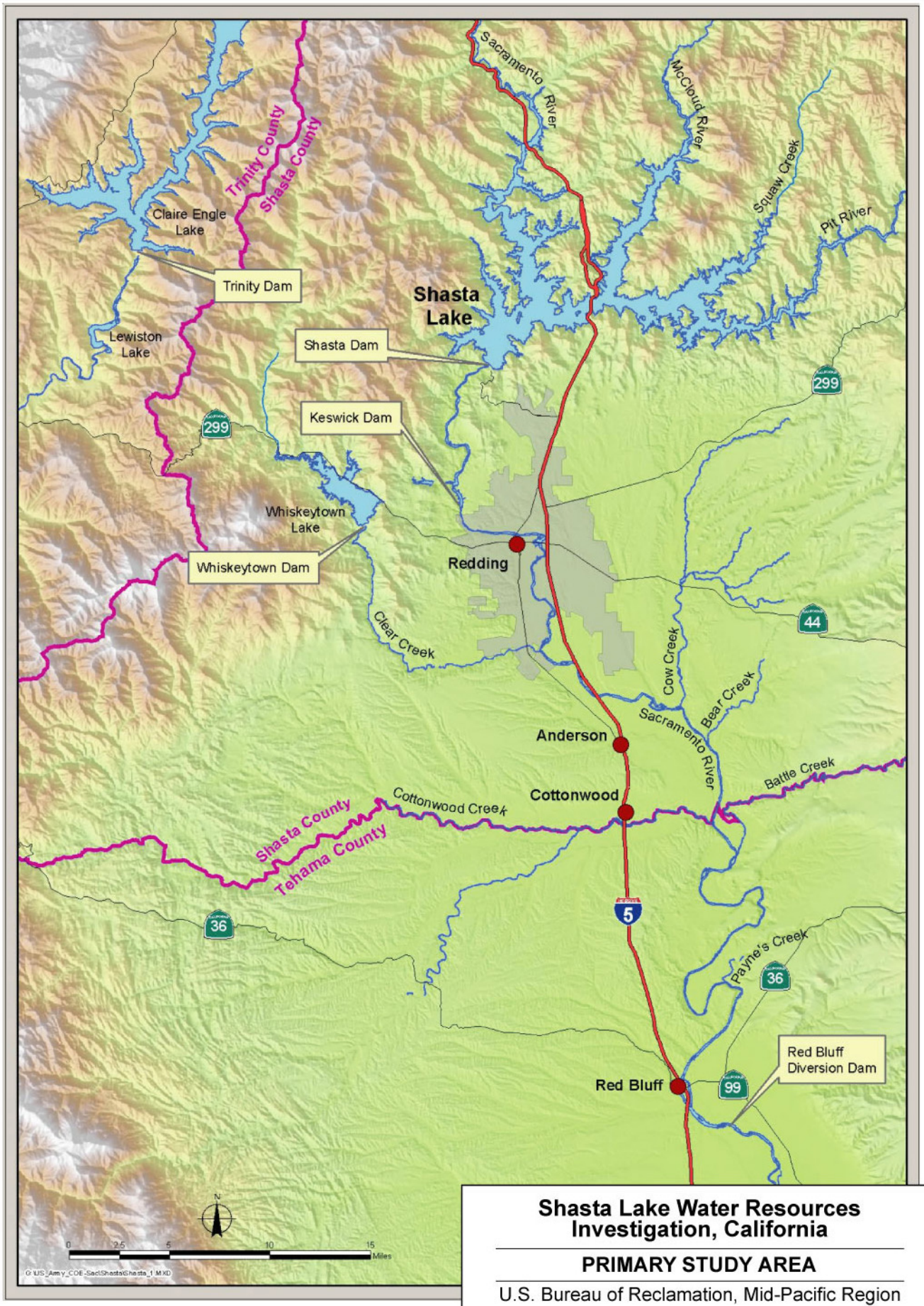
# Plan Formulation Report

## Shasta Lake Water Resources Investigation
## Plan Formulation Report

# Plates

U.S. Department of the Interior
Bureau of Reclamation
Mid-Pacific Region
Sacramento, California

December 2007




**Shasta Lake Water Resources Investigation, California**

**PRIMARY STUDY AREA**

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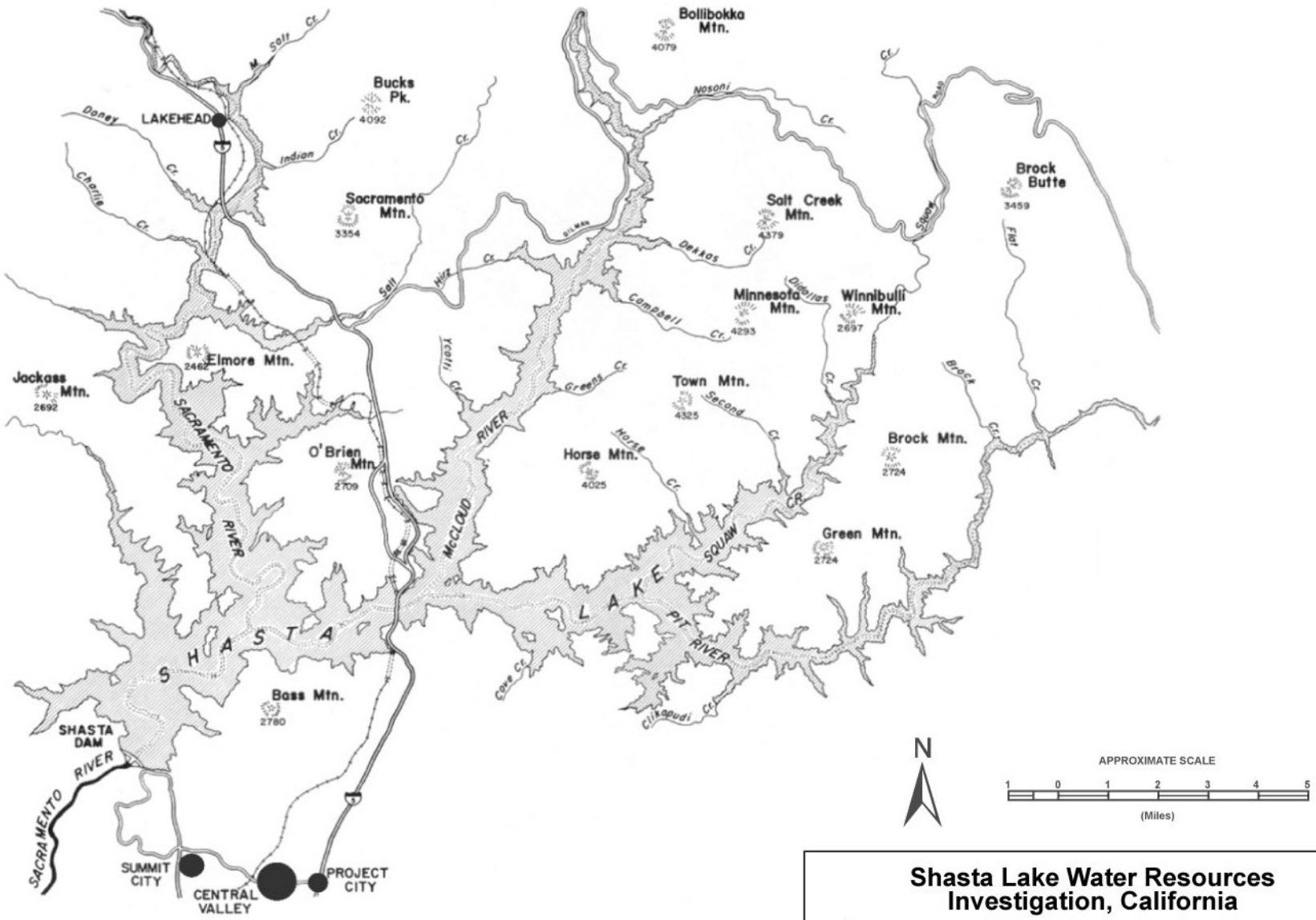
**PLATE 1**




*Source: U.S. Army Corps of Engineers, Shasta Dam and Lake, Sacramento River, California, Report on Reservoir Regulation for Flood Control, Rev. January 1977*

**Shasta Lake Water Resources Investigation, California**

**SHASTA RESERVOIR AREA**

U.S. Bureau of Reclamation, Mid-Pacific Region
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**PLATE 2**

**Shasta Lake Water Resources Investigation, California**

**MAJOR CVP AND SWP FACILITIES**

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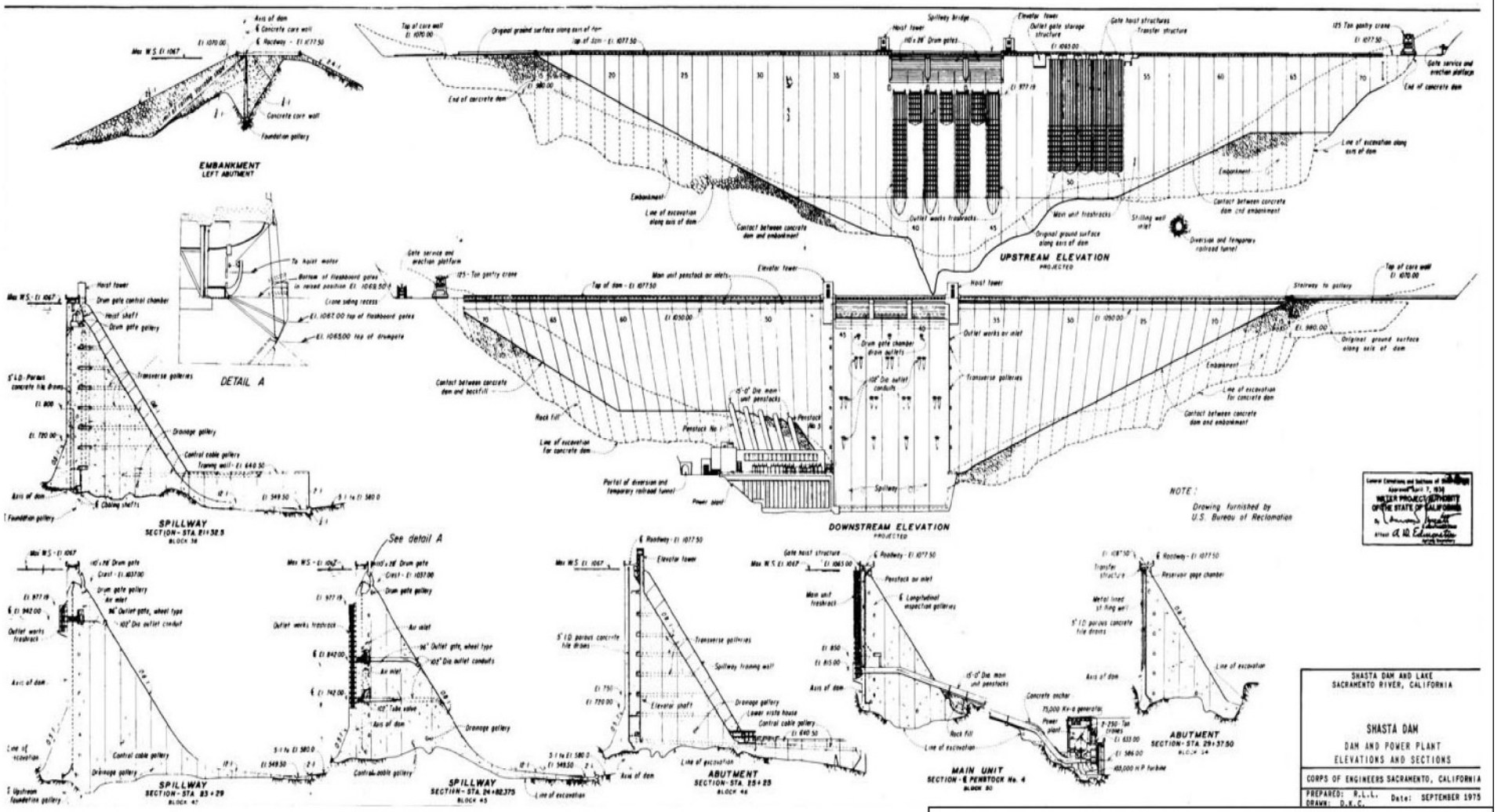
**PLATE 3**




*Source: U.S. Army Corps of Engineers, Shasta Dam and Lake, Sacramento River, California, Report on Reservoir Regulation for Flood Control, Rev. January 1977*

**Shasta Lake Water Resources Investigation, California**

**SHASTA DAM AND POWERPLANT ELEVATIONS AND SECTIONS**

U.S. Bureau of Reclamation. Mid-Pacific Region

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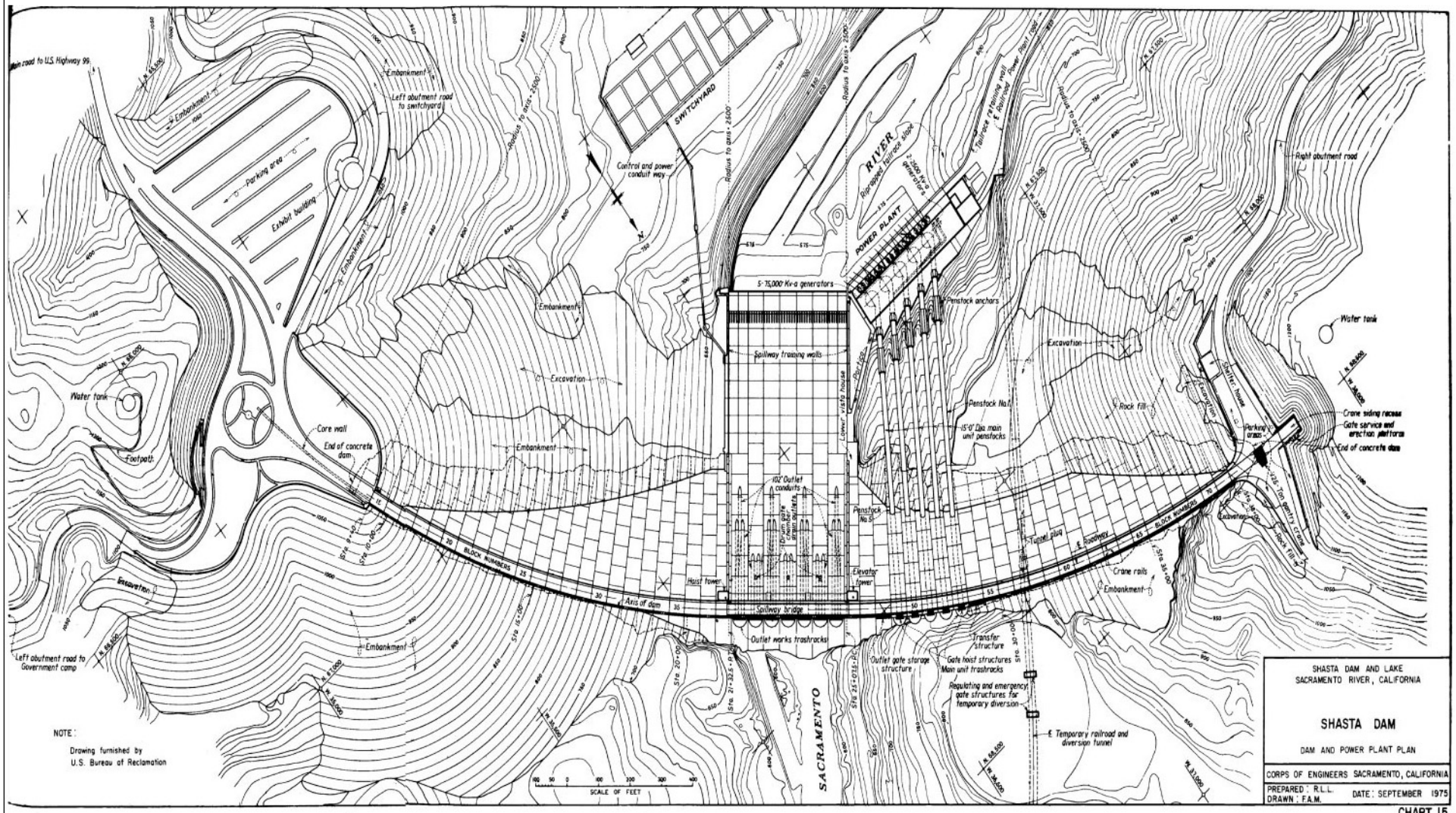
**PLATE 4**




**Shasta Lake Water Resources Investigation, California**

**SHASTA DAM AND POWERPLANT PLAN**

U.S. Bureau of Reclamation. Mid-Pacific Region
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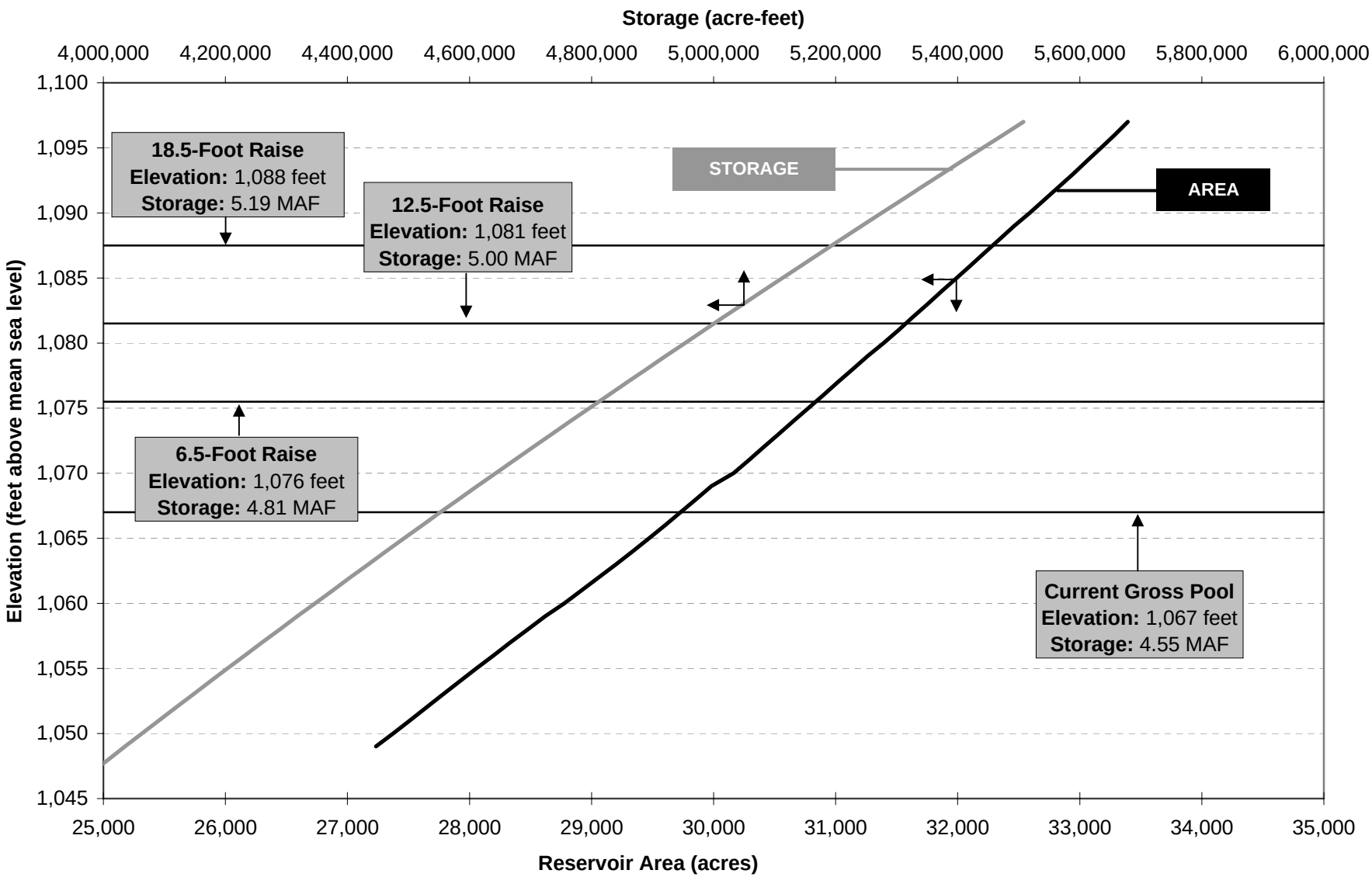
*Source: U.S. Army Corps of Engineers, Shasta Dam and Lake, Sacramento River, California, Report on Reservoir Regulation for Flood Control, Rev. January 1977*

**PLATE 5**




**Shasta Lake Water Resources Investigation, California**

**ENLARGED SHASTA RESERVOIR AREA - CAPACITY RELATIONSHIPS**

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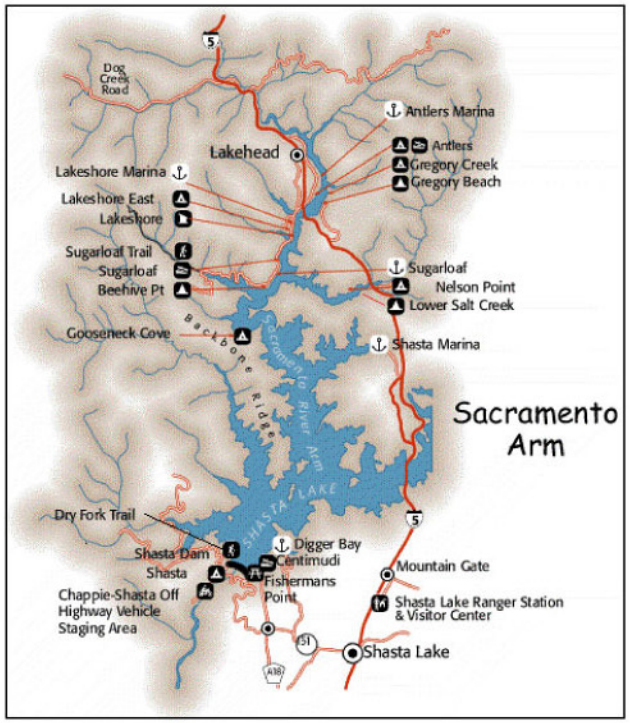
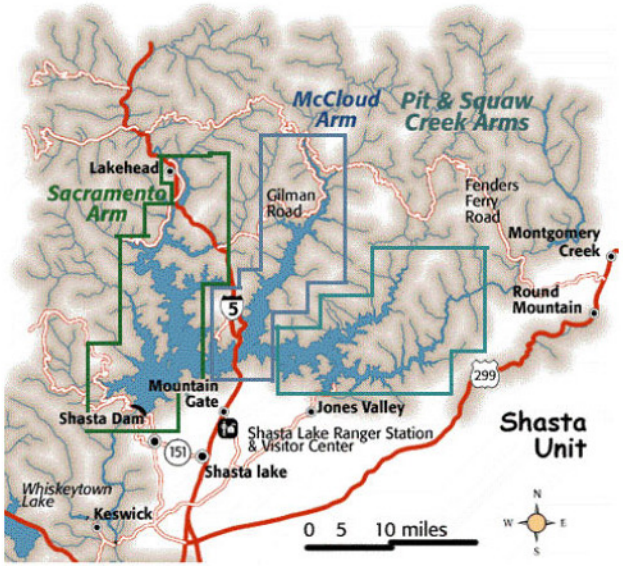
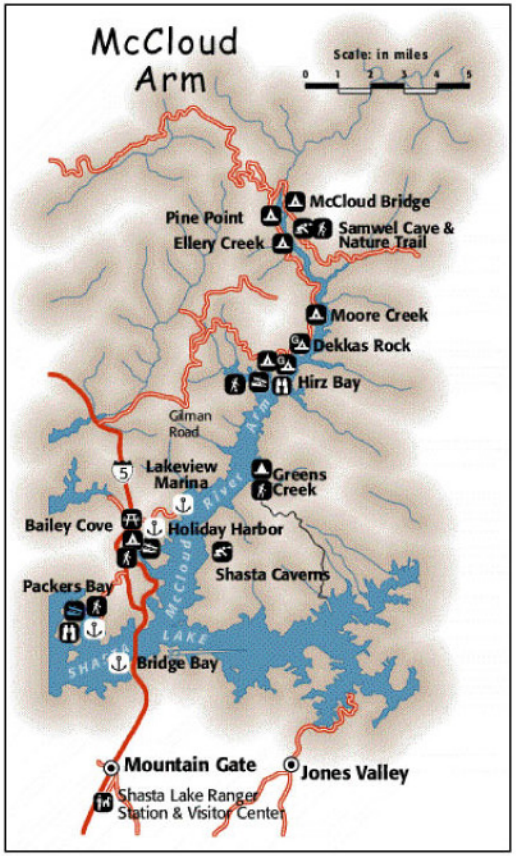
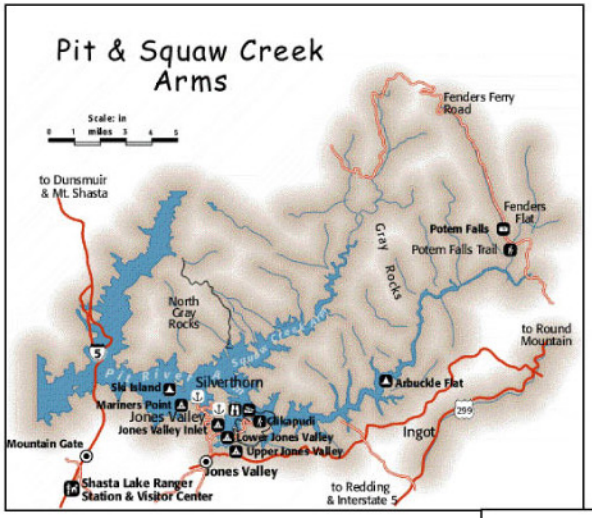
**PLATE 6**

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**SHASTA RECREATION FACILITIES**

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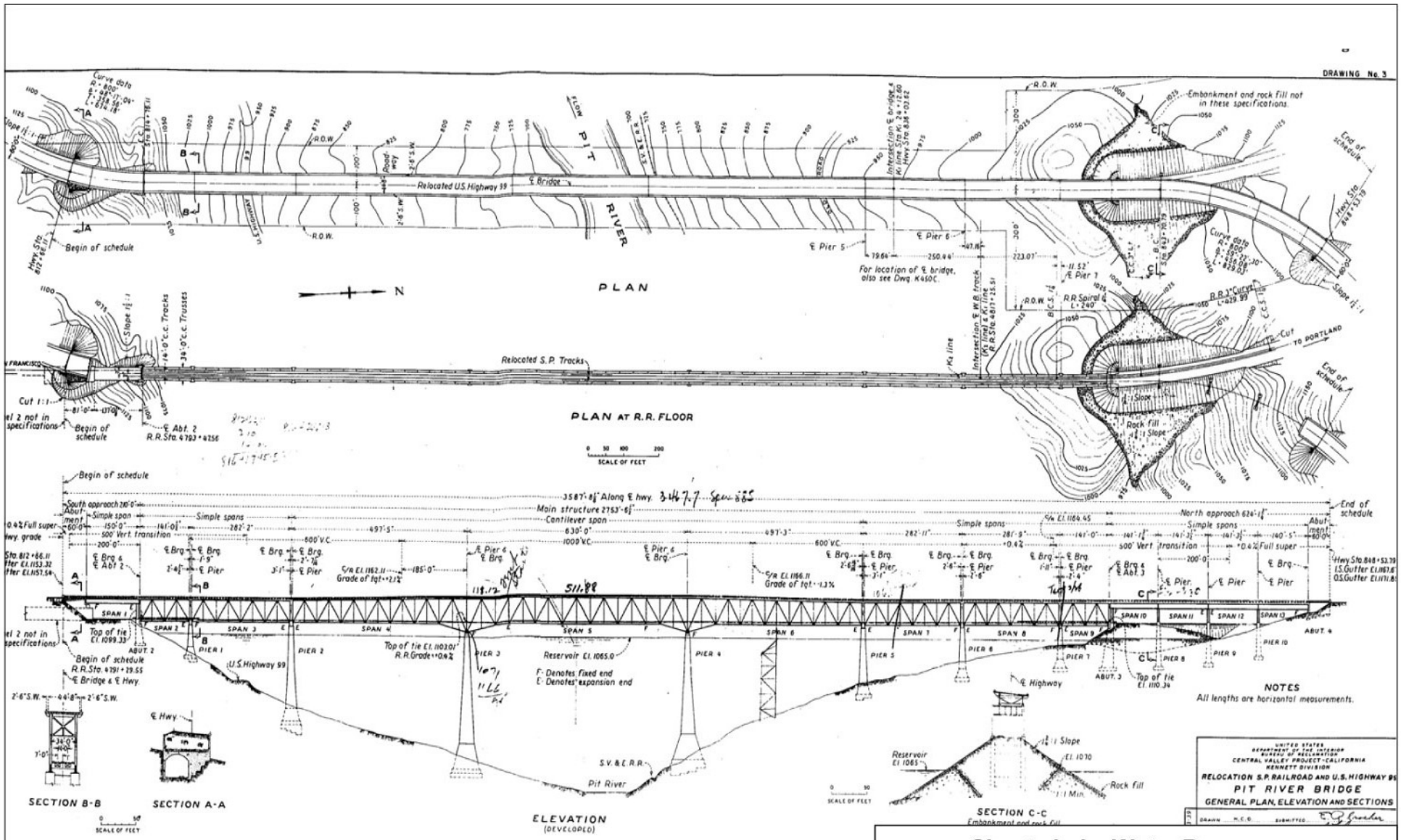
**PLATE 7**



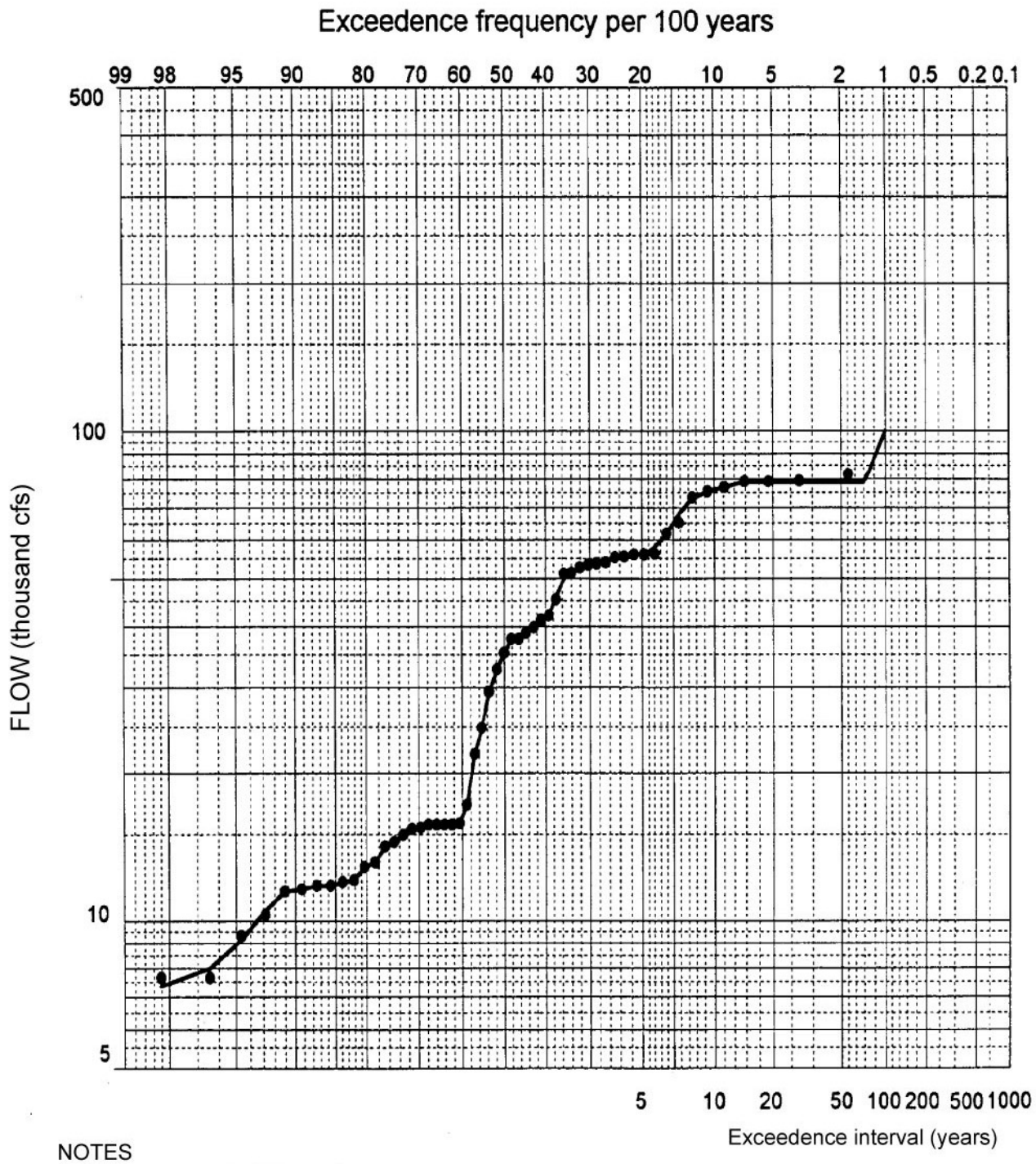

**Shasta Lake Water Resources Investigation, California**

**PIT RIVER BRIDGE**

U.S. Bureau of Reclamation, Mid-Pacific Region
December 2007

*Source: U.S. Bureau of Reclamation, Abutments and Piers, Pit River Bridge, Relocation of Southern Pacific Railroad and U.S. HIghway 99, 1939*

**PLATE 8**




NOTES
1. Drainage area 6,468 sq. mi.
2. Median plotting positions
3. Period of record: 1944-1998

*Source: U.S. Army Corps of Engineers, Sacramento and San Joaquin River Basins, California. Post-Flood Assessment, 1999.*

**Shasta Lake Water Resources Investigation, California**

**PEAK RAIN FLOOD FREQUENCY SACRAMENTO RIVER AT KESWICK REGULATED CONDITION**

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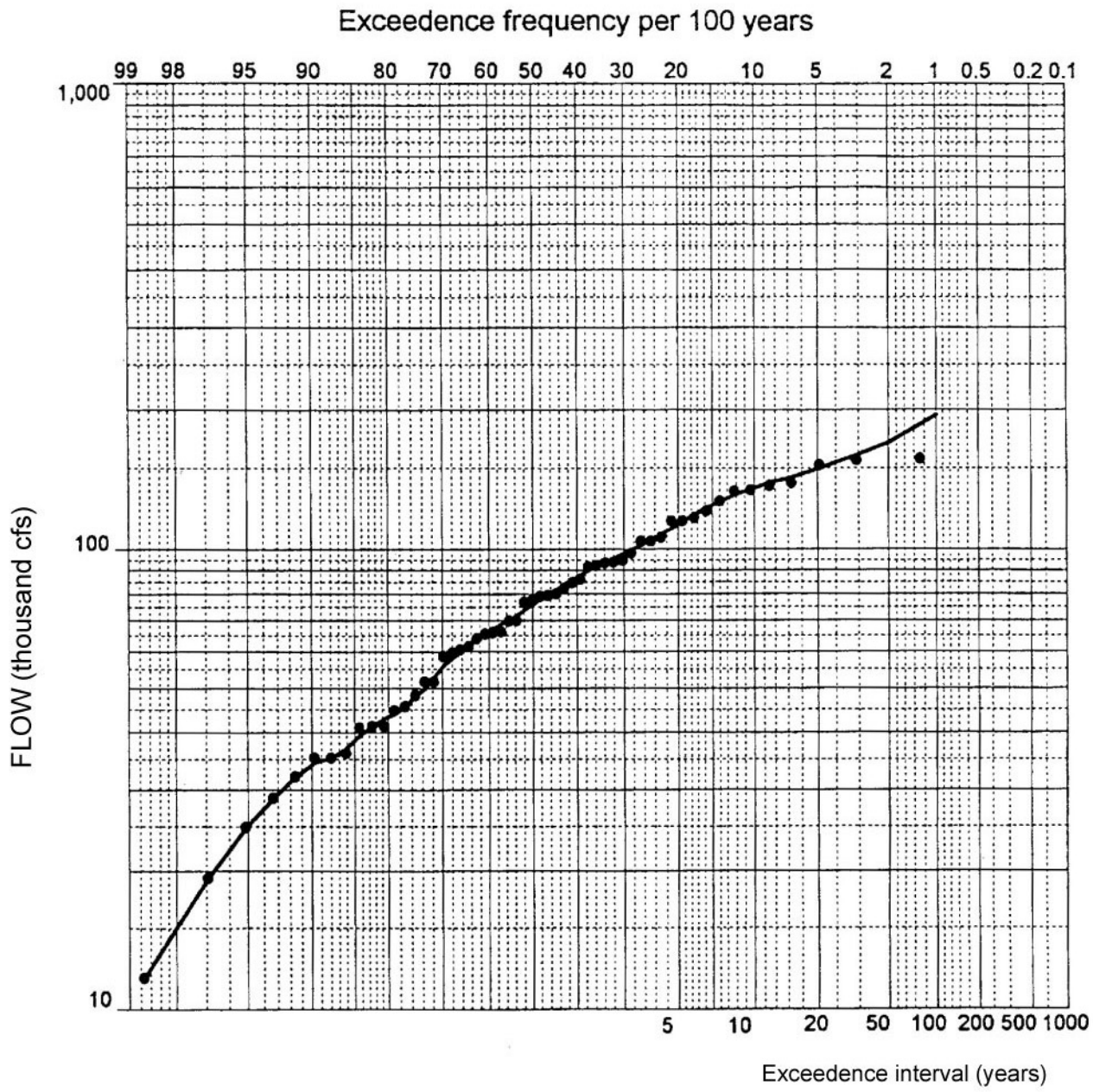
**PLATE 9**

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1. Drainage Area 6,468 sq. mi.
2. Median plotting positions
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*Source: U.S. Army Corps of Engineers, Sacramento and San Joaquin River Basins, California. Post-Flood Assessment, 1999.*

**Shasta Lake Water Resources Investigation, California**

**PEAK RAIN FLOOD FREQUENCY SACRAMENTO RIVER ABOVE BEND BRIDGE REGULATED CONDITION**

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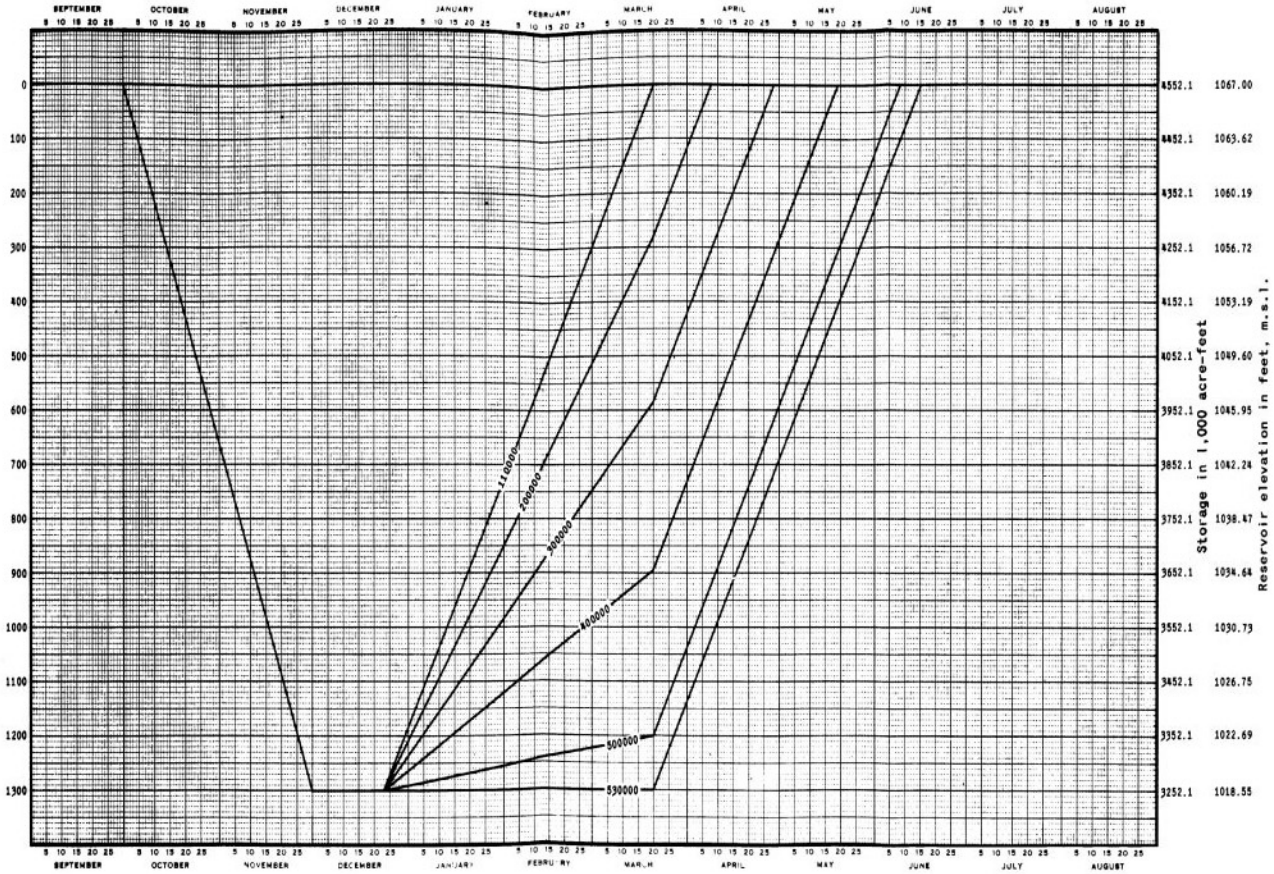
**PLATE 10**

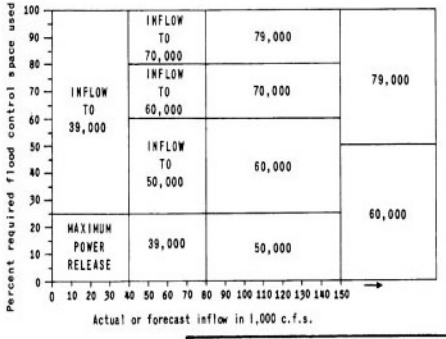



USE OF DIAGRAM

1. Rainflood parameters relate the accumulation of seasonal inflow to the required flood control space reservation on any given day. Parameter values are computed daily, from the accumulation of seasonal inflow by adding the current day's inflow in cubic feet per second (cfs) to 95% of the parameter value computed through the preceding day.*
2. Except when releases are governed by the emergency spillway release diagram currently in force (File No. SA-26-92), water stored in the flood control reservation, defined hereon, shall be released as rapidly as possible, subject to the following conditions:
   a. That releases are made according to the Release Schedule hereon.
   b. That flows in Sacramento River below Keswick Dam do not exceed 79,000 cfs.
   c. That flows in Sacramento River at Bend Bridge gage do not exceed 100,000 cfs.
   d. That releases are not increased more than 15,000 cfs or decreased more than 4,000 cfs in any 2-hour period.

*Flood Control Diagram is initialized each flood season by assuming a parameter value of 100,000 c.f.s. day on 1 October.

RELEASE SCHEDULE




SHASTA DAM AND LAKE
SACRAMENTO RIVER, CALIFORNIA

FLOOD CONTROL DIAGRAM

Prepared Pursuant to Flood Control Regulations for Shasta Dam and Lake

APPROVED: Richard M. Connell
Brigadier General, USA, Division Engineer
South Pacific Division

APPROVED: B. E. Martin
Regional Director Mid Pacific Region
U.S.B.R.

Effective Date: 8 JUL 1977 File No. SA-17-26-13

*Source: U.S. Army Corps of Engineers, Shasta Dam and Lake, Sacramento River, California, Report on Reservoir Regulation for Flood Control, Rev. January 1977*

**Shasta Lake Water Resources Investigation, California**

**SHASTA DAM FLOOD CONTROL DIAGRAM**

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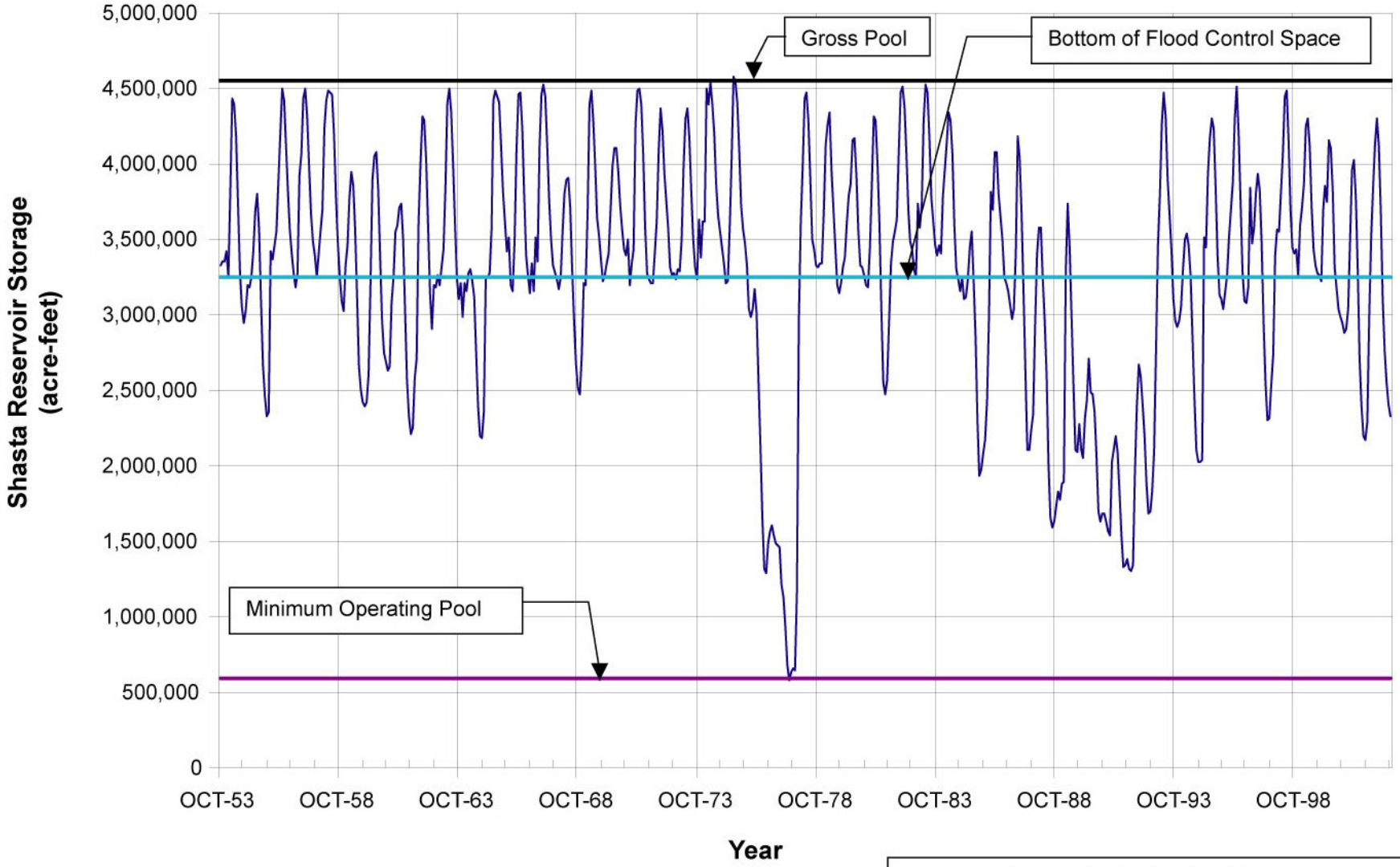
**PLATE 11**




**Shasta Lake Water Resources Investigation, California**

**SHASTA RESERVOIR STORAGE MONTHLY AVERAGE**

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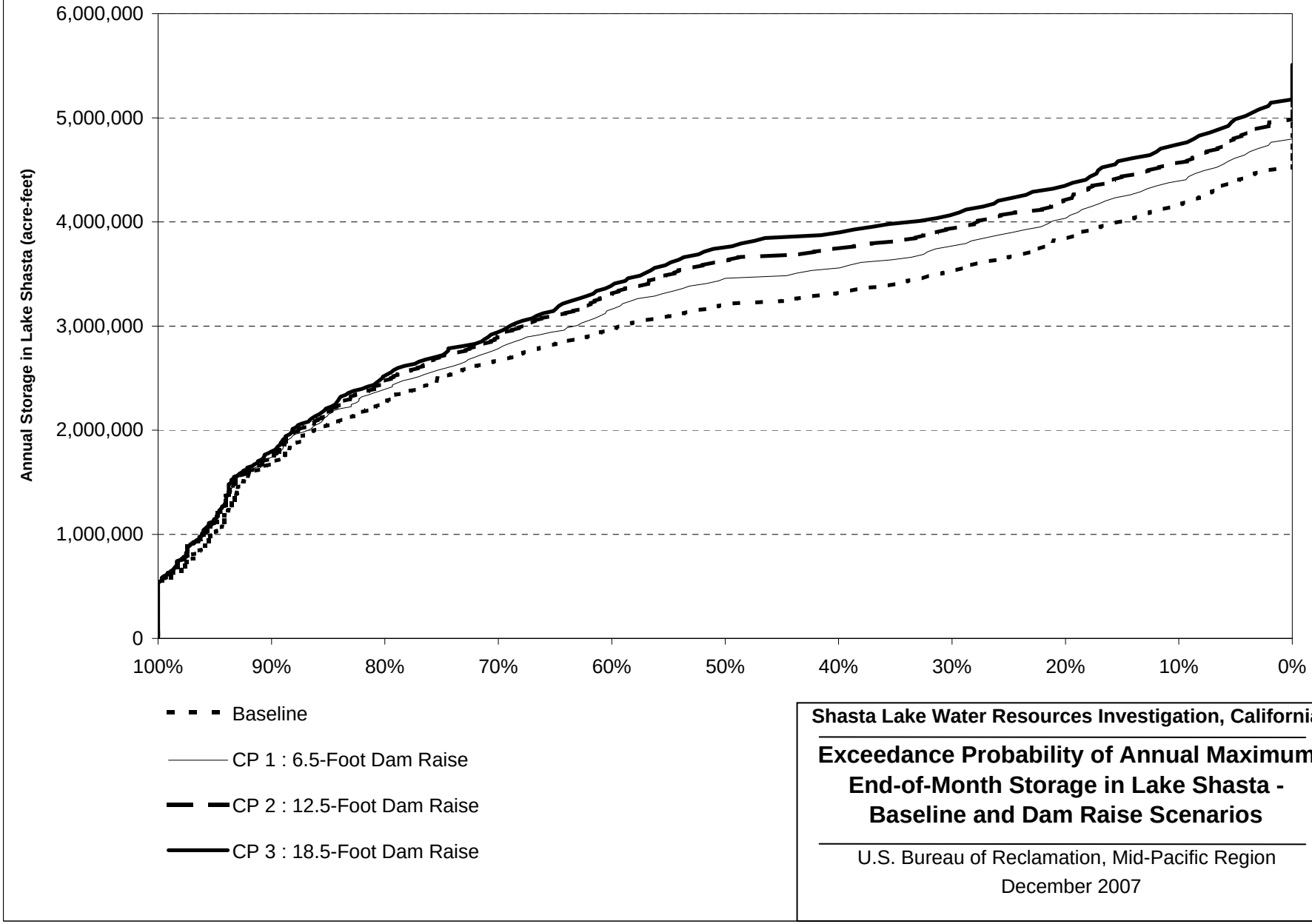
**PLATE 12**




**Shasta Lake Water Resources Investigation, California**

**Exceedance Probability of Annual Maximum End-of-Month Storage in Lake Shasta - Baseline and Dam Raise Scenarios**

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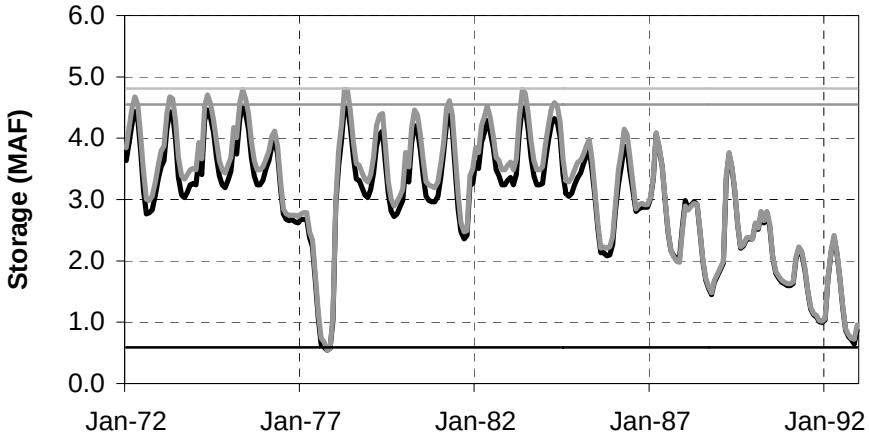
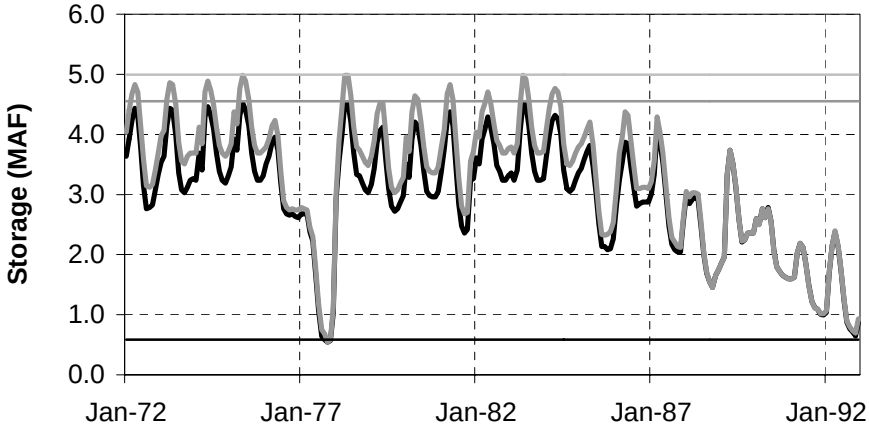
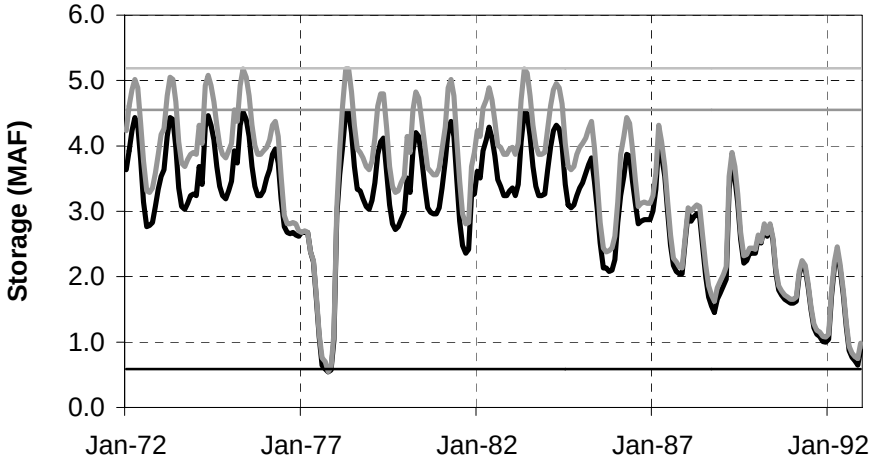
**PLATE 13**




**6.5-Foot Dam Raise**




**12.5-Foot Dam Raise**




**18.5-Foot Dam Raise**

No Action
With Dam Raise Scenario
New Gross Pool
Old Gross Pool
Minimum Operating Pool

**Shasta Lake Water Resources Investigation, California**

**Simulated Shasta Reservoir Storage Fluctuations - Baseline and Dam Raise Scenarios**

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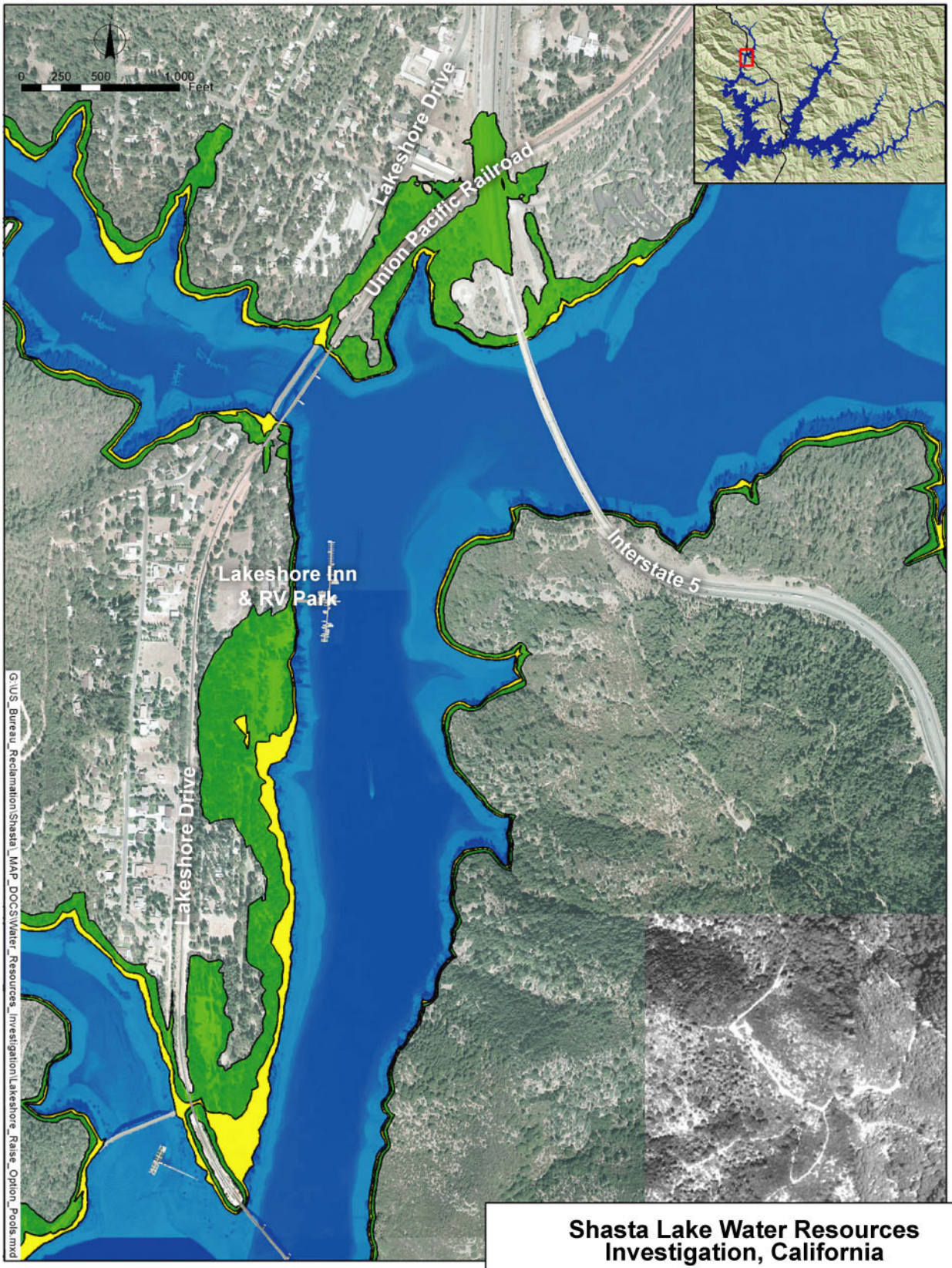


Existing Gross Pool

Approximate Gross Pool with 6.5-Foot Dam Raise

Approximate Gross Pool with 18.5-Foot Dam Raise

**Shasta Lake Water Resources Investigation, California**

**MAXIMUM INUNDATION LIMITS LAKESHORE AREA WITHOUT INFRASTRUCTURE PROTECTION**

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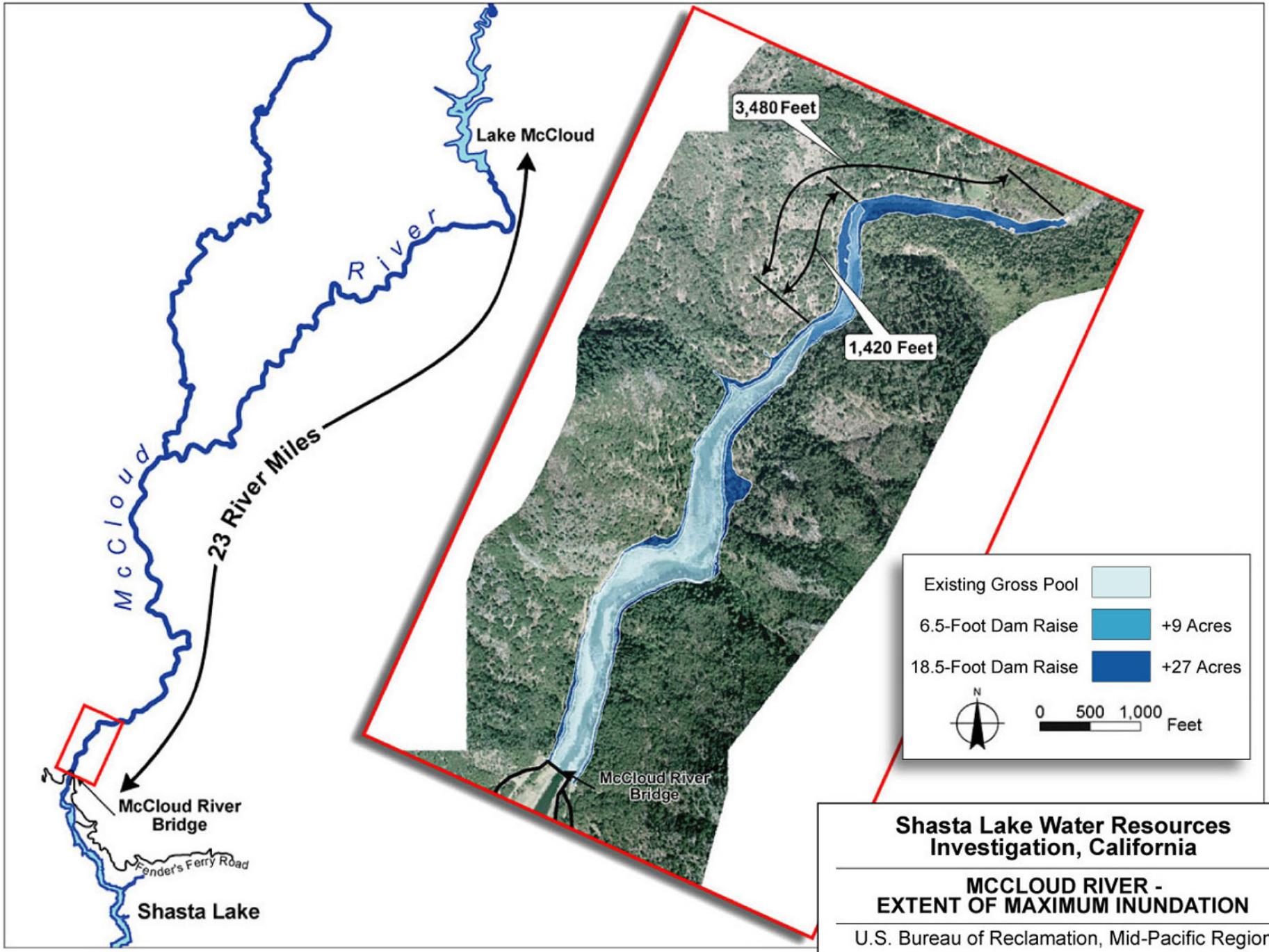
**PLATE 15**




**Shasta Lake Water Resources Investigation, California**

**MCCLOUD RIVER - EXTENT OF MAXIMUM INUNDATION**

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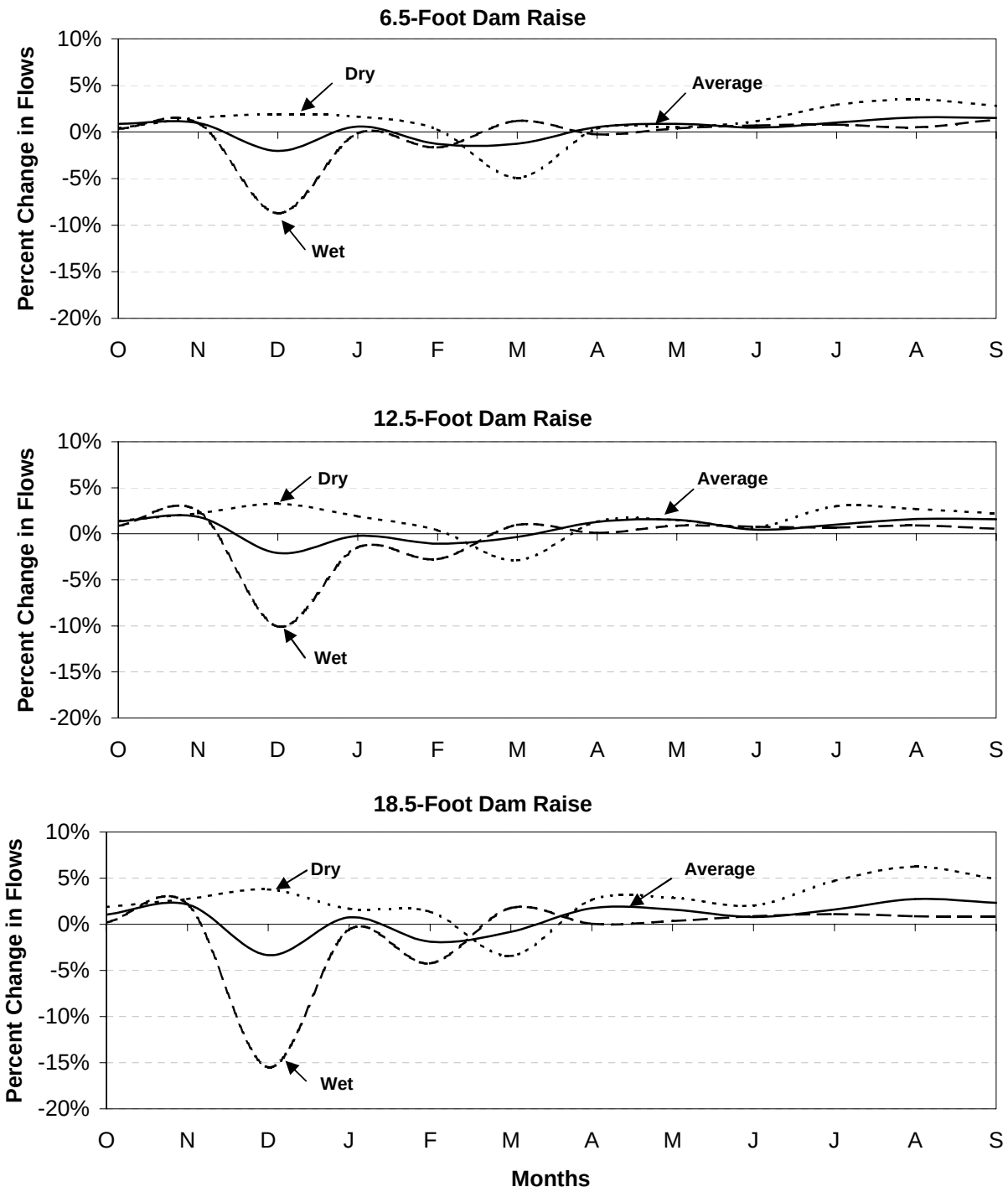
**PLATE 16**




Average

Wet

Dry

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**Percent Change in Simulated Flows at Keswick for Average, Dry, and Wet Year Conditions**

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