | 12863 |
| 696.6 | 12866 | 12869 | 12872 | 12875 | 12879 | 12882 | 12885 | 12888 | 12891 | 12894 |
| 696.7 | 12897 | 12900 | 12903 | 12905 | 12909 | 12912 | 12915 | 12918 | 12921 | 12924 |
| 696.8 | 12927 | 12930 | 12933 | 12935 | 12939 | 12942 | 12945 | 12948 | 12952 | 12955 |
| 696.9 | 12958 | 12961 | 12964 | 12967 | 12970 | 12973 | 12976 | 12979 | 12982 | 12985 |

SEPULVEDA DAM 4 GATED AND 4 UNGATED

CORPS OF ENGINEERS

ELEV (FT) VS OUTFLOW (CFS)

| ELEV  | 0.00  | 0.01  | 0.02  | 0.03  | 0.04  | 0.05  | 0.06  | 0.07  | 0.08  | 0.09  |
|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| 697.0 | 12988 | 12991 | 12994 | 12997 | 13001 | 13004 | 13007 | 13010 | 13013 | 13016 |
| 697.1 | 13019 | 13023 | 13026 | 13029 | 13032 | 13035 | 13038 | 13041 | 13045 | 13048 |
| 697.2 | 13051 | 13054 | 13057 | 13060 | 13063 | 13066 | 13070 | 13073 | 13076 | 13079 |
| 697.3 | 13062 | 13085 | 13088 | 13092 | 13095 | 13098 | 13101 | 13104 | 13107 | 13110 |
| 697.4 | 13114 | 13117 | 13120 | 13123 | 13126 | 13129 | 13132 | 13136 | 13139 | 13142 |
| 697.5 | 13145 | 13148 | 13151 | 13154 | 13158 | 13161 | 13164 | 13167 | 13170 | 13173 |
| 697.6 | 13176 | 13180 | 13183 | 13185 | 13189 | 13192 | 13195 | 13198 | 13202 | 13205 |
| 697.7 | 13208 | 13211 | 13214 | 13217 | 13220 | 13223 | 13227 | 13230 | 13233 | 13236 |
| 697.8 | 13239 | 13242 | 13245 | 13249 | 13252 | 13255 | 13258 | 13261 | 13264 | 13267 |
| 697.9 | 13271 | 13274 | 13277 | 13280 | 13283 | 13286 | 13289 | 13293 | 13296 | 13299 |
| 698.0 | 13302 | 13305 | 13308 | 13311 | 13314 | 13317 | 13320 | 13323 | 13326 | 13328 |
| 698.1 | 13331 | 13334 | 13337 | 13340 | 13343 | 13346 | 13349 | 13352 | 13355 | 13358 |
| 698.2 | 13361 | 13364 | 13367 | 13370 | 13373 | 13375 | 13378 | 13381 | 13384 | 13387 |
| 698.3 | 13390 | 13393 | 13396 | 13399 | 13402 | 13405 | 13408 | 13411 | 13414 | 13417 |
| 698.4 | 13420 | 13423 | 13425 | 13428 | 13431 | 13434 | 13437 | 13440 | 13443 | 13446 |
| 698.5 | 13449 | 13452 | 13455 | 13458 | 13461 | 13464 | 13467 | 13470 | 13473 | 13475 |
| 698.6 | 13478 | 13481 | 13484 | 13487 | 13490 | 13493 | 13496 | 13499 | 13502 | 13505 |
| 698.7 | 13508 | 13511 | 13514 | 13517 | 13520 | 13522 | 13525 | 13528 | 13531 | 13534 |
| 698.8 | 13537 | 13540 | 13543 | 13545 | 13549 | 13552 | 13555 | 13558 | 13561 | 13564 |
| 698.9 | 13567 | 13570 | 13572 | 13575 | 13578 | 13581 | 13584 | 13587 | 13590 | 13593 |
| 699.0 | 13596 | 13599 | 13602 | 13605 | 13608 | 13611 | 13614 | 13617 | 13620 | 13622 |
| 699.1 | 13625 | 13628 | 13631 | 13634 | 13637 | 13640 | 13643 | 13646 | 13649 | 13652 |
| 699.2 | 13655 | 13658 | 13661 | 13664 | 13667 | 13669 | 13672 | 13675 | 13678 | 13681 |
| 699.3 | 13684 | 13687 | 13690 | 13693 | 13696 | 13699 | 13702 | 13705 | 13708 | 13711 |
| 699.4 | 13714 | 13717 | 13719 | 13722 | 13725 | 13728 | 13731 | 13734 | 13737 | 13740 |
| 699.5 | 13743 | 13746 | 13749 | 13752 | 13755 | 13758 | 13761 | 13764 | 13767 | 13769 |
| 699.6 | 13772 | 13775 | 13778 | 13781 | 13784 | 13787 | 13790 | 13793 | 13796 | 13799 |
| 699.7 | 13802 | 13805 | 13808 | 13811 | 13814 | 13816 | 13819 | 13822 | 13825 | 13828 |
| 699.8 | 13831 | 13834 | 13837 | 13840 | 13843 | 13846 | 13849 | 13852 | 13855 | 13858 |
| 699.9 | 13861 | 13864 | 13866 | 13869 | 13872 | 13875 | 13878 | 13881 | 13884 | 13887 |

SEPULVEDA DAM - GATED AND 4 UNGATED) CORPS OF ENGINEERS ELEV (FT) VS OUTFLOW (CFS)

| ELEV  | 0.00  | 0.01  | 0.02  | 0.03  | 0.04  | 0.05  | 0.06  | 0.07  | 0.08  | 0.09  |
|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| 700.0 | 13890 | 13893 | 13896 | 13899 | 13902 | 13905 | 13908 | 13911 | 13914 | 13916 |
| 700.1 | 13919 | 13922 | 13925 | 13929 | 13931 | 13934 | 13937 | 13940 | 13943 | 13946 |
| 700.2 | 13949 | 13952 | 13955 | 13959 | 13961 | 13963 | 13966 | 13969 | 13972 | 13975 |
| 700.3 | 13978 | 13981 | 13984 | 13987 | 13990 | 13993 | 13996 | 13999 | 14002 | 14005 |
| 700.4 | 14008 | 14011 | 14013 | 14015 | 14019 | 14022 | 14025 | 14028 | 14031 | 14034 |
| 700.5 | 14037 | 14040 | 14043 | 14046 | 14049 | 14052 | 14055 | 14058 | 14061 | 14063 |
| 700.6 | 14066 | 14069 | 14072 | 14075 | 14078 | 14081 | 14084 | 14087 | 14090 | 14093 |
| 700.7 | 14096 | 14099 | 14102 | 14105 | 14108 | 14110 | 14113 | 14116 | 14119 | 14122 |
| 700.8 | 14125 | 14128 | 14131 | 14134 | 14137 | 14140 | 14143 | 14146 | 14149 | 14152 |
| 700.9 | 14155 | 14158 | 14160 | 14163 | 14166 | 14169 | 14172 | 14175 | 14178 | 14181 |
| 701.0 | 14194 | 14187 | 14190 | 14193 | 14195 | 14198 | 14201 | 14204 | 14207 | 14210 |
| 701.1 | 14212 | 14215 | 14218 | 14221 | 14224 | 14227 | 14229 | 14232 | 14235 | 14238 |
| 701.2 | 14241 | 14244 | 14246 | 14249 | 14252 | 14255 | 14258 | 14261 | 14264 | 14266 |
| 701.3 | 14269 | 14272 | 14275 | 14278 | 14281 | 14283 | 14286 | 14289 | 14292 | 14295 |
| 701.4 | 14298 | 14300 | 14303 | 14306 | 14309 | 14312 | 14315 | 14317 | 14320 | 14323 |
| 701.5 | 14326 | 14329 | 14332 | 14335 | 14337 | 14340 | 14343 | 14345 | 14349 | 14352 |
| 701.6 | 14354 | 14357 | 14360 | 14363 | 14366 | 14369 | 14371 | 14374 | 14377 | 14380 |
| 701.7 | 14383 | 14386 | 14388 | 14391 | 14394 | 14397 | 14400 | 14403 | 14405 | 14408 |
| 701.8 | 14411 | 14414 | 14417 | 14420 | 14423 | 14425 | 14428 | 14431 | 14434 | 14437 |
| 701.9 | 14440 | 14442 | 14445 | 14448 | 14451 | 14454 | 14457 | 14459 | 14462 | 14465 |
| 702.0 | 14468 | 14471 | 14473 | 14476 | 14479 | 14482 | 14484 | 14487 | 14490 | 14493 |
| 702.1 | 14495 | 14498 | 14501 | 14504 | 14506 | 14509 | 14512 | 14515 | 14517 | 14520 |
| 702.2 | 14523 | 14526 | 14528 | 14531 | 14534 | 14536 | 14539 | 14542 | 14545 | 14547 |
| 702.3 | 14550 | 14553 | 14556 | 14558 | 14561 | 14564 | 14567 | 14569 | 14572 | 14575 |
| 702.4 | 14578 | 14580 | 14583 | 14586 | 14589 | 14591 | 14594 | 14597 | 14600 | 14602 |
| 702.5 | 14605 | 14608 | 14610 | 14613 | 14616 | 14619 | 14621 | 14624 | 14627 | 14630 |
| 702.6 | 14632 | 14635 | 14638 | 14641 | 14643 | 14646 | 14649 | 14652 | 14654 | 14657 |
| 702.7 | 14660 | 14663 | 14665 | 14668 | 14671 | 14673 | 14676 | 14679 | 14682 | 14684 |
| 702.8 | 14687 | 14690 | 14693 | 14695 | 14698 | 14701 | 14704 | 14706 | 14709 | 14712 |
| 702.9 | 14715 | 14717 | 14720 | 14723 | 14726 | 14728 | 14731 | 14734 | 14737 | 14739 |

| SEFULVEDA DAM 4 GATED AND 4 UNGATED) |       |       |       |       |       |       |       |       |       | CORPS OF ENGINEERS |  |  | ELEV (FT) |  | VS |  | OUTFLOW (CFS) |  |
|--------------------------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|--------------------|--|--|-----------|--|----|--|---------------|--|
| ELEV                                 | 0.00  | 0.01  | 0.02  | 0.03  | 0.04  | 0.05  | 0.06  | 0.07  | 0.08  | 0.09               |  |  |           |  |    |  |               |  |
| 703.0                                | 14742 | 14745 | 14747 | 14750 | 14753 | 14756 | 14758 | 14761 | 14764 | 14767              |  |  |           |  |    |  |               |  |
| 703.1                                | 14769 | 14772 | 14775 | 14779 | 14780 | 14783 | 14786 | 14789 | 14791 | 14794              |  |  |           |  |    |  |               |  |
| 703.2                                | 14797 | 14800 | 14802 | 14805 | 14808 | 14810 | 14813 | 14816 | 14819 | 14821              |  |  |           |  |    |  |               |  |
| 703.3                                | 14824 | 14827 | 14830 | 14832 | 14835 | 14838 | 14841 | 14843 | 14846 | 14849              |  |  |           |  |    |  |               |  |
| 703.4                                | 14852 | 14854 | 14857 | 14860 | 14862 | 14865 | 14868 | 14871 | 14874 | 14876              |  |  |           |  |    |  |               |  |
| 703.5                                | 14879 | 14882 | 14884 | 14887 | 14890 | 14893 | 14895 | 14898 | 14901 | 14904              |  |  |           |  |    |  |               |  |
| 703.6                                | 14906 | 14909 | 14912 | 14915 | 14917 | 14920 | 14923 | 14926 | 14928 | 14931              |  |  |           |  |    |  |               |  |
| 703.7                                | 14934 | 14937 | 14939 | 14942 | 14945 | 14947 | 14950 | 14953 | 14956 | 14958              |  |  |           |  |    |  |               |  |
| 703.8                                | 14961 | 14964 | 14967 | 14969 | 14972 | 14975 | 14978 | 14980 | 14983 | 14986              |  |  |           |  |    |  |               |  |
| 703.9                                | 14969 | 14991 | 14994 | 14997 | 15000 | 15002 | 15005 | 15008 | 15011 | 15013              |  |  |           |  |    |  |               |  |
| 704.0                                | 15016 | 15019 | 15021 | 15024 | 15027 | 15030 | 15032 | 15035 | 15038 | 15041              |  |  |           |  |    |  |               |  |
| 704.1                                | 15043 | 15046 | 15049 | 15052 | 15054 | 15057 | 15060 | 15063 | 15065 | 15068              |  |  |           |  |    |  |               |  |
| 704.2                                | 15071 | 15074 | 15076 | 15079 | 15082 | 15084 | 15087 | 15090 | 15093 | 15095              |  |  |           |  |    |  |               |  |
| 704.3                                | 15098 | 15101 | 15104 | 15105 | 15109 | 15112 | 15115 | 15117 | 15120 | 15123              |  |  |           |  |    |  |               |  |
| 704.4                                | 15126 | 15128 | 15131 | 15134 | 15137 | 15139 | 15142 | 15145 | 15148 | 15150              |  |  |           |  |    |  |               |  |
| 704.5                                | 15153 | 15156 | 15158 | 15161 | 15164 | 15167 | 15169 | 15172 | 15175 | 15178              |  |  |           |  |    |  |               |  |
| 704.6                                | 15160 | 15163 | 15166 | 15169 | 15191 | 15194 | 15197 | 15200 | 15202 | 15205              |  |  |           |  |    |  |               |  |
| 704.7                                | 15208 | 15211 | 15213 | 15215 | 15219 | 15221 | 15224 | 15227 | 15230 | 15232              |  |  |           |  |    |  |               |  |
| 704.8                                | 15235 | 15238 | 15241 | 15243 | 15246 | 15249 | 15252 | 15254 | 15257 | 15260              |  |  |           |  |    |  |               |  |
| 704.9                                | 15263 | 15265 | 15268 | 15271 | 15274 | 15276 | 15279 | 15282 | 15285 | 15287              |  |  |           |  |    |  |               |  |
| 705.0                                | 15290 | 15292 | 15295 | 15297 | 15300 | 15302 | 15305 | 15307 | 15309 | 15312              |  |  |           |  |    |  |               |  |
| 705.1                                | 15314 | 15317 | 15319 | 15322 | 15324 | 15326 | 15329 | 15331 | 15334 | 15336              |  |  |           |  |    |  |               |  |
| 705.2                                | 15339 | 15341 | 15343 | 15345 | 15348 | 15351 | 15353 | 15356 | 15358 | 15360              |  |  |           |  |    |  |               |  |
| 705.3                                | 15363 | 15365 | 15368 | 15370 | 15373 | 15375 | 15377 | 15380 | 15382 | 15385              |  |  |           |  |    |  |               |  |
| 705.4                                | 15367 | 15390 | 15392 | 15394 | 15397 | 15399 | 15402 | 15404 | 15407 | 15409              |  |  |           |  |    |  |               |  |
| 705.5                                | 15411 | 15414 | 15416 | 15419 | 15421 | 15424 | 15426 | 15428 | 15431 | 15433              |  |  |           |  |    |  |               |  |
| 705.6                                | 15436 | 15438 | 15441 | 15443 | 15445 | 15448 | 15450 | 15453 | 15455 | 15458              |  |  |           |  |    |  |               |  |
| 705.7                                | 15460 | 15462 | 15465 | 15467 | 15470 | 15472 | 15475 | 15477 | 15479 | 15482              |  |  |           |  |    |  |               |  |
| 705.8                                | 15484 | 15487 | 15489 | 15492 | 15494 | 15496 | 15499 | 15501 | 15504 | 15506              |  |  |           |  |    |  |               |  |
| 705.9                                | 15509 | 15511 | 15513 | 15516 | 15518 | 15521 | 15523 | 15526 | 15528 | 15530              |  |  |           |  |    |  |               |  |

SEPULVEDA DAM 4 GATED AND 4 (UNGATED) CORPS OF ENGINEERS ELEV (FT) VS OUTFLOW (CFS)

| ELEV  | 0.00  | 0.01  | 0.02  | 0.03  | 0.04  | 0.05  | 0.06  | 0.07  | 0.08  | 0.09  |
|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| 706.0 | 15533 | 15535 | 15538 | 15540 | 15543 | 15545 | 15548 | 15550 | 15553 | 15556 |
| 706.1 | 15558 | 15561 | 15563 | 15565 | 15568 | 15571 | 15573 | 15576 | 15578 | 15581 |
| 706.2 | 15583 | 15586 | 15588 | 15591 | 15593 | 15596 | 15599 | 15601 | 15604 | 15606 |
| 706.3 | 15609 | 15611 | 15614 | 15616 | 15619 | 15621 | 15624 | 15626 | 15629 | 15631 |
| 706.4 | 15634 | 15636 | 15639 | 15642 | 15644 | 15647 | 15649 | 15652 | 15654 | 15657 |
| 706.5 | 15659 | 15662 | 15664 | 15667 | 15669 | 15672 | 15674 | 15677 | 15679 | 15682 |
| 706.6 | 15684 | 15687 | 15690 | 15692 | 15695 | 15697 | 15700 | 15702 | 15705 | 15707 |
| 706.7 | 15710 | 15712 | 15715 | 15717 | 15720 | 15722 | 15725 | 15727 | 15730 | 15733 |
| 706.8 | 15735 | 15738 | 15740 | 15743 | 15745 | 15748 | 15750 | 15753 | 15755 | 15758 |
| 706.9 | 15760 | 15763 | 15765 | 15769 | 15770 | 15773 | 15775 | 15778 | 15781 | 15783 |
| 707.0 | 15786 | 15788 | 15790 | 15793 | 15795 | 15797 | 15800 | 15802 | 15804 | 15807 |
| 707.1 | 15809 | 15811 | 15814 | 15816 | 15818 | 15821 | 15823 | 15825 | 15828 | 15830 |
| 707.2 | 15832 | 15834 | 15837 | 15839 | 15841 | 15844 | 15846 | 15848 | 15851 | 15853 |
| 707.3 | 15855 | 15858 | 15860 | 15862 | 15865 | 15867 | 15869 | 15872 | 15874 | 15876 |
| 707.4 | 15879 | 15881 | 15883 | 15885 | 15888 | 15890 | 15893 | 15895 | 15897 | 15900 |
| 707.5 | 15902 | 15904 | 15907 | 15909 | 15911 | 15914 | 15916 | 15918 | 15921 | 15923 |
| 707.6 | 15925 | 15928 | 15930 | 15932 | 15935 | 15937 | 15939 | 15942 | 15944 | 15946 |
| 707.7 | 15949 | 15951 | 15953 | 15955 | 15958 | 15960 | 15963 | 15965 | 15967 | 15970 |
| 707.8 | 15972 | 15974 | 15976 | 15979 | 15981 | 15983 | 15986 | 15988 | 15990 | 15996 |
| 707.9 | 15995 | 15997 | 16000 | 16002 | 16004 | 16007 | 16009 | 16011 | 16014 | 16016 |
| 708.0 | 16018 | 16021 | 16023 | 16025 | 16029 | 16031 | 16034 | 16036 | 16039 | 16041 |
| 708.1 | 16044 | 16046 | 16049 | 16051 | 16054 | 16056 | 16059 | 16061 | 16064 | 16066 |
| 708.2 | 16069 | 16071 | 16074 | 16077 | 16079 | 16082 | 16084 | 16087 | 16089 | 16092 |
| 708.3 | 16094 | 16097 | 16099 | 16102 | 16104 | 16107 | 16109 | 16112 | 16114 | 16117 |
| 708.4 | 16120 | 16122 | 16125 | 16127 | 16130 | 16132 | 16135 | 16137 | 16140 | 16142 |
| 708.5 | 16145 | 16147 | 16150 | 16152 | 16155 | 16157 | 16160 | 16162 | 16165 | 16168 |
| 708.6 | 16170 | 16173 | 16175 | 16178 | 16180 | 16183 | 16185 | 16188 | 16190 | 16193 |
| 708.7 | 16195 | 16198 | 16200 | 16203 | 16205 | 16208 | 16211 | 16213 | 16216 | 16218 |
| 708.8 | 16221 | 16223 | 16226 | 16228 | 16231 | 16233 | 16236 | 16238 | 16241 | 16243 |
| 708.9 | 16246 | 16248 | 16251 | 16254 | 16256 | 16259 | 16261 | 16264 | 16266 | 16269 |

| SEPULVEDA DAM 4 GATED AND 4 UNGATED 1 |              |       |       |       |       |       |       |       |       |
|---------------------------------------|--------------|-------|-------|-------|-------|-------|-------|-------|-------|
| CORPS OF ENGINEERS                    |              |       |       |       |       |       |       |       |       |
| ELEV                                  | ELEV (FT) VS |       |       |       |       |       |       |       |       |
|                                       | 0.00         | 0.01  | 0.02  | 0.03  | 0.04  | 0.05  | 0.06  | 0.07  | 0.08  |
| 709.0                                 | 16271        | 16274 | 16276 | 16278 | 16281 | 16283 | 16286 | 16288 | 16291 |
| 709.1                                 | 16295        | 16298 | 16300 | 16303 | 16305 | 16308 | 16310 | 16312 | 16315 |
| 709.2                                 | 16320        | 16322 | 16325 | 16327 | 16329 | 16332 | 16334 | 16337 | 16339 |
| 709.3                                 | 16344        | 16346 | 16349 | 16351 | 16354 | 16356 | 16359 | 16361 | 16363 |
| 709.4                                 | 16368        | 16371 | 16373 | 16375 | 16378 | 16380 | 16383 | 16385 | 16388 |
| 709.5                                 | 16393        | 16395 | 16397 | 16400 | 16402 | 16405 | 16407 | 16410 | 16412 |
| 709.6                                 | 16417        | 16419 | 16422 | 16424 | 16427 | 16429 | 16431 | 16434 | 16436 |
| 709.7                                 | 16441        | 16444 | 16446 | 16449 | 16451 | 16453 | 16456 | 16458 | 16461 |
| 709.8                                 | 16465        | 16468 | 16470 | 16473 | 16475 | 16478 | 16480 | 16482 | 16485 |
| 709.9                                 | 16490        | 16492 | 16495 | 16497 | 16499 | 16502 | 16504 | 16507 | 16509 |
| 710.0                                 | 16514        |       |       |       |       |       |       |       |       |

EXHIBIT F

RATING TABLE FOR STREAM GAUGES  
ON LOS ANGELES RIVER  
DOWNSTREAM OF SEPULVEDA DAM



# LOS ANGELES RIVER AT TUJUNGA AVE.

STATION #300b-H

RECORDER STATION RATING TABLE

\*\*\*\*\* RATING TABLE NO. 82-01 \*\*\*\*\*

| G.H. | .00   | .01   | .02   | .03   | .04   | .05   | .06   | .07   | .08   | .09   | DIFF. |
|------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| 0.0  | 0.00  | 0.10  | 0.20  | 0.30  | 0.40  | 0.50  | 0.60  | 0.70  | 0.80  | 0.90  | 0.10  |
| 0.1  | 1.00  | 1.13  | 1.26  | 1.39  | 1.52  | 1.65  | 1.78  | 1.91  | 2.04  | 2.17  | 0.13  |
| 0.2  | 2.00  | 2.15  | 2.30  | 2.45  | 2.60  | 2.75  | 2.90  | 3.05  | 3.20  | 3.35  | 0.15  |
| 0.3  | 3.00  | 3.17  | 3.34  | 3.51  | 3.68  | 3.85  | 4.02  | 4.19  | 4.36  | 4.53  | 0.17  |
| 0.4  | 4.00  | 4.18  | 4.36  | 4.54  | 4.72  | 4.90  | 5.08  | 5.26  | 5.44  | 5.62  | 0.19  |
| 0.5  | 5.00  | 5.19  | 5.38  | 5.57  | 5.76  | 5.95  | 6.14  | 6.33  | 6.52  | 6.71  | 0.21  |
| 0.6  | 6.00  | 6.20  | 6.40  | 6.60  | 6.80  | 7.00  | 7.20  | 7.40  | 7.60  | 7.80  | 0.23  |
| 0.7  | 7.00  | 7.21  | 7.42  | 7.63  | 7.84  | 8.05  | 8.26  | 8.47  | 8.68  | 8.89  | 0.25  |
| 0.8  | 8.00  | 8.22  | 8.44  | 8.66  | 8.88  | 9.10  | 9.32  | 9.54  | 9.76  | 9.98  | 0.27  |
| 0.9  | 9.00  | 9.23  | 9.46  | 9.69  | 9.92  | 10.15 | 10.38 | 10.61 | 10.84 | 11.07 | 0.30  |
| 1.0  | 10.00 | 10.24 | 10.48 | 10.72 | 10.96 | 11.20 | 11.44 | 11.68 | 11.92 | 12.16 | 0.34  |
| 1.1  | 11.00 | 11.25 | 11.50 | 11.75 | 12.00 | 12.25 | 12.50 | 12.75 | 13.00 | 13.25 | 0.36  |
| 1.2  | 12.00 | 12.26 | 12.52 | 12.78 | 13.04 | 13.30 | 13.56 | 13.82 | 14.08 | 14.34 | 0.39  |
| 1.3  | 13.00 | 13.27 | 13.54 | 13.81 | 14.08 | 14.35 | 14.62 | 14.89 | 15.16 | 15.43 | 0.41  |
| 1.4  | 14.00 | 14.28 | 14.56 | 14.84 | 15.12 | 15.40 | 15.68 | 15.96 | 16.24 | 16.52 | 0.44  |
| 1.5  | 15.00 | 15.29 | 15.58 | 15.87 | 16.16 | 16.45 | 16.74 | 17.03 | 17.32 | 17.61 | 0.46  |
| 1.6  | 16.00 | 16.30 | 16.60 | 16.90 | 17.20 | 17.50 | 17.80 | 18.10 | 18.40 | 18.70 | 0.50  |
| 1.7  | 17.00 | 17.31 | 17.62 | 17.93 | 18.24 | 18.55 | 18.86 | 19.17 | 19.48 | 19.79 | 0.55  |
| 1.8  | 18.00 | 18.32 | 18.64 | 18.96 | 19.28 | 19.60 | 19.92 | 20.24 | 20.56 | 20.88 | 0.58  |
| 1.9  | 19.00 | 19.33 | 19.66 | 19.99 | 20.32 | 20.65 | 20.98 | 21.31 | 21.64 | 21.97 | 0.61  |
| 2.0  | 20.00 | 20.34 | 20.68 | 21.02 | 21.36 | 21.70 | 22.04 | 22.38 | 22.72 | 23.06 | 0.67  |
| 2.1  | 21.00 | 21.35 | 21.70 | 22.05 | 22.40 | 22.75 | 23.10 | 23.45 | 23.80 | 24.15 | 0.71  |
| 2.2  | 22.00 | 22.36 | 22.72 | 23.08 | 23.44 | 23.80 | 24.16 | 24.52 | 24.88 | 25.24 | 0.74  |
| 2.3  | 23.00 | 23.37 | 23.74 | 24.11 | 24.48 | 24.85 | 25.22 | 25.59 | 25.96 | 26.33 | 0.80  |
| 2.4  | 24.00 | 24.38 | 24.76 | 25.14 | 25.52 | 25.90 | 26.28 | 26.66 | 27.04 | 27.42 | 0.90  |
| 2.5  | 25.00 | 25.39 | 25.78 | 26.17 | 26.56 | 26.95 | 27.34 | 27.73 | 28.12 | 28.51 | 1.00  |
| 2.6  | 26.00 | 26.40 | 26.80 | 27.20 | 27.60 | 28.00 | 28.40 | 28.80 | 29.20 | 29.60 | 1.10  |
| 2.7  | 27.00 | 27.41 | 27.82 | 28.23 | 28.64 | 29.05 | 29.46 | 29.87 | 30.28 | 30.69 | 1.20  |
| 2.8  | 28.00 | 28.42 | 28.84 | 29.26 | 29.68 | 30.10 | 30.52 | 30.94 | 31.36 | 31.78 | 1.50  |
| 2.9  | 29.00 | 29.43 | 29.86 | 30.29 | 30.72 | 31.15 | 31.58 | 32.01 | 32.44 | 32.87 |       |

SOURCE: LOS ANGELES COUNTY DEPT. OF PUBLIC WORKS

STATION NO. F300-R  
RATING TABLE NO. 62-01

SHEET 2

| G.H. | .00   | .01   | .02   | .03   | .04   | .05   | .06   | .07   | .08   | .09   | DIFF. |
|------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| 3.0  | 155.0 | 156.8 | 158.6 | 160.4 | 162.2 | 164.0 | 165.8 | 167.6 | 169.4 | 171.2 | 1.80  |
| 3.1  | 173.0 | 175.7 | 178.4 | 181.1 | 183.8 | 186.5 | 189.2 | 191.9 | 194.6 | 197.3 | 2.70  |
| 3.2  | 200.0 | 205.0 | 210.0 | 215.0 | 220.0 | 225.0 | 230.0 | 235.0 | 240.0 | 245.0 | 5.00  |
| 3.3  | 250.0 | 259.0 | 268.0 | 277.0 | 286.0 | 295.0 | 304.0 | 313.0 | 322.0 | 331.0 | 9.00  |
| 3.4  | 340.0 | 352.0 | 364.0 | 376.0 | 388.0 | 400.0 | 412.0 | 424.0 | 436.0 | 448.0 | 12.00 |
| 3.5  | 460.0 | 474.0 | 488.0 | 502.0 | 516.0 | 530.0 | 544.0 | 558.0 | 572.0 | 586.0 | 14.00 |
| 3.6  | 600.0 | 614.0 | 628.0 | 642.0 | 656.0 | 670.0 | 684.0 | 698.0 | 712.0 | 726.0 | 14.00 |
| 3.7  | 740.0 | 754.0 | 768.0 | 782.0 | 796.0 | 810.0 | 824.0 | 836.0 | 852.0 | 866.0 | 14.00 |
| 3.8  | 880.0 | 894.0 | 908.0 | 922.0 | 936.0 | 950.0 | 964.0 | 978.0 | 992.0 | 1006. | 14.00 |
| 3.9  | 1020. | 1035. | 1050. | 1065. | 1080. | 1095. | 1110. | 1125. | 1140. | 1155. | 15.00 |
| 4.0  | 1170. | 1186. | 1202. | 1218. | 1234. | 1250. | 1266. | 1282. | 1298. | 1314. | 16.00 |
| 4.1  | 1330. | 1346. | 1362. | 1378. | 1394. | 1410. | 1426. | 1442. | 1458. | 1474. | 16.00 |
| 4.2  | 1490. | 1506. | 1522. | 1538. | 1554. | 1570. | 1586. | 1602. | 1618. | 1634. | 16.00 |
| 4.3  | 1650. | 1667. | 1684. | 1701. | 1718. | 1735. | 1752. | 1769. | 1786. | 1803. | 17.00 |
| 4.4  | 1820. | 1837. | 1854. | 1871. | 1888. | 1905. | 1922. | 1939. | 1956. | 1973. | 17.00 |
| 4.5  | 1990. | 2008. | 2026. | 2044. | 2062. | 2080. | 2098. | 2116. | 2134. | 2152. | 18.00 |
| 4.6  | 2170. | 2183. | 2206. | 2224. | 2242. | 2260. | 2278. | 2296. | 2314. | 2332. | 18.00 |
| 4.7  | 2350. | 2369. | 2388. | 2407. | 2426. | 2445. | 2464. | 2483. | 2502. | 2521. | 19.00 |
| 4.8  | 2540. | 2560. | 2580. | 2600. | 2620. | 2640. | 2660. | 2680. | 2700. | 2720. | 20.00 |
| 4.9  | 2740. | 2760. | 2780. | 2800. | 2820. | 2840. | 2860. | 2880. | 2900. | 2920. | 20.00 |
| 5.0  | 2940. | 2960. | 2980. | 3000. | 3020. | 3040. | 3060. | 3080. | 3100. | 3120. | 20.00 |
| 5.1  | 3140. | 3161. | 3182. | 3203. | 3224. | 3245. | 3266. | 3287. | 3308. | 3329. | 21.00 |
| 5.2  | 3350. | 3372. | 3394. | 3416. | 3438. | 3460. | 3482. | 3504. | 3526. | 3548. | 22.00 |
| 5.3  | 3570. | 3593. | 3616. | 3639. | 3662. | 3685. | 3708. | 3731. | 3754. | 3777. | 23.00 |
| 5.4  | 3800. | 3824. | 3848. | 3872. | 3896. | 3920. | 3944. | 3968. | 3992. | 4016. | 24.00 |
| 5.5  | 4040. | 4064. | 4088. | 4112. | 4136. | 4160. | 4184. | 4208. | 4232. | 4256. | 24.00 |
| 5.6  | 4280. | 4305. | 4330. | 4355. | 4380. | 4405. | 4430. | 4455. | 4480. | 4505. | 25.00 |
| 5.7  | 4530. | 4555. | 4580. | 4605. | 4630. | 4655. | 4680. | 4705. | 4730. | 4755. | 25.00 |
| 5.8  | 4780. | 4806. | 4832. | 4858. | 4884. | 4910. | 4936. | 4962. | 4988. | 5014. | 26.00 |
| 5.9  | 5040. | 5066. | 5092. | 5118. | 5144. | 5170. | 5196. | 5222. | 5248. | 5274. | 26.00 |
| 6.0  | 5300. | 5327. | 5354. | 5381. | 5408. | 5435. | 5462. | 5489. | 5516. | 5543. | 27.00 |
| 6.1  | 5570. | 5599. | 5628. | 5657. | 5686. | 5715. | 5744. | 5773. | 5802. | 5831. | 29.00 |
| 6.2  | 5860. | 5889. | 5918. | 5947. | 5976. | 6005. | 6034. | 6063. | 6092. | 6121. | 29.00 |
| 6.3  | 6150. | 6179. | 6208. | 6237. | 6266. | 6295. | 6324. | 6353. | 6382. | 6411. | 29.00 |
| 6.4  | 6440. | 6470. | 6500. | 6530. | 6560. | 6590. | 6620. | 6650. | 6680. | 6710. | 30.00 |
| 6.5  | 6740. | 6770. | 6800. | 6830. | 6860. | 6890. | 6920. | 6950. | 6980. | 7010. | 30.00 |
| 6.6  | 7040. | 7072. | 7104. | 7136. | 7168. | 7200. | 7232. | 7264. | 7296. | 7328. | 32.00 |
| 6.7  | 7360. | 7392. | 7424. | 7456. | 7488. | 7520. | 7552. | 7584. | 7616. | 7648. | 32.00 |
| 6.8  | 7680. | 7712. | 7744. | 7776. | 7808. | 7840. | 7872. | 7904. | 7936. | 7968. | 32.00 |
| 6.9  | 8000. | 8033. | 8066. | 8099. | 8132. | 8165. | 8198. | 8231. | 8264. | 8297. | 33.00 |

STATION NO. F300-R  
RATING TABLE NO. 62-01

SHEET 3

| G.H. | .00    | .01    | .02    | .03    | .04    | .05    | .06    | .07    | .08    | .09    | DIFF. |
|------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|-------|
| 7.0  | 8330.  | 8364.  | 8398.  | 8432.  | 8466.  | 8500.  | 8534.  | 8568.  | 8602.  | 8636.  | 34.00 |
| 7.1  | 8670.  | 8704.  | 8738.  | 8772.  | 8806.  | 8840.  | 8874.  | 8908.  | 8942.  | 8976.  | 34.00 |
| 7.2  | 9010.  | 9045.  | 9080.  | 9115.  | 9150.  | 9185.  | 9220.  | 9255.  | 9290.  | 9325.  | 35.00 |
| 7.3  | 9360.  | 9395.  | 9430.  | 9465.  | 9500.  | 9535.  | 9570.  | 9605.  | 9640.  | 9675.  | 35.00 |
| 7.4  | 9710.  | 9746.  | 9782.  | 9818.  | 9854.  | 9890.  | 9926.  | 9962.  | 9998.  | 10034. | 36.00 |
| 7.5  | 10070. | 10106. | 10142. | 10178. | 10214. | 10250. | 10286. | 10322. | 10358. | 10394. | 36.00 |
| 7.6  | 10430. | 10466. | 10502. | 10538. | 10574. | 10610. | 10646. | 10682. | 10718. | 10754. | 36.00 |
| 7.7  | 10790. | 10826. | 10862. | 10898. | 10934. | 10970. | 11006. | 11042. | 11078. | 11114. | 36.00 |
| 7.8  | 11150. | 11189. | 11228. | 11267. | 11306. | 11345. | 11384. | 11423. | 11462. | 11501. | 39.00 |
| 7.9  | 11540. | 11579. | 11618. | 11657. | 11696. | 11735. | 11774. | 11813. | 11852. | 11891. | 39.00 |
| 8.0  | 11930. | 11969. | 12008. | 12047. | 12086. | 12125. | 12164. | 12203. | 12242. | 12281. | 39.00 |
| 8.1  | 12320. | 12359. | 12398. | 12437. | 12476. | 12515. | 12554. | 12593. | 12632. | 12671. | 39.00 |
| 8.2  | 12710. | 12749. | 12788. | 12827. | 12866. | 12905. | 12944. | 12983. | 13022. | 13061. | 39.00 |
| 8.3  | 13100. | 13140. | 13180. | 13220. | 13260. | 13300. | 13340. | 13380. | 13420. | 13460. | 40.00 |
| 8.4  | 13500. | 13540. | 13580. | 13620. | 13660. | 13700. | 13740. | 13780. | 13820. | 13860. | 40.00 |
| 8.5  | 13900. | 13940. | 13980. | 14020. | 14060. | 14100. | 14140. | 14180. | 14220. | 14260. | 40.00 |
| 8.6  | 14300. | 14340. | 14380. | 14420. | 14460. | 14500. | 14540. | 14580. | 14620. | 14660. | 40.00 |
| 8.7  | 14700. | 14740. | 14780. | 14820. | 14860. | 14900. | 14940. | 14980. | 15020. | 15060. | 40.00 |
| 8.8  | 15100. | 15140. | 15180. | 15220. | 15260. | 15300. | 15340. | 15380. | 15420. | 15460. | 40.00 |
| 8.9  | 15500. | 15540. | 15580. | 15620. | 15660. | 15700. | 15740. | 15780. | 15820. | 15860. | 40.00 |
| 9.0  | 15900. | 15940. | 15980. | 16020. | 16060. | 16100. | 16140. | 16180. | 16220. | 16260. | 40.00 |
| 9.1  | 16300. | 16340. | 16380. | 16420. | 16460. | 16500. | 16540. | 16580. | 16620. | 16660. | 40.00 |
| 9.2  | 16700. | 16740. | 16780. | 16820. | 16860. | 16900. | 16940. | 16980. | 17020. | 17060. | 40.00 |
| 9.3  | 17100. | 17140. | 17180. | 17220. | 17260. | 17300. | 17340. | 17380. | 17420. | 17460. | 40.00 |
| 9.4  | 17500. | 17540. | 17580. | 17620. | 17660. | 17700. | 17740. | 17780. | 17820. | 17860. | 40.00 |
| 9.5  | 17900. | 17940. | 17980. | 18020. | 18060. | 18100. | 18140. | 18180. | 18220. | 18260. | 40.00 |
| 9.6  | 18300. | 18341. | 18382. | 18423. | 18464. | 18505. | 18546. | 18587. | 18628. | 18669. | 41.00 |
| 9.7  | 18710. | 18751. | 18792. | 18833. | 18874. | 18915. | 18956. | 18997. | 19038. | 19079. | 41.00 |
| 9.8  | 19120. | 19161. | 19202. | 19243. | 19284. | 19325. | 19366. | 19407. | 19448. | 19489. | 41.00 |
| 9.9  | 19530. | 19571. | 19612. | 19653. | 19694. | 19735. | 19776. | 19817. | 19858. | 19899. | 41.00 |
| 10.0 | 19940. | 19981. | 20022. | 20063. | 20104. | 20145. | 20186. | 20227. | 20268. | 20309. | 41.00 |
| 10.1 | 20350. | 20391. | 20432. | 20473. | 20514. | 20555. | 20596. | 20637. | 20678. | 20719. | 41.00 |
| 10.2 | 20760. | 20801. | 20842. | 20883. | 20924. | 20965. | 21006. | 21047. | 21088. | 21129. | 41.00 |
| 10.3 | 21170. | 21212. | 21254. | 21296. | 21338. | 21380. | 21422. | 21464. | 21506. | 21548. | 42.00 |
| 10.4 | 21590. | 21632. | 21674. | 21716. | 21758. | 21800. | 21842. | 21884. | 21926. | 21968. | 42.00 |
| 10.5 | 22010. | 22052. | 22094. | 22136. | 22178. | 22220. | 22262. | 22304. | 22346. | 22388. | 42.00 |
| 10.6 | 22430. | 22472. | 22514. | 22556. | 22598. | 22640. | 22682. | 22724. | 22766. | 22808. | 42.00 |
| 10.7 | 22850. | 22892. | 22934. | 22976. | 23018. | 23060. | 23102. | 23144. | 23186. | 23228. | 42.00 |
| 10.8 | 23270. | 23313. | 23356. | 23399. | 23442. | 23485. | 23528. | 23571. | 23614. | 23657. | 43.00 |
| 10.9 | 23700. | 23743. | 23786. | 23829. | 23872. | 23915. | 23958. | 24001. | 24044. | 24087. | 43.00 |

STATION NO. F300-R  
RATING TABLE NO. 62-01

SHEET 4

| G.H. | .00    | .01    | .02    | .03    | .04    | .05    | .06    | .07    | .08    | .09    | DIFF. |
|------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|-------|
| 11.0 | 24130. | 24173. | 24216. | 24259. | 24302. | 24345. | 24388. | 24431. | 24474. | 24517. | 43.00 |
| 11.1 | 24560. | 24604. | 24648. | 24692. | 24736. | 24780. | 24824. | 24868. | 24912. | 24956. | 44.00 |
| 11.2 | 25000. | 25044. | 25088. | 25132. | 25176. | 25220. | 25264. | 25308. | 25352. | 25396. | 44.00 |
| 11.3 | 25440. | 25484. | 25528. | 25572. | 25616. | 25660. | 25704. | 25748. | 25792. | 25836. | 44.00 |
| 11.4 | 25880. | 25924. | 25968. | 26012. | 26056. | 26100. | 26144. | 26188. | 26232. | 26276. | 44.00 |
| 11.5 | 26320. | 26365. | 26410. | 26455. | 26500. | 26545. | 26590. | 26635. | 26680. | 26725. | 45.00 |
| 11.6 | 26770. | 26815. | 26860. | 26905. | 26950. | 26995. | 27040. | 27085. | 27130. | 27175. | 45.00 |
| 11.7 | 27220. | 27265. | 27310. | 27355. | 27400. | 27445. | 27490. | 27535. | 27580. | 27625. | 45.00 |
| 11.8 | 27670. | 27715. | 27760. | 27805. | 27850. | 27895. | 27940. | 27985. | 28030. | 28075. | 45.00 |
| 11.9 | 28120. | 28166. | 28212. | 28258. | 28304. | 28350. | 28396. | 28442. | 28488. | 28534. | 46.00 |
| 12.0 | 28580. | 28627. | 28674. | 28721. | 28768. | 28815. | 28862. | 28909. | 28956. | 29003. | 47.00 |
| 12.1 | 29050. | 29098. | 29146. | 29194. | 29242. | 29290. | 29338. | 29386. | 29434. | 29482. | 48.00 |
| 12.2 | 29530. | 29579. | 29628. | 29677. | 29726. | 29775. | 29824. | 29873. | 29922. | 29971. | 49.00 |
| 12.3 | 30020. | 30070. | 30120. | 30170. | 30220. | 30270. | 30320. | 30370. | 30420. | 30470. | 50.00 |
| 12.4 | 30520. | 30571. | 30622. | 30673. | 30724. | 30775. | 30826. | 30877. | 30928. | 30979. | 51.00 |
| 12.5 | 31030. | 31082. | 31134. | 31186. | 31238. | 31290. | 31342. | 31394. | 31446. | 31498. | 52.00 |
| 12.6 | 31550. | 31603. | 31656. | 31709. | 31762. | 31815. | 31868. | 31921. | 31974. | 32027. | 53.00 |
| 12.7 | 32080. | 32134. | 32188. | 32242. | 32296. | 32350. | 32404. | 32458. | 32512. | 32566. | 54.00 |
| 12.8 | 32620. | 32675. | 32730. | 32785. | 32840. | 32895. | 32950. | 33005. | 33060. | 33115. | 55.00 |
| 12.9 | 33170. | 33226. | 33282. | 33338. | 33394. | 33450. | 33506. | 33562. | 33618. | 33674. | 56.00 |
| 13.0 | 33730. | 33787. | 33844. | 33901. | 33958. | 34015. | 34072. | 34129. | 34186. | 34243. | 57.00 |
| 13.1 | 34300. | 34358. | 34416. | 34474. | 34532. | 34590. | 34648. | 34706. | 34764. | 34822. | 58.00 |
| 13.2 | 34880. | 34939. | 34998. | 35057. | 35116. | 35175. | 35234. | 35293. | 35352. | 35411. | 59.00 |
| 13.3 | 35470. | 35530. | 35590. | 35650. | 35710. | 35770. | 35830. | 35890. | 35950. | 36010. | 60.00 |
| 13.4 | 36070. | 36131. | 36192. | 36253. | 36314. | 36375. | 36436. | 36497. | 36558. | 36619. | 61.00 |
| 13.5 | 36680. | 36742. | 36804. | 36866. | 36928. | 36990. | 37052. | 37114. | 37176. | 37238. | 62.00 |
| 13.6 | 37300. | 37363. | 37426. | 37489. | 37552. | 37615. | 37678. | 37741. | 37804. | 37867. | 63.00 |
| 13.7 | 37930. | 37994. | 38058. | 38122. | 38186. | 38250. | 38314. | 38378. | 38442. | 38506. | 64.00 |
| 13.8 | 38570. | 38635. | 38700. | 38765. | 38830. | 38895. | 38960. | 39025. | 39090. | 39155. | 65.00 |
| 13.9 | 39220. | 39286. | 39352. | 39418. | 39484. | 39550. | 39616. | 39682. | 39748. | 39814. | 66.00 |
| 14.0 | 39880. |        |        |        |        |        |        |        |        |        |       |

# LOS ANGELES RIVER ABOVE ARROYO SECO

STATION F57C-R

RECORDER STATION RATING TABLE

\*\*\*\*\* RATING TABLE NO. 69-01 \*\*\*\*\*

| G.H. | .00   | .01   | .02   | .03   | .04   | .05   | .06   | .07   | .08   | .09   | DIFF. |
|------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| 0.0  | 0.10  | 0.20  | 0.30  | 0.40  | 0.50  | 0.60  | 0.80  | 1.00  | 1.20  | 1.40  |       |
| 0.0  | 1.60  | 1.90  | 2.20  | 2.50  | 2.80  | 3.10  | 3.40  | 3.80  | 4.20  | 4.60  |       |
| 0.0  | 5.00  | 5.00  | 5.40  | 5.80  | 6.20  | 6.70  | 7.20  | 7.70  | 8.20  | 8.70  |       |
| 0.0  | 9.20  | 9.80  | 10.40 | 11.00 | 11.60 | 12.20 | 12.80 | 13.50 | 14.20 | 14.90 |       |
| 0.4  | 15.6  | 16.5  | 17.5  | 18.4  | 19.4  | 20.3  | 21.2  | 22.2  | 23.1  | 24.1  | 0.94  |
| 0.5  | 25.0  | 26.2  | 27.3  | 28.5  | 29.6  | 30.8  | 31.9  | 33.1  | 34.2  | 35.4  | 1.15  |
| 0.6  | 36.5  | 37.9  | 39.2  | 40.6  | 41.9  | 43.3  | 44.6  | 46.0  | 47.3  | 48.7  | 1.35  |
| 0.7  | 50.0  | 51.5  | 53.0  | 54.5  | 56.0  | 57.5  | 59.0  | 60.5  | 62.0  | 63.5  | 1.50  |
| 0.8  | 65.0  | 66.7  | 68.5  | 70.2  | 72.0  | 73.7  | 75.4  | 77.2  | 78.9  | 80.7  | 1.74  |
| 0.9  | 82.4  | 85.0  | 87.5  | 90.1  | 92.6  | 95.2  | 97.8  | 100.3 | 102.9 | 105.4 | 2.56  |
| 1.0  | 108.0 | 111.0 | 114.0 | 117.0 | 120.0 | 123.0 | 126.0 | 129.0 | 132.0 | 135.0 | 3.00  |
| 1.1  | 138.0 | 144.2 | 150.4 | 156.6 | 162.8 | 169.0 | 175.2 | 181.4 | 187.6 | 193.8 | 6.20  |
| 1.2  | 200.0 | 209.3 | 218.6 | 227.9 | 237.2 | 246.5 | 255.8 | 265.1 | 274.4 | 283.7 | 9.30  |
| 1.3  | 293.0 | 304.5 | 316.0 | 327.5 | 339.0 | 350.5 | 362.0 | 373.5 | 385.0 | 396.5 | 11.50 |
| 1.4  | 408.0 | 421.2 | 434.4 | 447.6 | 460.8 | 474.0 | 487.2 | 500.4 | 513.6 | 526.8 | 13.20 |
| 1.5  | 540.0 | 554.2 | 568.4 | 582.6 | 596.8 | 611.0 | 625.2 | 639.4 | 653.6 | 667.8 | 14.20 |
| 1.6  | 682.0 | 697.2 | 712.4 | 727.6 | 742.8 | 758.0 | 773.2 | 788.4 | 803.6 | 818.8 | 15.20 |
| 1.7  | 834.0 | 850.4 | 866.8 | 883.2 | 899.6 | 916.0 | 932.4 | 948.8 | 965.2 | 981.6 | 16.40 |
| 1.8  | 998.0 | 1015. | 1033. | 1050. | 1068. | 1085. | 1102. | 1120. | 1137. | 1155. | 17.40 |
| 1.9  | 1172. | 1190. | 1208. | 1226. | 1244. | 1263. | 1281. | 1299. | 1317. | 1335. | 18.10 |
| 2.0  | 1353. | 1372. | 1391. | 1410. | 1429. | 1448. | 1467. | 1486. | 1505. | 1524. | 19.00 |
| 2.1  | 1543. | 1563. | 1583. | 1603. | 1623. | 1643. | 1662. | 1682. | 1702. | 1722. | 19.90 |
| 2.2  | 1742. | 1763. | 1784. | 1804. | 1825. | 1846. | 1867. | 1888. | 1908. | 1929. | 20.80 |
| 2.3  | 1950. | 1972. | 1993. | 2015. | 2037. | 2059. | 2080. | 2102. | 2124. | 2145. | 21.70 |
| 2.4  | 2167. | 2190. | 2213. | 2235. | 2258. | 2281. | 2304. | 2327. | 2349. | 2372. | 22.80 |
| 2.5  | 2395. | 2419. | 2442. | 2466. | 2489. | 2513. | 2536. | 2560. | 2583. | 2607. | 23.50 |
| 2.6  | 2630. | 2654. | 2678. | 2702. | 2726. | 2750. | 2774. | 2798. | 2822. | 2846. | 24.00 |
| 2.7  | 2870. | 2896. | 2922. | 2948. | 2974. | 3000. | 3026. | 3052. | 3078. | 3104. | 26.00 |
| 2.8  | 3130. | 3156. | 3182. | 3208. | 3234. | 3260. | 3286. | 3312. | 3338. | 3364. | 26.00 |
| 2.9  | 3390. | 3417. | 3444. | 3471. | 3498. | 3525. | 3552. | 3579. | 3606. | 3633. | 27.00 |

STATION NO. F57C  
RATING TABLE NO. 65-01

SHEET 2

| G.H. | .00    | .01    | .02    | .03    | .04    | .05    | .06    | .07    | .08    | .09    | DIFF. |
|------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|-------|
| 3.0  | 3660.  | 3688.  | 3716.  | 3744.  | 3772.  | 3800.  | 3828.  | 3856.  | 3884.  | 3912.  | 28.00 |
| 3.1  | 3940.  | 3969.  | 3998.  | 4027.  | 4056.  | 4085.  | 4114.  | 4143.  | 4172.  | 4201.  | 29.00 |
| 3.2  | 4230.  | 4260.  | 4290.  | 4320.  | 4350.  | 4380.  | 4410.  | 4440.  | 4470.  | 4500.  | 30.00 |
| 3.3  | 4530.  | 4561.  | 4592.  | 4623.  | 4654.  | 4685.  | 4716.  | 4747.  | 4778.  | 4809.  | 31.00 |
| 3.4  | 4840.  | 4872.  | 4904.  | 4936.  | 4968.  | 5000.  | 5032.  | 5064.  | 5096.  | 5128.  | 32.00 |
| 3.5  | 5160.  | 5192.  | 5224.  | 5256.  | 5288.  | 5320.  | 5352.  | 5384.  | 5416.  | 5448.  | 32.00 |
| 3.6  | 5480.  | 5513.  | 5546.  | 5579.  | 5612.  | 5645.  | 5678.  | 5711.  | 5744.  | 5777.  | 33.00 |
| 3.7  | 5810.  | 5843.  | 5876.  | 5909.  | 5942.  | 5975.  | 6008.  | 6041.  | 6074.  | 6107.  | 33.00 |
| 3.8  | 6140.  | 6173.  | 6206.  | 6239.  | 6272.  | 6305.  | 6338.  | 6371.  | 6404.  | 6437.  | 33.00 |
| 3.9  | 6470.  | 6504.  | 6538.  | 6572.  | 6606.  | 6640.  | 6674.  | 6708.  | 6742.  | 6776.  | 34.00 |
| 4.0  | 6810.  | 6844.  | 6878.  | 6912.  | 6946.  | 6980.  | 7014.  | 7048.  | 7082.  | 7116.  | 34.00 |
| 4.1  | 7150.  | 7185.  | 7220.  | 7255.  | 7290.  | 7325.  | 7360.  | 7395.  | 7430.  | 7465.  | 35.00 |
| 4.2  | 7500.  | 7535.  | 7570.  | 7605.  | 7640.  | 7675.  | 7710.  | 7745.  | 7780.  | 7815.  | 35.00 |
| 4.3  | 7850.  | 7886.  | 7922.  | 7958.  | 7994.  | 8030.  | 8066.  | 8102.  | 8138.  | 8174.  | 36.00 |
| 4.4  | 8210.  | 8246.  | 8282.  | 8318.  | 8354.  | 8390.  | 8426.  | 8462.  | 8498.  | 8534.  | 36.00 |
| 4.5  | 8570.  | 8607.  | 8644.  | 8681.  | 8718.  | 8755.  | 8792.  | 8829.  | 8866.  | 8903.  | 37.00 |
| 4.6  | 8940.  | 8977.  | 9014.  | 9051.  | 9088.  | 9125.  | 9162.  | 9199.  | 9236.  | 9273.  | 37.00 |
| 4.7  | 9310.  | 9347.  | 9384.  | 9421.  | 9458.  | 9495.  | 9532.  | 9569.  | 9606.  | 9643.  | 37.00 |
| 4.8  | 9680.  | 9717.  | 9754.  | 9791.  | 9828.  | 9865.  | 9902.  | 9939.  | 9976.  | 10013. | 37.00 |
| 4.9  | 10050. | 10088. | 10126. | 10164. | 10202. | 10240. | 10278. | 10316. | 10354. | 10392. | 38.00 |
| 5.0  | 10430. | 10468. | 10506. | 10544. | 10582. | 10620. | 10658. | 10696. | 10734. | 10772. | 38.00 |
| 5.1  | 10810. | 10848. | 10886. | 10924. | 10962. | 11000. | 11038. | 11076. | 11114. | 11152. | 38.00 |
| 5.2  | 11190. | 11228. | 11266. | 11304. | 11342. | 11380. | 11418. | 11456. | 11494. | 11532. | 38.00 |
| 5.3  | 11570. | 11608. | 11646. | 11684. | 11722. | 11760. | 11798. | 11836. | 11874. | 11912. | 38.00 |
| 5.4  | 11950. | 11988. | 12026. | 12064. | 12102. | 12140. | 12178. | 12216. | 12254. | 12292. | 38.00 |
| 5.5  | 12330. | 12368. | 12406. | 12444. | 12482. | 12520. | 12558. | 12596. | 12634. | 12672. | 38.00 |
| 5.6  | 12710. | 12749. | 12788. | 12827. | 12866. | 12905. | 12944. | 12983. | 13022. | 13061. | 39.00 |
| 5.7  | 13100. | 13140. | 13180. | 13220. | 13260. | 13300. | 13340. | 13380. | 13420. | 13460. | 40.00 |
| 5.8  | 13500. | 13540. | 13580. | 13620. | 13660. | 13700. | 13740. | 13780. | 13820. | 13860. | 40.00 |
| 5.9  | 13900. | 13940. | 13980. | 14020. | 14060. | 14100. | 14140. | 14180. | 14220. | 14260. | 40.00 |
| 6.0  | 14300. | 14341. | 14382. | 14423. | 14464. | 14505. | 14546. | 14587. | 14628. | 14669. | 41.00 |
| 6.1  | 14710. | 14751. | 14792. | 14833. | 14874. | 14915. | 14956. | 14997. | 15038. | 15079. | 41.00 |
| 6.2  | 15120. | 15161. | 15202. | 15243. | 15284. | 15325. | 15366. | 15407. | 15448. | 15489. | 41.00 |
| 6.3  | 15530. | 15571. | 15612. | 15653. | 15694. | 15735. | 15776. | 15817. | 15858. | 15899. | 41.00 |
| 6.4  | 15940. | 15981. | 16022. | 16063. | 16104. | 16145. | 16186. | 16227. | 16268. | 16309. | 41.00 |
| 6.5  | 16350. | 16391. | 16432. | 16473. | 16514. | 16555. | 16596. | 16637. | 16678. | 16719. | 41.00 |
| 6.6  | 16760. | 16802. | 16844. | 16886. | 16928. | 16970. | 17012. | 17054. | 17096. | 17138. | 42.00 |
| 6.7  | 17180. | 17222. | 17264. | 17306. | 17348. | 17390. | 17432. | 17474. | 17516. | 17558. | 42.00 |
| 6.8  | 17600. | 17643. | 17686. | 17729. | 17772. | 17815. | 17858. | 17901. | 17944. | 17987. | 43.00 |
| 6.9  | 18030. | 18073. | 18116. | 18159. | 18202. | 18245. | 18288. | 18331. | 18374. | 18417. | 43.00 |

STATION NO. F57C-R  
RATING TABLE NO. 69-01

SHEET 3

| G.H. | .00    | .01    | .02    | .03    | .04    | .05    | .06    | .07    | .08    | .09    | DIFF. |
|------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|-------|
| 7.0  | 18460. | 18503. | 18546. | 18589. | 18632. | 18675. | 18718. | 18761. | 18804. | 18847. | 43.00 |
| 7.1  | 18890. | 18933. | 18976. | 19019. | 19062. | 19105. | 19148. | 19191. | 19234. | 19277. | 43.00 |
| 7.2  | 19320. | 19363. | 19406. | 19449. | 19492. | 19535. | 19578. | 19621. | 19664. | 19707. | 43.00 |
| 7.3  | 19750. | 19793. | 19836. | 19879. | 19922. | 19965. | 20008. | 20051. | 20094. | 20137. | 43.00 |
| 7.4  | 20180. | 20224. | 20268. | 20312. | 20356. | 20400. | 20444. | 20488. | 20532. | 20576. | 44.00 |
| 7.5  | 20620. | 20664. | 20708. | 20752. | 20796. | 20840. | 20884. | 20928. | 20972. | 21016. | 44.00 |
| 7.6  | 21060. | 21104. | 21148. | 21192. | 21236. | 21280. | 21324. | 21368. | 21412. | 21456. | 44.00 |
| 7.7  | 21500. | 21544. | 21588. | 21632. | 21676. | 21720. | 21764. | 21808. | 21852. | 21896. | 44.00 |
| 7.8  | 21940. | 21984. | 22028. | 22072. | 22116. | 22160. | 22204. | 22248. | 22292. | 22336. | 44.00 |
| 7.9  | 22380. | 22424. | 22468. | 22512. | 22556. | 22600. | 22644. | 22688. | 22732. | 22776. | 44.00 |
| 8.0  | 22820. | 22864. | 22908. | 22952. | 22996. | 23040. | 23084. | 23128. | 23172. | 23216. | 44.00 |
| 8.1  | 23260. | 23304. | 23348. | 23392. | 23436. | 23480. | 23524. | 23568. | 23612. | 23656. | 44.00 |
| 8.2  | 23700. | 23744. | 23788. | 23832. | 23876. | 23920. | 23964. | 24008. | 24052. | 24096. | 44.00 |
| 8.3  | 24140. | 24184. | 24228. | 24272. | 24316. | 24360. | 24404. | 24448. | 24492. | 24536. | 44.00 |
| 8.4  | 24580. | 24624. | 24668. | 24712. | 24756. | 24800. | 24844. | 24888. | 24932. | 24976. | 44.00 |
| 8.5  | 25020. | 25064. | 25108. | 25152. | 25196. | 25240. | 25284. | 25328. | 25372. | 25416. | 44.00 |
| 8.6  | 25460. | 25504. | 25548. | 25592. | 25636. | 25680. | 25724. | 25768. | 25812. | 25856. | 44.00 |
| 8.7  | 25900. | 25944. | 25988. | 26032. | 26076. | 26120. | 26164. | 26208. | 26252. | 26296. | 44.00 |
| 8.8  | 26340. | 26384. | 26428. | 26472. | 26516. | 26560. | 26604. | 26648. | 26692. | 26736. | 44.00 |
| 8.9  | 26780. | 26824. | 26868. | 26912. | 26956. | 27000. | 27044. | 27088. | 27132. | 27176. | 44.00 |
| 9.0  | 27220. | 27264. | 27308. | 27352. | 27396. | 27440. | 27484. | 27528. | 27572. | 27616. | 44.00 |
| 9.1  | 27660. | 27704. | 27748. | 27792. | 27836. | 27880. | 27924. | 27968. | 28012. | 28056. | 44.00 |
| 9.2  | 28100. | 28144. | 28188. | 28232. | 28276. | 28320. | 28364. | 28408. | 28452. | 28496. | 44.00 |
| 9.3  | 28540. | 28584. | 28628. | 28672. | 28716. | 28760. | 28804. | 28848. | 28892. | 28936. | 44.00 |
| 9.4  | 28960. | 29004. | 29048. | 29092. | 29136. | 29180. | 29224. | 29268. | 29312. | 29356. | 44.00 |
| 9.5  | 29420. | 29464. | 29508. | 29552. | 29596. | 29640. | 29684. | 29728. | 29772. | 29816. | 44.00 |
| 9.6  | 29860. | 29904. | 29948. | 29992. | 30036. | 30080. | 30124. | 30168. | 30212. | 30256. | 44.00 |
| 9.7  | 30300. | 30344. | 30388. | 30432. | 30476. | 30520. | 30564. | 30608. | 30652. | 30696. | 44.00 |
| 9.8  | 30740. | 30784. | 30828. | 30872. | 30916. | 30960. | 31004. | 31048. | 31092. | 31136. | 44.00 |
| 9.9  | 31180. | 31224. | 31268. | 31312. | 31356. | 31400. | 31444. | 31488. | 31532. | 31576. | 44.00 |
| 10.0 | 31620. | 31664. | 31708. | 31752. | 31796. | 31840. | 31884. | 31928. | 31972. | 32016. | 44.00 |
| 10.1 | 32060. | 32104. | 32148. | 32192. | 32236. | 32280. | 32324. | 32368. | 32412. | 32456. | 44.00 |
| 10.2 | 32500. | 32544. | 32588. | 32632. | 32676. | 32720. | 32764. | 32808. | 32852. | 32896. | 44.00 |
| 10.3 | 32940. | 32984. | 33028. | 33072. | 33116. | 33160. | 33204. | 33248. | 33292. | 33336. | 44.00 |
| 10.4 | 33380. | 33424. | 33468. | 33512. | 33556. | 33600. | 33644. | 33688. | 33732. | 33776. | 44.00 |
| 10.5 | 33820. | 33865. | 33910. | 33955. | 34000. | 34045. | 34090. | 34135. | 34180. | 34225. | 45.00 |
| 10.6 | 34270. | 34315. | 34360. | 34405. | 34450. | 34495. | 34540. | 34585. | 34630. | 34675. | 45.00 |
| 10.7 | 34720. | 34765. | 34810. | 34855. | 34900. | 34945. | 34990. | 35035. | 35080. | 35125. | 45.00 |
| 10.8 | 35170. | 35215. | 35260. | 35305. | 35350. | 35395. | 35440. | 35485. | 35530. | 35575. | 45.00 |
| 10.9 | 35620. | 35665. | 35710. | 35755. | 35800. | 35845. | 35890. | 35935. | 35980. | 36025. | 45.00 |

STATION NO. F5/C-R  
RATING TABLE NO. 69-01

SHEET 4

| G.M. | .00    | .01    | .02    | .03    | .04    | .05    | .06    | .07    | .08    | .09    | DIFF. |
|------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|-------|
| 11.0 | 36070. | 36116. | 36162. | 36208. | 36254. | 36300. | 36346. | 36392. | 36438. | 36484. | 46.00 |
| 11.1 | 36530. | 36576. | 36622. | 36668. | 36714. | 36760. | 36806. | 36852. | 36898. | 36944. | 46.00 |
| 11.2 | 36990. | 37036. | 37082. | 37128. | 37174. | 37220. | 37266. | 37312. | 37358. | 37404. | 46.00 |
| 11.3 | 37450. | 37496. | 37542. | 37588. | 37634. | 37680. | 37726. | 37772. | 37818. | 37864. | 46.00 |
| 11.4 | 37910. | 37956. | 38002. | 38048. | 38094. | 38140. | 38186. | 38232. | 38278. | 38324. | 46.00 |
| 11.5 | 38370. | 38416. | 38462. | 38508. | 38554. | 38600. | 38646. | 38692. | 38738. | 38784. | 46.00 |
| 11.6 | 38830. | 38876. | 38922. | 38968. | 39014. | 39060. | 39106. | 39152. | 39198. | 39244. | 46.00 |
| 11.7 | 39290. | 39336. | 39382. | 39428. | 39474. | 39520. | 39566. | 39612. | 39658. | 39704. | 46.00 |
| 11.8 | 39750. | 39796. | 39842. | 39888. | 39934. | 39980. | 40026. | 40072. | 40118. | 40164. | 46.00 |
| 11.9 | 40210. | 40256. | 40302. | 40348. | 40394. | 40440. | 40486. | 40532. | 40578. | 40624. | 46.00 |
| 12.0 | 40670. | 40716. | 40762. | 40808. | 40854. | 40900. | 40946. | 40992. | 41038. | 41084. | 46.00 |
| 12.1 | 41130. | 41176. | 41222. | 41268. | 41314. | 41360. | 41406. | 41452. | 41498. | 41544. | 46.00 |
| 12.2 | 41590. | 41636. | 41682. | 41728. | 41774. | 41820. | 41866. | 41912. | 41958. | 42004. | 46.00 |
| 12.3 | 42050. | 42096. | 42142. | 42188. | 42234. | 42280. | 42326. | 42372. | 42418. | 42464. | 46.00 |
| 12.4 | 42510. | 42556. | 42602. | 42648. | 42694. | 42740. | 42786. | 42832. | 42878. | 42924. | 46.00 |
| 12.5 | 42970. | 43016. | 43062. | 43108. | 43154. | 43200. | 43246. | 43292. | 43338. | 43384. | 46.00 |
| 12.6 | 43430. | 43476. | 43522. | 43568. | 43614. | 43660. | 43706. | 43752. | 43798. | 43844. | 46.00 |
| 12.7 | 43890. | 43936. | 43982. | 44028. | 44074. | 44120. | 44166. | 44212. | 44258. | 44304. | 46.00 |
| 12.8 | 44350. | 44396. | 44442. | 44488. | 44534. | 44580. | 44626. | 44672. | 44718. | 44764. | 46.00 |
| 12.9 | 44810. | 44856. | 44902. | 44948. | 44994. | 45040. | 45086. | 45132. | 45178. | 45224. | 46.00 |
| 13.0 | 45270. | 45316. | 45362. | 45408. | 45454. | 45500. | 45546. | 45592. | 45638. | 45684. | 46.00 |
| 13.1 | 45730. | 45776. | 45822. | 45868. | 45914. | 45960. | 46006. | 46052. | 46098. | 46144. | 46.00 |
| 13.2 | 46190. | 46236. | 46282. | 46328. | 46374. | 46420. | 46466. | 46512. | 46558. | 46604. | 46.00 |
| 13.3 | 46650. | 46696. | 46742. | 46788. | 46834. | 46880. | 46926. | 46972. | 47018. | 47064. | 46.00 |
| 13.4 | 47110. | 47156. | 47202. | 47248. | 47294. | 47340. | 47386. | 47432. | 47478. | 47524. | 46.00 |
| 13.5 | 47570. | 47616. | 47662. | 47708. | 47754. | 47800. | 47846. | 47892. | 47938. | 47984. | 46.00 |
| 13.6 | 48030. | 48076. | 48122. | 48168. | 48214. | 48260. | 48306. | 48352. | 48398. | 48444. | 46.00 |
| 13.7 | 48490. | 48536. | 48582. | 48628. | 48674. | 48720. | 48766. | 48812. | 48858. | 48904. | 46.00 |
| 13.8 | 48950. | 48996. | 49042. | 49088. | 49134. | 49180. | 49226. | 49272. | 49318. | 49364. | 46.00 |
| 13.9 | 49410. | 49456. | 49502. | 49548. | 49594. | 49640. | 49686. | 49732. | 49778. | 49824. | 46.00 |
| 14.0 | 49870. | 49916. | 49962. | 50008. | 50054. | 50100. | 50146. | 50192. | 50238. | 50284. | 46.00 |
| 14.1 | 50330. | 50376. | 50422. | 50468. | 50514. | 50560. | 50606. | 50652. | 50698. | 50744. | 46.00 |
| 14.2 | 50790. | 50836. | 50882. | 50928. | 50974. | 51020. | 51066. | 51112. | 51158. | 51204. | 46.00 |
| 14.3 | 51250. | 51296. | 51342. | 51388. | 51434. | 51480. | 51526. | 51572. | 51618. | 51664. | 46.00 |
| 14.4 | 51710. | 51756. | 51802. | 51848. | 51894. | 51940. | 51986. | 52032. | 52078. | 52124. | 46.00 |
| 14.5 | 52170. | 52216. | 52262. | 52308. | 52354. | 52400. | 52446. | 52492. | 52538. | 52584. | 46.00 |
| 14.6 | 52630. | 52676. | 52722. | 52768. | 52814. | 52860. | 52906. | 52952. | 52998. | 53044. | 46.00 |
| 14.7 | 53090. | 53136. | 53182. | 53228. | 53274. | 53320. | 53366. | 53412. | 53458. | 53504. | 46.00 |
| 14.8 | 53550. | 53596. | 53642. | 53688. | 53734. | 53780. | 53826. | 53872. | 53918. | 53964. | 46.00 |
| 14.9 | 54010. | 54056. | 54102. | 54148. | 54194. | 54240. | 54286. | 54332. | 54378. | 54424. | 46.00 |



# LOS ANGELES RIVER BELOW FIRESTONE BLVD.

STATION F34D-R

RECORDER STATION RATING TABLE

\*\*\*\*\* RATING TABLE NO. 66-01 \*\*\*\*\*

| G.H. | .00   | .01   | .02   | .03   | .04   | .05   | .06   | .07   | .08   | .09   | DIFF. |
|------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| 0.1  | 0.00  | 0.08  | 0.16  | 0.24  | 0.32  | 0.40  | 0.48  | 0.56  | 0.64  | 0.72  | 0.08  |
| 0.2  | 0.80  | 0.94  | 1.08  | 1.22  | 1.36  | 1.50  | 1.64  | 1.78  | 1.92  | 2.06  | 0.14  |
| 0.3  | 2.20  | 2.43  | 2.66  | 2.89  | 3.12  | 3.35  | 3.58  | 3.81  | 4.04  | 4.27  | 0.23  |
| 0.4  | 4.50  | 4.99  | 5.48  | 5.97  | 6.46  | 6.95  | 7.44  | 7.93  | 8.42  | 8.91  | 0.49  |
| 0.5  | 9.40  | 10.10 | 10.80 | 11.60 | 12.30 | 13.00 | 13.70 | 14.40 | 15.20 | 15.90 | 0.72  |
| 0.6  | 16.6  | 17.5  | 18.4  | 19.3  | 20.2  | 21.1  | 21.9  | 22.8  | 23.7  | 24.6  | 0.89  |
| 0.7  | 25.5  | 26.7  | 27.8  | 29.0  | 30.2  | 31.4  | 32.5  | 33.7  | 34.9  | 36.0  | 1.17  |
| 0.8  | 37.2  | 38.8  | 40.3  | 41.9  | 43.4  | 45.0  | 46.6  | 48.1  | 49.7  | 51.2  | 1.56  |
| 0.9  | 52.8  | 54.6  | 56.4  | 58.3  | 60.1  | 61.9  | 63.7  | 65.5  | 67.4  | 69.2  | 1.82  |
| 1.0  | 71.0  | 73.1  | 75.2  | 77.3  | 79.4  | 81.5  | 83.6  | 85.7  | 87.8  | 89.9  | 2.10  |
| 1.1  | 92.0  | 94.2  | 96.4  | 98.6  | 100.8 | 103.0 | 105.2 | 107.4 | 109.6 | 111.8 | 2.20  |
| 1.2  | 114.0 | 116.5 | 119.0 | 121.5 | 124.0 | 126.5 | 129.0 | 131.5 | 134.0 | 136.5 | 2.50  |
| 1.3  | 139.0 | 141.7 | 144.4 | 147.1 | 149.8 | 152.5 | 155.2 | 157.9 | 160.6 | 163.3 | 2.70  |
| 1.4  | 166.0 | 169.0 | 172.0 | 175.0 | 178.0 | 181.0 | 184.0 | 187.0 | 190.0 | 193.0 | 3.00  |
| 1.5  | 196.0 | 199.5 | 203.0 | 206.5 | 210.0 | 213.5 | 217.0 | 220.5 | 224.0 | 227.5 | 3.50  |
| 1.6  | 231.0 | 235.2 | 239.4 | 243.6 | 247.8 | 252.0 | 256.2 | 260.4 | 264.6 | 268.8 | 4.20  |
| 1.7  | 273.0 | 278.1 | 283.2 | 288.3 | 293.4 | 298.5 | 303.6 | 308.7 | 313.8 | 318.9 | 5.10  |
| 1.8  | 324.0 | 330.9 | 337.8 | 344.7 | 351.6 | 358.5 | 365.4 | 372.3 | 379.2 | 386.1 | 6.90  |
| 1.9  | 393.0 | 402.7 | 412.4 | 422.1 | 431.8 | 441.5 | 451.2 | 460.9 | 470.6 | 480.3 | 9.70  |
| 2.0  | 490.0 | 505.5 | 521.0 | 536.5 | 552.0 | 567.5 | 583.0 | 598.5 | 614.0 | 629.5 | 15.50 |
| 2.1  | 645.0 | 665.0 | 685.0 | 705.0 | 725.0 | 745.0 | 765.0 | 785.0 | 805.0 | 825.0 | 20.00 |
| 2.2  | 845.0 | 866.5 | 888.0 | 909.5 | 931.0 | 952.5 | 974.0 | 995.5 | 1017. | 1039. | 21.50 |
| 2.3  | 1060. | 1083. | 1107. | 1130. | 1154. | 1177. | 1200. | 1224. | 1247. | 1271. | 23.40 |
| 2.4  | 1294. | 1319. | 1345. | 1370. | 1395. | 1421. | 1446. | 1471. | 1496. | 1522. | 25.30 |
| 2.5  | 1547. | 1575. | 1604. | 1632. | 1660. | 1689. | 1717. | 1745. | 1773. | 1802. | 28.30 |
| 2.6  | 1830. | 1862. | 1894. | 1926. | 1958. | 1990. | 2022. | 2054. | 2086. | 2118. | 32.00 |
| 2.7  | 2150. | 2185. | 2220. | 2255. | 2290. | 2325. | 2360. | 2395. | 2430. | 2465. | 35.00 |
| 2.8  | 2500. | 2538. | 2576. | 2614. | 2652. | 2690. | 2728. | 2766. | 2804. | 2842. | 38.00 |
| 2.9  | 2880. | 2921. | 2962. | 3003. | 3044. | 3085. | 3126. | 3167. | 3208. | 3249. | 41.00 |
| 3.0  | 3290. | 3334. | 3378. | 3422. | 3466. | 3510. | 3554. | 3598. | 3642. | 3686. | 44.00 |

SOURCE: LOS ANGELES COUNTY DEPT. OF PUBLIC WORKS

STATION NO. F34D-R  
RATING TABLE NO. 66-01

SHEET 2

| G.H. | .00    | .01    | .02    | .03    | .04    | .05    | .06    | .07    | .08    | .09    | DIFF.  |
|------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 3.1  | 3730.  | 3777.  | 3824.  | 3871.  | 3918.  | 3965.  | 4012.  | 4059.  | 4106.  | 4153.  | 47.00  |
| 3.2  | 4200.  | 4250.  | 4300.  | 4350.  | 4400.  | 4450.  | 4500.  | 4550.  | 4600.  | 4650.  | 50.00  |
| 3.3  | 4700.  | 4753.  | 4806.  | 4859.  | 4912.  | 4965.  | 5018.  | 5071.  | 5124.  | 5177.  | 53.00  |
| 3.4  | 5230.  | 5286.  | 5342.  | 5398.  | 5454.  | 5510.  | 5566.  | 5622.  | 5678.  | 5734.  | 56.00  |
| 3.5  | 5790.  | 5848.  | 5906.  | 5964.  | 6022.  | 6080.  | 6138.  | 6196.  | 6254.  | 6312.  | 58.00  |
| 3.6  | 6370.  | 6431.  | 6492.  | 6553.  | 6614.  | 6675.  | 6736.  | 6797.  | 6858.  | 6919.  | 61.00  |
| 3.7  | 6980.  | 7044.  | 7108.  | 7172.  | 7236.  | 7300.  | 7364.  | 7428.  | 7492.  | 7556.  | 64.00  |
| 3.8  | 7620.  | 7688.  | 7756.  | 7824.  | 7892.  | 7960.  | 8028.  | 8096.  | 8164.  | 8232.  | 68.00  |
| 3.9  | 8300.  | 8369.  | 8438.  | 8507.  | 8576.  | 8645.  | 8714.  | 8783.  | 8852.  | 8921.  | 69.00  |
| 4.0  | 8990.  | 9060.  | 9130.  | 9200.  | 9270.  | 9340.  | 9410.  | 9480.  | 9550.  | 9620.  | 70.00  |
| 4.1  | 9690.  | 9762.  | 9834.  | 9906.  | 9978.  | 10050. | 10122. | 10194. | 10266. | 10338. | 72.00  |
| 4.2  | 10410. | 10484. | 10558. | 10632. | 10706. | 10780. | 10854. | 10928. | 11002. | 11076. | 74.00  |
| 4.3  | 11150. | 11225. | 11300. | 11375. | 11450. | 11525. | 11600. | 11675. | 11750. | 11825. | 75.00  |
| 4.4  | 11900. | 11975. | 12050. | 12125. | 12200. | 12275. | 12350. | 12425. | 12500. | 12575. | 75.00  |
| 4.5  | 12650. | 12725. | 12800. | 12875. | 12950. | 13025. | 13100. | 13175. | 13250. | 13325. | 75.00  |
| 4.6  | 13400. | 13480. | 13560. | 13640. | 13720. | 13800. | 13880. | 13960. | 14040. | 14120. | 80.00  |
| 4.7  | 14200. | 14280. | 14360. | 14440. | 14520. | 14600. | 14680. | 14760. | 14840. | 14920. | 80.00  |
| 4.8  | 15000. | 15080. | 15160. | 15240. | 15320. | 15400. | 15480. | 15560. | 15640. | 15720. | 80.00  |
| 4.9  | 15800. | 15880. | 15960. | 16040. | 16120. | 16200. | 16280. | 16360. | 16440. | 16520. | 80.00  |
| 5.0  | 16600. | 16685. | 16770. | 16855. | 16940. | 17025. | 17110. | 17195. | 17280. | 17365. | 85.00  |
| 5.1  | 17450. | 17535. | 17620. | 17705. | 17790. | 17875. | 17960. | 18045. | 18130. | 18215. | 85.00  |
| 5.2  | 18300. | 18385. | 18470. | 18555. | 18640. | 18725. | 18810. | 18895. | 18980. | 19065. | 85.00  |
| 5.3  | 19150. | 19235. | 19320. | 19405. | 19490. | 19575. | 19660. | 19745. | 19830. | 19915. | 85.00  |
| 5.4  | 20000. | 20090. | 20180. | 20270. | 20360. | 20450. | 20540. | 20630. | 20720. | 20810. | 90.00  |
| 5.5  | 20900. | 20990. | 21080. | 21170. | 21260. | 21350. | 21440. | 21530. | 21620. | 21710. | 90.00  |
| 5.6  | 21800. | 21890. | 21980. | 22070. | 22160. | 22250. | 22340. | 22430. | 22520. | 22610. | 90.00  |
| 5.7  | 22700. | 22795. | 22890. | 22985. | 23080. | 23175. | 23270. | 23365. | 23460. | 23555. | 95.00  |
| 5.8  | 23650. | 23745. | 23840. | 23935. | 24030. | 24125. | 24220. | 24315. | 24410. | 24505. | 95.00  |
| 5.9  | 24600. | 24695. | 24790. | 24885. | 24980. | 25075. | 25170. | 25265. | 25360. | 25455. | 95.00  |
| 6.0  | 25550. | 25645. | 25740. | 25835. | 25930. | 26025. | 26120. | 26215. | 26310. | 26405. | 95.00  |
| 6.1  | 26500. | 26595. | 26690. | 26785. | 26880. | 26975. | 27070. | 27165. | 27260. | 27355. | 95.00  |
| 6.2  | 27450. | 27545. | 27640. | 27735. | 27830. | 27925. | 28020. | 28115. | 28210. | 28305. | 95.00  |
| 6.3  | 28400. | 28500. | 28600. | 28701. | 28801. | 28901. | 29001. | 29102. | 29202. | 29302. | 100.22 |
| 6.4  | 29402. | 29502. | 29602. | 29703. | 29803. | 29903. | 30003. | 30104. | 30204. | 30304. | 100.22 |
| 6.5  | 30404. | 30504. | 30604. | 30705. | 30805. | 30905. | 31005. | 31106. | 31206. | 31306. | 100.22 |
| 6.6  | 31406. | 31506. | 31606. | 31707. | 31807. | 31907. | 32007. | 32108. | 32208. | 32308. | 100.22 |
| 6.7  | 32408. | 32508. | 32608. | 32709. | 32809. | 32909. | 33009. | 33110. | 33210. | 33310. | 100.22 |
| 6.8  | 33410. | 33510. | 33610. | 33711. | 33811. | 33911. | 34011. | 34112. | 34212. | 34312. | 100.22 |
| 6.9  | 34412. | 34512. | 34612. | 34713. | 34813. | 34913. | 35013. | 35114. | 35214. | 35314. | 100.22 |
| 7.0  | 35414. | 35514. | 35614. | 35715. | 35815. | 35915. | 36015. | 36116. | 36216. | 36316. | 100.22 |

STATION NO. 534D-R  
RATING TABLE NO. 66-01

SHEET 3

| G.H. | .00    | .01    | .02    | .03    | .04    | .05    | .06    | .07    | .08    | .09    | DIFF.  |
|------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 7.1  | 36416. | 36516. | 36616. | 36717. | 36817. | 36917. | 37017. | 37118. | 37218. | 37318. | 100.22 |
| 7.2  | 37418. | 37518. | 37618. | 37719. | 37819. | 37919. | 38019. | 38120. | 38220. | 38320. | 100.22 |
| 7.3  | 38420. | 38520. | 38620. | 38721. | 38821. | 38921. | 39021. | 39122. | 39222. | 39322. | 100.22 |
| 7.4  | 39425. | 39528. | 39630. | 39733. | 39835. | 39938. | 40040. | 40143. | 40245. | 40348. | 102.50 |
| 7.5  | 40450. | 40553. | 40655. | 40758. | 40860. | 40963. | 41065. | 41168. | 41270. | 41373. | 102.50 |
| 7.6  | 41475. | 41578. | 41680. | 41783. | 41885. | 41988. | 42090. | 42193. | 42295. | 42398. | 102.50 |
| 7.7  | 42500. | 42603. | 42705. | 42808. | 42910. | 43013. | 43115. | 43218. | 43320. | 43423. | 102.50 |
| 7.8  | 43525. | 43628. | 43730. | 43833. | 43935. | 44038. | 44140. | 44243. | 44345. | 44448. | 102.50 |
| 7.9  | 44550. | 44653. | 44755. | 44858. | 44960. | 45063. | 45165. | 45268. | 45370. | 45473. | 102.50 |
| 8.0  | 45575. | 45678. | 45780. | 45883. | 45985. | 46088. | 46190. | 46293. | 46395. | 46498. | 102.50 |
| 8.1  | 46600. | 46705. | 46811. | 46916. | 47021. | 47126. | 47232. | 47337. | 47442. | 47547. | 105.25 |
| 8.2  | 47653. | 47758. | 47864. | 47969. | 48074. | 48179. | 48285. | 48390. | 48495. | 48600. | 105.25 |
| 8.3  | 48706. | 48811. | 48917. | 49022. | 49127. | 49232. | 49338. | 49443. | 49548. | 49653. | 105.25 |
| 8.4  | 49759. | 49864. | 49970. | 50075. | 50180. | 50285. | 50391. | 50496. | 50601. | 50706. | 105.25 |
| 8.5  | 50812. | 50917. | 51023. | 51128. | 51233. | 51338. | 51444. | 51549. | 51654. | 51759. | 105.25 |
| 8.6  | 51865. | 51970. | 52076. | 52181. | 52285. | 52391. | 52497. | 52602. | 52707. | 52812. | 105.25 |
| 8.7  | 52918. | 53023. | 53129. | 53234. | 53339. | 53444. | 53550. | 53655. | 53760. | 53865. | 105.25 |
| 8.8  | 53971. | 54076. | 54182. | 54287. | 54392. | 54497. | 54603. | 54708. | 54813. | 54918. | 105.25 |
| 8.9  | 55024. | 55129. | 55235. | 55340. | 55445. | 55550. | 55656. | 55761. | 55866. | 55971. | 105.25 |
| 9.0  | 56077. | 56182. | 56288. | 56393. | 56498. | 56603. | 56709. | 56814. | 56919. | 57024. | 105.25 |
| 9.1  | 57125. | 57233. | 57340. | 57448. | 57555. | 57663. | 57770. | 57878. | 57985. | 58093. | 107.50 |
| 9.2  | 58200. | 58308. | 58415. | 58523. | 58630. | 58738. | 58845. | 58953. | 59060. | 59168. | 107.50 |
| 9.3  | 59275. | 59383. | 59490. | 59598. | 59705. | 59813. | 59920. | 60028. | 60135. | 60243. | 107.50 |
| 9.4  | 60350. | 60460. | 60570. | 60680. | 60790. | 60900. | 61010. | 61120. | 61230. | 61340. | 110.00 |
| 9.5  | 61450. | 61560. | 61670. | 61780. | 61890. | 62000. | 62110. | 62220. | 62330. | 62440. | 110.00 |
| 9.6  | 62550. | 62660. | 62770. | 62880. | 62990. | 63100. | 63210. | 63320. | 63430. | 63540. | 110.00 |
| 9.7  | 63650. | 63760. | 63870. | 63980. | 64090. | 64200. | 64310. | 64420. | 64530. | 64640. | 110.00 |
| 9.8  | 64750. | 64860. | 64970. | 65080. | 65190. | 65300. | 65410. | 65520. | 65630. | 65740. | 110.00 |
| 9.9  | 65850. | 65960. | 66070. | 66180. | 66290. | 66400. | 66510. | 66620. | 66730. | 66840. | 110.00 |
| 10.0 | 66950. | 67060. | 67170. | 67280. | 67390. | 67500. | 67610. | 67720. | 67830. | 67940. | 110.00 |
| 10.1 | 68050. | 68160. | 68270. | 68380. | 68490. | 68600. | 68710. | 68820. | 68930. | 69040. | 110.00 |
| 10.2 | 69150. | 69260. | 69370. | 69480. | 69590. | 69700. | 69810. | 69920. | 70030. | 70140. | 110.00 |
| 10.3 | 70250. | 70360. | 70470. | 70580. | 70690. | 70800. | 70910. | 71020. | 71130. | 71240. | 110.00 |
| 10.4 | 71350. | 71460. | 71570. | 71680. | 71790. | 71900. | 72010. | 72120. | 72230. | 72340. | 110.00 |
| 10.5 | 72450. | 72560. | 72670. | 72780. | 72890. | 73000. | 73110. | 73220. | 73330. | 73440. | 110.00 |
| 10.6 | 73550. | 73660. | 73770. | 73880. | 73990. | 74100. | 74210. | 74320. | 74430. | 74540. | 110.00 |
| 10.7 | 74650. | 74760. | 74870. | 74980. | 75090. | 75200. | 75310. | 75420. | 75530. | 75640. | 110.00 |
| 10.8 | 75750. | 75860. | 75970. | 76080. | 76190. | 76300. | 76410. | 76520. | 76630. | 76740. | 110.00 |
| 10.9 | 76850. | 76965. | 77080. | 77195. | 77310. | 77425. | 77540. | 77655. | 77770. | 77885. | 115.00 |
| 11.0 | 78000. | 78115. | 78230. | 78345. | 78460. | 78575. | 78690. | 78805. | 78920. | 79035. | 115.00 |

STATION NO. F34D-R  
RATING TABLE NO. 66-01

SHEET 4

| G.H. | .00    | .01    | .02    | .03    | .04    | .05    | .06    | .07    | .08    | .09    | DIFF.  |
|------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 11.1 | 79150. | 79265. | 79380. | 79495. | 79610. | 79725. | 79840. | 79955. | 80070. | 80185. | 115.00 |
| 11.2 | 80300. | 80415. | 80530. | 80645. | 80760. | 80875. | 80990. | 81105. | 81220. | 81335. | 115.00 |
| 11.3 | 81450. | 81565. | 81680. | 81795. | 81910. | 82025. | 82140. | 82255. | 82370. | 82485. | 115.00 |
| 11.4 | 82600. | 82715. | 82830. | 82945. | 83060. | 83175. | 83290. | 83405. | 83520. | 83635. | 115.00 |
| 11.5 | 83750. | 83865. | 83980. | 84095. | 84210. | 84325. | 84440. | 84555. | 84670. | 84785. | 115.00 |
| 11.6 | 84900. | 85015. | 85130. | 85245. | 85360. | 85475. | 85590. | 85705. | 85820. | 85935. | 115.00 |
| 11.7 | 86050. | 86165. | 86280. | 86395. | 86510. | 86625. | 86740. | 86855. | 86970. | 87085. | 115.00 |
| 11.8 | 87200. | 87315. | 87430. | 87545. | 87660. | 87775. | 87890. | 88005. | 88120. | 88235. | 115.00 |
| 11.9 | 88350. | 88465. | 88580. | 88695. | 88810. | 88925. | 89040. | 89155. | 89270. | 89385. | 115.00 |
| 12.0 | 89500. |        |        |        |        |        |        |        |        |        |        |

# LOS ANGELES RIVER BELOW WARDLOW ROAD

STATION F319-R

## RECORDER STATION RATING TABLE

\*\*\*\*\* RATING TABLE NO. 58-01 \*\*\*\*\*

| G.H. | .00   | .01   | .02   | .03   | .04   | .05   | .06   | .07   | .08   | .09   | DIFF. |
|------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| 0.1  | 0.00  | 0.02  | 0.04  | 0.06  | 0.09  | 0.10  | 0.12  | 0.14  | 0.16  | 0.18  | 0.02  |
| 0.2  | 0.20  | 0.36  | 0.52  | 0.68  | 0.84  | 1.00  | 1.16  | 1.32  | 1.48  | 1.64  | 0.16  |
| 0.3  | 1.80  | 2.03  | 2.26  | 2.49  | 2.72  | 2.95  | 3.18  | 3.41  | 3.64  | 3.87  | 0.23  |
| 0.4  | 4.10  | 4.49  | 4.88  | 5.27  | 5.66  | 6.05  | 6.44  | 6.83  | 7.22  | 7.61  | 0.39  |
| 0.5  | 8.00  | 8.50  | 9.00  | 9.50  | 10.00 | 10.50 | 11.00 | 11.50 | 12.00 | 12.50 | 0.50  |
| 0.6  | 13.0  | 13.8  | 14.6  | 15.4  | 16.2  | 17.0  | 17.8  | 18.6  | 19.4  | 20.2  | 0.80  |
| 0.7  | 21.0  | 22.0  | 23.0  | 24.0  | 25.0  | 26.0  | 27.0  | 28.0  | 29.0  | 30.0  | 1.00  |
| 0.8  | 31.0  | 32.0  | 33.0  | 34.0  | 35.0  | 36.0  | 37.0  | 38.0  | 39.0  | 40.0  | 1.00  |
| 0.9  | 41.0  | 42.3  | 43.6  | 44.9  | 46.2  | 47.5  | 48.8  | 50.1  | 51.4  | 52.7  | 1.30  |
| 1.0  | 54.0  | 55.4  | 56.8  | 58.2  | 59.6  | 61.0  | 62.4  | 63.8  | 65.2  | 66.6  | 1.40  |
| 1.1  | 68.0  | 69.7  | 71.4  | 73.1  | 74.8  | 76.5  | 78.2  | 79.9  | 81.6  | 83.3  | 1.70  |
| 1.2  | 85.0  | 86.9  | 88.8  | 90.7  | 92.6  | 94.5  | 96.4  | 98.3  | 100.2 | 102.1 | 1.90  |
| 1.3  | 104.0 | 106.0 | 108.0 | 110.0 | 112.0 | 114.0 | 116.0 | 118.0 | 120.0 | 122.0 | 2.00  |
| 1.4  | 124.0 | 126.2 | 128.4 | 130.6 | 132.8 | 135.0 | 137.2 | 139.4 | 141.6 | 143.8 | 2.20  |
| 1.5  | 146.0 | 151.4 | 156.8 | 162.2 | 167.5 | 173.0 | 178.4 | 183.8 | 189.2 | 194.6 | 5.40  |
| 1.6  | 200.0 | 211.0 | 222.0 | 233.0 | 244.0 | 255.0 | 266.0 | 277.0 | 288.0 | 299.0 | 11.00 |
| 1.7  | 310.0 | 324.0 | 338.0 | 352.0 | 366.0 | 380.0 | 394.0 | 408.0 | 422.0 | 436.0 | 14.00 |
| 1.8  | 450.0 | 467.0 | 484.0 | 501.0 | 518.0 | 535.0 | 552.0 | 569.0 | 586.0 | 603.0 | 17.00 |
| 1.9  | 620.0 | 638.0 | 656.0 | 674.0 | 692.0 | 710.0 | 728.0 | 746.0 | 764.0 | 782.0 | 18.00 |
| 2.0  | 800.0 | 819.0 | 838.0 | 857.0 | 876.0 | 895.0 | 914.0 | 933.0 | 952.0 | 971.0 | 19.00 |
| 2.1  | 990.0 | 1011. | 1032. | 1053. | 1074. | 1095. | 1116. | 1137. | 1158. | 1179. | 21.00 |
| 2.2  | 1200. | 1222. | 1244. | 1266. | 1288. | 1310. | 1332. | 1354. | 1376. | 1398. | 22.00 |
| 2.3  | 1420. | 1442. | 1464. | 1486. | 1508. | 1530. | 1552. | 1574. | 1596. | 1618. | 22.00 |
| 2.4  | 1640. | 1664. | 1688. | 1712. | 1736. | 1760. | 1784. | 1808. | 1832. | 1856. | 24.00 |
| 2.5  | 1880. | 1905. | 1930. | 1955. | 1980. | 2005. | 2030. | 2055. | 2080. | 2105. | 25.00 |
| 2.6  | 2130. | 2156. | 2182. | 2208. | 2234. | 2260. | 2286. | 2312. | 2338. | 2364. | 26.00 |
| 2.7  | 2390. | 2417. | 2444. | 2471. | 2498. | 2525. | 2552. | 2579. | 2606. | 2633. | 27.00 |
| 2.8  | 260.  | 2688. | 2716. | 2744. | 2772. | 2800. | 2828. | 2856. | 2884. | 2912. | 28.00 |
| 2.9  | 2940. | 2968. | 2996. | 3024. | 3052. | 3080. | 3108. | 3136. | 3164. | 3192. | 28.00 |
| 3.0  | 3220. | 3248. | 3276. | 3304. | 3332. | 3360. | 3388. | 3416. | 3444. | 3472. | 28.00 |

SOURCE: LOS ANGELES COUNTY DEPT. OF PUBLIC WORKS

STATION NO. F319-R  
RATING TABLE NO. 58-01

SHEET 2

| G.H. | .00    | .01    | .02    | .03    | .04    | .05    | .06    | .07    | .08    | .09    | DIFF. |
|------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|-------|
| 3.1  | 3500.  | 3530.  | 3560.  | 3590.  | 3620.  | 3650.  | 3680.  | 3710.  | 3740.  | 3770.  | 30.00 |
| 3.2  | 3800.  | 3832.  | 3864.  | 3896.  | 3928.  | 3960.  | 3992.  | 4024.  | 4056.  | 4088.  | 32.00 |
| 3.3  | 4120.  | 4152.  | 4184.  | 4216.  | 4248.  | 4280.  | 4312.  | 4344.  | 4376.  | 4408.  | 32.00 |
| 3.4  | 4440.  | 4474.  | 4508.  | 4542.  | 4576.  | 4610.  | 4644.  | 4678.  | 4712.  | 4746.  | 34.00 |
| 3.5  | 4780.  | 4816.  | 4852.  | 4888.  | 4924.  | 4960.  | 4996.  | 5032.  | 5068.  | 5104.  | 36.00 |
| 3.6  | 5140.  | 5176.  | 5212.  | 5248.  | 5284.  | 5320.  | 5356.  | 5392.  | 5428.  | 5464.  | 36.00 |
| 3.7  | 5500.  | 5538.  | 5576.  | 5614.  | 5652.  | 5690.  | 5728.  | 5766.  | 5804.  | 5842.  | 38.00 |
| 3.8  | 5880.  | 5920.  | 5960.  | 6000.  | 6040.  | 6080.  | 6120.  | 6160.  | 6200.  | 6240.  | 40.00 |
| 3.9  | 6280.  | 6321.  | 6362.  | 6403.  | 6444.  | 6485.  | 6526.  | 6567.  | 6608.  | 6649.  | 41.00 |
| 4.0  | 6690.  | 6731.  | 6772.  | 6813.  | 6854.  | 6895.  | 6936.  | 6977.  | 7018.  | 7059.  | 41.00 |
| 4.1  | 7100.  | 7142.  | 7184.  | 7226.  | 7268.  | 7310.  | 7352.  | 7394.  | 7436.  | 7478.  | 42.00 |
| 4.2  | 7520.  | 7563.  | 7606.  | 7649.  | 7692.  | 7735.  | 7778.  | 7821.  | 7864.  | 7907.  | 43.00 |
| 4.3  | 7950.  | 7994.  | 8038.  | 8082.  | 8126.  | 8170.  | 8214.  | 8258.  | 8302.  | 8346.  | 44.00 |
| 4.4  | 8390.  | 8435.  | 8480.  | 8525.  | 8570.  | 8615.  | 8660.  | 8705.  | 8750.  | 8795.  | 45.00 |
| 4.5  | 8840.  | 8886.  | 8932.  | 8978.  | 9024.  | 9070.  | 9116.  | 9162.  | 9208.  | 9254.  | 46.00 |
| 4.6  | 9300.  | 9348.  | 9396.  | 9444.  | 9492.  | 9540.  | 9588.  | 9636.  | 9684.  | 9732.  | 48.00 |
| 4.7  | 9780.  | 9830.  | 9880.  | 9930.  | 9980.  | 10030. | 10080. | 10130. | 10180. | 10230. | 50.00 |
| 4.8  | 10280. | 10331. | 10382. | 10433. | 10484. | 10535. | 10586. | 10637. | 10688. | 10739. | 51.00 |
| 4.9  | 10790. | 10841. | 10892. | 10943. | 10994. | 11045. | 11096. | 11147. | 11198. | 11249. | 51.00 |
| 5.0  | 11300. | 11352. | 11404. | 11456. | 11508. | 11560. | 11612. | 11664. | 11716. | 11768. | 52.00 |
| 5.1  | 11820. | 11873. | 11926. | 11979. | 12032. | 12085. | 12138. | 12191. | 12244. | 12297. | 53.00 |
| 5.2  | 12350. | 12405. | 12460. | 12515. | 12570. | 12625. | 12680. | 12735. | 12790. | 12845. | 55.00 |
| 5.3  | 12900. | 12956. | 13012. | 13068. | 13124. | 13180. | 13236. | 13292. | 13348. | 13404. | 56.00 |
| 5.4  | 13460. | 13517. | 13574. | 13631. | 13688. | 13745. | 13802. | 13859. | 13916. | 13973. | 57.00 |
| 5.5  | 14030. | 14087. | 14144. | 14201. | 14258. | 14315. | 14372. | 14429. | 14486. | 14543. | 57.00 |
| 5.6  | 14600. | 14657. | 14714. | 14771. | 14828. | 14885. | 14942. | 14999. | 15056. | 15113. | 57.00 |
| 5.7  | 15170. | 15227. | 15284. | 15341. | 15398. | 15455. | 15512. | 15569. | 15626. | 15683. | 57.00 |
| 5.8  | 15740. | 15797. | 15854. | 15911. | 15968. | 16025. | 16082. | 16139. | 16196. | 16253. | 57.00 |
| 5.9  | 16310. | 16367. | 16424. | 16481. | 16538. | 16595. | 16652. | 16709. | 16766. | 16823. | 57.00 |
| 6.0  | 16880. | 16938. | 16996. | 17054. | 17112. | 17170. | 17228. | 17286. | 17344. | 17402. | 58.00 |
| 6.1  | 17460. | 17519. | 17578. | 17637. | 17696. | 17755. | 17814. | 17873. | 17932. | 17991. | 59.00 |
| 6.2  | 18050. | 18110. | 18170. | 18230. | 18290. | 18350. | 18410. | 18470. | 18530. | 18590. | 60.00 |
| 6.3  | 18650. | 18711. | 18772. | 18833. | 18894. | 18955. | 19016. | 19077. | 19138. | 19199. | 61.00 |
| 6.4  | 19260. | 19321. | 19382. | 19443. | 19504. | 19565. | 19626. | 19687. | 19748. | 19809. | 61.00 |
| 6.5  | 19870. | 19932. | 19994. | 20056. | 20118. | 20180. | 20242. | 20304. | 20366. | 20428. | 62.00 |
| 6.6  | 20490. | 20553. | 20616. | 20679. | 20742. | 20805. | 20868. | 20931. | 20994. | 21057. | 63.00 |
| 6.7  | 21120. | 21183. | 21246. | 21309. | 21372. | 21435. | 21498. | 21561. | 21624. | 21687. | 63.00 |
| 6.8  | 21750. | 21813. | 21876. | 21939. | 22002. | 22065. | 22128. | 22191. | 22254. | 22317. | 63.00 |
| 6.9  | 22380. | 22443. | 22506. | 22569. | 22632. | 22695. | 22758. | 22821. | 22884. | 22947. | 63.00 |
| 7.0  | 23010. | 23073. | 23136. | 23199. | 23262. | 23325. | 23388. | 23451. | 23514. | 23577. | 63.00 |

STATION NO. F319-R  
RATING TABLE NO. 58-01

SHEET 3

| G.H. | .00    | .01    | .02    | .03    | .04    | .05    | .06    | .07    | .08    | .09    | DIFF. |
|------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|-------|
| 7.1  | 23640. | 23703. | 23766. | 23829. | 23892. | 23955. | 24018. | 24081. | 24144. | 24207. | 63.00 |
| 7.2  | 24270. | 24334. | 24398. | 24462. | 24526. | 24590. | 24654. | 24718. | 24782. | 24846. | 64.00 |
| 7.3  | 24910. | 24975. | 25040. | 25105. | 25170. | 25235. | 25300. | 25365. | 25430. | 25495. | 65.00 |
| 7.4  | 25560. | 25626. | 25692. | 25758. | 25824. | 25890. | 25956. | 26022. | 26088. | 26154. | 66.00 |
| 7.5  | 26220. | 26287. | 26354. | 26421. | 26488. | 26555. | 26622. | 26689. | 26756. | 26823. | 67.00 |
| 7.6  | 26890. | 26958. | 27026. | 27094. | 27162. | 27230. | 27298. | 27366. | 27434. | 27502. | 68.00 |
| 7.7  | 27570. | 27639. | 27708. | 27777. | 27846. | 27915. | 27984. | 28053. | 28122. | 28191. | 69.00 |
| 7.8  | 28260. | 28330. | 28400. | 28470. | 28540. | 28610. | 28680. | 28750. | 28820. | 28890. | 70.00 |
| 7.9  | 28960. | 29031. | 29102. | 29173. | 29244. | 29315. | 29386. | 29457. | 29528. | 29599. | 71.00 |
| 8.0  | 29670. | 29742. | 29814. | 29886. | 29958. | 30030. | 30102. | 30174. | 30246. | 30318. | 72.00 |
| 8.1  | 30390. | 30463. | 30536. | 30609. | 30682. | 30755. | 30828. | 30901. | 30974. | 31047. | 73.00 |
| 8.2  | 31120. | 31194. | 31268. | 31342. | 31416. | 31490. | 31564. | 31638. | 31712. | 31786. | 74.00 |
| 8.3  | 31860. | 31935. | 32010. | 32085. | 32160. | 32235. | 32310. | 32385. | 32460. | 32535. | 75.00 |
| 8.4  | 32610. | 32686. | 32762. | 32838. | 32914. | 32990. | 33066. | 33142. | 33218. | 33294. | 76.00 |
| 8.5  | 33370. | 33447. | 33524. | 33601. | 33678. | 33755. | 33832. | 33909. | 33986. | 34063. | 77.00 |
| 8.6  | 34140. | 34217. | 34294. | 34371. | 34448. | 34525. | 34602. | 34679. | 34756. | 34833. | 77.00 |
| 8.7  | 34710. | 34788. | 34866. | 34944. | 35022. | 35100. | 35178. | 35256. | 35334. | 35412. | 78.00 |
| 8.8  | 35690. | 35768. | 35846. | 35924. | 36002. | 36080. | 36158. | 36236. | 36314. | 36392. | 78.00 |
| 8.9  | 36470. | 36548. | 36626. | 36704. | 36782. | 36860. | 36938. | 37016. | 37094. | 37172. | 78.00 |
| 9.0  | 37250. | 37328. | 37406. | 37484. | 37562. | 37640. | 37718. | 37796. | 37874. | 37952. | 78.00 |
| 9.1  | 38030. | 38108. | 38186. | 38264. | 38342. | 38420. | 38498. | 38576. | 38654. | 38732. | 78.00 |
| 9.2  | 38810. | 38888. | 38966. | 39044. | 39122. | 39200. | 39278. | 39356. | 39434. | 39512. | 78.00 |
| 9.3  | 39590. | 39668. | 39746. | 39824. | 39902. | 39980. | 40058. | 40136. | 40214. | 40292. | 78.00 |
| 9.4  | 40370. | 40448. | 40526. | 40604. | 40682. | 40760. | 40838. | 40916. | 40994. | 41072. | 78.00 |
| 9.5  | 41150. | 41228. | 41306. | 41384. | 41462. | 41540. | 41618. | 41696. | 41774. | 41852. | 78.00 |
| 9.6  | 41930. | 42009. | 42088. | 42167. | 42246. | 42325. | 42404. | 42483. | 42562. | 42641. | 79.00 |
| 9.7  | 42720. | 42799. | 42878. | 42957. | 43036. | 43115. | 43194. | 43273. | 43352. | 43431. | 79.00 |
| 9.8  | 43510. | 43589. | 43668. | 43747. | 43826. | 43905. | 43984. | 44063. | 44142. | 44221. | 79.00 |
| 9.9  | 44300. | 44380. | 44460. | 44540. | 44620. | 44700. | 44780. | 44860. | 44940. | 45020. | 80.00 |
| 10.0 | 45100. | 45181. | 45262. | 45343. | 45424. | 45505. | 45586. | 45667. | 45748. | 45829. | 81.00 |
| 10.1 | 45910. | 45992. | 46074. | 46156. | 46238. | 46320. | 46402. | 46484. | 46566. | 46648. | 82.00 |
| 10.2 | 46730. | 46813. | 46896. | 46979. | 47062. | 47145. | 47228. | 47311. | 47394. | 47477. | 83.00 |
| 10.3 | 47560. | 47644. | 47728. | 47812. | 47896. | 47980. | 48064. | 48148. | 48232. | 48316. | 84.00 |
| 10.4 | 48400. | 48484. | 48568. | 48652. | 48736. | 48820. | 48904. | 48988. | 49072. | 49156. | 84.00 |
| 10.5 | 49240. | 49325. | 49410. | 49495. | 49580. | 49665. | 49750. | 49835. | 49920. | 50005. | 85.00 |
| 10.6 | 50090. | 50175. | 50260. | 50345. | 50430. | 50515. | 50600. | 50685. | 50770. | 50855. | 85.00 |
| 10.7 | 50940. | 51025. | 51110. | 51195. | 51280. | 51365. | 51450. | 51535. | 51620. | 51705. | 85.00 |
| 10.8 | 51790. | 51875. | 51960. | 52045. | 52130. | 52215. | 52300. | 52385. | 52470. | 52555. | 85.00 |
| 10.9 | 52640. | 52725. | 52810. | 52895. | 52980. | 53065. | 53150. | 53235. | 53320. | 53405. | 85.00 |
| 11.0 | 53490. | 53576. | 53662. | 53748. | 53834. | 53920. | 54006. | 54092. | 54178. | 54264. | 86.00 |

STATION NO. F319-R  
RATING TABLE NO. 58-01

SHEET 4

| G.H. | .00    | .01    | .02    | .03    | .04    | .05    | .06    | .07    | .08    | .09    | DIFF.  |
|------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 11.1 | 54350. | 54437. | 54524. | 54611. | 54698. | 54785. | 54872. | 54959. | 55046. | 55133. | 87.00  |
| 11.2 | 55220. | 55308. | 55396. | 55484. | 55572. | 55660. | 55748. | 55836. | 55924. | 56012. | 88.00  |
| 11.3 | 56100. | 56188. | 56276. | 56364. | 56452. | 56540. | 56628. | 56716. | 56804. | 56892. | 88.00  |
| 11.4 | 56980. | 57068. | 57156. | 57244. | 57332. | 57420. | 57508. | 57596. | 57684. | 57772. | 88.00  |
| 11.5 | 57860. | 57948. | 58036. | 58124. | 58212. | 58300. | 58388. | 58476. | 58564. | 58652. | 88.00  |
| 11.6 | 58740. | 58829. | 58918. | 59007. | 59096. | 59185. | 59274. | 59363. | 59452. | 59541. | 89.00  |
| 11.7 | 59630. | 59719. | 59808. | 59897. | 59986. | 60075. | 60164. | 60253. | 60342. | 60431. | 89.00  |
| 11.8 | 60520. | 60610. | 60700. | 60790. | 60880. | 60970. | 61060. | 61150. | 61240. | 61330. | 90.00  |
| 11.9 | 61420. | 61511. | 61602. | 61693. | 61784. | 61875. | 61966. | 62057. | 62148. | 62239. | 91.00  |
| 12.0 | 62330. | 62422. | 62514. | 62606. | 62698. | 62790. | 62882. | 62974. | 63066. | 63158. | 92.00  |
| 12.1 | 63250. | 63343. | 63436. | 63529. | 63622. | 63715. | 63808. | 63901. | 63994. | 64087. | 93.00  |
| 12.2 | 64180. | 64274. | 64368. | 64462. | 64556. | 64650. | 64744. | 64838. | 64932. | 65026. | 94.00  |
| 12.3 | 65120. | 65215. | 65310. | 65405. | 65500. | 65595. | 65690. | 65785. | 65880. | 65975. | 95.00  |
| 12.4 | 66070. | 66166. | 66262. | 66358. | 66454. | 66550. | 66646. | 66742. | 66838. | 66934. | 96.00  |
| 12.5 | 67030. | 67127. | 67224. | 67321. | 67418. | 67515. | 67612. | 67709. | 67806. | 67903. | 97.00  |
| 12.6 | 68000. | 68098. | 68196. | 68294. | 68392. | 68490. | 68588. | 68686. | 68784. | 68882. | 98.00  |
| 12.7 | 68980. | 69079. | 69178. | 69277. | 69376. | 69475. | 69574. | 69673. | 69772. | 69871. | 99.00  |
| 12.8 | 69970. | 70070. | 70170. | 70270. | 70370. | 70470. | 70570. | 70670. | 70770. | 70870. | 100.00 |
| 12.9 | 70970. | 71071. | 71172. | 71273. | 71374. | 71475. | 71576. | 71677. | 71778. | 71879. | 101.00 |
| 13.0 | 71980. | 72081. | 72182. | 72283. | 72384. | 72485. | 72586. | 72687. | 72788. | 72889. | 101.00 |
| 13.1 | 72990. | 73091. | 73192. | 73293. | 73394. | 73495. | 73596. | 73697. | 73798. | 73899. | 101.00 |
| 13.2 | 74000. | 74101. | 74202. | 74303. | 74404. | 74505. | 74606. | 74707. | 74808. | 74909. | 101.00 |
| 13.3 | 75010. | 75111. | 75212. | 75313. | 75414. | 75515. | 75616. | 75717. | 75818. | 75919. | 101.00 |
| 13.4 | 76020. | 76121. | 76222. | 76323. | 76424. | 76525. | 76626. | 76727. | 76828. | 76929. | 101.00 |
| 13.5 | 77030. | 77132. | 77234. | 77336. | 77438. | 77540. | 77642. | 77744. | 77846. | 77948. | 102.00 |
| 13.6 | 78050. | 78153. | 78256. | 78359. | 78462. | 78565. | 78668. | 78771. | 78874. | 78977. | 103.00 |
| 13.7 | 79080. | 79184. | 79288. | 79392. | 79496. | 79600. | 79704. | 79808. | 79912. | 80016. | 104.00 |
| 13.8 | 80120. | 80225. | 80330. | 80435. | 80540. | 80645. | 80750. | 80855. | 80960. | 81065. | 105.00 |
| 13.9 | 81170. | 81275. | 81380. | 81485. | 81590. | 81695. | 81800. | 81905. | 82010. | 82115. | 105.00 |
| 14.0 | 82220. | 82325. | 82430. | 82535. | 82640. | 82745. | 82850. | 82955. | 83060. | 83165. | 105.00 |
| 14.1 | 83270. | 83375. | 83480. | 83585. | 83690. | 83795. | 83900. | 84005. | 84110. | 84215. | 105.00 |
| 14.2 | 84320. | 84425. | 84530. | 84635. | 84740. | 84845. | 84950. | 85055. | 85160. | 85265. | 105.00 |
| 14.3 | 85370. | 85475. | 85580. | 85685. | 85790. | 85895. | 86000. | 86105. | 86210. | 86315. | 105.00 |
| 14.4 | 86420. | 86525. | 86630. | 86735. | 86840. | 86945. | 87050. | 87155. | 87260. | 87365. | 105.00 |
| 14.5 | 87470. | 87575. | 87680. | 87785. | 87890. | 87995. | 88100. | 88205. | 88310. | 88415. | 105.00 |
| 14.6 | 88520. | 88625. | 88730. | 88835. | 88940. | 89045. | 89150. | 89255. | 89360. | 89465. | 105.00 |
| 14.7 | 89570. | 89675. | 89780. | 89885. | 89990. | 90095. | 90200. | 90305. | 90410. | 90515. | 105.00 |
| 14.8 | 90620. | 90725. | 90830. | 90935. | 91040. | 91145. | 91250. | 91355. | 91460. | 91565. | 105.00 |
| 14.9 | 91670. | 91775. | 91880. | 91985. | 92090. | 92195. | 92300. | 92405. | 92510. | 92615. | 105.00 |
| 15.0 | 92720. | 92825. | 92930. | 93035. | 93140. | 93245. | 93350. | 93455. | 93560. | 93665. | 105.00 |



STATION NO. F319-R  
RATING TABLE NO. 53-01

SHEET 5

| G.H. | .00     | .01     | .02     | .03     | .04     | .05     | .06     | .07     | .08     | .09     | DIFF.  |
|------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|--------|
| 15.1 | 93770.  | 93876.  | 93982.  | 94088.  | 94194.  | 94300.  | 94406.  | 94512.  | 94618.  | 94724.  | 106.00 |
| 15.2 | 94830.  | 94937.  | 95044.  | 95151.  | 95258.  | 95365.  | 95472.  | 95579.  | 95686.  | 95793.  | 107.00 |
| 15.3 | 95900.  | 96008.  | 96116.  | 96224.  | 96332.  | 96440.  | 96548.  | 96656.  | 96764.  | 96872.  | 108.00 |
| 15.4 | 96980.  | 97089.  | 97198.  | 97307.  | 97416.  | 97525.  | 97634.  | 97743.  | 97852.  | 97961.  | 109.00 |
| 15.5 | 98070.  | 98181.  | 98292.  | 98403.  | 98514.  | 98625.  | 98736.  | 98847.  | 98958.  | 99069.  | 111.00 |
| 15.6 | 99180.  | 99293.  | 99406.  | 99519.  | 99632.  | 99745.  | 99858.  | 99971.  | 100084. | 100197. | 113.00 |
| 15.7 | 100310. | 100425. | 100540. | 100655. | 100770. | 100885. | 101000. | 101115. | 101230. | 101345. | 115.00 |
| 15.8 | 101460. | 101577. | 101694. | 101811. | 101928. | 102045. | 102162. | 102279. | 102396. | 102513. | 117.00 |
| 15.9 | 102630. | 102749. | 102868. | 102987. | 103106. | 103225. | 103344. | 103463. | 103582. | 103701. | 119.00 |
| 16.0 | 103820. | 103941. | 104062. | 104183. | 104304. | 104425. | 104546. | 104667. | 104788. | 104909. | 121.00 |
| 16.1 | 105030. | 105152. | 105274. | 105396. | 105518. | 105640. | 105762. | 105884. | 106006. | 106128. | 122.00 |
| 16.2 | 106250. | 106372. | 106494. | 106616. | 106738. | 106860. | 106982. | 107104. | 107226. | 107348. | 122.00 |
| 16.3 | 107470. | 107593. | 107716. | 107839. | 107962. | 108085. | 108208. | 108331. | 108454. | 108577. | 123.00 |
| 16.4 | 108700. | 108823. | 108946. | 109069. | 109192. | 109315. | 109438. | 109561. | 109684. | 109807. | 123.00 |
| 16.5 | 109930. | 110053. | 110176. | 110299. | 110422. | 110545. | 110668. | 110791. | 110914. | 111037. | 123.00 |
| 16.6 | 111160. | 111283. | 111406. | 111529. | 111652. | 111775. | 111898. | 112021. | 112144. | 112267. | 123.00 |
| 16.7 | 112390. | 112513. | 112636. | 112759. | 112882. | 113005. | 113128. | 113251. | 113374. | 113497. | 123.00 |
| 16.8 | 113620. | 113743. | 113866. | 113989. | 114112. | 114235. | 114358. | 114481. | 114604. | 114727. | 123.00 |
| 16.9 | 114850. | 114974. | 115098. | 115222. | 115346. | 115470. | 115594. | 115718. | 115842. | 115966. | 124.00 |
| 17.0 | 116090. | 116216. | 116342. | 116468. | 116594. | 116720. | 116846. | 116972. | 117098. | 117224. | 126.00 |
| 17.1 | 117350. | 117477. | 117604. | 117731. | 117858. | 117985. | 118112. | 118239. | 118366. | 118493. | 127.00 |
| 17.2 | 118620. | 118748. | 118876. | 119004. | 119132. | 119260. | 119388. | 119516. | 119644. | 119772. | 128.00 |
| 17.3 | 119900. | 120028. | 120156. | 120284. | 120412. | 120540. | 120668. | 120796. | 120924. | 121052. | 128.00 |
| 17.4 | 121180. | 121308. | 121436. | 121564. | 121692. | 121820. | 121948. | 122076. | 122204. | 122332. | 128.00 |
| 17.5 | 122460. | 122588. | 122716. | 122844. | 122972. | 123100. | 123228. | 123356. | 123484. | 123612. | 128.00 |
| 17.6 | 123740. | 123868. | 123996. | 124124. | 124252. | 124380. | 124508. | 124636. | 124764. | 124892. | 128.00 |
| 17.7 | 125020. | 125148. | 125276. | 125404. | 125532. | 125660. | 125788. | 125916. | 126044. | 126172. | 128.00 |
| 17.8 | 126300. | 126428. | 126556. | 126684. | 126812. | 126940. | 127068. | 127196. | 127324. | 127452. | 128.00 |
| 17.9 | 127580. | 127708. | 127836. | 127964. | 128092. | 128220. | 128348. | 128476. | 128604. | 128732. | 128.00 |
| 18.0 | 128860. | 128989. | 129118. | 129247. | 129376. | 129505. | 129634. | 129763. | 129892. | 130021. | 129.00 |
| 18.1 | 130150. | 130280. | 130410. | 130540. | 130670. | 130800. | 130930. | 131060. | 131190. | 131320. | 130.00 |
| 18.2 | 131450. | 131581. | 131712. | 131843. | 131974. | 132105. | 132236. | 132367. | 132498. | 132629. | 131.00 |
| 18.3 | 132760. | 132892. | 133024. | 133156. | 133288. | 133420. | 133552. | 133684. | 133816. | 133948. | 132.00 |
| 18.4 | 134080. | 134213. | 134346. | 134479. | 134612. | 134745. | 134878. | 135011. | 135144. | 135277. | 133.00 |
| 18.5 | 135410. | 135544. | 135678. | 135812. | 135946. | 136080. | 136214. | 136348. | 136482. | 136616. | 134.00 |
| 18.6 | 136750. | 136885. | 137020. | 137155. | 137290. | 137425. | 137560. | 137695. | 137830. | 137965. | 135.00 |
| 18.7 | 138100. | 138236. | 138372. | 138508. | 138644. | 138780. | 138916. | 139052. | 139188. | 139324. | 136.00 |
| 18.8 | 139460. | 139597. | 139734. | 139871. | 140008. | 140145. | 140282. | 140419. | 140556. | 140693. | 137.00 |
| 18.9 | 140830. | 140968. | 141106. | 141244. | 141382. | 141520. | 141658. | 141796. | 141934. | 142072. | 138.00 |
| 19.0 | 142210. | 142349. | 142488. | 142627. | 142766. | 142905. | 143044. | 143183. | 143322. | 143461. | 139.00 |

STATION NO. F319-R  
RATING TABLE NO. 53-01

SHEET 6

| G.H. | .00     | .01     | .02     | .03     | .04     | .05     | .06     | .07     | .08     | .09     | DIFF.  |
|------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|--------|
| 19.1 | 143600. | 143739. | 143878. | 144017. | 144156. | 144295. | 144434. | 144573. | 144712. | 144851. | 139.00 |
| 19.2 | 144990. | 145129. | 145268. | 145407. | 145546. | 145685. | 145824. | 145963. | 146102. | 146241. | 139.00 |
| 19.3 | 146380. | 146519. | 146658. | 146797. | 146936. | 147075. | 147214. | 147353. | 147492. | 147631. | 139.00 |
| 19.4 | 147770. | 147909. | 148048. | 148187. | 148326. | 148465. | 148604. | 148743. | 148882. | 149021. | 139.00 |
| 19.5 | 149160. | 149299. | 149438. | 149577. | 149716. | 149855. | 149994. | 150133. | 150272. | 150411. | 139.00 |
| 19.6 | 150550. | 150689. | 150828. | 150967. | 151106. | 151245. | 151384. | 151523. | 151662. | 151801. | 139.00 |
| 19.7 | 151940. | 152079. | 152218. | 152357. | 152496. | 152635. | 152774. | 152913. | 153052. | 153191. | 139.00 |
| 19.8 | 153330. | 153470. | 153610. | 153750. | 153890. | 154030. | 154170. | 154310. | 154450. | 154590. | 140.00 |
| 19.9 | 154730. | 154870. | 155010. | 155150. | 155290. | 155430. | 155570. | 155710. | 155850. | 155990. | 140.00 |
| 20.0 | 156130. |         |         |         |         |         |         |         |         |         |        |

EXHIBIT G

FINDING OF NO SIGNIFICANT IMPACT  
WATER CONTROL PLAN  
SEPULVEDA FLOOD CONTROL BASIN  
LOS ANGELES COUNTY, CALIFORNIA

LOS ANGELES DISTRICT CORPS OF ENGINEERS

FINDING OF NO SIGNIFICANT

IMPACT

WATER CONTROL PLAN

SEPULVEDA FLOOD CONTROL BASIN

LOS ANGELES COUNTY, CALIFORNIA

APRIL 1987

I have reviewed the attached environmental assessment that has been prepared for the Water Control Plan, Sepulveda Flood Control Basin, Los Angeles County, California. The significant resources potentially affected by this project are biological resources, cultural resources, water quality and land use, including flood control, recreation and agriculture.

Although the proposed Water Control Plan permits deviations from the operation schedule for Sepulveda Dam, these deviations are not discernibly different from existing conditions and, therefore, should not have any effect on the extent and duration of inundation within the flood control basin. The impacts on the quality of the human environment due to these changes are not considered significant. Therefore, an environmental impact statement is not required for this project.

Date

21 May 87

  
D. FRED BUTLER  
Colonel, CE  
Commanding

EXHIBIT H

CHAIN OF CORRESPONDENCE  
FOR APPROVAL OF  
WATER CONTROL MANUAL

CESPD-ED-W (CESPL-ED-HR/13 OCT 88) (1110-2-240b) 3d End  
Krhoun/dh/556-2033  
SUBJECT: Sepulveda Dam Water Control Manual

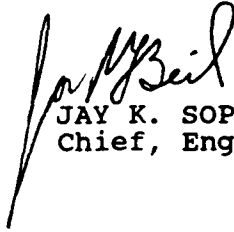
DA, South Pacific Division, Corps of Engineers, 630 Sansome  
Street, Room 720, San Francisco CA 94111-2206 JUN 1993

FOR Commander, Los Angeles District, ATTN: CESPL-ED-HR

1. Subject report is approved.
2. Please furnish this office four copies of the final printing of the report.

FOR THE COMMANDER:

Encl  
wd

  
JAY K. SOPER  
Chief, Engineering Division

1 - JUN 1989

CESPL-ED-HR (CESPD-ED-W/12 Jan 89) (1110-2-240b) 2nd End  
Reid/ep/894-3003  
SUBJECT: Sepulveda Dam Water Control Manual

DA, Los Angeles District, Corps of Engineers, 300 N. Los Angeles Street, Room  
6042, Los Angeles, CA 90053-2325 30 May 1989

FOR Commander, South Pacific Division, Attn: CESPD-ED-W

1. Enclosed are four copies of the final Sepulveda Dam Water Control Manual prepared in accordance with ETL 1110-2-251. Responses to CESPD comments provided by 1st endorsement have been incorporated into the enclosed manuals. Report quality reproduction of this final version of the manual will begin upon receipt of your final approval.

2. If there are any questions, please contact Boni Bigornia of the Reservoir Regulation Unit at (213)894-6916.

FOR THE COMMANDER:

Enclosure

1. as



h Carl F. Ensor, PE  
Chief, Engineering Division

05 April 1989

LAD RESPONSES TO SPD COMMENTS ON THE SEPULVEDA DAM WATER CONTROL MANUAL:

1. Concur. The title page has been changed accordingly.
2. Concur. Table 4-07 on page 4-19 has been updated to the present, and the footnotes clarified.
3. Concur. A description of the unit hydrograph procedure was expanded and included on page 4-7, para. 4-07.
4. Concur. The rubber dam and Verdugo Wash have been located on Plate 2-02. The channel capacity of 16,900 cfs downstream of the dam and other points of constraints have also been included on Plate 2-02. With the rubber dam fully inflated to 6.9 feet, the flow in the channel will reach 800 cfs, when the depth of flow in the channel is 8.3 feet. At that time, the dam begins to deflate automatically. The channel capacity of the Los Angeles River with the dam lowered is 55,000 cfs. With the dam in the raised position, the maximum channel capacity is about 20,000 cfs. This information has been noted on page 7-1, para. 7-02.
5. Concur. The Section on Flood Control on page 7-2, para. 7-05 was modified to describe only the flood control plan regardless of the forecast. Deviations from the plan in the event of a forecast of no spillway flow was moved to page 7-5, paragraph 7-13d.
6. Concur. A small paragraph on drought contingency plans has been added to Section 7-09, entitled "Drought Contingency Plan".
7. Additions to the text resulting from the SPD comments are attached.



CESPD-ED-W (CESPL-ED-HR/13 OCT 1988) (1110-2,240b) 1st End\Krhoun\dh\6-2033  
SUBJECT: Sepulveda Dam Water Control Manual

13 JAN 1989

DA, South Pacific Division, Corps of Engineers, 630 Sansome street, Room  
720, San Francisco CA. 94111-2206

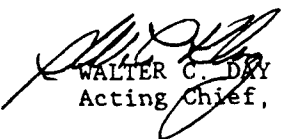
FOR: Commander, Los Angeles District, ATTN: CESPL-ED-HR

1. Subject final draft manual has been reviewed and comments are attached. These comments are submitted to assist the District in finalizing the manual. Approval will be given after review by this office of the final manual.

2. District is requested to submit its responses to the comments along with the final manual.

THE COMMANDER:

2 Encls  
wd encl 1  
Added 1 encl  
2. SPD Comments

  
WALTER C. DAY  
Acting Chief, Engineering Division

12 January 1989

SOUTH PACIFIC DIVISION  
COMMENTS  
FINAL DRAFT  
SEPULVEDA WATER CONTROL MANUAL

1. Page i- Title of project should be identical to the name on the cover of the manual.
2. Page 4-19, Table 4-07- This table should be updated to include years from 1980 to present. Note 2 is unclear. It should be modified or eliminated when the table is updated.
3. Page 6-2, paragraph 6-02- A description of the unit hydrograph procedures should be included in this paragraph or on Plate 4-08. This will permit the reader to understand the method used.
4. Page 7-1, paragraph 7-02- Locate Verdugo Wash and the rubber dam on Plate 2-02. Another constraint appears to be the channel capacity of 16,900 cfs immediately downstream of the dam (see paragraph 7-05b). Indicate the channel capacity corresponding to the 8.3 feet depth at the rubber dam. In addition the correlation of the flows at the points of constraints should be noted.
5. Page 7-2, paragraph 7-05- This paragraph should describe the flood control plan regardless of the forecast. The manual infers that the plan shown on plate 7-02 will only be followed if there is no forecast or if large spillway flow is anticipated. The operating criteria should be developed for all storms regardless of their magnitude. Deviations for emergencies are handled as shown in paragraph 7-13. Paragraph 7-05 should be revised accordingly.
6. A small paragraph on drought contingency plans should be included in Chapter 7. This paragraph would explain in general terms water control actions that would occur during drought conditions.

AD-A211 528

WATER CONTROL MANUAL SEPULVEDA DAM AND RESERVOIR LOS  
ANGELES RIVER CALIFORNIA (U) ARMY ENGINEER DISTRICT LOS  
ANGELES CA MAY 89

4/4

UNCLASSIFIED

F/G 13/2

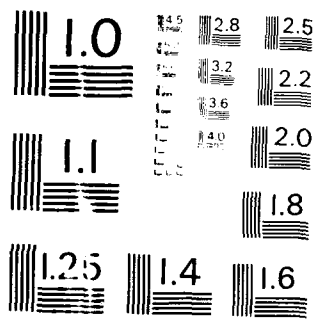
NL

END

DATE

EXPIRES

10 '89





DEPARTMENT OF THE ARMY  
LOS ANGELES DISTRICT, CORPS OF ENGINEERS

REPLY TO  
ATTENTION OF

13 OCT 1988

CESPL-ED-HR (1110-2-240b)

MEMORANDUM FOR: Commander, South Pacific Division, Attn: CESPD-ED-W

SUBJECT: Sepulveda Dam Water Control Manual

1. Enclosed for your review and approval are three copies of the updated Sepulveda Dam Water Control Manual (final draft) dated September 1988 (enclosure 1). The previous version of this manual was approved by SPDED-W by endorsement dated 23 October 1986.
2. Before final reproduction of the previously approved water control manual could be initiated, a final Environmental Assessment (EA) had to be approved by SPL. The final EA, dated May 1987, determined a Finding of No Significant Impact (FONSI) and was subsequently approved by SPD. However, because of the time difference between approval of the water control manual and approval of the May 1987 EA, new developments had occurred in the Sepulveda Basin that needed to be included in the water control manual.
3. The enclosed September 1988 version of the manual updates the October 1986 approved version to include the changes to the basin. None of the basin changes affect the conclusions stated in the existing EA. In addition, the changes included in the September 1988 water control manual do not significantly impact the reservoir regulation schedule used to operate the outlet works. Enclosure 2 is a list of the revisions to the previously approved water control manual furnished to expedite the your review process. You may refer to the May 1987 EA as necessary, as it still applies in all respects.
4. We request an expedited review and approval of the enclosed manual in keeping with the Division's goal of having all water control manuals brought up to date by the end of FY 91.

FOR THE COMMANDER:

CARL F. ENSON  
Chief, Engineering Division

Encls

SPDED-W (SPLED-HE/28 May 85) 3rd End Bhamidipaty/6-6210  
SUBJECT: Sepulveda Reservoir Water Control Manual

DA, South Pacific Division, Corps of Engineers, 630 Sansome  
Street, Room 720, San Francisco, CA 94111-2206 25 OCT 85

TO: Commander, Los Angeles District, ATTN: SPLED-HE

The subject reservoir regulation manual is approved.

FOR THE COMMANDER:

3 Encls  
wd encl 2  
l&3. nc

A. E. WANKET  
Chief, Engineering Division

CF: SPDED-W/Bhamidipaty  
SPDED-W  
SPD RF

SB  
85/dh  
SPDED-W  
6-6210  
16 Oct 86

JM  
SPDED-W  
WCD  
WCD

WCD  
AEW  
SPDED  
3 Oct 86

6 - OCT 1986

MEMO (25 May 1986) 2nd And  
SUBJECT: Sepulveda Reservoir Water Control Manual

Dd, Los Angeles District, Corps of Engineers, P.O. Box 2711, Los Angeles,  
California 90033

TO: Commander, South Pacific Division, ATTN: SPDEP-W

1. Enclosed for your review and approval are two copies of the updated Sepulveda Reservoir Water Control Manual (final draft) dated May 1986. The draft water control manual was transmitted to SPD in May 1985 and comments were returned to LAD by the int endorsement dated 11 Feb 1986. Responses to all SPD comments received with the int endorsement have been incorporated in the final draft with the exception of comments addressed in enclosure 3.

2. A draft Environmental Assessment was forwarded to SPDEP-W for review in the summer of 1985. The final Environmental Assessment for Sepulveda Reservoir is being prepared at this time by Planning Division, LAD, and will be forwarded separately.

FOR THE COMMANDER:

3 Encls  
added 1 encl  
3. Response to Comments

WILLIAM ARNO  
Chief, Engineering Division

CF (no/encs):

N&R  
CDE  
ED  
H&H Br.  
LHES (3)  
Op Br.  
PD  
RRB  
RP (KORRIGS)

APND  
SPLED

KOFLIN  
SPLED

EVELYN  
SPLED-6

HARVICE  
SPLED-HE

HANLOS  
SPLED-HE  
#4756/rg  
HYV

SEPULVEDA DAM AND RESERVOIR  
DRAFT WATER CONTROL MANUAL (MAY 1986)  
RESPONSE TO SPDED-W COMMENTS

All SPDED-W comments have been incorporated in this update of the water control manual except as follows:

Comment # 9. Section 4-06. Information on historic flood damages is included in Section 4-12 (d) under economic data and it is not duplicated in Section 4-06 under Storms and Floods.

Comment # 10. Plate 4-03. This plate was kept because it helps to establish plate 4-05.

Comment # 13. Section 4-05. The water surface profiles for control points on the Los Angeles River are not available at this time. The old ones are obsolete since more side drains and new construction changed the original channel design. However, these water surface profiles will be incorporated in the next update of the water control manual which is scheduled for FY 88.

Comment # 23. Table 4-06. The values of this table are correct. Backup material can be sent if requested.

Comment # 24. Plates. The plates are kept at the end of the report rather than with each section, because this way the water control manual is more easily used.

Comment # 25. Exhibit F. This exhibit is incorporated in this update of the water control manual but Plates and Tables that are used in the main body of the water control manual are not duplicated in the exhibit. This avoids duplication of work and the possibility of two versions of one table in the same water control manual. The dam tender is required to have available at the dam other pertinent books that complement this exhibit. These books are: the current Orange Book - "Instructions for Reservoir Operations (For Personnel)" the "Sepulveda Dam Flood Emergency Plan" and the "Operation and Maintenance Manual for Sepulveda Dam". Names and telephone numbers are included in the "Orange Book", not in the water control manual, otherwise an annual update and distribution of the water control manual would be required.



SPDED-W (SPLED-HE/Undated Ltr Received on 28 May 1985) 1st End  
SUBJECT: Sepulveda Reservoir Water Control Manual

DA, South Pacific Division, Corps of Engineers, 630 Sansome  
Street, Room 720, San Francisco, CA 94111-2206 11 JUL 85

TO: Commander, Los Angeles District, ATTN: SPLED-HE

The referenced draft manual (July 85 Draft) has been reviewed.  
Our comments are attached, together with a marked-up copy of  
the draft for incorporation in the final.

FOR THE COMMANDER:

2 Encl

*A. E. Wanket*  
A. E. WANKET  
Chief, Engineering Division

SEPULVEDA DAM AND RESERVOIR  
DRAFT WATER CONTROL MANUAL (JULY 1985)  
SPDED-W COMMENTS

1. Make title on the front cover and page i consistent.
2. Table 1. Make the date at the beginning of the table consistent with the date of the manual. Provide real estate taking lines by fee and easements. Change MSL to NGVD through out the table and through out the report. Under Elevation, items 4 and 5 are not clear and appears something is missing. Either provide allowance for sediment or delete-50-year.
3. Paragraph Titles: Use lower case letters and underscore the title.
4. Para 1-01: Add EM 1110-2-3600.
5. Add Para 1-05 with necessary information as required by ETL 1110-2-251.
6. Chapter II: Too descriptive and can be condensed.
7. Section 4-03: Provide brief description of the geology of the area.
8. Section 4-04: Identify various debris basins on plate 2-01 or plate 2-02.
9. Section 4-06: Provide information on historic flood damages.
10. Plate 4-03: This plate shows the 10-year moving mean of peak flows. There is no significance to this plate and should be removed.
11. Table 4-07: There are some errors in this table. For example for the month of March, the mean is 3,124 and not 2,035, and the median is 2,200 and not 1,111. Correct these and check other values.
12. Section 4-07: Provide time of concentration value at the dam site.
13. Section 4-09: Provide water surface profiles for floods such as 10-year and 100-year. Indicate control points and damage centers, and provide rating curves.
14. Section 4-10: Provide drainage area at Chatsworth Reservoir and Encino Reservoir.
15. Section 4-11 d: Provide drainage areas.
16. Section 5-08: Does LAD inform local and state Emergency Management agencies instead of LA Police Department in case of

flood emergencies? Check into this and if necessary correct it. Also provide phone numbers and addresses of these agencies.

17. Section 6-01.a: Reference to Sec. 5-06.b does not make any sense. Check this and correct it, if necessary.

18. Section 6-02. The information provided is inadequate. Provide details as required by ETL 1110-2-251.

19. Section 7-02: This section is incomplete. Provide maximum discharge that can be released without exceeding downstream channel capacity, maximum changes in releases from time to time and the release that can be made in case of gate failure. Discuss the impact of flows from downstream uncontrolled area on the releases from Sepulveda Dam.

20. Section 7.05 c(1): Provide the maximum release that can be made the rough the four ungated outlets when the water level is at spillway crest.

21. Section 7.05: Paragraph e is missing and paragraph f appears to be out of place.

22. Plates: Provide the following plates.  
Location and Vicinity Maps.  
Sediment Ranges or Sediment Survey Info.  
Embankment Section.  
Unit hydrograph.  
Tailwater Rating curve.  
Profile of the downstream reach of the river.

23. Table 4-06: The values in this table appear to be not correct. How could the ratio of the flows in columns (2) and (3) be the same for peak flow and 5-day duration flow.

24. Plates: Provide the plates with each section rather than at the end of the report.

25. Exhibit A: a. Provide Exhibit A on a colored paper.

b. Provide time required to raise and lower the gates of spillway outlets.

c. Type of energy dissipator for spillway and outlets.

d. Discharge through the outlets at pertinent elevations.

e. Control points downstream and pertinent information.

26. Exhibit F: This exhibit is incomplete and inadequate for dam tender's use during flood emergency. This exhibit should be self contained with all the necessary backup information.

Provide as a minimum the following:

a. A table containing the names, offices, and office and home telephone numbers of all concerned people with the regulation of floods of Sepulveda Dam and Reservoir.

b. A narrative covering

- (I) General
- (II) Flood Control Operational Requirements
- (III) Limitations on Storage and Releases
- (IV) Standing Instruction During Flood Emergency
- (V) Operational Responsibilities
- (VI) Gate Operation
- (VII) Normal and Emergency Operation Procedures
- (VIII) Reports (Number, extent and frequency)
- (IX) Emergency Notification
- (X) Modification of Regulations
- (XI) Spillway and Outlet Rating Curves
- (XII) Tailwater Rating Curve
- (XIII) Rating Curves for Downstream Control Points
- (XIV) Flood Control Diagram

#### SPDPD COMMENTS

1. Water Control Manual, Page 2-1, Paragraph 2-01. There is no Table 1 in Exhibit A. Also, Plate 2-01 is sufficient reference for the location discussed.
2. Para 8.02(b), Page 8-3. Contains an incorrect statement regarding status of SPF flood design for reservoirs which ignores all guidance that is current. Change it.



DEPARTMENT OF THE ARMY  
LOS ANGELES DISTRICT, CORPS OF ENGINEERS  
P.O. BOX 2711  
LOS ANGELES, CALIFORNIA 90053-2325

REPLY TO  
ATTENTION OF

SPLED-HE

SUBJECT: Sepulveda Reservoir Water Control Manual

Commander, South Pacific Division  
ATTN: SPDED-W

1. Enclosed are two draft copies of the Water Control Manual for Sepulveda Reservoir for your review and comments.
2. Copies of this draft report are also being circulated simultaneously for review by local water resources and flood control agencies.
3. An Environmental Assessment for Sepulveda Reservoir is also being prepared at this time by Planning Division, LAD, and will be forwarded separately.

FOR THE COMMANDER:

Encl (2 cys)

*Robert C. Kepner*  
NORMAN ARNO  
for Chief, Engineering Division

DATE  
FILMED  
0-8