# PART C

## CONSERVATION USE AND OPERATION FOR DIVERSION OF WATER

## WHITTIER NARROWS FLOOD-CONTROL RESERVOIR

## SAN GABRIEL RIVER BASIN, CALIF.

1 OCTOBER 1957

TABLE OF CONTENTS

PART C

CONSERVATION USE AND OPEATION FOR DIVERSION WATER



TABLES

PART C

CONSERVATION USE AND OPERATION FOR DIVERSION OF WATER

WHITTIER NARROWS FLOOD-CONTROL RESERVOIR
SAN GABRIEL RIVER BASIN, CALIF.

1. Authority.--Authority for conservation operation at Whittier Narrows Reservoir is contained in the 2d endorsement from the Office, Chief of Engineers, dated 18 October 1956 to basin letter from this office, subject: "Conservation Storage in Whittier Narrows Dam Project," dated 12 September 1956.

2. Operational requirements.--Conservation operation at Whittier Narrows Reservoir is accomplished in accordance with regulations contained herein to achieve the following objectives:

a. To pass the normal flow of the San Gabriel River, up to 5,000 cubic feet per second, through the spillway gates to satisfy existing downstream water rights.

b. To pass rising water flows in Mission Creek through the dam in accordance with the desires of local interests.

c. To divert rising water flows (up to 50 cubic feet per second) from the Rio Hondo approach channel through the 36-inch diversion conduit in the left abutment of the outlet works to the original Rio Hondo channel behind the left bank of the concrete outlet channel.

d. To develop, during the storm runoff, a conservation pool for downstream spreading by the Los Angeles County Flood Control District. This pool is developed above the Rio Hondo outlets to elevation 195.5 (about 1,000 acre-feet) during rising stages by limiting the outflows to an average of 600 cubic feet per second. It is maintained by making outflow equal inflow up to a combined Rio Hondo and flood flow channel inflow of 10,000 cubic feet per second. A conservation pool is again developed to elevation 195.5 during falling stages when the inflow recedes to 10,000 cubic feet per second. This pool is maintained by making outflow approximately equal to inflow until the inflow recedes to 600 cubic feet per second.

3. The above operational requirements are necessary to satisfy downstream water rights and to compensate for the normal percolation in the Rio Hondo channel that occurred prior to construction of the concrete-lined channel below the dam.

4. Cooperation with other agencies.--The Los Angeles County Flood Control District is the representative of the various water users affected by the operation of the Whittier Narrows project. This

office and that organization are connected by teletype and a direct private telephone line to assure uninterrupted communications for flood control and conservation operation of Whittier Narrows Reservoir.

5. The Los Angeles County Flood Control District operates the Rio Hondo Coastal Basin spreading grounds downstream from the reservoir (pl. A-12). Diversion of low flows into the spreading grounds is affected by means of a headworks consisting of 3 tainter gates in the floodflow channel and 4 slide gates in the left levee. The tainter gates are kept in a fully raised position, (above the channel) except when the spreading grounds are being operated. An operator from the Los Angeles Country Flood Control District is required to be on duty whenever the tainter gates are closed. A direct-line telephone has been installed between the diversion headworks and the outlet control house at the dam so that operations during spreading periods can be coordinated.

6. Conservation operation.--Whittier Narrows Reservoir is operated for conservation as follows:

a. Spillway gates Nos. 1, 4, 6 and 9 are open 1.6 feet and the other gates are closed prior to the occurrence of a storm. These gate settings restrict the discharge to 5,000 cubic feet per second at reservoir water-surface elevation 208 (sill of floodflow channel) in the event that an unexpected flash flood should occur prior to the arrival of the operator for the spillway gates. This is required for downstream protection until the channel is constructed. At the beginning of a storm, gates Nos. 1, 4, 6, and 9 are set at 2.1 feet and remain at that opening until the reservoir water surface reaches elevation 206.0 feet (outflow approximately 5,000 cubic feet per second). When the water surface exceeds elevation 206.0 feet, the gates are operated so as to limit outflow into the San Gabriel River to 5,000 cubic feet per second (table B-2).

b. The Mission Creek conduit is used to pass rising water through the dam in accordance with the desires of local interests. They have requested that flows be limited to 5 cubic feet per second during storms. When heavy runoff is occurring, the gate at the intake structure of the conduit is closed to prevent water with high silt content from entering Mission Creek. This gate can be operated until the reservoir

water surface reaches elevation 202.5 feet, above which the gate control becomes inundated. (If flows have not been throttled before the gate control is inundated, emergency control can be effected by closing the slide gate in the access gallery at the downstream end of the conduit.)

c. The outlet works and diversion conduit through the left abutment of the outlet works are operated to divert rising water from the Rio Hondo approach channel into the original Rio Hondo channel behind the left levee of the concrete floodflow channel. The dike extending upstream from the left pier directs low flows through the left gate (gate No. 1). Normally, gate No. 1 is closed and the gate on the 36-inch diversion conduit is open. Under this system of operation, the depth of water in the approach channel above the left gate will provide sufficient head to insure passage of 50 cubic feet per second through the conduit before overtopping of the diversion dike occurs (elev. 188 feet). Automatic equipment has been installed on gate No. 1 so that in an emergency it will rise automatically to the normal position for flood operation whenever the reservoir pool reaches elevation 189 feet. It will automatically close to conserve water when the pool recedes to elevation 187 feet. The gate on the 36-inch diversion conduit is closed during high flows.

d. The Rio Hondo outlet gates are operated to conserve storm runoff by developing a conservation pool to elevation 195.5, when the inflow is 10,000 cubic feet per second or less, during rising of falling stages. When the inflow recedes to 600 cubic feet per second, the pool is drained at that rate. During operations for conservation, a qualified engineer from the Los Angeles District will direct gate operations from the District Office, or from the dam if communications should fail. All gate changes will be coordinated with the Los Angeles County Flood Control District's dispatch office and Rio Hondo diversion headworks.

(1) During rising stages, the gate operation schedule for conservation shown in table C-1 is followed. Under this operation plan, releases are restricted to an average of 600 cubic feet per second (capacity of spreading grounds) to water-surface elevation 194.5. Above this elevation, releases are gradually increased to 10,000 cubic feet per second at water-surface elevation 195.5. If the inflow exceeds 10,000 cubic feet per second, causing the water-surface elevation to rise above 195.5, the outlet gates are fully opened and the current flood-operations schedule followed.

(2) During falling stages, the current flood-operations schedule is followed in reverse to water-surface

elevation 195.5. Between water-surface elevations 195.5 and 193.5, the outlet gates remain fully open. If the water-surface falls below 193.5, indicating that the inflow has receded to 10,000 cubic feet per second, a conservation pool is developed to elevation 195.5 and maintained by making outflow approximately equal inflow. The outflow is determined from the combined inflow as measured at gaging stations located on Alhambra Wash near Klingerman Street, on the Rio Hondo below Garvey Avenue, and on the floodflow channel at Rosemead Boulevard. This inflow is plotted and extrapolated one period to determine required outflow. Average inflow may be computed using storage change and outflow. When the inflow recedes to under 600 cubic feet per second, the pool is drained at that rate. After the inflow recedes to 100 cubic feet per second or less, gate No. 1 may be closed, if the Los Angeles County Flood Control District requests such a closure, to facilitate diversion of water through the 36-inch diversion conduit.

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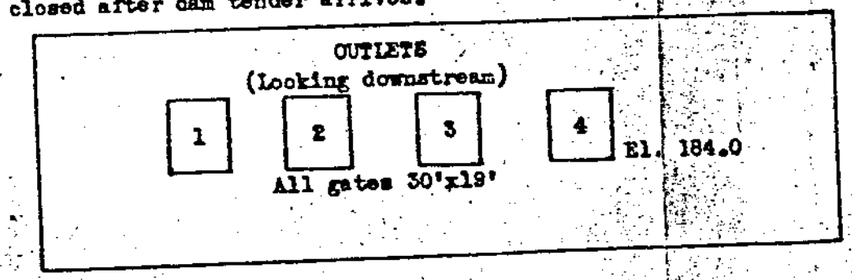
Table C-1

Whittier Narrows flood-control reservoir outlet gate operation schedule for conservation

| Step No. | When reservoir water surface is between elevations | Gate setting for gates as indicated: No. 1* | No. 2 | No. 3 | No. 4 | Outlet discharge |
|---|---|---|---|---|---|---|
| | Feet above mean sea level | Feet of opening | Feet of opening | Feet of opening | Feet of opening | Cubic feet per second |
| | | | | | | 0 - 550 |
| 1 | 184 - 188 | 2.5 | **0 | **0 | **0 | 550 - 650 |
| 2 | 188 - 189 | 1.8 | 0 | 0 | 0 | |
| 3 | 189 - 190 | 1.4 | 0 | 0 | 0 | 550 - 650 |
| 4 | 190 - 191 | 1.3 | 0 | 0 | 0 | 550 - 650 |
| 5 | 191 - 194.5 | 1.1 | 0 | 0 | 0 | 530 - 670 |
| 6 | 194.5 - 194.7 | 1.6 | 0 | 0 | 0 | 980 - 1,000 |
| 7 | 194.7 - 194.9 | 1.6 | 0.8 | 0.8 | 1.6 | 2,960 - 3,000 |
| 8 | 194.9 - 195.1 | 2.1 | 2.1 | 2.1 | 2.1 | 4,960 - 5,000 |
| 9 | 195.1 - 195.3 | 3.3 | 3.3 | 3.3 | 3.3 | 6,800 - 7,000 |
| 10 | 195.3 - 195.5 | 5.5 | 5.5 | 5.5 | 5.5 | 9,880 - 10,000 |
| 11 | 195.5 - 208.7 | 19.0 | 19.0 | 19.0 | 19.0 | 13,000 - 40,800 |
| 12 | Above 208.7 | See flood-operations schedule | | | | |

* For conservation of rising water, gate No. 1 opens automatically at elevation 189.0 on rising stages and closes at elevation 187.0 on falling stages. Automatic operation is shut off when dam tender is on duty.

** Gates Nos. 2, 3, and 4 open to 19.0 feet prior to arrival of dam tender. These gates closed after dam tender arrives.




NOTE: Gates are regulated for flood operations above elevation 195.5.

INSTRUCTIONS

1. Communication with the district office, existing.

a. Notify the Hydraulic Operations Center when a gate change will be required according to the schedule.

b. To report gate settings, while operating on schedule, give the applicable step number only.

c. Notify the Hydraulic Operations Center if unable to set the gates as instructed.

2. Communications with the district office interrupted.

a. Follow the gate operation schedule.

3. Notification to Los Angeles County Flood Control District.

a. Notify personnel at the Los Angeles County Flood Control District spreading grounds prior to making each gate change.

4. During falling stages.

a. Gate operation schedule followed in reverse to water-surface elevation 195.5. Between elevations 195.5 and 193.5, the outlet gates remain fully open. When the water-surface elevation recedes to 193.5, a conservation pool is developed to elevation 195.5 and maintained by making outflow equal inflow. After the inflow recedes to 600 cubic feet per second, the reservoir is drained at that rate.

December 1958

Revised 26 February 1959

Water Conservatic Mr. Reinhard)

A1

# LOS ANGELES COUNTY FLOOD CONTROL DISTRICT

P.O. BOX 2416, TERMINAL ANNEX
LOS ANGELES, CALIFORNIA 90051

TELEPHONE 225-4101

A. E. BRUNGTON
CHIEF ENGINEER

EDWARD M. HAILE
DEPUTY ENGINEER

ASST. CHIEF DEPUTY ENGINEERS
CYRIL D. HALL
CHESTER MAGNESS
JOHN M. TETTEMER

ADMINISTRATIVE DEPUTY
XXXXXXXXXXXX
James T. Davis

February 22, 1977

IN REPLY PLEASE REFER TO
FILE NO 70.41

Whittier Narrows Dam and Reserv
Request for Trial Implementatic
of Alterations in the Operatior
Schedule of Outlet Gates

Col. Hugh G. Robinson
District Engineer
U.S. Army Engineer District, Los Angeles
300 North Los Angeles Street
Los Angeles, CA 90012

Dear Colonel Robinson:

The current drought in Northern California and the less than normal rainfall amounts State-wide cause us to propose the immediate implementation of an additional conservation measure that we have been investigating. This proposal, which can be readily implemented, is to reduce the amount of storm run-off reaching the ocean through the Rio Hondo and San Gabriel River Channels.

In past years, storm run-off in amounts averaging 15,000 acre-feet per year have been released from Whittier Narrows Dam to the San Gabriel River and have been "wasted" to the ocean. This "wasted" water could have been conserved if the flow rates had been equal to or less than the intake capacity of the San Gabriel River Coastal Basin Spreading Grounds plus the infiltration capacity of the San Gabriel River from the Whittier Narrows Dam to Florence Avenue. Whenever the flow rates exceed about 300 cfs, water is "wasted" to the ocean.

During periods of "wasting" water to the ocean on the San Gabriel River system, the Rio Hondo spreading system often had additional capacity for conservation. Because of this condition, we undertook a study on minimizing the "waste" by changing gate operations at Whittier Narrows Dam and diverting storm water from the San Gabriel River to the Rio Hondo system.

The theoretical computations for the study have been completed and a report is now in the preparation stage. The results of the study indicate that the average annual conservation benefit attributable to our proposed gate operations is about 3,000 acre-feet of local water. Under current water values, the savings to water users is about $150,000 per year and even greater savings are anticipated in the future as the water costs have been projected to more than double. One of the criteria of our study was to not change the flood routing through the Whittier Narrows Reservoir during major storms.

Based on the results of our study, we are requesting that changes in the gate operation schedules of the San Gabriel River and the Rio Hondo be implemented during the 1976-77 storm season. This schedule will allow diverting excess conservable water from the San Gabriel River system to the Rio Hondo Conservation Pool. At the Rio Hondo side, we propose a revised conservation release schedule averaging 700 cfs. This will permit more conservation at the downstream facilities before flood releases are made from the dam which would bypass the Rio Hondo Coastal Basin Spreading Grounds.

We have discussed this proposal with Mr. Robert Land, Chief of your Operation Branch, who has been very cooperative in assisting with our conservation program.

Enclosed is our proposed operation schedule for the Whittier Narrows Reservoir. If you have any questions regarding this proposal, please contact Mr. C. J. Reinhard at 226-4381.

Yours very truly,

A. E. Bruington, Chief Engineer

ERL:go

Enc.

cc: Mr. William M. Whiteside, Secretary (Enc.)
San Gabriel Valley Protective Association
P.O. Box 1026, Perry Annex
Whittier, CA 90603

Addressee (2)
Hydraulic
Water Conservation (3) (Messrs. Ostrom and Reinhard, W/C Files)

A2

DEPARTMENT OF THE ARMY
LOS ANGELES DISTRICT, CORPS OF ENGINEERS
P. O. BOX 2711
LOS ANGELES, CALIFORNIA 90053

SPLCO-O

28 March 1977

70.41

Mr. A. E. Bruington, Chief Engineer
Los Angeles County Flood Control District
P.O. Box 2418, Terminal Annex
Los Angeles, California 90051

Dear Mr. Bruington:

Please refer to your File No. 70.41, Whittier Narrows Dam and Reservoir, Request for Trial Implementation of Alterations in the Operations Schedule of Outlet Gates.

We have reviewed your proposed operation plan and agree it will save a substantial amount of water that would ordinarily be "wasted" to the ocean. The plan should be implemented, on a trial basis, this coming flood season. However, to insure proper operation of the L. A. Telemetry System, the operation of gates Nos. 2, 3, 5 & 7 is recommended as shown on Whittier Narrows Flood Control Reservoir Spillway Gate Operation Schedule for San Gabriel Conservation Pool.

Under certain storage conditions in San Gabriel and Cogswell Dams, water could be stored behind Santa Fe Dam for conservation purposes. The conservation plan, as outlined in the Santa Fe Reservoir Regulation Manual could be implemented at the beginning of next flood season along with the Whittier Narrows plan. Los Angeles County Flood Control District personnel could operate Santa Fe Dam for conservation in a manner similar to their conservation operation of Whittier Narrows Dam. The details of operation can be worked out prior to next flood season.

While implementing the above interim plans, the Los Angeles County Flood Control District and the Corps could look into the possibility of infringing slightly upon flood control storage on the San Gabriel River system with the idea of greatly improving water conservation benefits.

Please contact Mr. Robert Land at (213) 688-5620, to establish conservation operating criteria for Santa Fe Dam and to initiate discussions on the additional conservation.

Sincerely yours,

Hugh L. Robinson

HUGH G. ROBINSON
COL, CE
District Engineer

RLO 4/22
MB 4/21

2726

2x

Water Conservation Files

A3

# LOS ANGELES COUNTY FLOOD CONTROL DISTRICT

P.O. BOX 2418, TERMINAL ANNEX
LOS ANGELES, CALIFORNIA 90051
TELEPHONE 226-4101

A. E. BRUINGTON
CHIEF ENGINEER

HOWARD H. HAILE
ASSISTANT CHIEF DEPUTY ENGINEER

ASSISTANT CHIEF DEPUTY ENGINEERS
OMER D. HALL
CHESTER MAGNESS
JOHN M. TETTEMER

ADMINISTRATIVE DEPUTY
JAMES T. DAVIS

June 2, 1977

IN REPLY PLEASE REFER TO
FILE NO 70.41
Whittier Narrows Dam
and Reservoir
Request for Implementation
of 2,500 Acre-Foot Pool

Col. Hugh G. Robinson
District Engineer
U.S. Army Engineer District, Los Angeles
300 North Los Angeles Street
Los Angeles, CA 90012

Dear Colonel Robinson:

The Flood Control District proposes to enlarge the conservation pool at Whittier Narrows Dam and Reservoir. The results of our study, in conjunction with the recently implemented alterations in the operation schedule of outlet gates, indicate that enlarging the storage capacity to 2,500 acre-feet will result in an average annual water conservation benefit of about 4,500 acre-feet or a savings to water users of about $225,000 per year at current water values.

The 1,000 acre-foot conservation pool, for which we currently have a license, inundates the area west of Rosemead Boulevard and south of San Gabriel Boulevard below Elevation 194.5 feet. The proposed 2,500 acre-foot pool would inundate that same area up to Elevation 201.6 feet. Inundation areas and improvements needed to be made by the District are shown on the enclosed "Map A".

The existing oil wells and any other structures within the proposed inundation area will need to be protected by earth levees except as noted below. These levees will be constructed to Elevation 205 feet, providing more than 3 feet of freeboard (approximately 900 acre-feet of additional available storage) above the proposed maximum water surface elevation. The approximate locations of these levees are shown on enclosed "Map A".

One well, Century Oil Management Company Well No. 1A, located south of the flood flow channel, is too distant from the bulk of the others for a levee protection to be practical. The most economic alternate appears to be raising the well. The concrete pads for Century Oil Management Company Well Nos. 21 and 22 are presently at Elevations 204.2 feet and 205.0 feet, respectively, and are considered protected "as is".

Suitable material for use in constructing the protective levees is available from within the existing 1,000 acre-foot area. We propose using the grading plan from the previous clean-out operations as the basis for removal of material.

Based on the results of our study, we are requesting that (1) your office make an evaluation of the flood routing through the reservoir for your "Project Flood" with a 2,500 acre-foot conservation pool and (2) negotiations be started by your Real Estate Division with the oil companies and other parties presently under lease with your department. Assistance will be provided by our staff in these negotiations through explanations of the concepts. Gate operation schedules for the Rio Hondo and San Gabriel River were developed as part of our study to enlarge the conservation pool and are enclosed for your review.

This project has been included in our 1977-78 Budget request and may be eligible for funding by the Economic Development Administration (EDA) through the Local Public Works Employment Act (LPW) as a drought project. In order to meet LPW criteria, this project must be ready for construction not later than August 1977. This accelerated timetable requires approval of the design and environmental assessment parameters by your department not later than mid-June. The following parameters are currently being used in our design phase:

| | |
|---|---|
| Pool operating water surface elevation | 201.6 feet |
| Levee top elevations | 205.0 feet |
| Levee side slopes (subject to pending soils analysis) | 2½:1 |

The storm of May 8-10, 1977 provided an excellent opportunity to review the benefit attributable to the recently implemented gate operations changes. During this storm alone, approximately 3,000 acre-feet of water flowed into the conservation pool from the San Gabriel River at rates up to 3,000 cfs. Only about 750 acre-feet of excess water was "wasted" to the ocean. Without this new operation, however, 3,000 acre-feet would have been "wasted". Therefore, the net benefit attributable to the new gate operation schedules was 2,250 acre-feet.

We certainly appreciate the cooperation given the Flood Control District in our conservation efforts and look forward to establishing conservation plans at other facilities.

Enclosed are copies of our proposed gate operation schedules for the Rio Hondo and San Gabriel River and a map showing levee locations and inundation areas. If you have any questions regarding this proposal, please contact Mr. C. J. Reinhard at 226-4381.

Yours very truly,

For and in the absence of
A. E. Bruington, Chief Engineer

Howard H. Haile
Chief Deputy Engineer

BRL:go

Enc. 3

cc: Mr. William M. Whiteside, Secretary (Enc. 3)
San Gabriel Valley Protective Association
P.O. Box 1026, Perry Annex
Whittier, CA 90603

Addressee (2)
Mr. Hall
Mr. Magness
Mr. Tettemer
Design
Hydraulic
Management Systems
Project Planning
R/W Acquisition
R/W Engineering
Water Conservation (3) (Messrs. Ostrom and Reinhard; W/C Files)

DEPARTMENT OF THE ARMY
LOS ANGELES DISTRICT, CORPS OF ENGINEERS
P. O. BOX 2711
LOS ANGELES, CALIFORNIA 90053

SPLRE-MM-(F)

16 August 1977

Mr. A. E. Bruington, Chief Engineer
Los Angeles County Flood Control District
P. O. Box 2418, Terminal Annex
Los Angeles, California 90051

Dear Mr. Bruington:

Reference is made to your letter, dated 2 June 1977, regarding the Los Angeles County Flood Control District proposal to enlarge the conservation pool to 2,500 acre-feet at Whittier Narrows Flood Control Basin.

Pursuant to authority vested by the Secretary of the Army, approval by our Engineering Evaluation and Maintenance Section and the enlargement of the conservation pool being in the public interest, right of entry is hereby granted to the Los Angeles County Flood Control District to construct levees to enlarge the storage capacity of the conservation pool to 2,500 acre-feet as described in above-referenced letter and drawings submitted by the County showing in detail proposed levees, said letter and drawings being on file at the Los Angeles District Corps of Engineers, 300 North Los Angeles Street, Los Angeles, California.

This right of entry is granted subject to the following conditions:

a. That the grantee shall furnish a legal description and drawing delineating the area that encroaches beyond the 229.08 acres granted to the County under Easement No. DA-04-353-CIVENG-62-152 to the Chief, Real Estate Division, U. S. Army Corps of Engineers, Los Angeles District, P. O. Box 2711, Los Angeles, California 90053.

b. That the grantee shall execute an amendment to Easement No. DA-04-353-CIVENG-62-152 incorporating the additional area required.

c. That the above-mentioned construction shall be subject to the general supervision of the chief of the Engineering Evaluation and Maintenance Section, Mr. Robert L. Gray, or his representative; and that prior to the start of construction Mr. Gray shall be contacted at (213) 283-2759.

d. That any deviation from proposed constrction plans or problems arising therefrom shall be subject to the approval and/or coordination of said section chief.

d. That any deviation from proposed construction plans or problems arising therefrom shall be subject to the approval and/or coordination of said section chief.

e. That the exercise of the privileges hereby granted shall be without cost or expense to the United States.

f. That any property of the United States damaged or destroyed by the grantee incident to the exercise of the privileges herein granted shall be promptly repaired or replaced by the grantee to the satisfaction of the United States; or in lieu of such repair or replacement the grantee shall, if so required by the United States, pay the United States money in an amount sufficient to compensate for the loss sustained by the United States by reason of damage to or destruction of Government property.

g. That the United States shall not be responsible for damages to property or injuries to persons which may arise from or be incident to the exercise of the privileges herein granted, or for damages to the property of the grantee, or for injuries to the person of the grantee, or for damages to the property or injuries to the person of the grantee's officers, agents, servants, or employees or others who may be on Government premises at their invitation or the invitation of any one of them, arising from governmental activities on the said premises, and the grantee shall hold the United States harmless from any and all such claims.

h. That it is to be understood that this grant is effective only insofar as the rights of the United States in the property involved are concerned, and that the grantee shall obtain such permission as may be necessary on account of any other existing rights, if any.

We ask that the duplicate copy of this letter be executed in the space provided below by your authorized representative and returned to us as soon as possible.

Sincerely yours,

Edgar H. Miller

EDGAR H. MILLER
Acting Chief, Real Estate Division

This authorization is accepted this _____ day of _____ 1977

subject to the conditions set forth herein.

LOS ANGELES COUNTY FLOOD CONTROL DISTRICT

By: _____

Title: _____

## Whittier Narrows Flood Control Reservoir Outlet Gate Operation Schedule for Rio Hondo Conservation Pool

| Step No. | When reservoir water surface is between elevations | Gate setting for gates as indicated | | | | Outlet Discharge |
|---|---|---|---|---|---|---|
| | | No. 1* | No. 2 | No. 3 | No. 4 | |
| | Feet Above Mean Sea Level | Feet of Opening | Feet of Opening | Feet of Opening | Feet of Opening | Cubic Feet Per Second |
| 1 | 184 - 188 | 2.6 | **0 | **0 | **0 | 0 - 700 |
| 2 | 188 - 189 | 2.3 | 0 | 0 | 0 | 650 - 750 |
| 3 | 189 - 190 | 1.8 | 0 | 0 | 0 | 650 - 750 |
| 4 | 190 - 191 | 1.5 | 0 | 0 | 0 | 650 - 750 |
| 5 | 191 - 192.5 | 1.4 | 0 | 0 | 0 | 650 - 750 |
| 6 | 192.5 - 195.5 | 1.2 | 0 | 0 | 0 | 650 - 750 |
| 7 | 195.5 - 197.5 | 1.1 | 0 | 0 | 0 | 650 - 750 |
| 8 | 197.5 - 199.5 | 1.0 | 0 | 0 | 0 | 650 - 750 |
| 9 | 199.5 - 200.5 | 0.9 | 0 | 0 | 0 | 650 - 750 |
| 10 | 200.5 - 201.6 | 0.8 | 0 | 0 | 0 | 650 - 750 |
| 11 | 201.6 - 201.8 | 1.2 | 0 | 0 | 0 | 980 - 1,000 |
| 12 | 201.8 - 202.0 | 1.2 | 0.6 | 0.6 | 1.2 | 2,960 - 3,000 |
| 13 | 202.0 - 202.2 | 1.5 | 1.5 | 1.5 | 1.5 | 4,960 - 5,000 |
| 14 | 202.2 - 202.4 | 2.2 | 2.2 | 2.2 | 2.2 | 6,800 - 7,000 |
| 15 | 202.4 - 202.6 | 3.4 | 3.4 | 3.4 | 3.4 | 9,880 - 10,000 |
| 16 | 202.6 - 208.7 | 19 | 19 | 19 | 19 | 27,000 - 40,800 |
| 17 | Above 208.7 | Go to Table B-1, Step 3 | | | | |

* For conservation of rising water, Gate No. 1 opens automatically at Elevation 189.0 on rising stages and closes at Elevation 187.0 on falling stages. Automatic operation is shut off when dam tender is on duty.

** Gate Nos. 2, 3, and 4 open to 19.0 feet prior to arrival of dam tender. These gates closed after dam tender arrives.

NOTE: Gates are regulated for flood operations above Elevation 202.6.

### INSTRUCTIONS

1. Communication with the District office, existing.
   a. Notify the Hydraulic Operations Center when a gate change will be required according to the schedule.
   b. To report gate settings, while operating on schedule, give the applicable step number only.
   c. Notify the Hydraulic Operations Center if unable to set the gates as instructed.
2. Communications with the District office, interrupted.
   a. Follow the gate operation schedule.
3. Notification to Los Angeles County Flood Control District.
   a. Notify personnel at the Los Angeles County Flood Control District spreading grounds prior to making each gate change.
4. During falling stages.
   a. Gate operation schedule followed in reverse to water surface Elevation 202.6. Between Elevations 202.6 and 199.5 the outlet gates remain fully open. When the water surface elevation recedes to 199.5, a conservation pool is developed to Elevation 202.6 and maintained by making outflow equal inflow. After the inflow recedes to 700 cubic feet per second, the reservoir is drained at that rate.