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MODEL STUDY OF COOL WATER DISCHARGE FROM PROPOSED LNG FACILITY --ETC(U)
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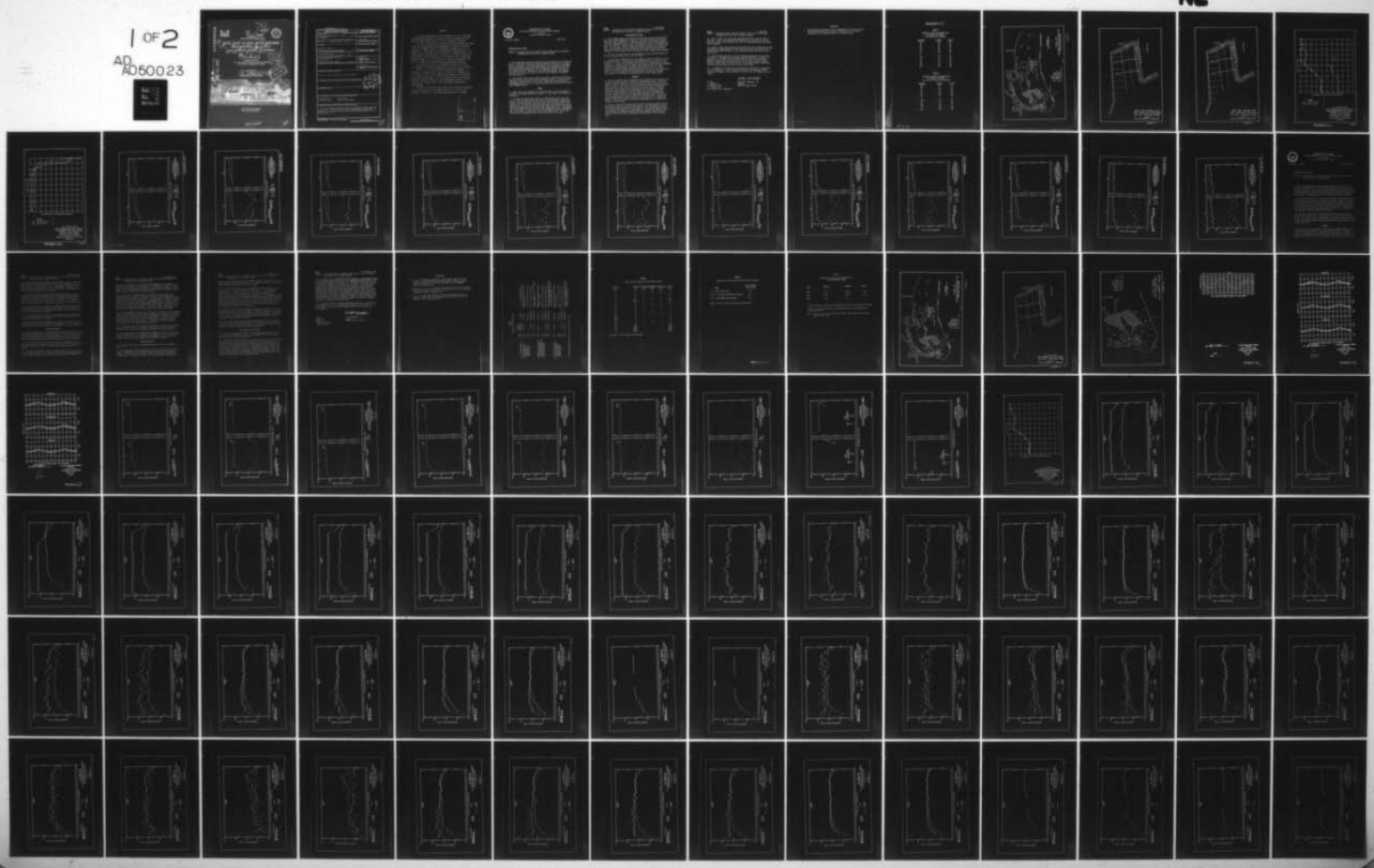

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(6) MODEL STUDY OF COOL WATER DISCHARGE FROM PROPOSED LNG FACILITY LOS ANGELES HARBOR, CALIFORNIA

by
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Physical hydraulic model dye tests were conducted to define near-field dilution of a cool-water discharge from a proposed LNG facility in Los Angeles Harbor, California, and to describe the far-field behavior of the resulting plume.

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AB

PREFACE

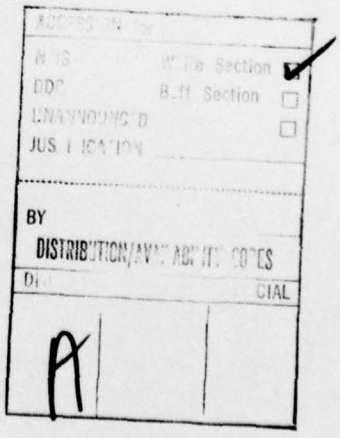
The study described herein was conducted at the U. S. Army Engineer Waterways Experiment Station (WES) under an agreement with the Board of Harbor Commissioners, City of Los Angeles, California.

Personnel of the Hydraulics Laboratory of WES performed this study during the period December 1975 through May 1977 under the direction of Mr. H. B. Simmons, Chief of the Hydraulics Laboratory; Mr. F. A. Herrmann, Jr., Assistant Chief of the Hydraulics Laboratory; Mr. R. A. Sager, Chief of the Estuaries Division; Dr. R. W. Whalin, Chief of the Wave Dynamics Division; and Mr. G. M. Fisackerly, Chief of the Harbor Entrance Branch. Mr. W. H. McAnally, Jr., was Project Engineer, and Mr. J. T. Hilbun was the Project Senior Engineering Technician.

This report consists of two Memoranda for Record written by Mr. McAnally to convey preliminary model test results to the sponsors.

Messrs. W. L. Brown of Southern California Gas Company; L. L. Whiteneck, L. Anderson, and V. Hall of the Port of Los Angeles; and C. S. Todd of the City of Los Angeles participated in the planning of the tests described herein. Mr. R. A. Busch of Fluor Ocean Services provided preliminary designs of the LNG unloading platform. The cooperation and contributions of these individuals are gratefully acknowledged.

Directors of WES during the course of this study and the preparation and publication of this report were COL G. H. Hilt, CE, and COL John L. Cannon, CE. Technical Director was Mr. F. R. Brown.



DEPARTMENT OF THE ARMY
WATERWAYS EXPERIMENT STATION, CORPS OF ENGINEERS
P. O. BOX 631
VICKSBURG, MISSISSIPPI 39180

IN REPLY REFER TO: WESHE

1 June 1977

MEMORANDUM FOR RECORD

SUBJECT: Preliminary Data from Model Study of LNG Facility Cool-Water Discharge into Slip 302, Los Angeles Harbor

1. This memorandum conveys preliminary data from model tests of the LNG facility cool-water discharge system proposed for Slip 302, Los Angeles Harbor, California. Tests described herein were performed at the Waterways Experiment Station (WES) from November 1975 through February 1976 and November 1976 through May 1977, by agreement between the Port of Los Angeles and WES. Preliminary data from the November 1975 through February 1976 tests were sent to the Port of Los Angeles in February 1976 (Reference 1).

2. The purpose of the recent model tests was to compare near-field dilution of the cool-water plume when discharged through a four-pipe system with that resulting from a single pipe. These data are presented in preliminary form so that they can be available more quickly than possible with a formal report.

Model

3. These tests were conducted in an undistorted, 1:50-scale model of Slip 302, Los Angeles Harbor (see Figure 1). The model is described in Reference 1.

4. The model discharge pipes were also constructed to the 1:50-size scale. The four-pipe system consisted of 72-inch-diameter pipes (see Figure 2) passing through the north end of the slip with a center-line elevation of -12 feet mean lower low water (mllw) and spaced in a line symetrically about the slip bottom width center line on 75-foot centers. The axis of each pipe was parallel to the slip center line. The single pipe (see Figure 3) tested had a 96-inch diameter and passed through the slip's north wall on the center line at an elevation of -12 feet mllw. The pipe axis was perpendicular to the north wall of the slip.

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SUBJECT: Preliminary Data from Model Study of LNG Facility Cool-Water Discharge into Slip 302, Los Angeles Harbor

Description of Tests

5. Two discharge plans were tested for both pipe systems--62,100-gallons per minute (gpm) commingled LNG facility cool-water and Terminal Island Treatment Plant effluent at a combined salinity of 27 parts per thousand (ppt) and temperature of 56°F; and 87,000-gpm LNG facility discharge alone at 34 ppt and 56°F. Ambient water conditions were taken to be 34 ppt and 60°F. In the model, density differences between effluent and receiving water were achieved by varying their relative salinities such that the densimetric Froude number of the effluent was equal in model and prototype.

6. The water surface elevation in the model was held constant during the tests at the mean tide level, +2.8 feet mllw.

7. A conservative fluorescent dye was added to the model effluent so that it could be traced. Water samples were withdrawn from 12 stations (see Figure 2) at 70-minute (prototype) intervals for an equivalent 14.1 prototype hours. Surface or bottom samples were taken at every station depending on whether a sinking plume or rising plume was being tested. Both surface and bottom samples were taken at Stations 2C, 2E, 3C, and 3E. Samples were taken at eight depths at Station 2D to define the plume interface. The water samples were fluorometrically analyzed to determine dye content and thus degree of plume dilution at each sample point.

Results

8. Plots of relative dye concentration versus time for the four-pipe and one-pipe discharge systems are shown in the attached plates. Four-pipe results have been plotted as Base tests and the single-pipe results are shown as Plan 1. The relative concentrations have been normalized by the source concentration in each test so that the results can be directly compared. Concentration time histories for the 87,000-gpm discharge show that plume concentrations were higher for the single pipe than for the four-pipe system. With four pipes, the plume concentration reached a peak 6 hours after starting the discharge whereas the peak was not obtained until about 11 hours for the single pipe. The 62,100-gpm discharge plume concentrations also are higher for the single pipe except at Station 2C where the terminal concentrations are essentially equal for both systems.

9. Table 1 shows the 87,000-gpm LNG facility discharge terminal concentrations for the one- and four-pipe systems. For both Ranges 2 and 3, the average plume concentration is higher for the one-pipe (36 percent) than for the four-pipe system (20 percent). In addition, Range 3 shows a nonuniform concentration distribution with higher concentrations on the east side of the slip, probably due to the angle of the discharge pipe.

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10. Table 2 shows the 62,100-gpm commingled discharge terminal concentrations. Again, the average plume concentration is higher for the one-pipe (42 percent and 46 percent) than for the four-pipe system (34 percent and 37 percent).

11. Figure 4 shows dye concentration profiles for the 87,000-gpm discharge. Higher plume concentrations for the single pipe are illustrated, and it is seen that the plume interface is more sharply defined than for the four-pipe system.

12. Concentration profiles for the 62,100-gpm discharge are illustrated by Figure 5. Although the single-pipe peak concentration is higher, it appears that the plume is much thinner than for the four-pipe system. With the single pipe, concentrations at the 5 percent depth fluctuated between 5 percent and 35 percent of the source concentration, indicating that the plume interface was very close to that depth.

13. In summary, the single-pipe system caused a reduction in plume dilution in comparison to the four-pipe system for both discharges tested. Concomitant changes in plume thickness occurred, but the changes were not large.

William H McAnally Jr

WILLIAM H. McANALLY, JR.
Engineer
Harbor Entrance Branch

19 Incl
1. Reference
2. Tables 1 and 2
3-7. Figures 1-5
8-19. Plates (12, unnumbered)

Reference

1. USAE Waterways Experiment Station, Memorandum for Record, subject: Preliminary Data from Model Study of LNG Facility Cool-Water Discharge into Los Angeles Harbor, 20 February 1976.

Trial 1

PRELIMINARY DATA

TABLE 1

TERMINAL BOTTOM CONCENTRATIONS
AS PERCENT OF SOURCE
87,000-gpm LNG Discharge

STATION	4 PIPES	1 PIPE
2A	18	34
2B	20	37
2C	20	39
2D	20	37
2E	19	37
2F	20	31
Avg.	20	36
3A	19	31
3B	19	33
3C	20	36
3D	19	38
3E	21	37
3F	20	42
Avg.	20	36

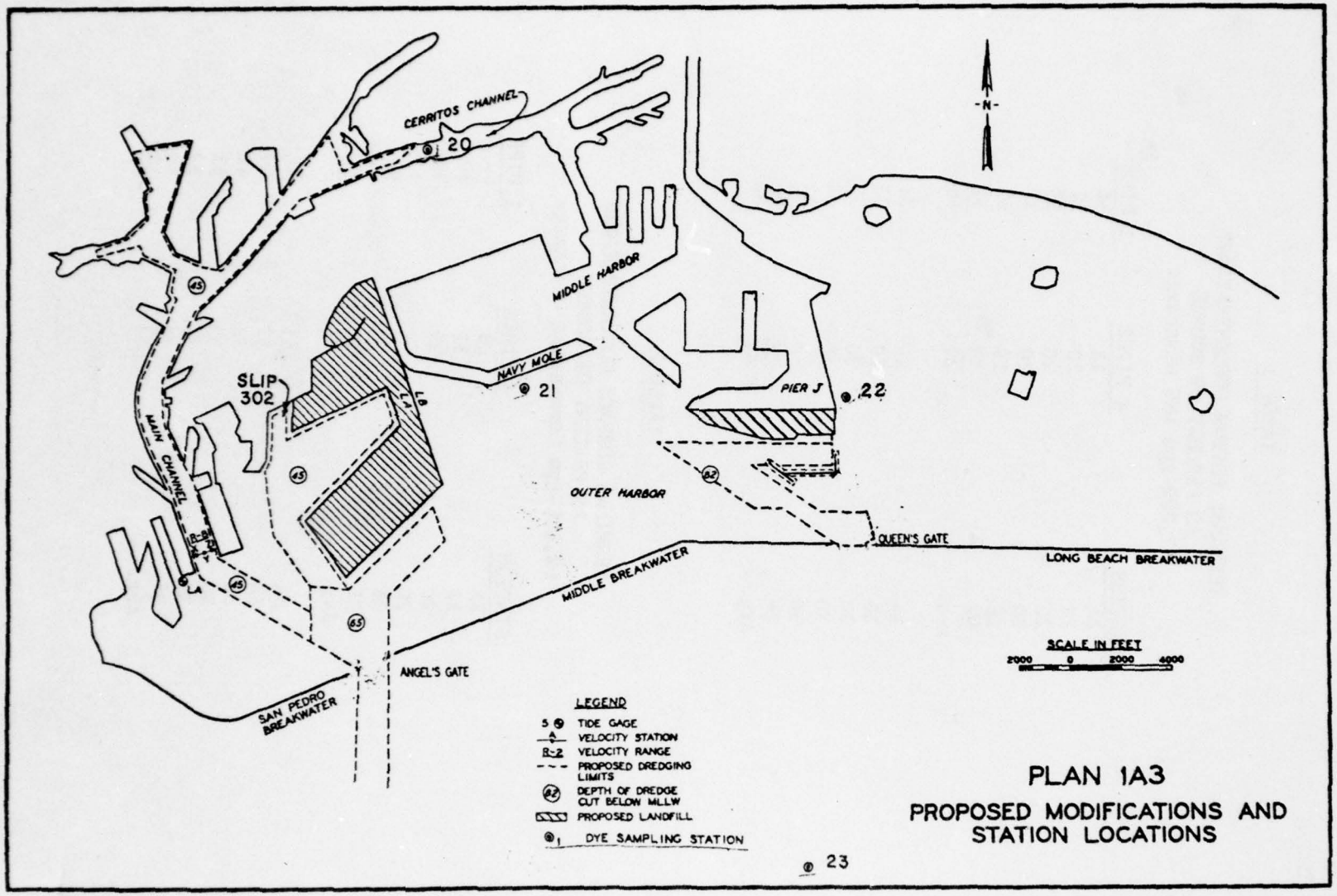
TABLE 2

TERMINAL SURFACE CONCENTRATIONS
AS PERCENT OF SOURCE
62,100-gpm Commingled Discharge

STATION	4 PIPES	1 PIPE
2A	28	--
2B	31	50
2C	39	38
2D	39	48
2E	42	54
2F	42	38
Avg.	37	46
3A	31	42
3B	37	40
3C	32	42
3D	33	41
3E	34	39
3F	34	50
Avg.	34	42

Incl 2

Incl 3-7



PLAN 1A3

PROPOSED MODIFICATIONS AND STATION LOCATIONS

FIGURE 1

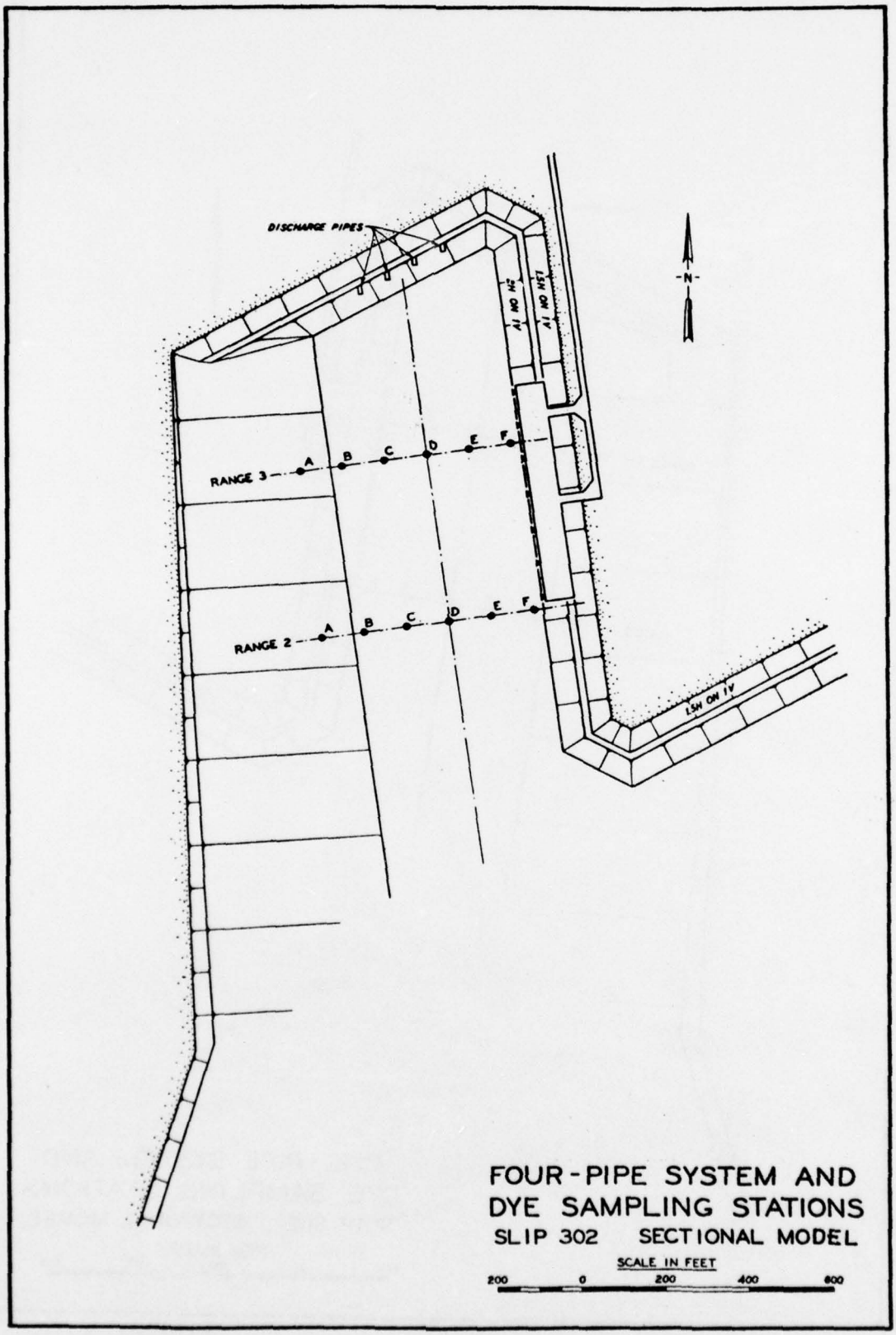

DISCHARGE PIPES
LSH ON 1V
LSH ON 1V
N
RANGE 3
A
B
C
D
E
F
RANGE 2
A
B
C
D
E
F
LSH ON 1V
FOUR-PIPE SYSTEM AND
DYE SAMPLING STATIONS
SLIP 302 SECTIONAL MODEL
SCALE IN FEET
200
0
200
400
800

FIGURE 2

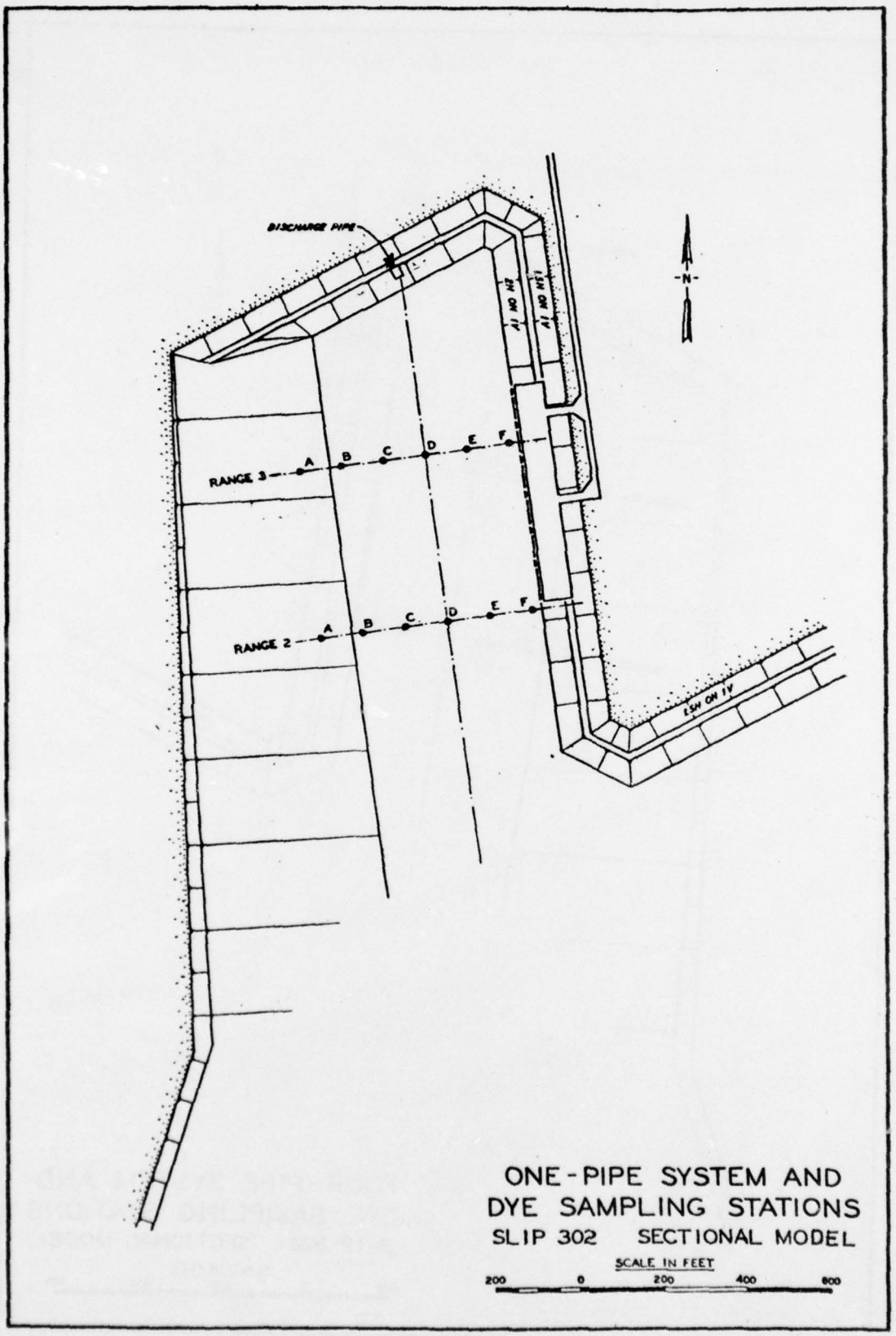
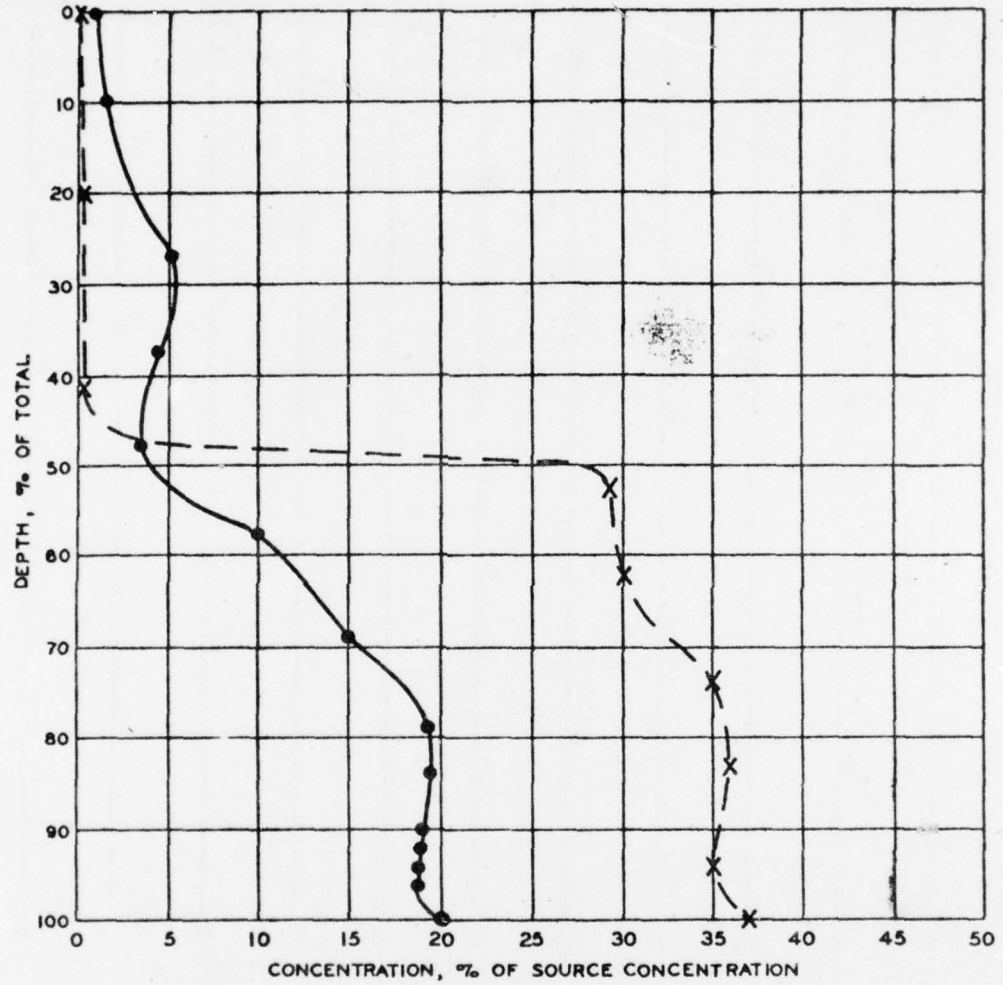

DISCHARGE PIPE
-N-
RANGE 3
A
B
C
D
E
F
RANGE 2
A
B
C
D
E
F
1.5H ON 1V
2H ON 1V
1.5H ON 1V
ONE-PIPE SYSTEM AND
DYE SAMPLING STATIONS
SLIP 302 SECTIONAL MODEL
SCALE IN FEET
200
0
200
400
800

FIGURE 3



LEGEND

—●— FOUR PIPE SYSTEM

—X— ONE PIPE SYSTEM

LA - LB HARBORS MODEL

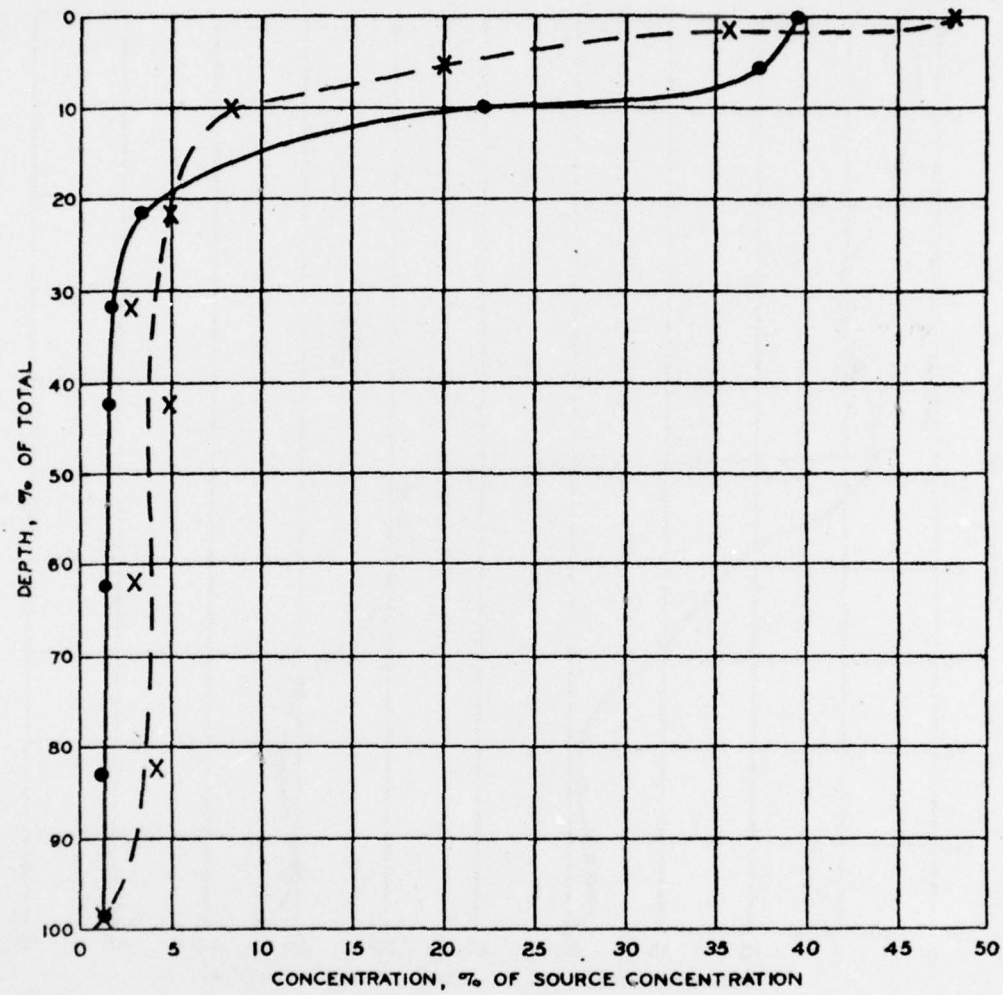
DYE CONCENTRATION PROFILE
DISCHARGE INTO SECTIONAL
MODEL OF SLIP 302,
LOS ANGELES HARBOR

87,000 GPM LNG DISCHARGE

STATION 2D

PRELIMINARY DATA

FIGURE 4



LEGEND

FOUR PIPE SYSTEM

ONE PIPE SYSTEM

LA - LB HARBORS MODEL

DYE CONCENTRATION PROFILE
DISCHARGE INTO SECTIONAL
MODEL OF SLIP 302,
LOS ANGELES HARBOR

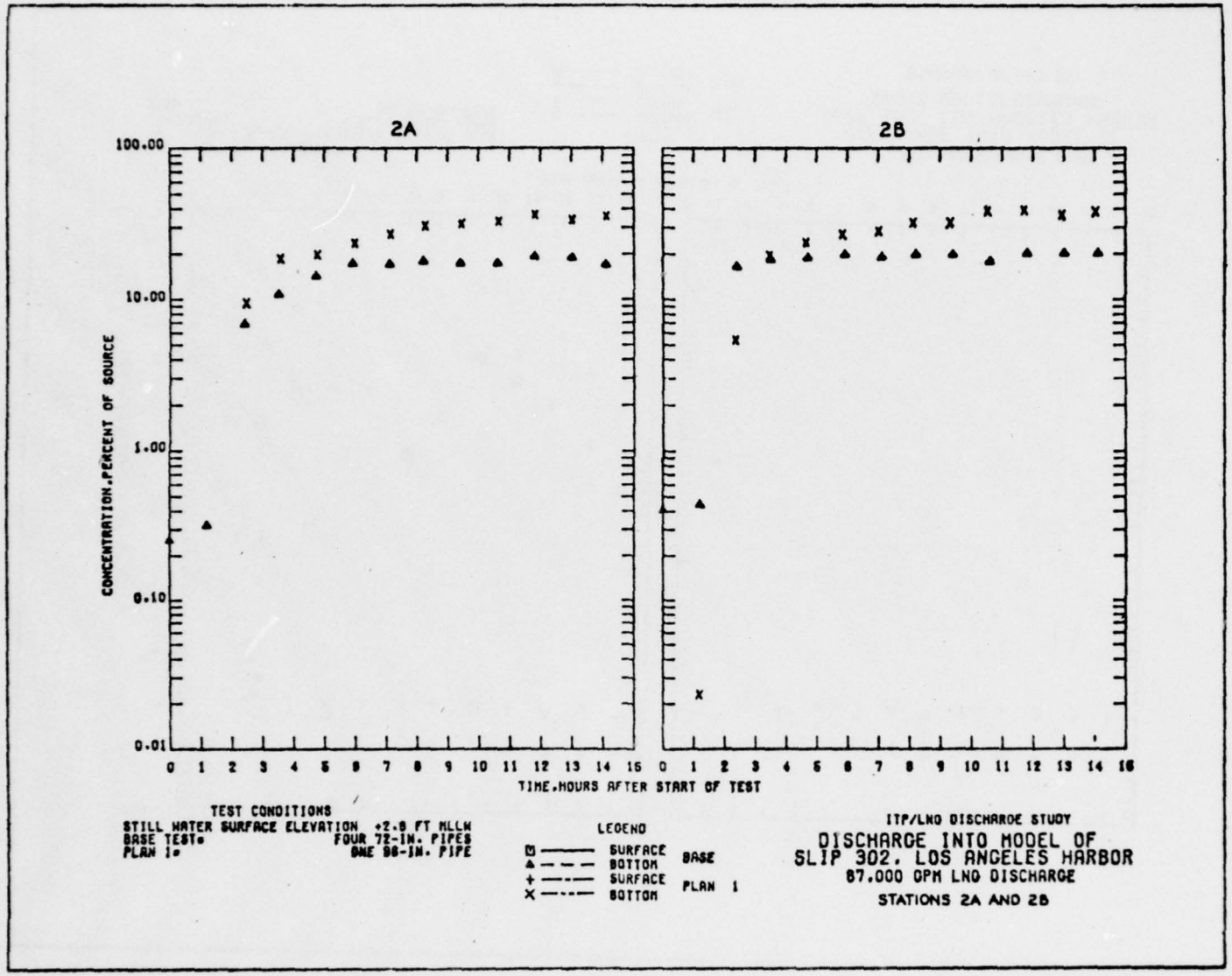
62,000 GPM COMMINGLED DISCHARGE

STATION 2D

PRELIMINARY DATA

FIGURE 5

61-8 ICU



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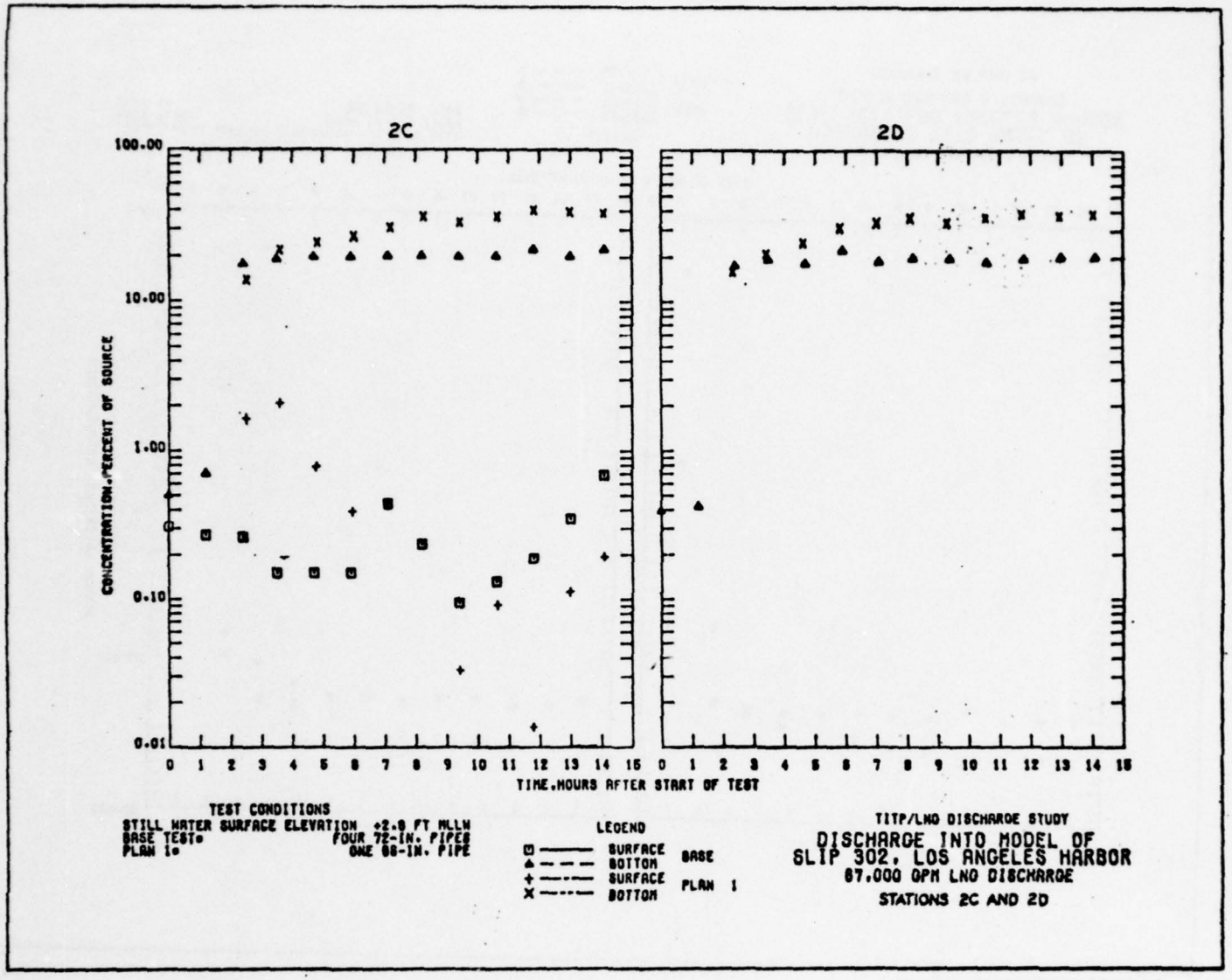

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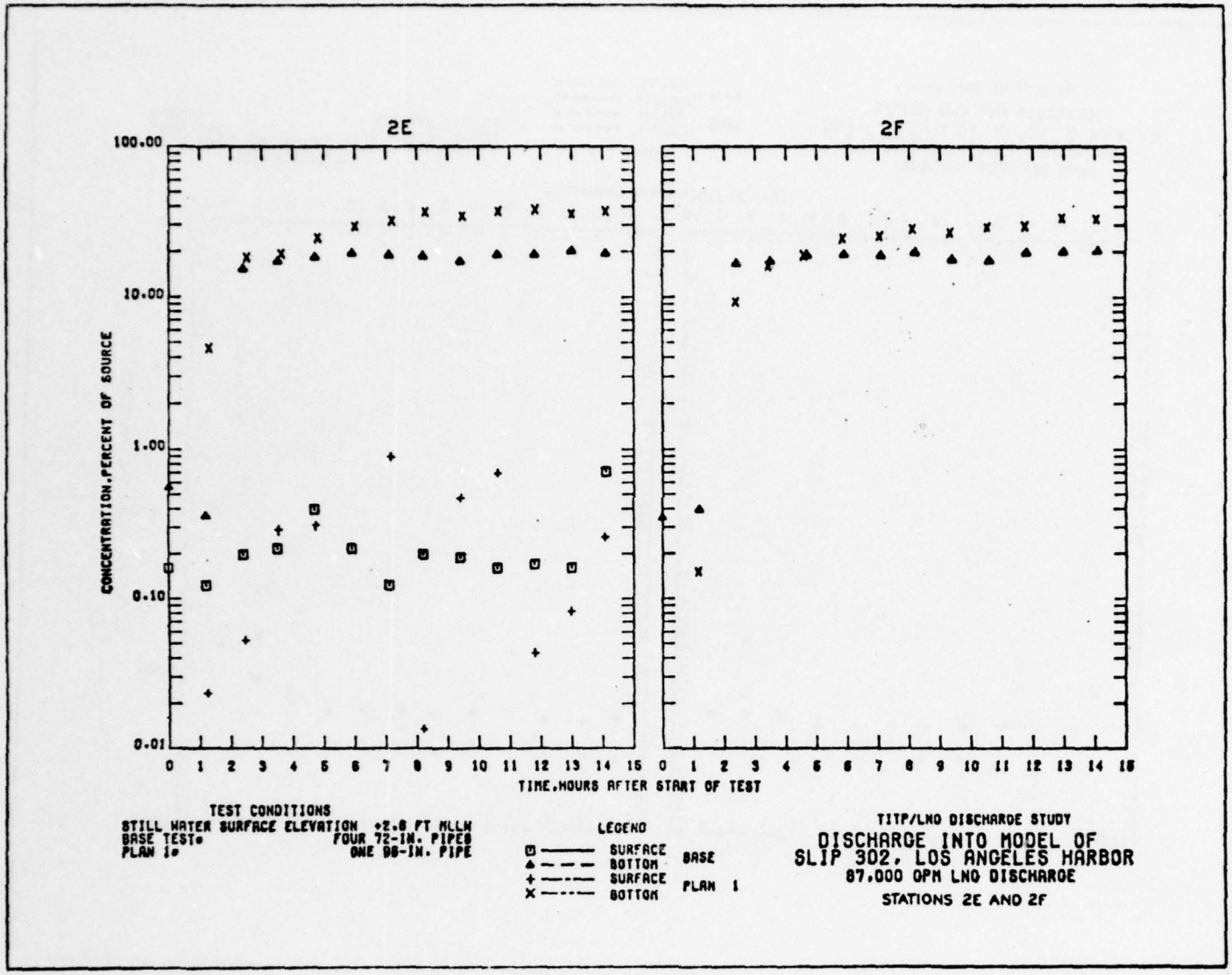

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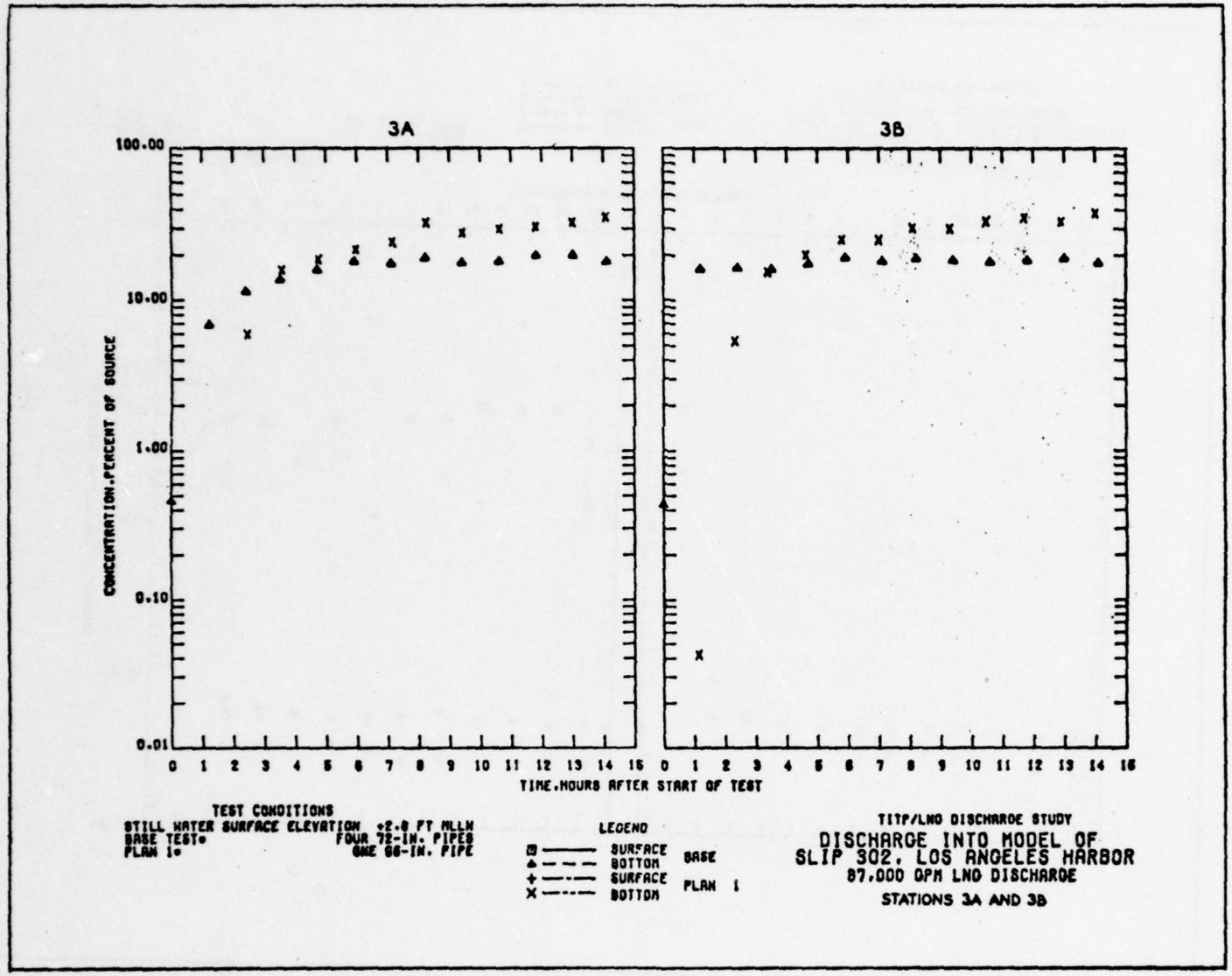

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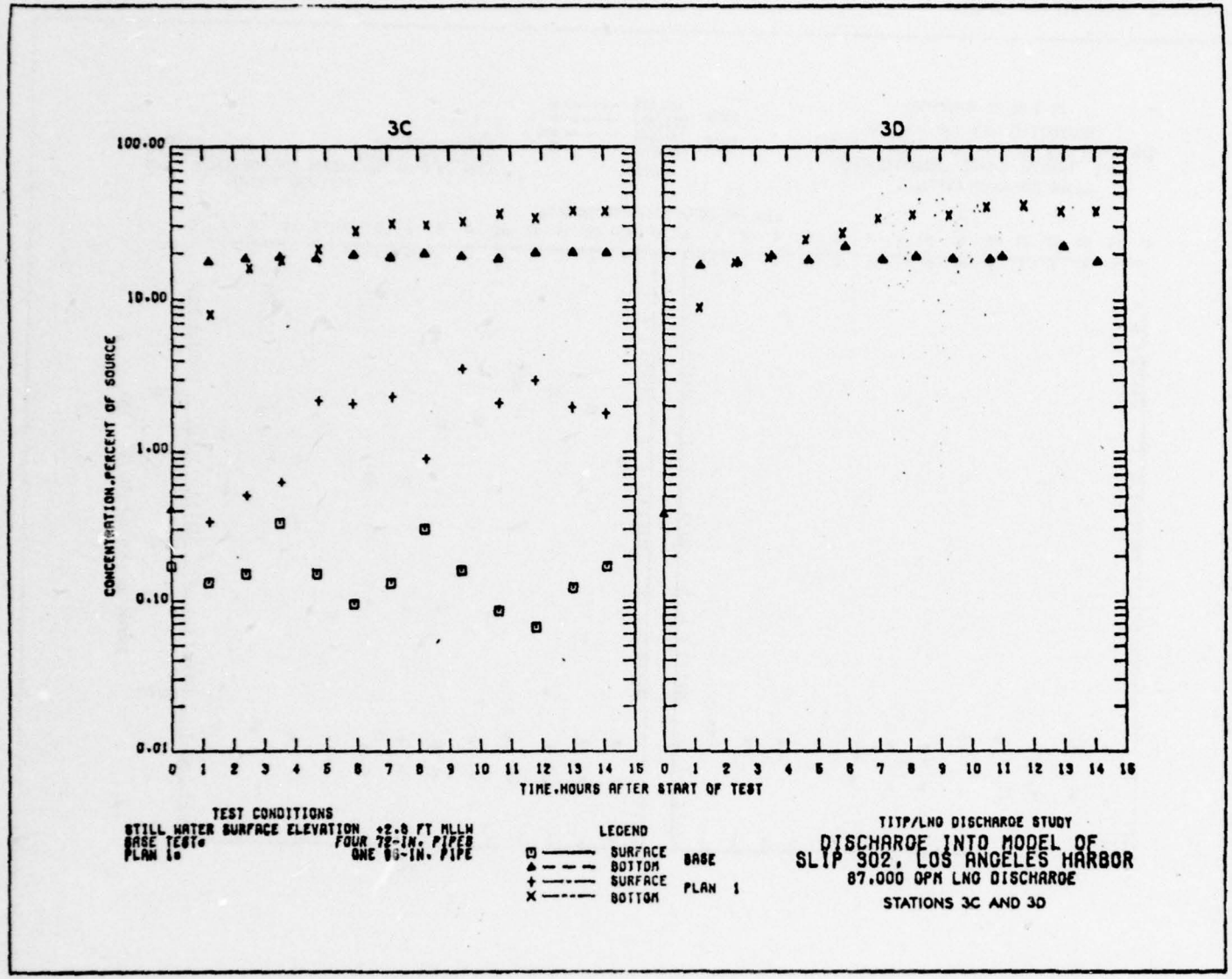

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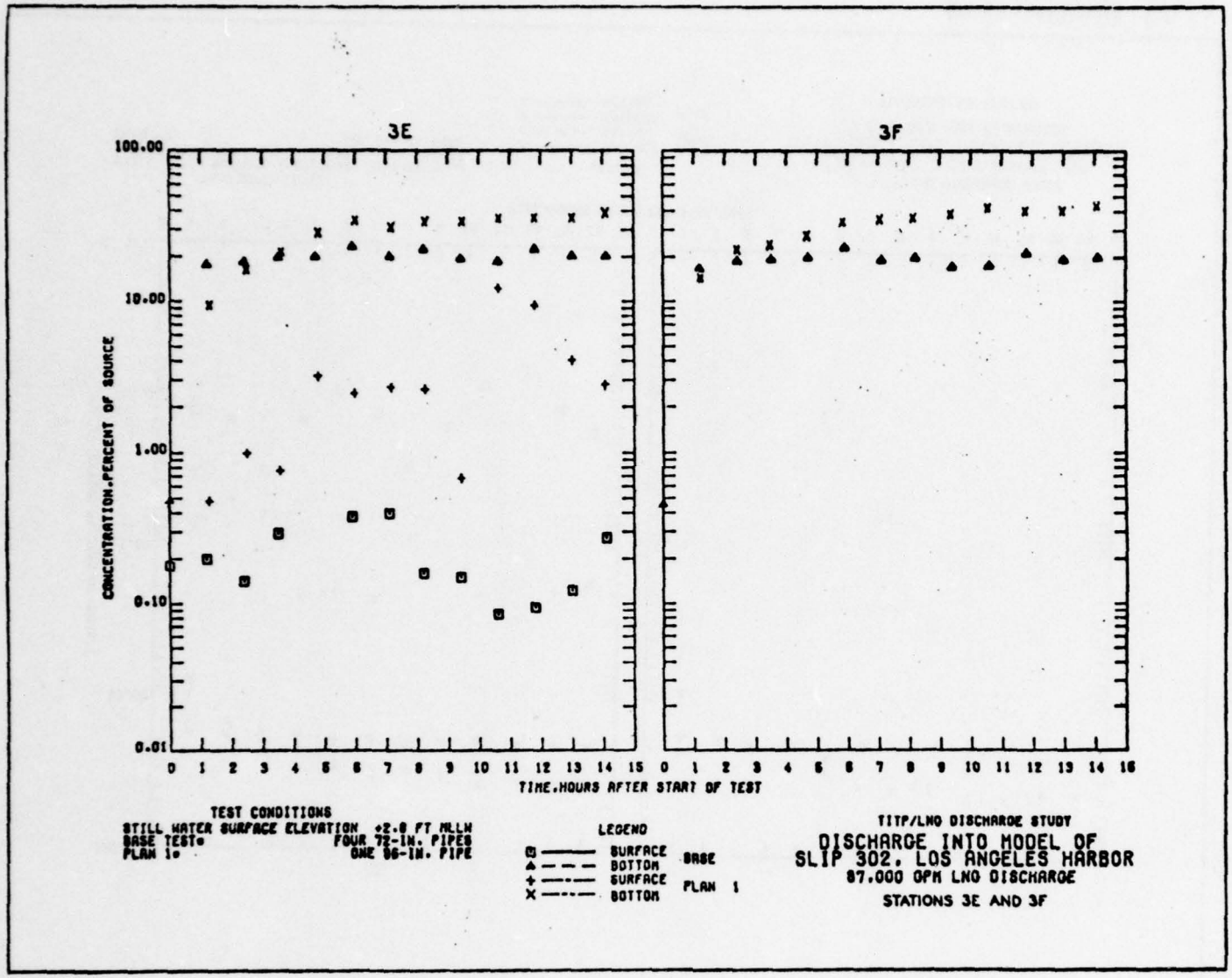

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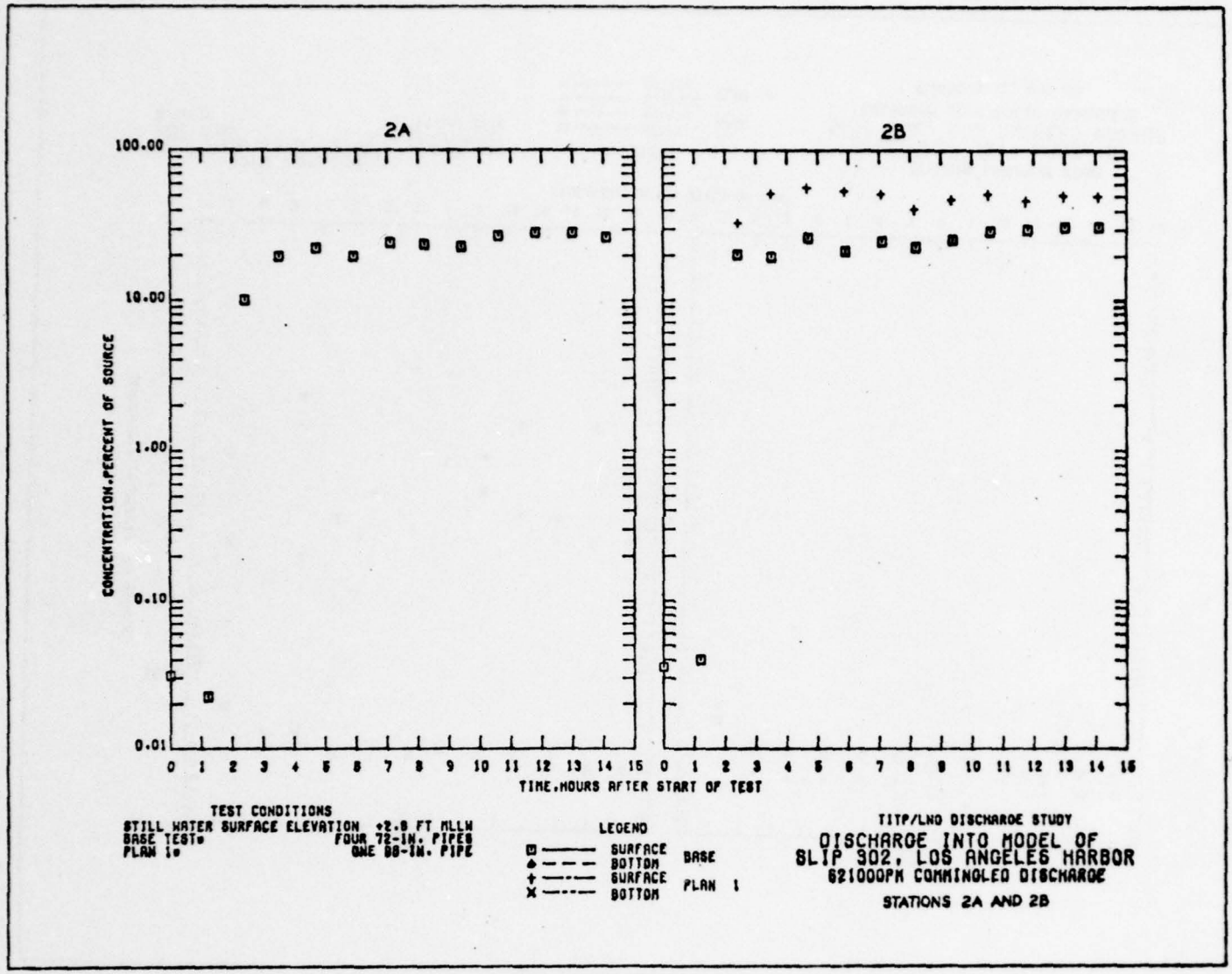

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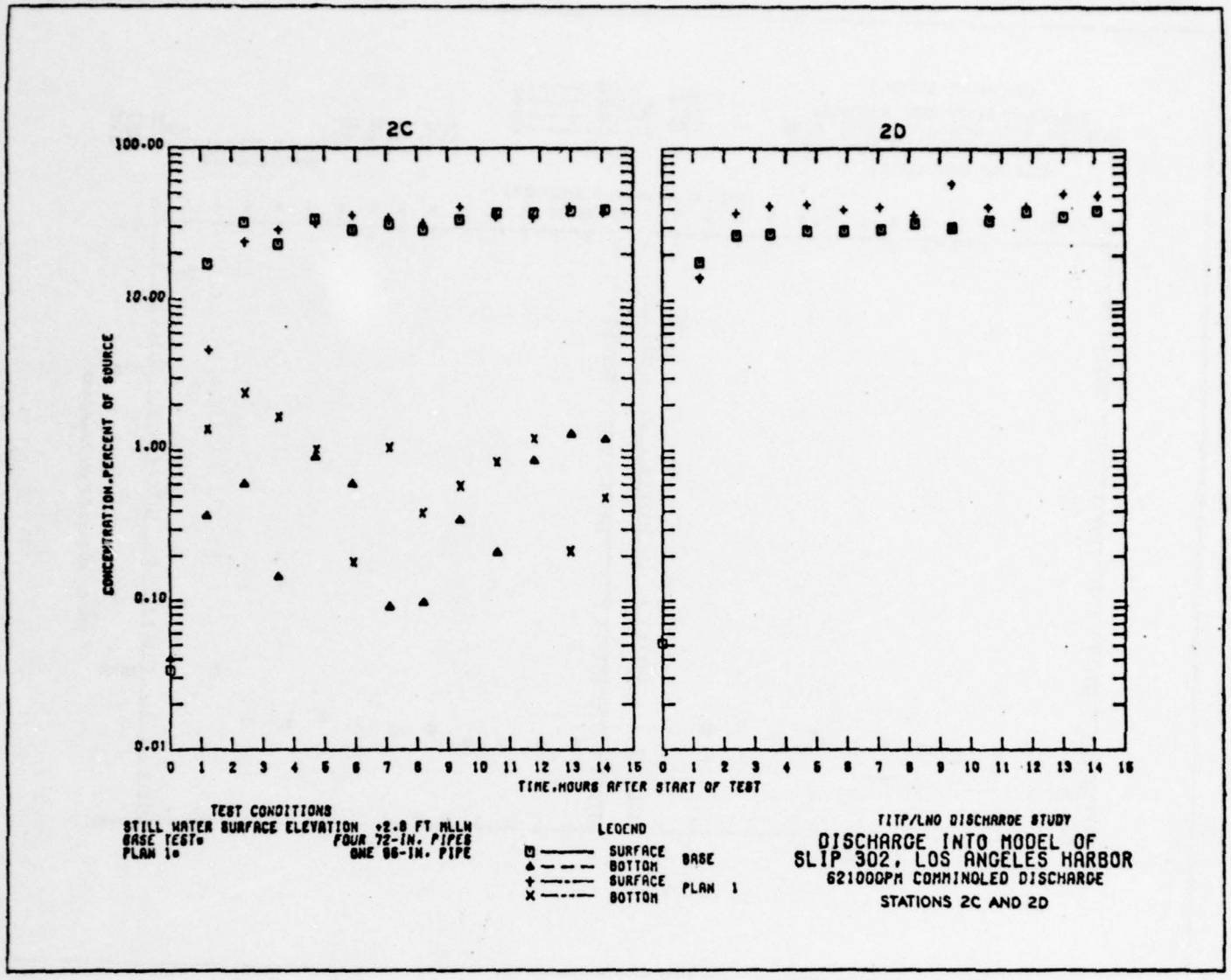

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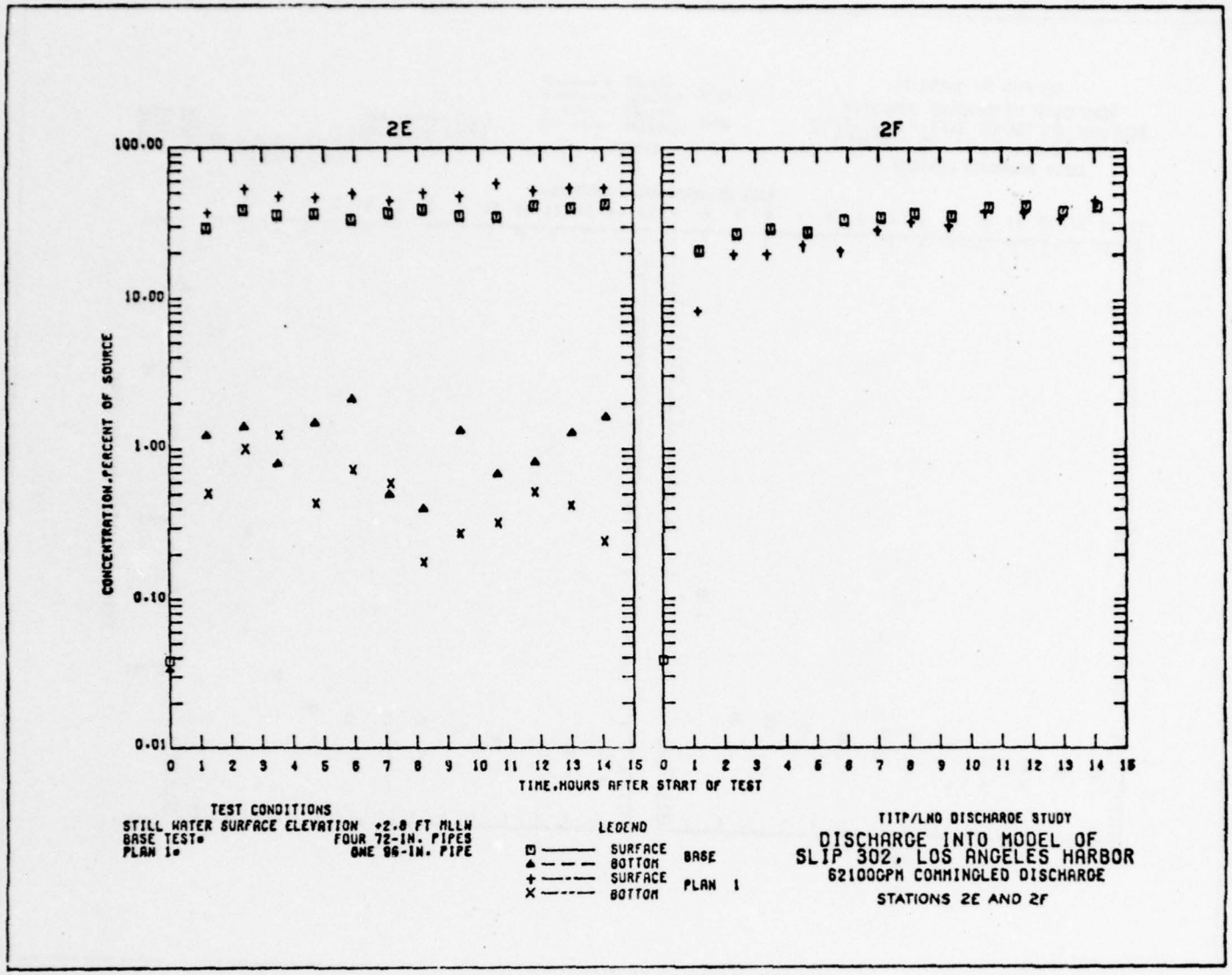

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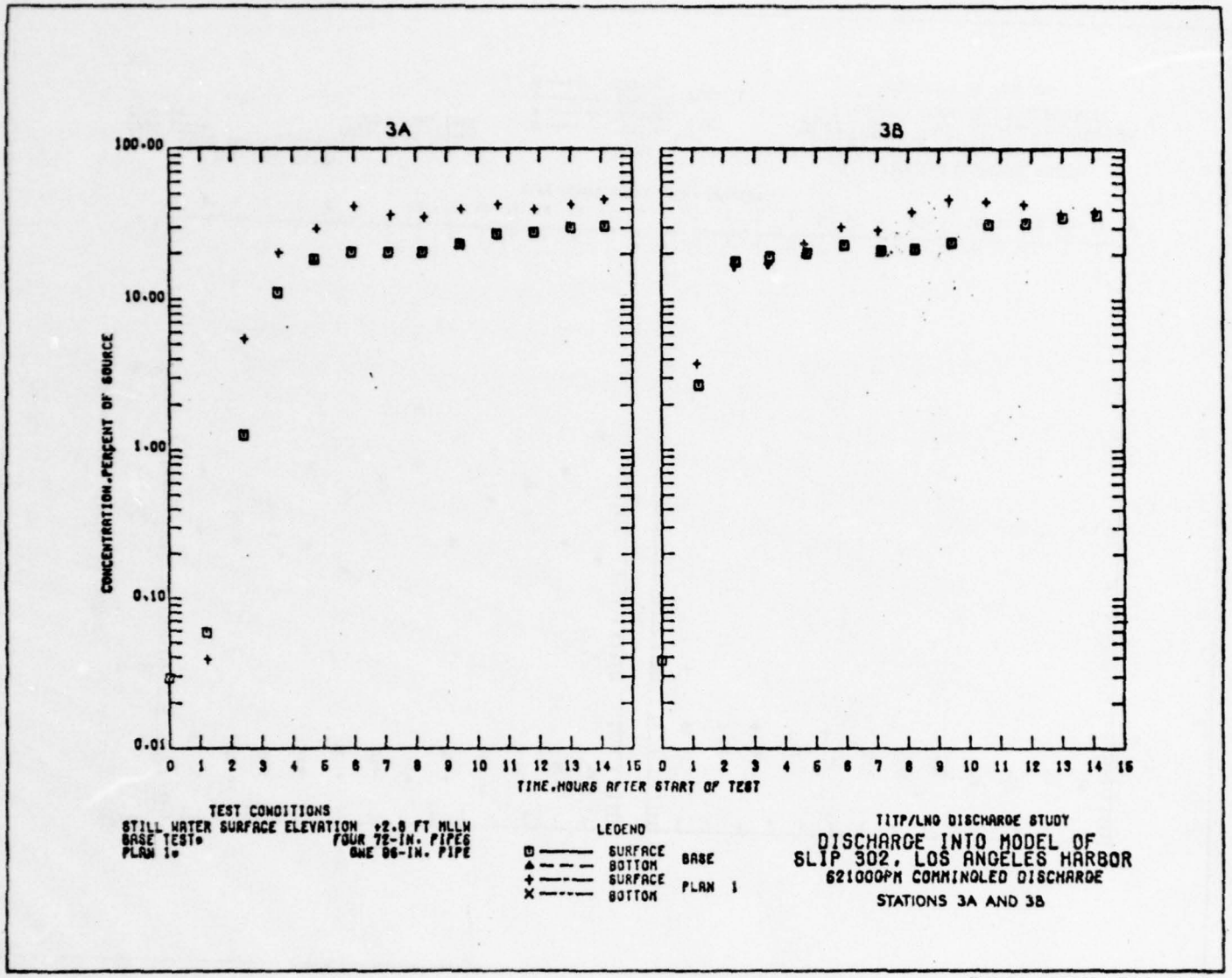

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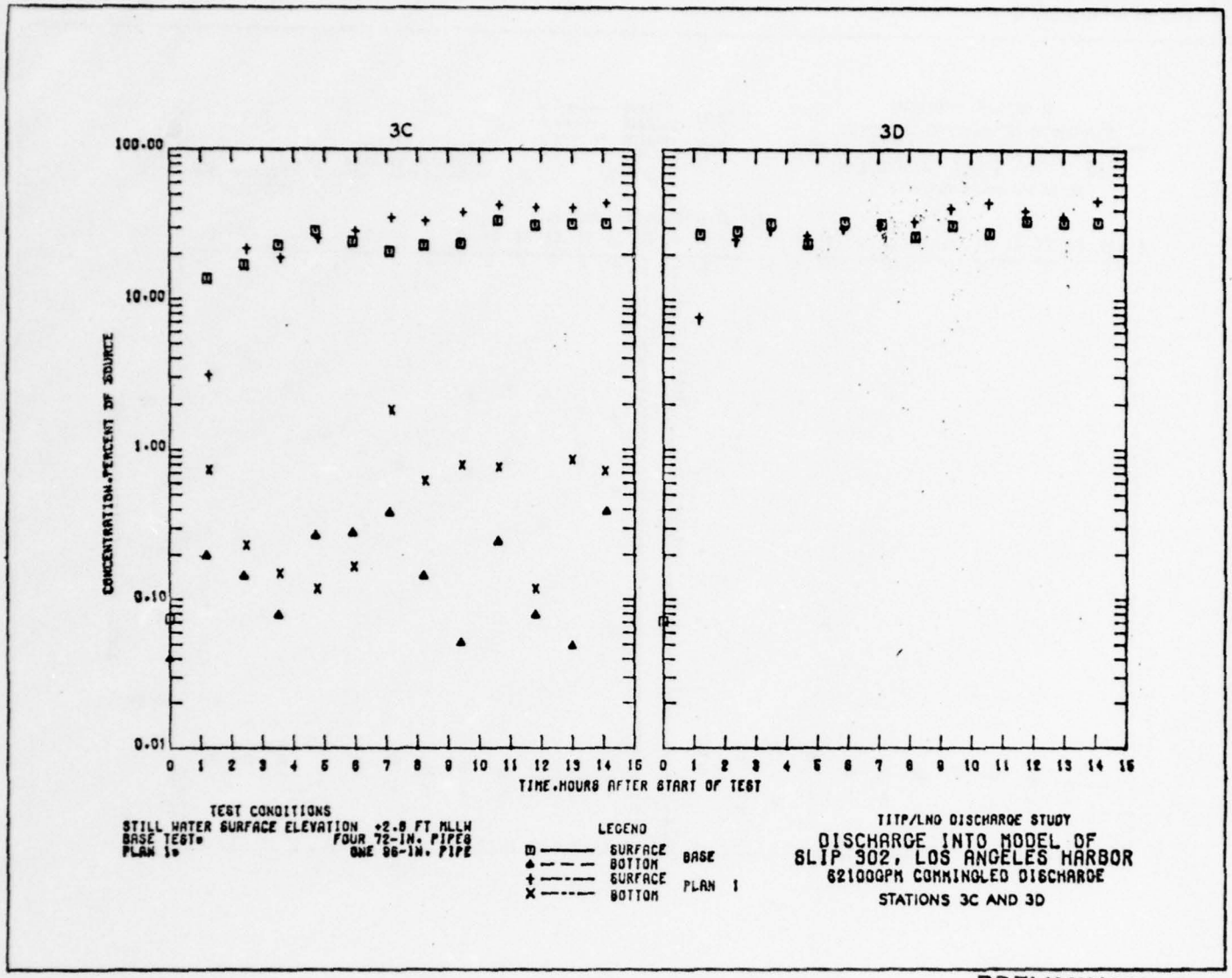

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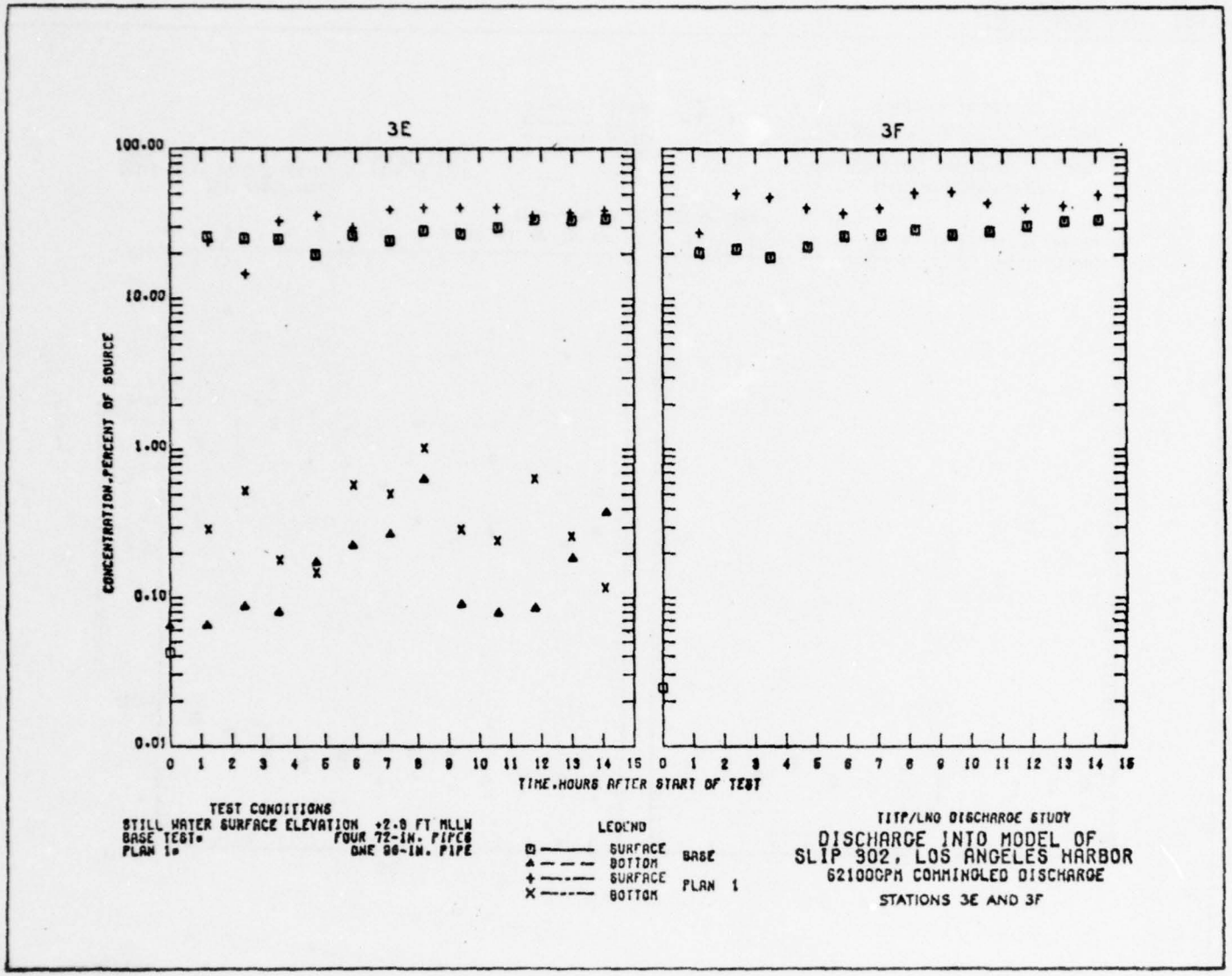


PRELIMINARY DATA

DEPARTMENT OF THE ARMY
WATERWAYS EXPERIMENT STATION, CORPS OF ENGINEERS
P. O. BOX 631
VICKSBURG, MISSISSIPPI 39180

IN REPLY REFER TO: WESHE

20 February 1976

MEMORANDUM FOR RECORD

SUBJECT: Preliminary Data from Model Study of LNG Facility Cool-Water Discharge into Los Angeles Harbor

1. This memorandum conveys preliminary data from model tests of cool-water discharge into Slip 302, Los Angeles Harbor from the Liquified Natural Gas (LNG) facility proposed for construction on Terminal Island, Los Angeles Harbor. Tests described herein were conducted at the Waterways Experiment Station (WES) during the period November 1975 through February 1976 by agreement between the Port of Los Angeles and WES.

2. Tests for the Port of Los Angeles were coordinated with model tests of discharge from the City of Los Angeles' Terminal Island Treatment Plant. Tests of the treatment plant discharge were performed by agreement between the City of Los Angeles and WES. Those model tests which were conducted solely for the City are described in this memorandum but results from those tests are not included. Reference 1 contains preliminary data from tests conducted solely for the City and those that were sponsored jointly by the City and Port.

3. These data are provided in preliminary form so that they may be available at an early date. They are subject to revision and analysis by WES. The purpose of this memorandum is to provide a basic description of the tests and data so that they may be readily understood. A formal report describing the tests in detail and analyzing the data will be published later.

Models

4. These tests were conducted in two physical hydraulic models. Near-field tests were performed in an undistorted, 1:50-scale, sectional model of the proposed slip. The slip location is shown in Figure 1, and the limits of the sectional model are illustrated by Figure 2. The model was constructed to scale according to the configuration shown in

Fluor Ocean Services Drawing Number 702115-00-002, revised 30 July 1975, plus additional details provided by the Port of Los Angeles. The LNG facility pier was constructed to scale in the model according to Fluor Ocean Services Drawing Number 702115-00-005A dated 23 September 1975. Rock cover protecting slip side slopes was scaled to preliminary design sizes provided by the Port of Los Angeles.

5. The sectional model discharge manifold was constructed to scale reproducing a prototype design of four 6-foot-diameter pipes passing through the north end of the slip with a center-line elevation of -12 feet mllw and spaced in a line at 75 feet on centers. The discharge pipes were arranged symmetrically about the center line of the slip's bottom width, and the axis of each pipe was parallel to the center line.

6. Far-field tests were conducted in the WES comprehensive Los Angeles-Long Beach Harbors model, which has length scales of 1:100 vertically and 1:400 horizontally. The comprehensive model and its tidal verification are described in Reference 2.

7. The discharge manifold used in the comprehensive model consisted of four rectangular ports 0.14 inch wide and 0.72 inch high installed in the location described in Paragraph 5.

8. The comprehensive model configuration during these tests was that designated as Plan 1A3 of the harbors development. Plan 1A3 consists of dredging and landfill construction in both harbors as shown in Figure 1.

Tests Description

9. Three discharge plans were tested as described in Reference 3. The plans were 18,000-gpm sewer discharge alone at 10 ppt salinity and 76°F; 62,100-gpm commingled sewer and LNG discharges at 27 ppt salinity and 56°F; and 87,000-gpm LNG facility discharge alone at 34 ppt and 56°F. Average ambient conditions were taken to be 34 ppt salinity and 60°F.

10. Each plan was tested in both sectional and comprehensive models. Multiple tests were conducted to permit collection of the desired data. A brief description of each test and the data acquired is given in Table 1.

11. In the sectional model tests, the water surface was held constant at the mean tide level, +2.8 feet mllw. The density difference between effluent and receiving water was achieved by varying their relative

salinities. In each case, the controlling parameter was the density ratio in the densimetric Froude number--the difference in density between effluent and receiving waters divided by receiving water density. Since other scales were determined by Froudian relationships, densimetric Froude numbers were the same in model and prototype.

12. A conservative fluorescent dye was added to the sectional model effluent so that it might be traced in the model. Water samples were withdrawn from 13 stations (see Figure 2) in the model at 70-minute (prototype) intervals for an equivalent 14.1 prototype hours. Surface or bottom samples were taken at every station, depending upon which plan was being tested, and both surface and bottom samples were taken at Stations 2C, 2E, 3C, and 3E. Samples were withdrawn from several depths at Station 2D to define the effluent plume interface. The water samples were analyzed to determine dye content and thus the degree of dilution of the plume.

13. In the comprehensive model tests, density differences were obtained by heating the effluent to create a surface plume or by adding salt to create a bottom plume. The effluent plume's temperature or salinity was adjusted until the proper density at Station 2D was obtained. The proper density was that providing the density ratio (Paragraph 11) computed from dye tracer results in the sectional model. A mean tide (5.4-foot diurnal range) was used in all comprehensive model tests.

14. Color movies of the dyed effluent plume were obtained in the comprehensive model by means of a time-lapse camera with a 2-second framing interval. Color slides were taken of the plume at regular intervals.

15. Dye tracer tests in the comprehensive model were similar to those of the sectional model. Water samples were withdrawn from 24 stations (see Figures 1 and 3) for dye concentration measurement. Table 2 lists the sampling stations and the depths at which samples were taken.

Data Description

16. The mean tide used in the comprehensive model tests is plotted in Plate 1.

17. The viewpoint of the camera for the slides and movies was from outside the breakwater, looking downward and to the north of Los Angeles Harbor. Proposed landfill areas are covered with gravel and proposed dredged areas are outlined in black. In the lower left corner of the

frame are signs identifying the test number, number of elapsed tidal cycles, and elapsed hours of the present cycle. Projecting the movies at normal speeds greatly speeds motion of the dye cloud.

18. Results of dye tracer tests in both models are illustrated in the plates as plots of dye concentration versus time. Dye concentration is expressed as a percent of source concentration. For the sectional model tests, the source concentration is the actual measured dye concentration in the effluent before discharge. In the comprehensive model tests, an equivalent source concentration has been computed by taking the absolute dye concentration at Station 1 to be equivalent to the concentration at the corresponding station (Station 2D) in the sectional model test. Thus the plotted percent of source concentration represents the tracer concentration that would have resulted if the comprehensive model reproduced near-field plume behavior correctly.

19. Current velocities were measured at Range 8 (see Figure 1) in the comprehensive model so that the effect of the plans upon net flow through the Cerritos Channel could be determined. Measured velocities are plotted in Plates 2, 3, and 4 against base velocities (no discharge). Apparent net discharges for Range 8 were computed by the technique described in Reference 2 and are shown in Table 3.

20. Center-line current velocities were measured at Station 2D in the sectional model by measuring the transit time of floats over a measured distance. Current velocities measured in the sectional model are being checked for accuracy and will be forwarded separately.

Limitations of the Data

21. Analysis of the errors present in the accompanying data is beyond the scope of this memorandum, but it is appropriate to include a brief description of the data's limitations.

22. Dilution of the dye tracer in the sectional model tests is considered to be an accurate and reliable indication of effluent dilution in the prototype under similar conditions. Several deviations from these conditions that could or would occur in the prototype, such as uneven flow splitting in the manifold, tidal- or wind-induced water surface fluctuations, ambient water stratification, variations in discharge rate, and vessel transit, were not reproduced in the sectional model. While such deviations would cause dilution changes, the sectional model results are a good representation of an average condition.

WESHE 20 February 1976

SUBJECT: Preliminary Data from Model Study of LNG Facility Cool-Water Discharge into Los Angeles Harbor

23. Dye tests in the comprehensive model show where the diluted effluent will be transported, but note that the comprehensive model has not been verified for dispersive transport, i.e., the model has not been proven to accurately reproduce the dispersion of a tracer. This means that at distances far enough from the source for transverse and longitudinal dispersion to significantly affect concentration and where vertical stratification breaks down, dye concentrations may not represent concentrations that would occur in the prototype. However, past experience indicates that the relative distribution of tracer along the dye cloud path tends to be a fairly accurate representation of what would occur in the prototype under similar conditions. Where a strong stratification exists within constraining lateral boundaries, the model is assumed to accurately reproduce prototype behavior.

24. During Test CM3D (62,100-gpm commingled discharge), a malfunction of equipment used to heat the effluent occurred at about Cycle 30. For this reason, data for Test CM3D between Cycles 30 and 40 should be disregarded.

W. H. McANALLY, JR.
Engineer
Harbor Entrance Branch

3 Att
Tables 1-3
Figures 1-3
Plates 1-4, L1-L71,
and SL1-SL70

REFERENCES

1. U. S. A. E. Waterways Experiment Station, Memorandum for Record, Subject: Preliminary Data from Model Study of Terminal Island Treatment Plant (TITP) Effluent Discharged into Los Angeles Harbor, 19 February 1976.

2. McAnally, W. H., Jr., Los Angeles-Long Beach Harbors Model, Report 5, Tidal Verification and Base Tests, TR-H-75-4, U. S. A. E. Waterways Experiment Station, September 1975.

3. U. S. A. E. Waterways Experiment Station, Memorandum for Record, Subject: Model Tests of Discharges into Proposed LNG Slip, Los Angeles Harbor, 29 October 1975.

TABLE 1

Summary of Tests Performed

Plan Description	Test No.	Test Duration (Prototype)	Model	Data Description
Sewer discharge only 18,000 gpm @ 16°F above ambient temperature and 10 ppt salinity	SM4	14.1 hrs	Sectional	Percent dye concentration plots, Plates S1-S8A
	SM4V	-	Sectional	Center-line velocities, Table 4
	CM4	9 cycles	Comprehensive	Movie and slides of dye cloud
	CM4A	1 cycle	Comprehensive	Surface current pattern photographs, Plates S9-S20
Commingled sewer and LNG facility discharges 62,100 gpm @ 4°F below ambient temperature and 27 ppt salinity	SM3	14.1 hrs	Sectional	Percent dye concentration plots, Plates SL1-SL8A
	SM3V	-	Sectional	Center-line velocities, Table 4
	CM3A	8 cycles	Comprehensive	Movie and slides of dye cloud
	CM3D	61 cycles*	Comprehensive	Percent dye concentration plots and net flow through Cerritos Channel, Plates SL9-SL70, Table 3
LNG facility discharge only. 87,000 gpm @ 4°F below ambient temperature and ambient salinity	SM5	14.1 hrs	Sectional	Percent dye concentration plots, Plates L1-L9A
	SM5V	-	Sectional	Center-line velocities, Table 4
	CM5A	9 cycles	Comprehensive	Movie and slides of dye cloud
	CM5D	81 cycles*	Comprehensive	Percent dye concentration plots and net flow through Cerritos Channel, Plates L10-L71, Table 3

* No effluent discharged during last 10 tidal cycles of test.

TABLE 2

Water Sample Depths for Tests CM3D and CM5D

Station No.	Fraction of Low-Water Depth Below Water Surface				
	2%	25%	50%	75%	*98%
1	X	X	X	X	X
2	X	X	X	X	X
3	X				X
4	X				X
5	X	X	X	X	X
6	CM3D				CM5D
7	X				X
8	X	X	X	X	X
9	X				X
10	X	X	X	X	X
11	X				X
12	X				
13	X	X	X	X	X
14	X				X
15	X				X
16A	X				X
16B	X				X
17	X				X
18	X	X	X	X	X
19	X				X
20	CM3D				CM5D
21	CM3D				CM5D
22	CM3D				CM5D
23	CM3D				CM5D

*Constant 1 ft (prototype) above bottom

TABLE 3

Apparent Net Discharge Per Tidal Cycle at Range 8

PLAN	NET DISCHARGE (10^6 cu ft)
1A3 - Base, Mean Tide	+87
1A3 - 62,100-gpm Commingled Discharge	+158
1A3 - 87,000-gpm LNG Discharge	+94

NOTE: Positive values indicate net flood flows.

TABLE 4

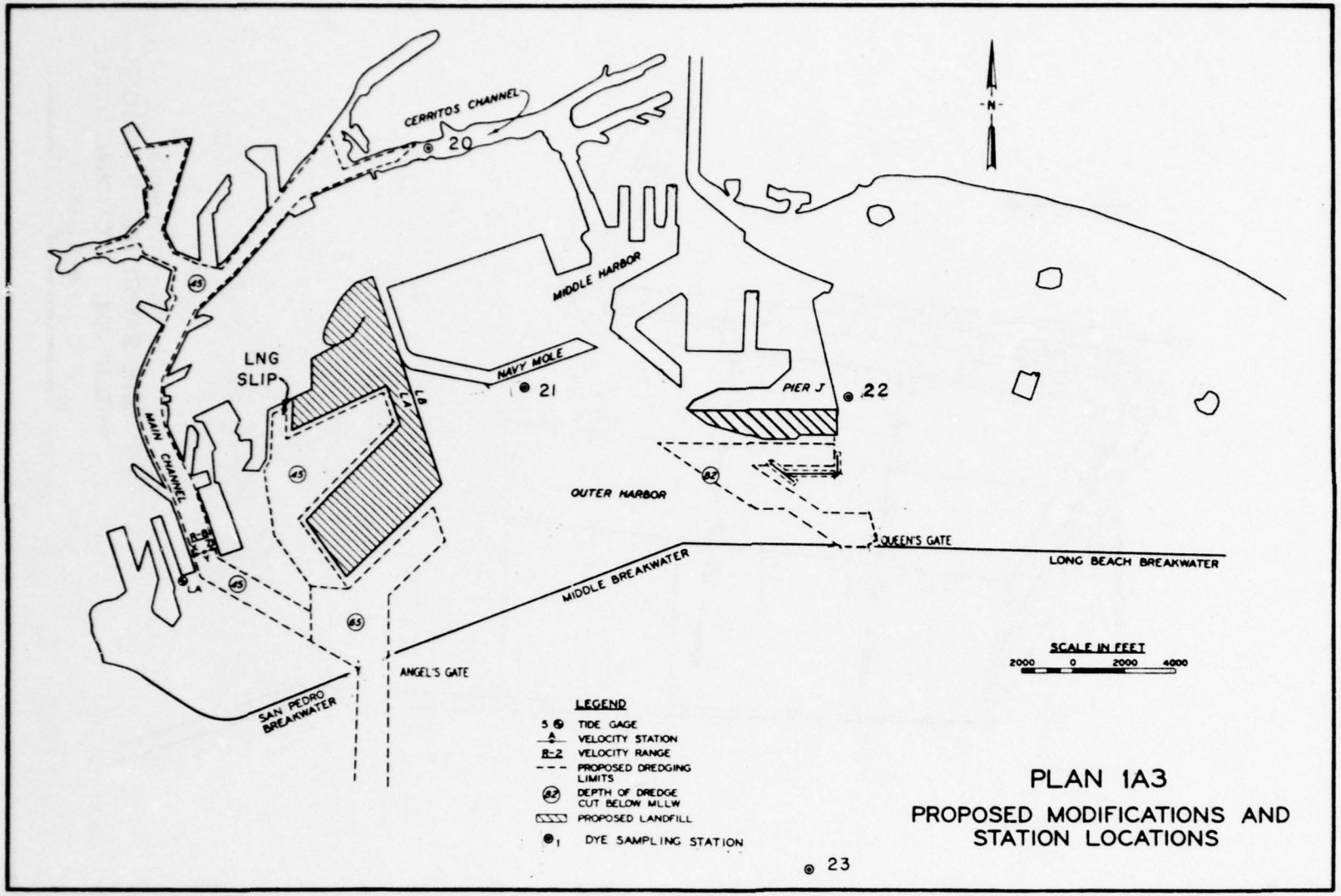
CENTERLINE VELOCITIES IN PROTOTYPE FPS
SECTIONAL MODEL TESTS

TEST NO.	SURFACE	MIDDEPTH	BOTTOM
SM3V	+0.17	+0.06*	-0.01*
SM4V	+0.05	+0.04*	-0.01*
SM5V	+0.18	**	**

*Values possibly contaminated by multi-layer flow causing erroneous readings

**Values not presented because of strong possibility of contamination by multi-layer flow

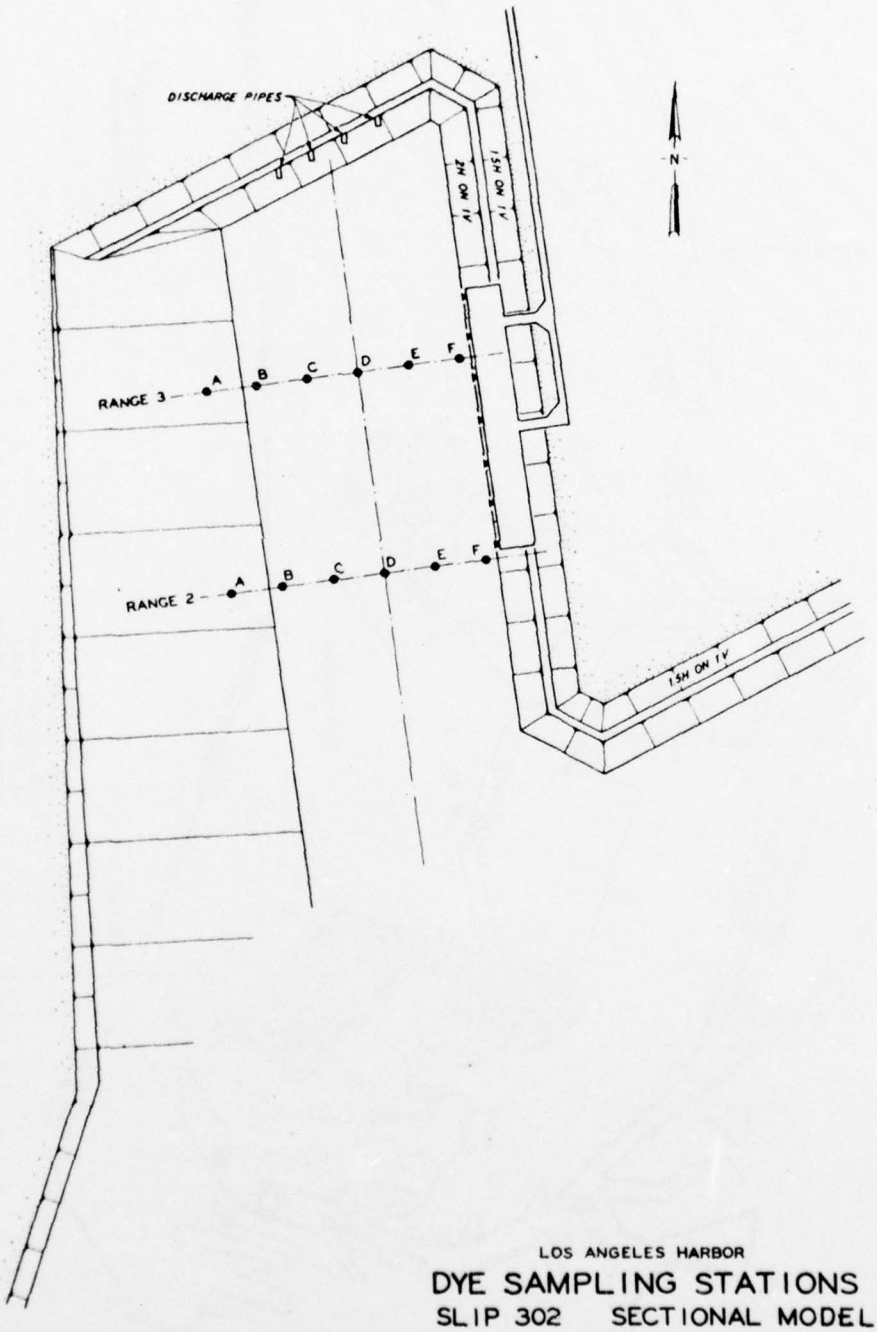
NOTE: Positive sign indicates flow out of the slip; negative sign indicates flow into the slip



PLAN 1A3

PROPOSED MODIFICATIONS AND STATION LOCATIONS

FIGURE 1



LOS ANGELES HARBOR

DYE SAMPLING STATIONS

SLIP 302 SECTIONAL MODEL

SCALE IN FEET

200 0 200 400 600

FIGURE 2

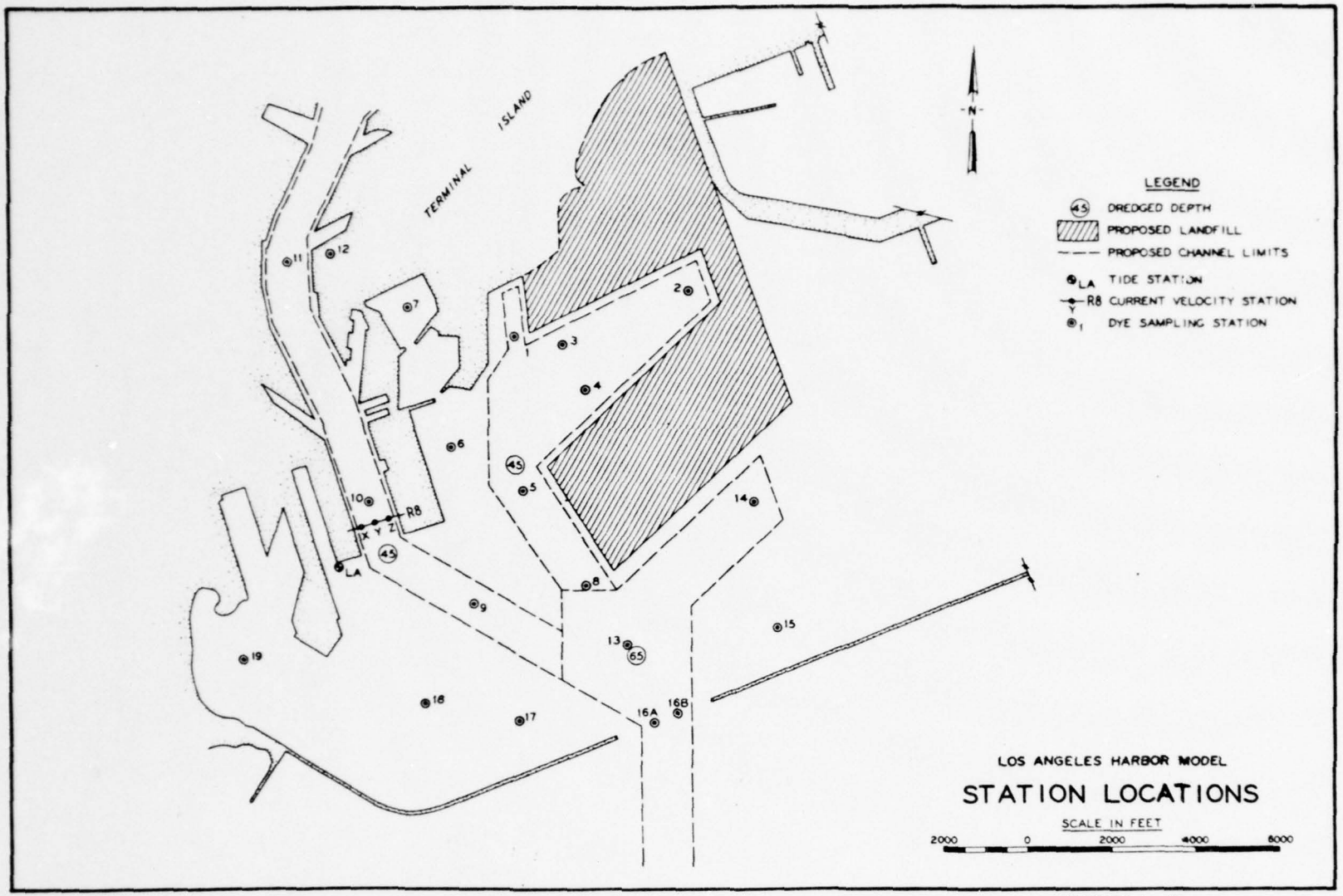
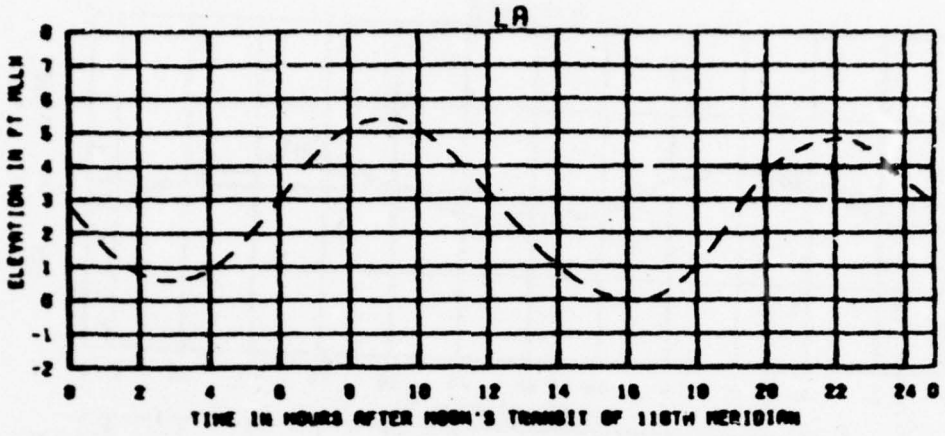

TERMINAL ISLAND
N
LEGEND
(45) DREDGED DEPTH
PROPOSED LANDFILL
PROPOSED CHANNEL LIMITS
LA TIDE STATION
R8 CURRENT VELOCITY STATION
1 DYE SAMPLING STATION
LOS ANGELES HARBOR MODEL
STATION LOCATIONS
SCALE IN FEET
2000 0 2000 4000 6000

FIGURE 3



TEST CONDITIONS
TIDAL RANGE AT QUEENS GATE = 5.4 FT

LEGEND

MODEL — — —

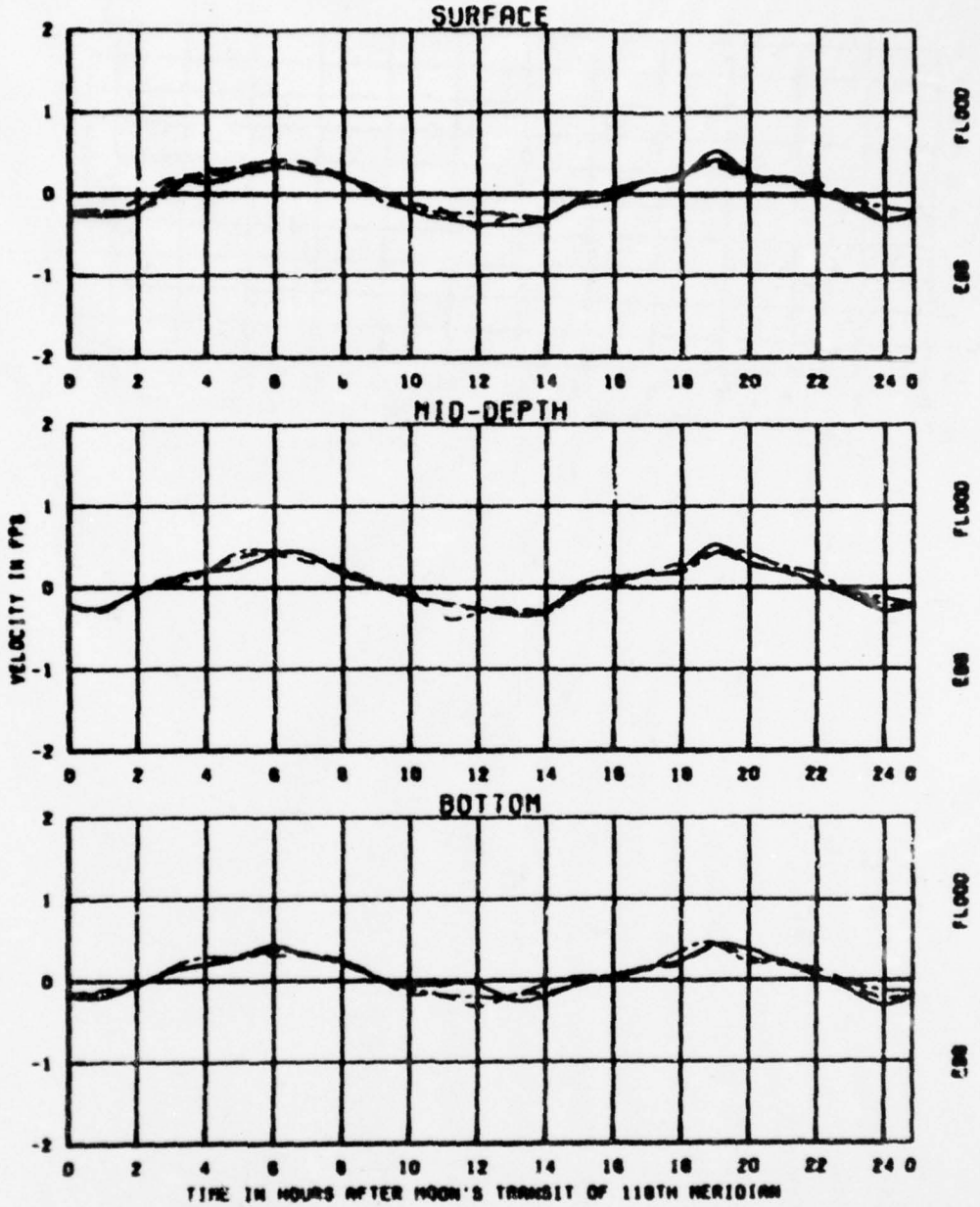
LOS ANGELES-LONG BEACH HARBORS
PLAN 1A3

TIDAL ELEVATIONS
SEWER/LNG DISCHARGE
MEAN TIDE

STATION
LA

PRELIMINARY DATA

PLATE 1



TEST CONDITIONS
TIDAL RANGE AT QUEENS GATE = 5.4 FT

LOS ANGELES-LONG BEACH HARBORS
PLAN 1R3

VELOCITIES
SEWER/LNG DISCHARGE
MEAN TIDE

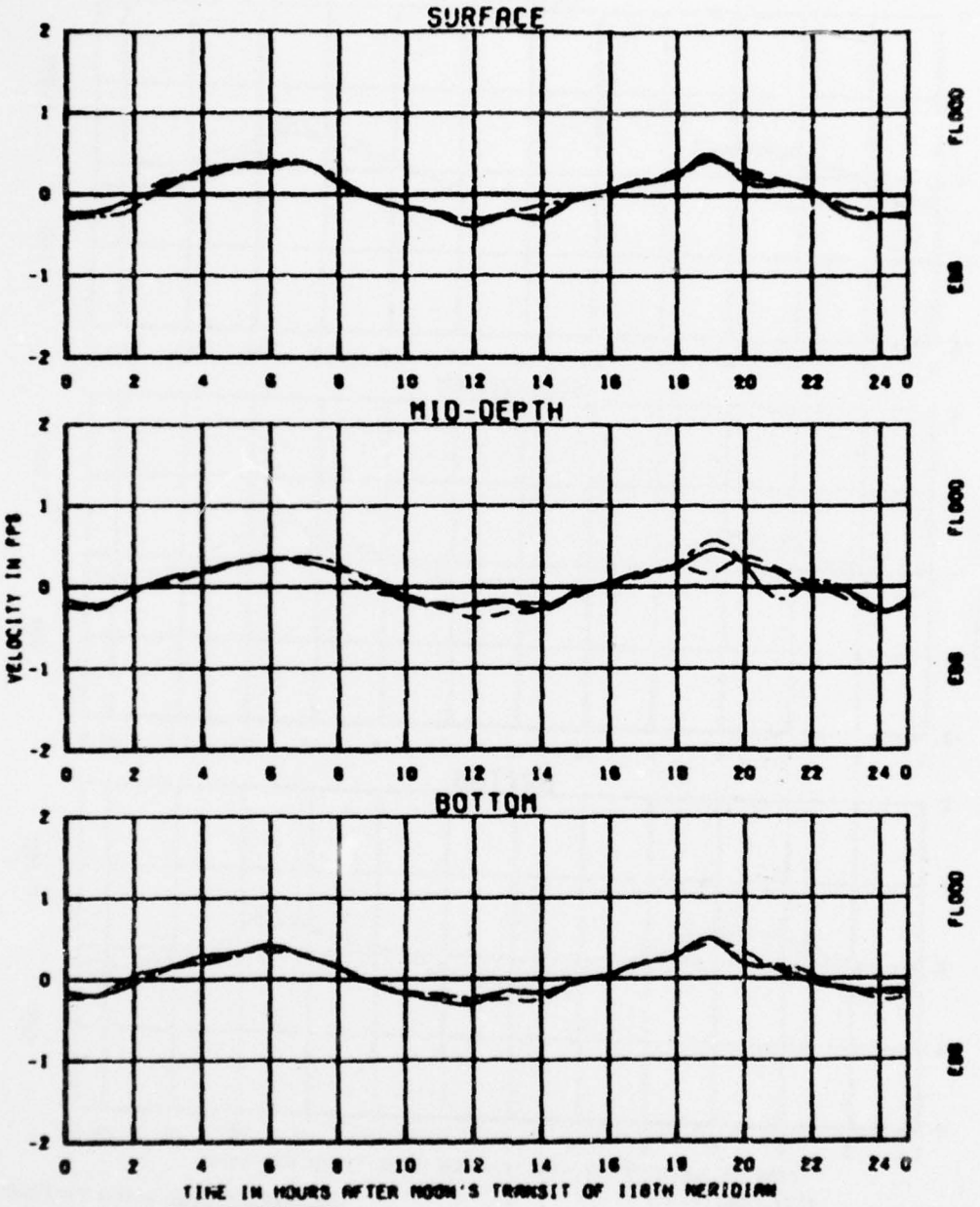
STATION
8X

LEGEND

BASE ———
CM3D — — —
CM5D —·—

PRELIMINARY DATA

PLATE 2



TEST CONDITIONS
TIDAL RANGE AT QUEENS GATE = 5.4 FT

LOS ANGELES-LONG BEACH HARBORS
PLAN 1A3

VELOCITIES
SEWER/LNG DISCHARGE
MEAN TIDE

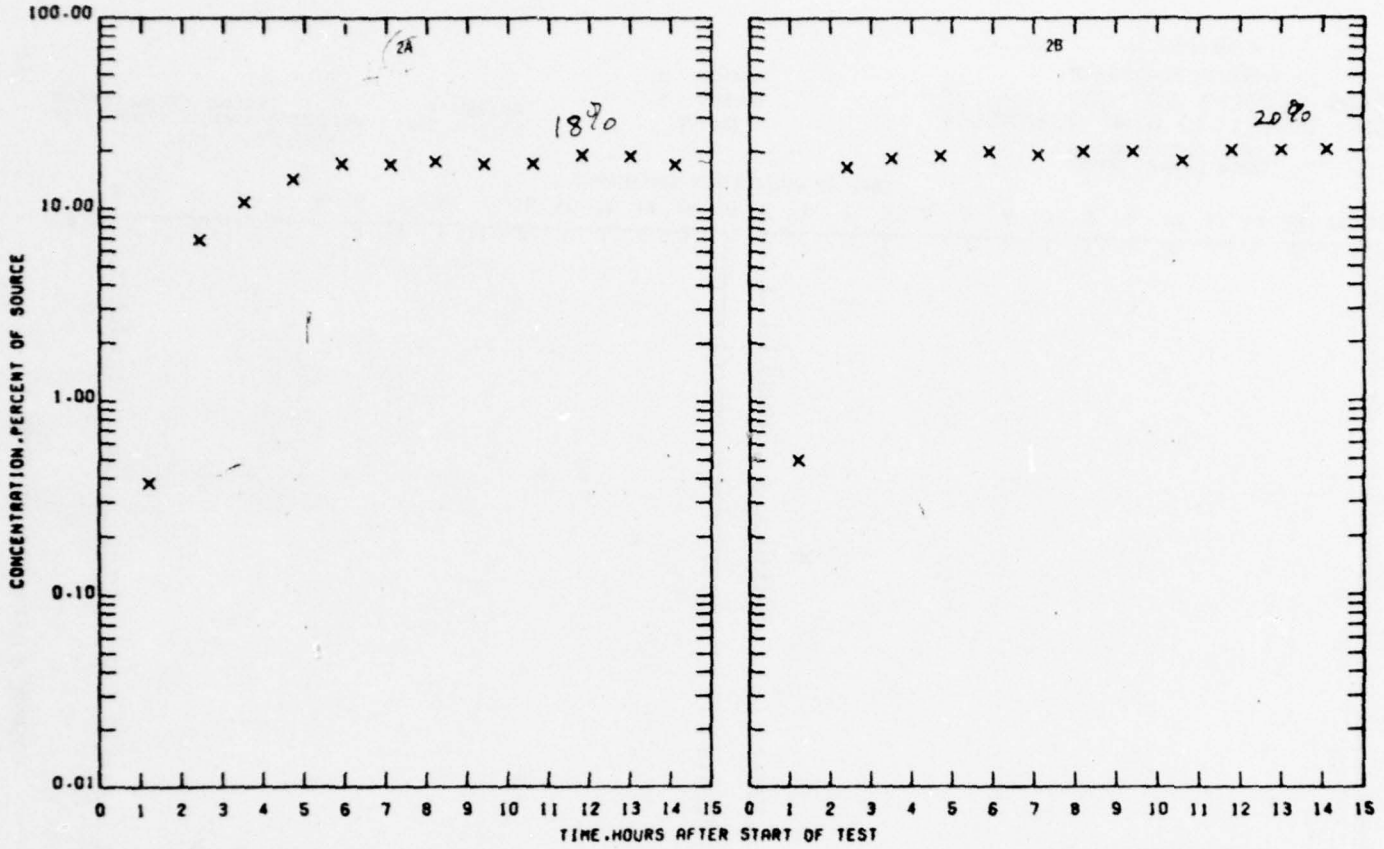
STATION
8Y

LEGEND

BASE ———
CM3D — — —
CM5D —·—

PLATE 3

PRELIMINARY DATA



TEST CONDITIONS

STILL WATER SURFACE ELEVATION +2.8 FT MLLW
SOURCE CONCENTRATION 3,400 PPB

LEGEND

\+ SURFACE
× BOTTOM

LA-LB HARBORS MODEL
LNG DISCHARGE STUDY

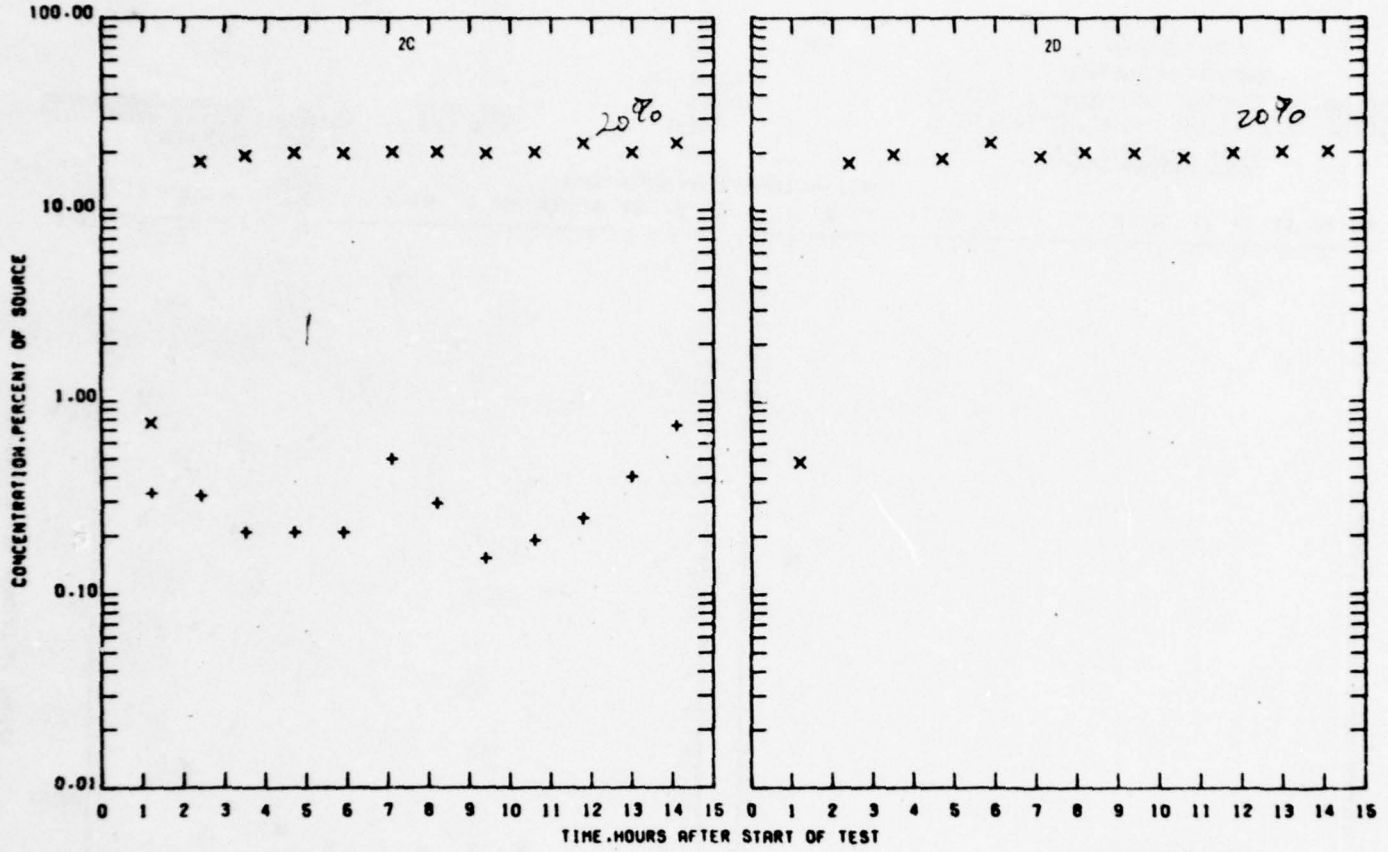
DISCHARGE INTO SECTIONAL MODEL OF SLIP 302, LOS ANGELES HARBOR

87,000 GPM LNG DISCHARGE

STATIONS 2A AND 2B

PRELIMINARY DATA

PLATE 11



TEST CONDITIONS

STILL WATER SURFACE ELEVATION +2.8 FT MLLW

SOURCE CONCENTRATION 3,400 PPB

LEGEND

\+ SURFACE

× BOTTOM

LA-LB HARBORS MODEL
LNG DISCHARGE STUDY

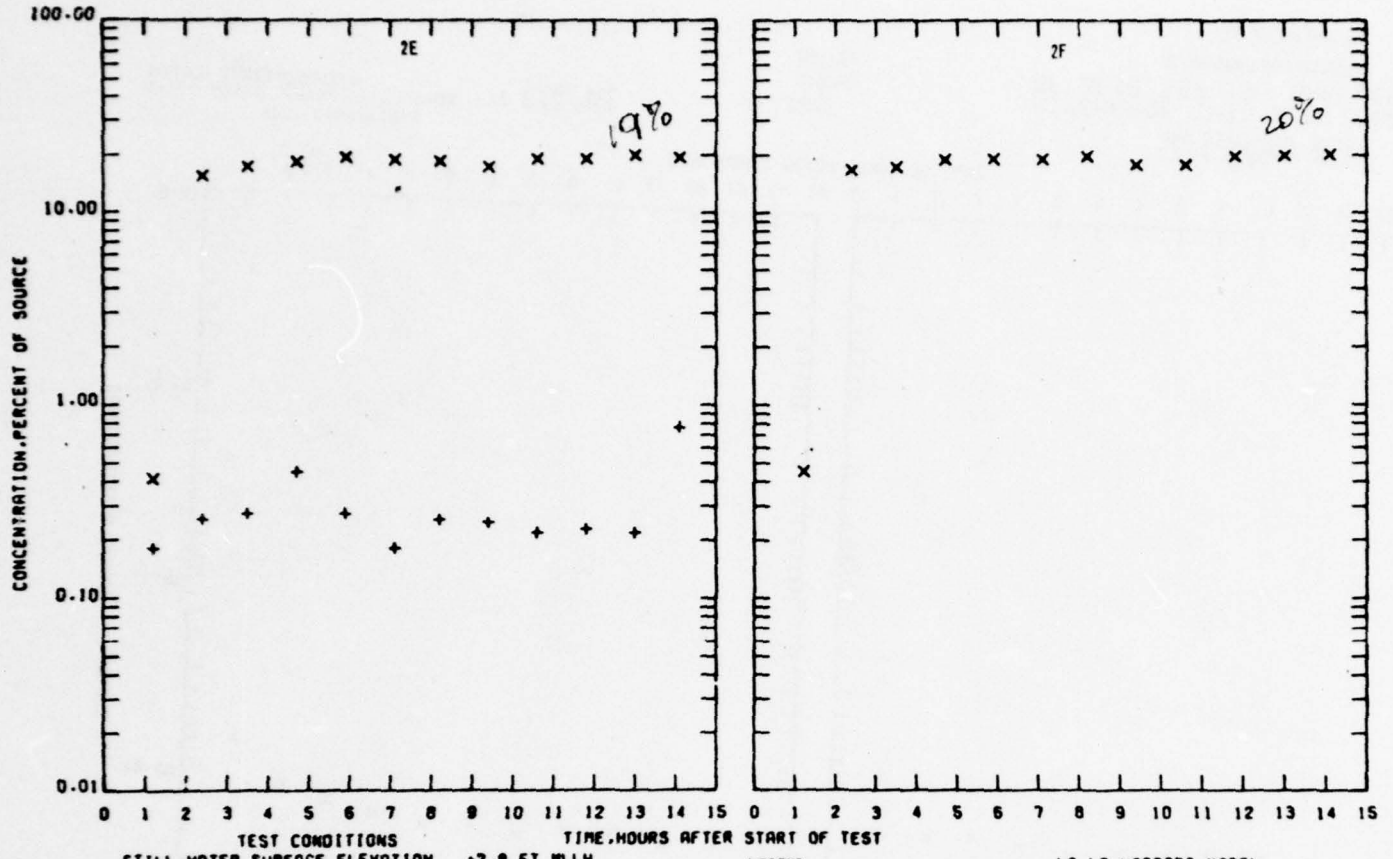
DISCHARGE INTO SECTIONAL MODEL OF SLIP 302, LOS ANGELES HARBOR

87,000 GPM LNG DISCHARGE

STATIONS 2C AND 2D

PRELIMINARY DATA

PLATE L2



TEST CONDITIONS
STILL WATER SURFACE ELEVATION +2.8 FT MLLW
SOURCE CONCENTRATION 3,400 PPB

LEGEND
+ SURFACE
X BOTTOM

LA-LB HARBORS MODEL
LNG DISCHARGE STUDY

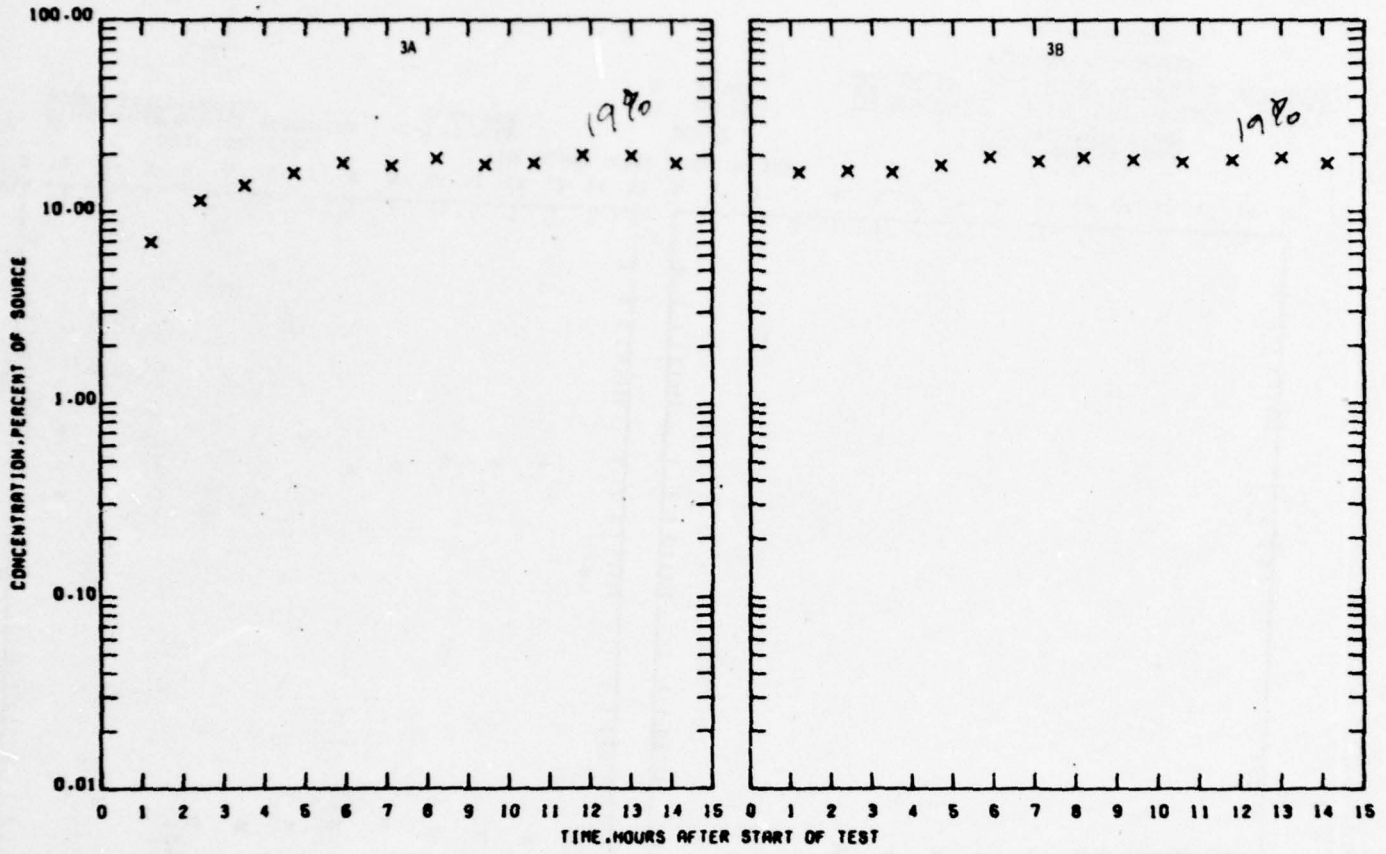
DISCHARGE INTO SECTIONAL MODEL OF SLIP 302, LOS ANGELES HARBOR

87,000 GPM LNG DISCHARGE

STATIONS 2E AND 2F

PRELIMINARY DATA

PLATE E3



TEST CONDITIONS

STILL WATER SURFACE ELEVATION +2.8 FT MLLW
SOURCE CONCENTRATION 3,400 PPB

LEGEND

\+ SURFACE
X BOTTOM

LA-LB HARBORS MODEL
LNG DISCHARGE STUDY

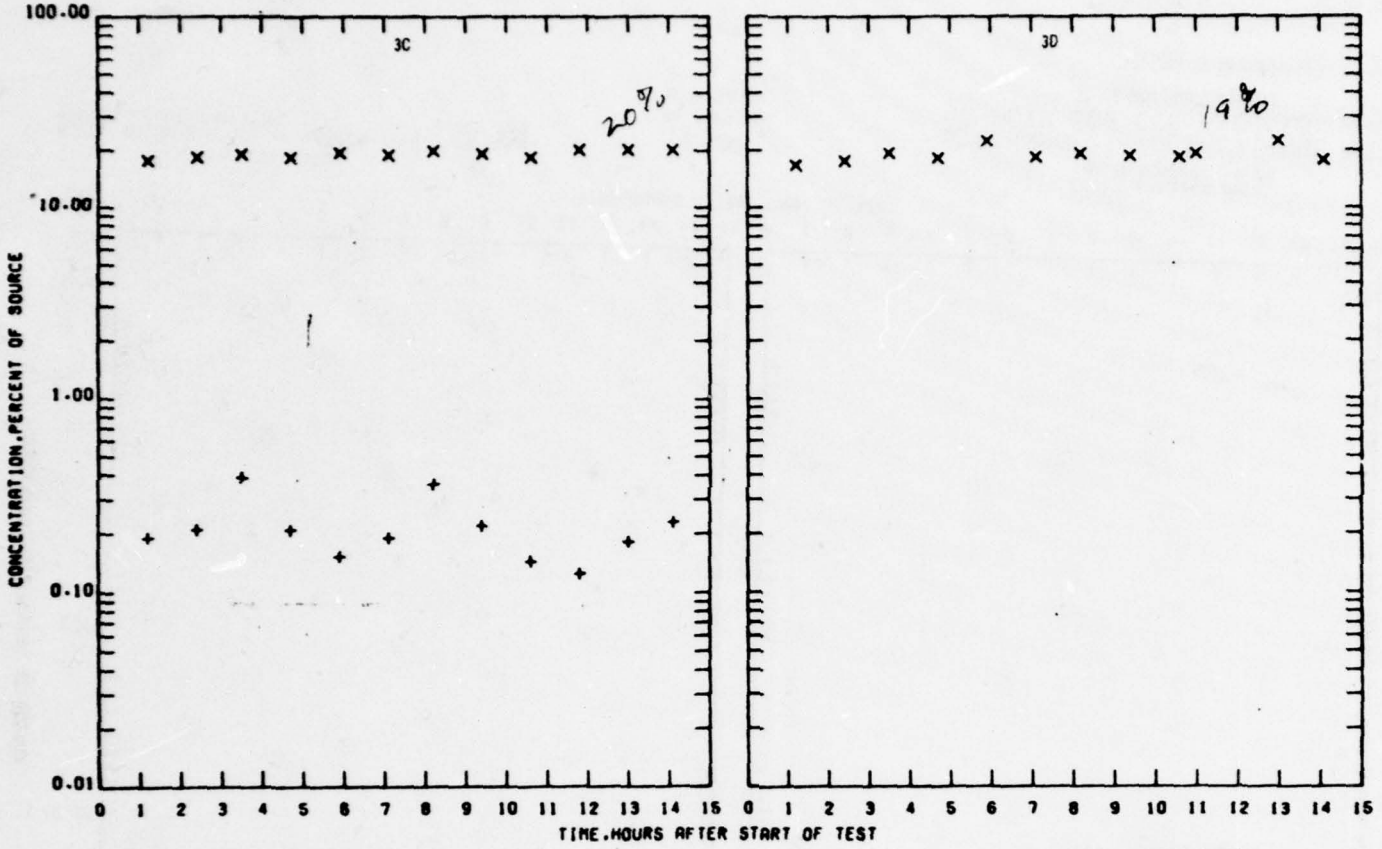
DISCHARGE INTO SECTIONAL MODEL OF SLIP 302, LOS ANGELES HARBOR

87,000 GPM LNG DISCHARGE

STATIONS 3A AND 3B

PRELIMINARY DATA

PLATE E-



TEST CONDITIONS
STILL WATER SURFACE ELEVATION +2.8 FT MLLW
SOURCE CONCENTRATION 3,400 PPB

LEGEND
+ SURFACE
× BOTTOM

LA-LB HARBORS MODEL
LNG DISCHARGE STUDY

DISCHARGE INTO SECTIONAL MODEL
OF SLIP 302, LOS ANGELES HARBOR
87,000 GPM LNG DISCHARGE
STATIONS 3C AND 3D

PRELIMINARY DATA

PLATE 13

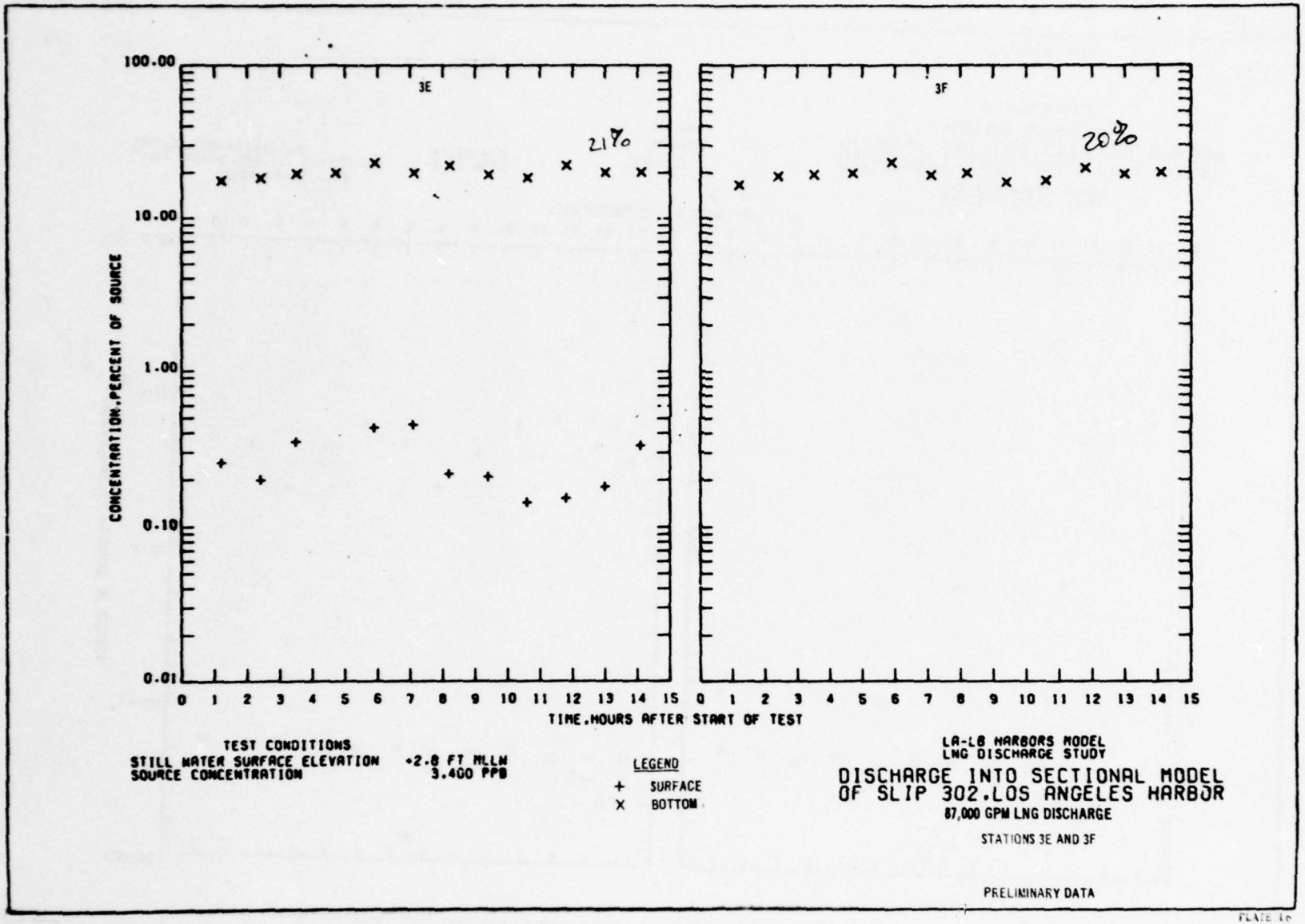
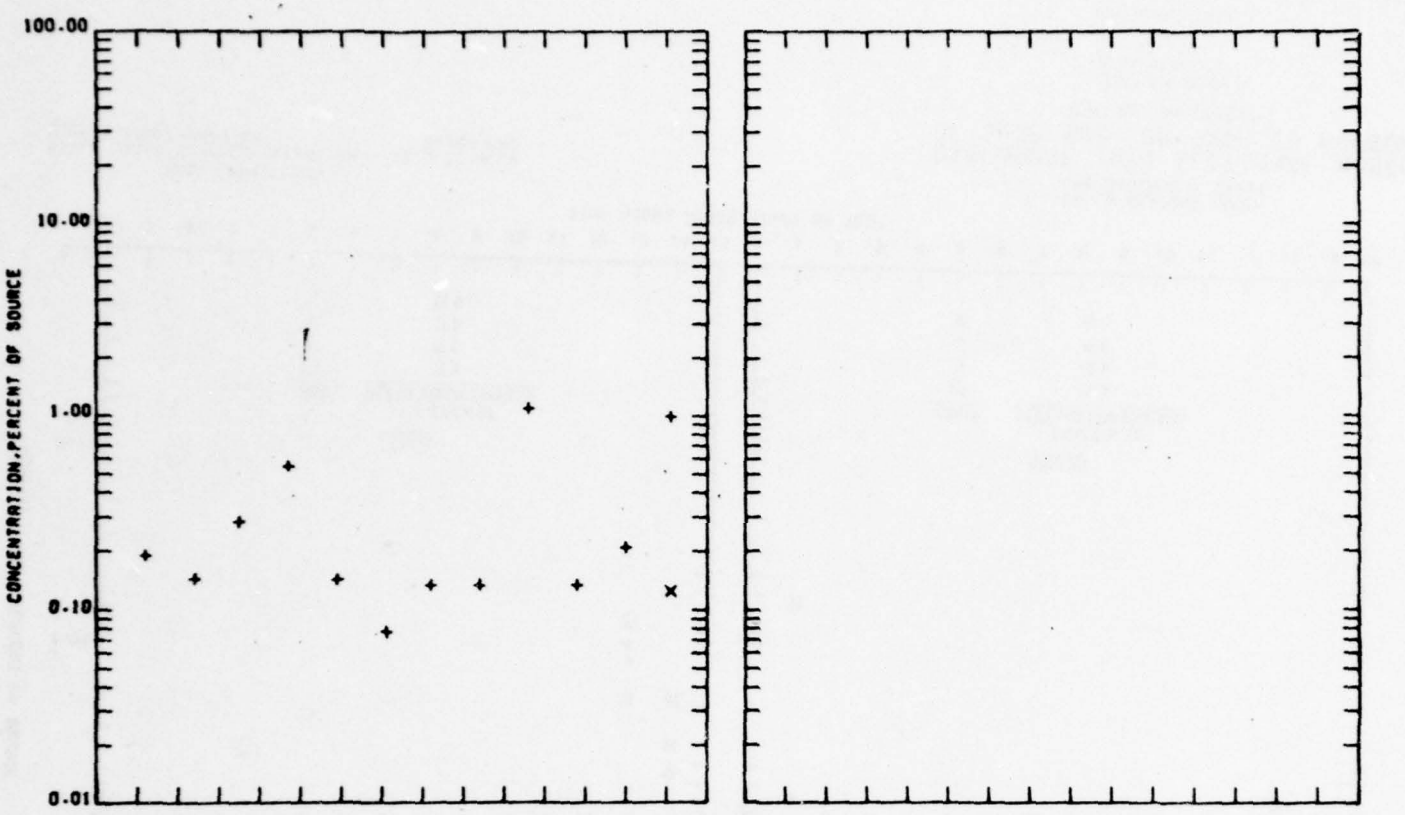

100.00
10.00
1.00
0.10
0.01
CONCENTRATION, PERCENT OF SOURCE
3E
3F
21%
20%
0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15
TIME, HOURS AFTER START OF TEST
TEST CONDITIONS
STILL WATER SURFACE ELEVATION +2.8 FT MLLW
SOURCE CONCENTRATION 3,400 PPB
LEGEND
+ SURFACE
X BOTTOM
LA-LB HARBORS MODEL
LNG DISCHARGE STUDY
DISCHARGE INTO SECTIONAL MODEL
OF SLIP 302, LOS ANGELES HARBOR
87,000 GPM LNG DISCHARGE
STATIONS 3E AND 3F
PRELIMINARY DATA

PLATE 16



TEST CONDITIONS
STILL WATER SURFACE ELEVATION +2.8 FT MLLW
SOURCE CONCENTRATION 3,400 PPB

LEGEND
+ SURFACE
X BOTTOM

LA-LB HARBORS MODEL
LNG DISCHARGE STUDY

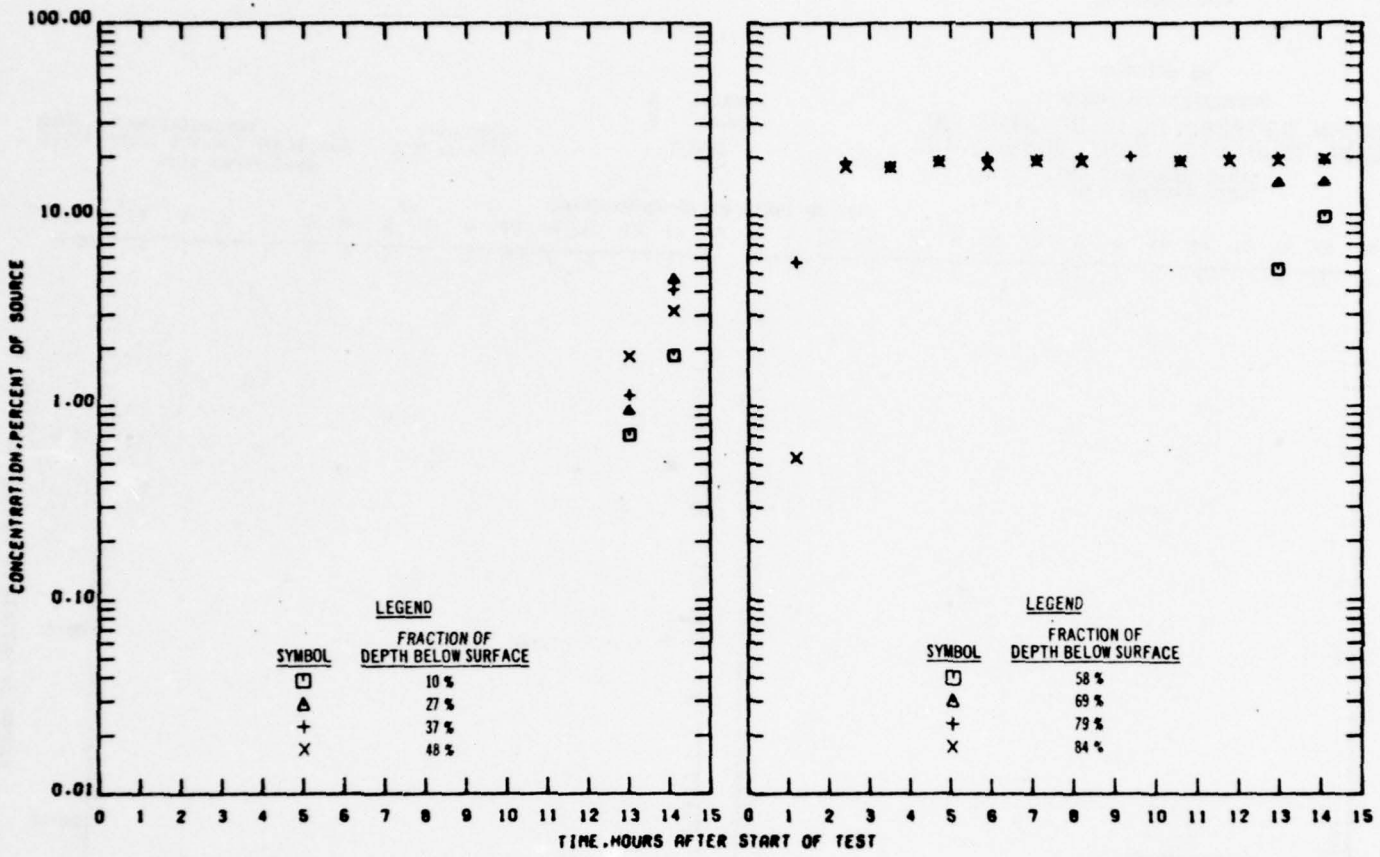
DISCHARGE INTO SECTIONAL MODEL
OF SLIP 302, LOS ANGELES HARBOR

87,000 GPM LNG DISCHARGE

STATION 8W

PRELIMINARY DATA

PLATE 1



TEST CONDITIONS

STILL WATER SURFACE ELEVATION +2.8 FT MLLW

SOURCE CONCENTRATION 3,400 PPB

LA-LB HARBORS MODEL
LNG DISCHARGE STUDY

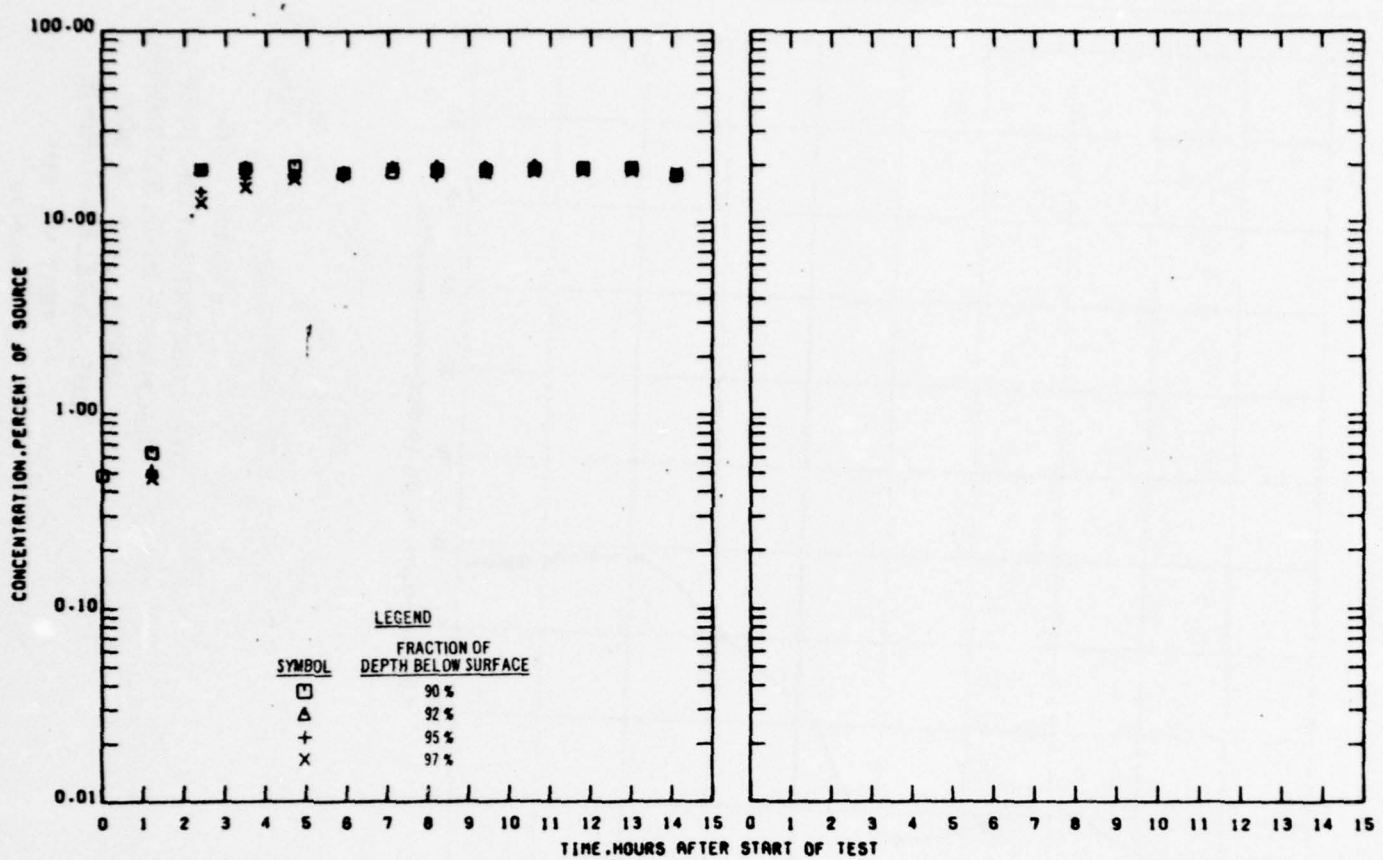
DISCHARGE INTO SECTIONAL MODEL OF SLIP 302, LOS ANGELES HARBOR

87,000 GPM LNG DISCHARGE

STATION 2D PROFILES
10-84% OF DEPTH

PRELIMINARY DATA

PLATE L8



TEST CONDITIONS

STILL WATER SURFACE ELEVATION +2.8 FT MLLW

SOURCE CONCENTRATION 3,400 PPB

LA-LB HARBORS MODEL
LNG DISCHARGE STUDY

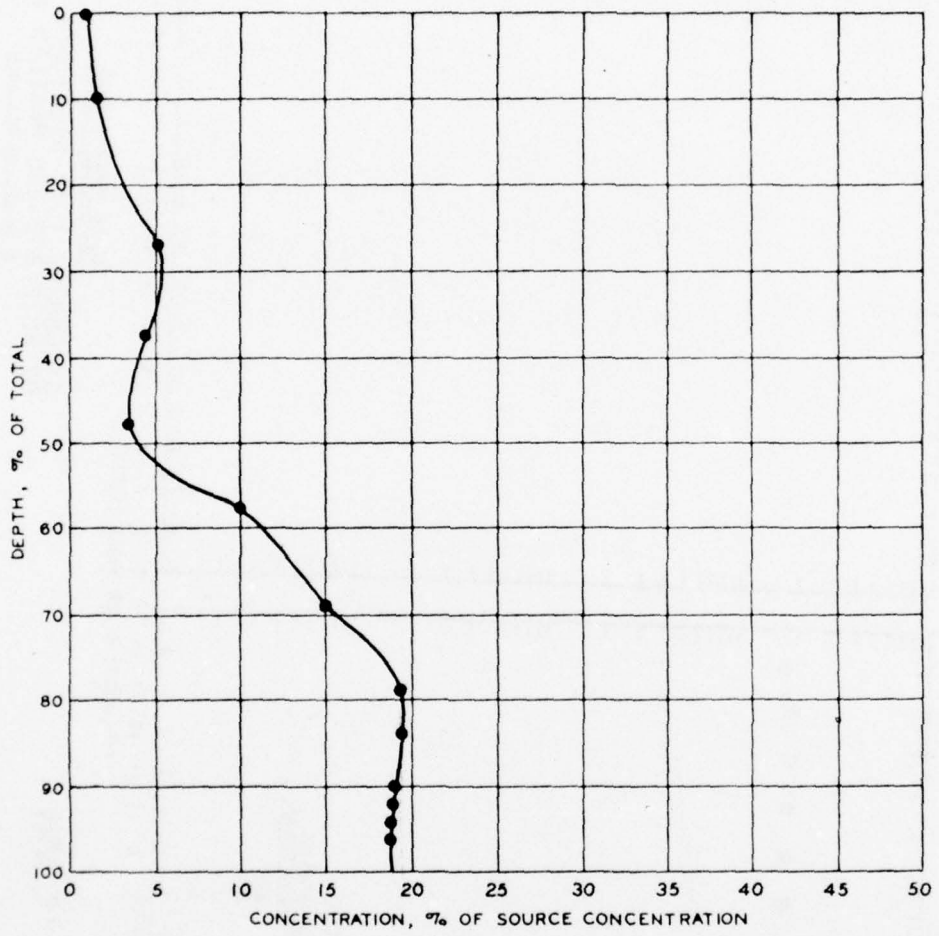
DISCHARGE INTO SECTIONAL MODEL OF SLIP 302, LOS ANGELES HARBOR

67,000 GPM LNG DISCHARGE

STATION 2D PROFILES
90-97% OF DEPTH

PRELIMINARY DATA

PLATE L9



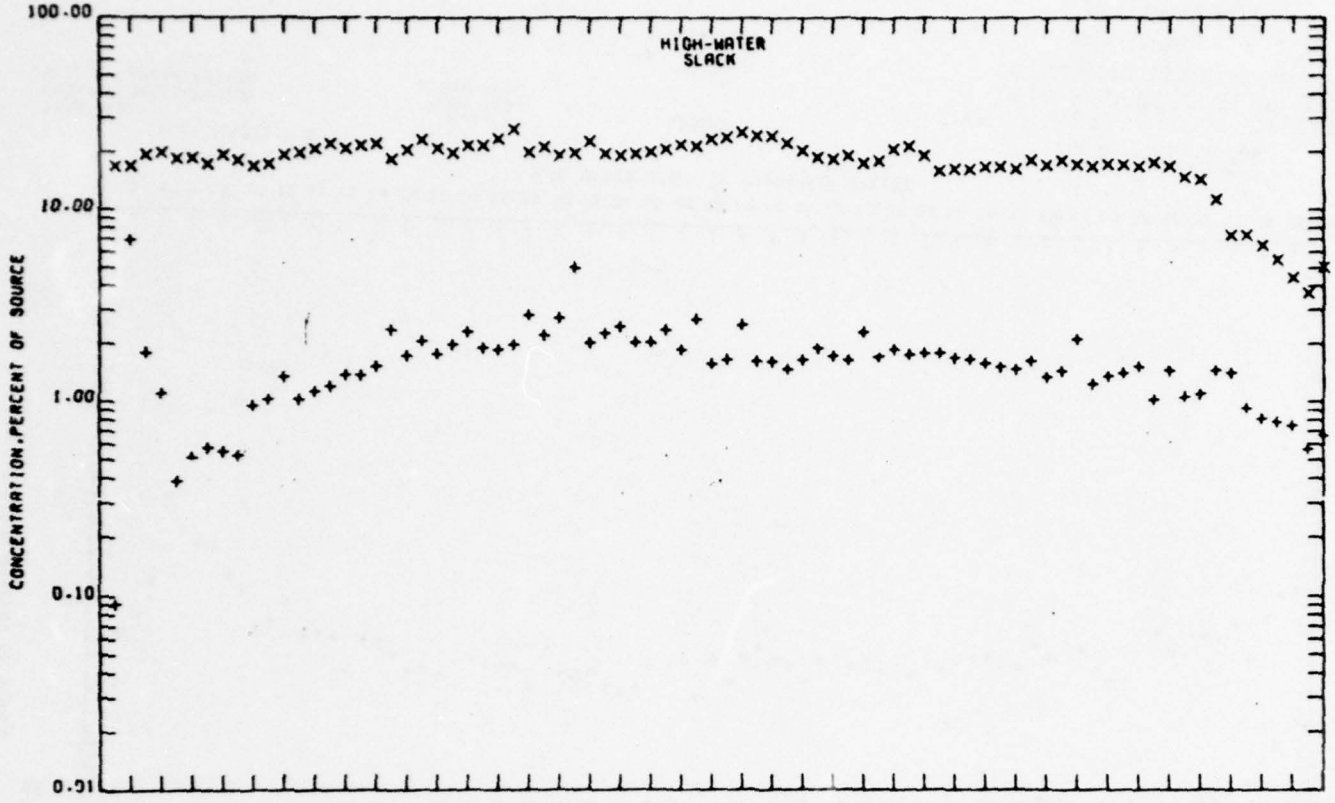
LA - LB HARBORS MODEL

DYE CONCENTRATION PROFILE
DISCHARGE INTO SECTIONAL
MODEL OF SLIP 302,
LOS ANGELES HARBOR

TEST NO. SM5

STATION 2D

PLATE L 9 A



TEST CONDITIONS

TIDE RANGE	5.4 FT
HARBOR CONFIGURATION	PLAN 1A3
SOURCE CONCENTRATION	6,740 PPB

LEGEND

+ —·— SURFACE
× ---- BOTTOM

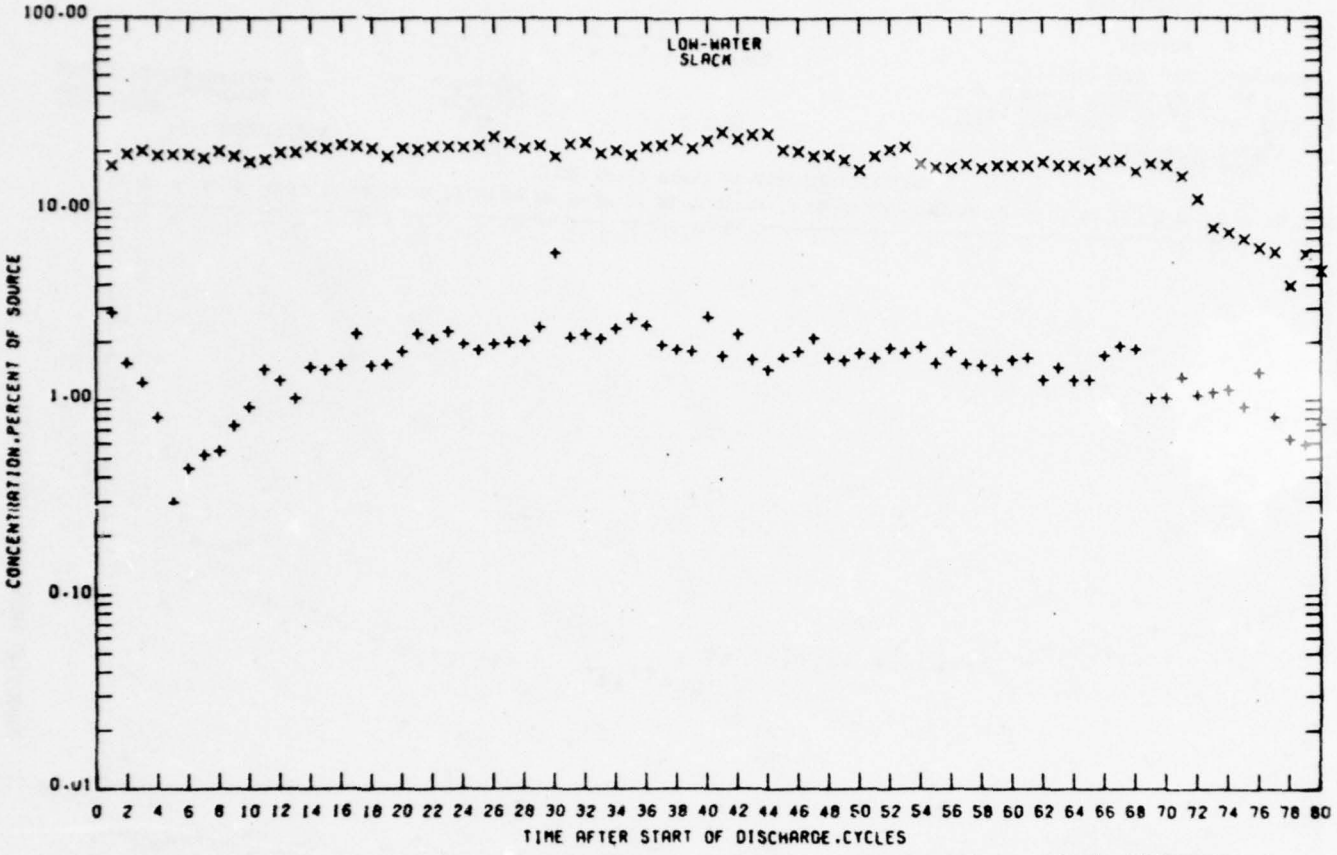
LA-LB HARBORS MODEL
LNG DISCHARGE STUDY

DYE TRACER TEST OF DISCHARGE
INTO PROPOSED SLIP 302
87,000 GPM LNG DISCHARGE

STATION 1

PRELIMINARY DATA

PLATE [illegible]



TEST CONDITIONS

TIDE RANGE	5.4 FT
HARBOR CONFIGURATION	PLAN 1A3
SOURCE CONCENTRATION	6,740 PPB

LEGEND

+ —·— SURFACE
× —··— BOTTOM

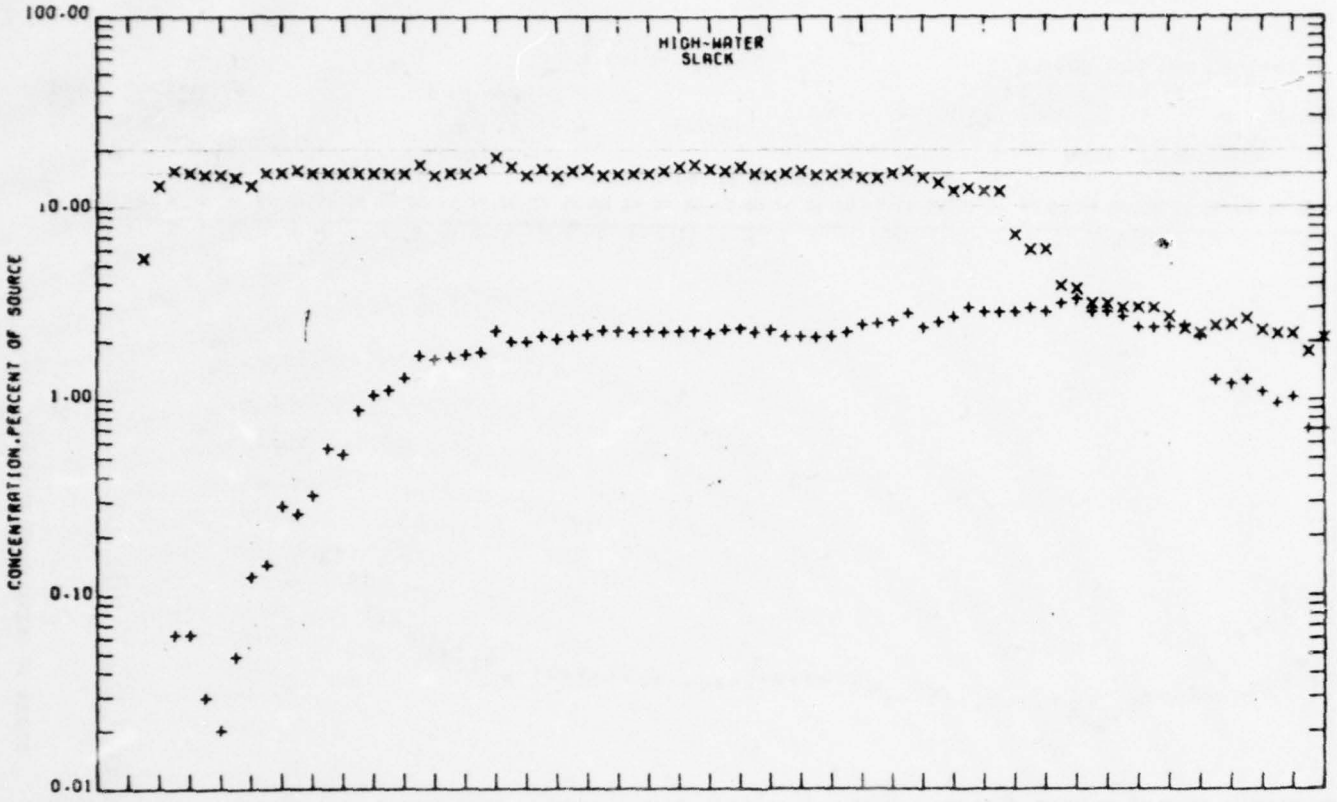
LA-LB HARBORS MODEL
LNG DISCHARGE STUDY

DYE TRACER TEST OF DISCHARGE
INTO PROPOSED SLIP 302
87,000 GPM LNG DISCHARGE

STATION 1

PRELIMINARY DATA

PLATE L11



TEST CONDITIONS

TIDE RANGE	5.4 FT
HARBOR CONFIGURATION	PLAN 1A3
SOURCE CONCENTRATION	6,740 PPB

LEGEND

+ —·— SURFACE
× — — — BOTTOM

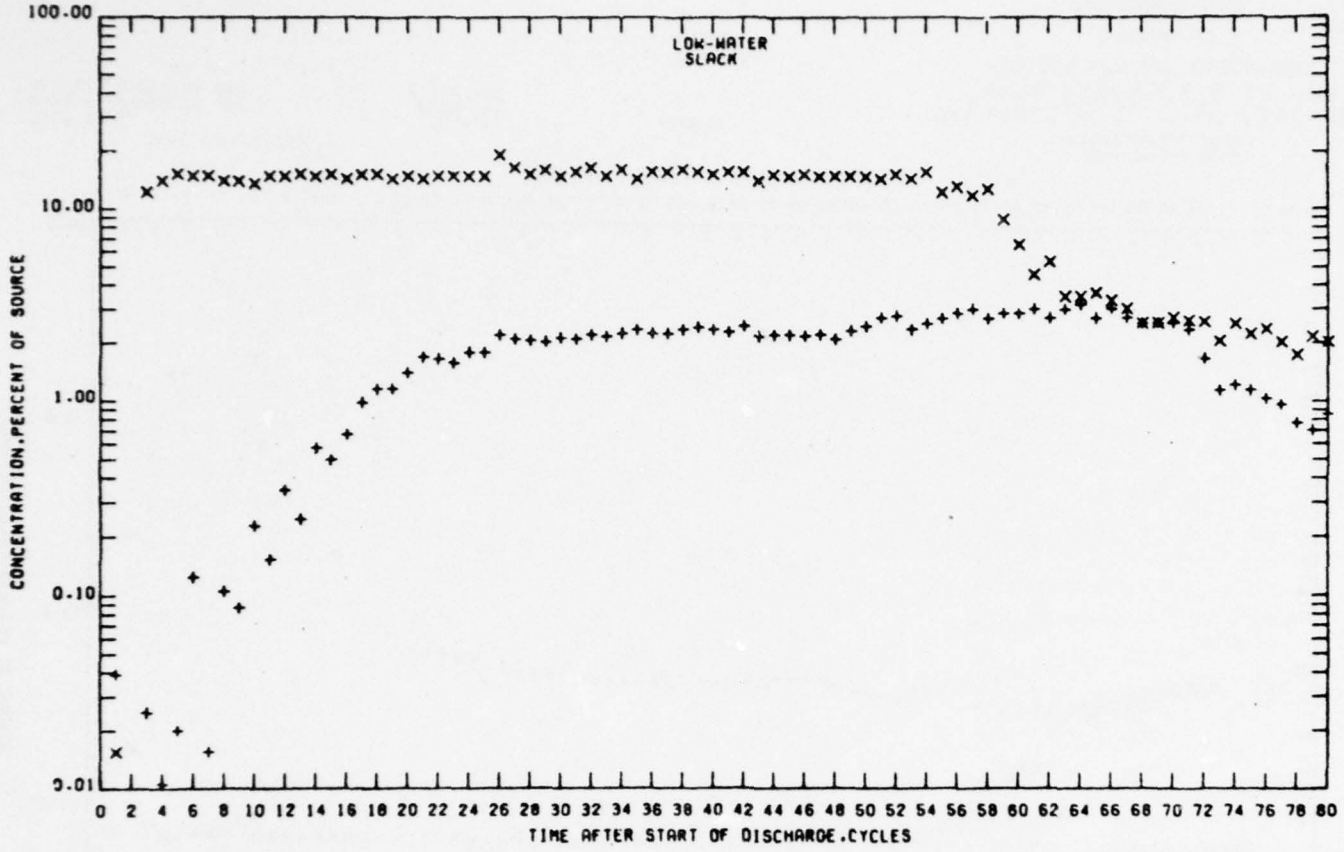
LA-LB HARBORS MODEL
LNG DISCHARGE STUDY

DYE TRACER TEST OF DISCHARGE
INTO PROPOSED SLIP 302
87,000 GPM LNG DISCHARGE

STATION 2

PRELIMINARY DATA

PLATE L12



TEST CONDITIONS

TIDE RANGE	5.4 FT
HARBOR CONFIGURATION	PLAN 1A3
SOURCE CONCENTRATION	6.740 PPB

LEGEND

+ —·— SURFACE

× —··— BOTTOM

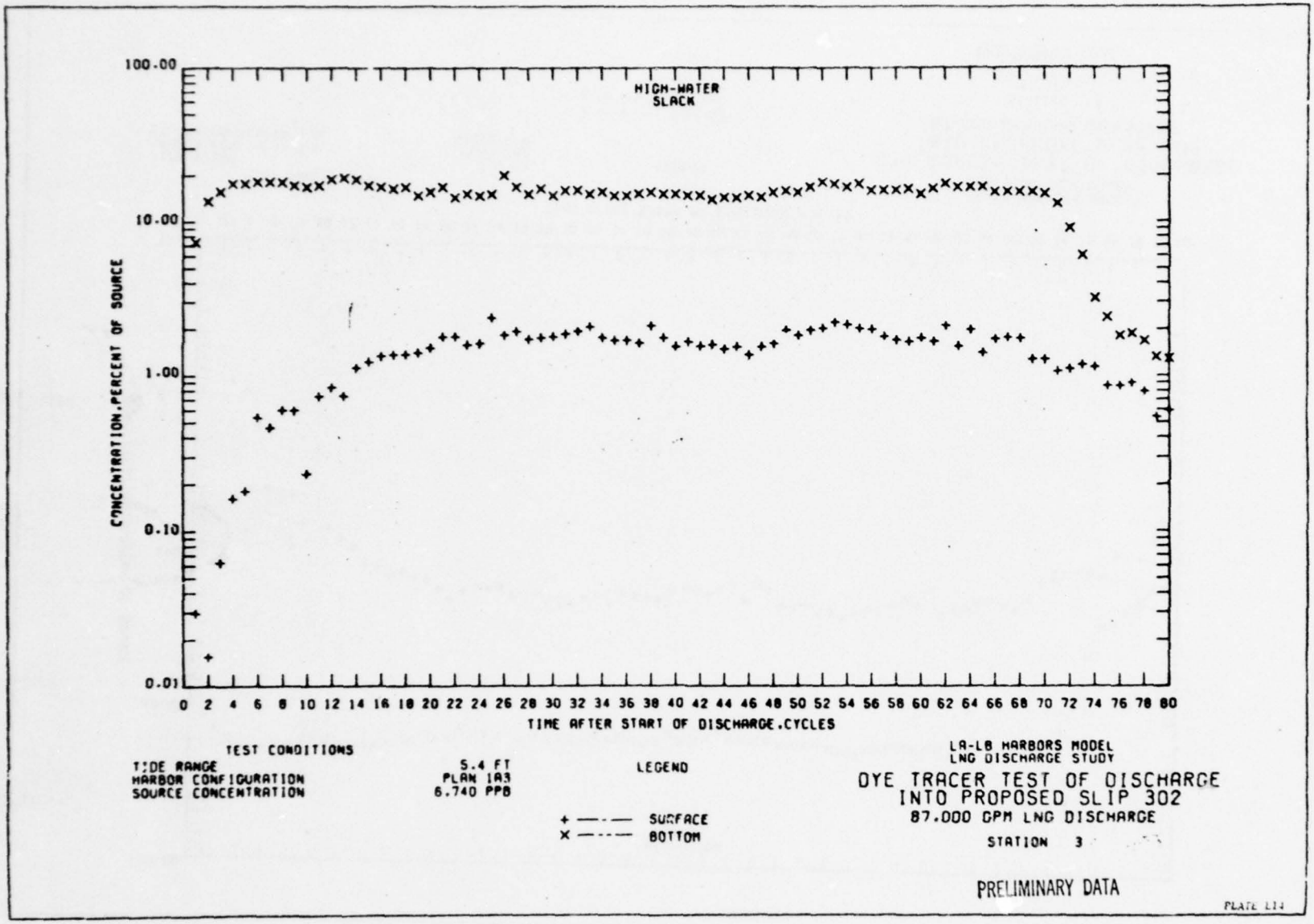
LA-LB HARBORS MODEL
LNG DISCHARGE STUDY

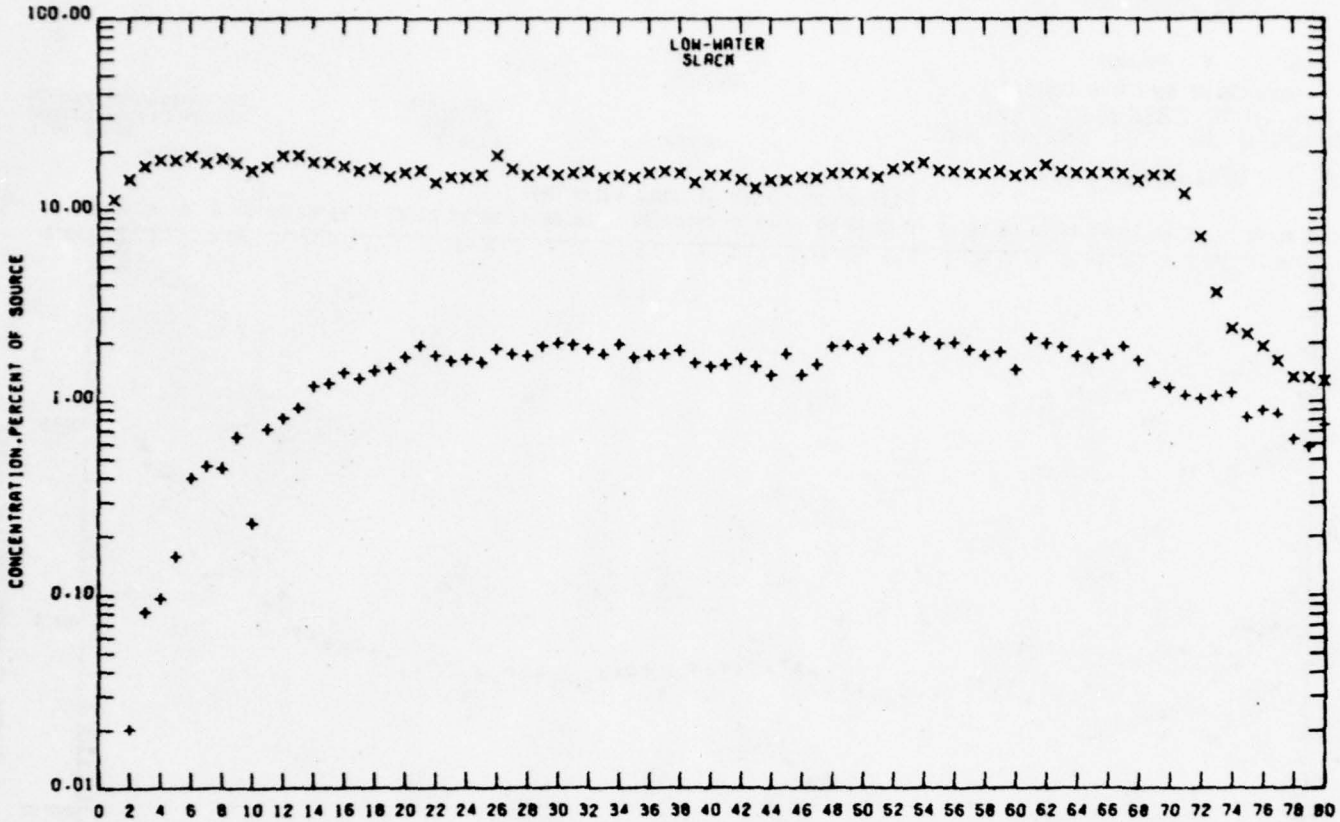
DYE TRACER TEST OF DISCHARGE
INTO PROPOSED SLIP 302
87,000 GPM LNG DISCHARGE

STATION 2

PRELIMINARY DATA

PLATE L13


HIGH-WATER SLACK
100.00
10.00
1.00
0.10
0.01
CONCENTRATION, PERCENT OF SOURCE
0 2 4 6 8 10 12 14 16 18 20 22 24 26 28 30 32 34 36 38 40 42 44 46 48 50 52 54 56 58 60 62 64 66 68 70 72 74 76 78 80
TIME AFTER START OF DISCHARGE, CYCLES
TEST CONDITIONS
TIDE RANGE 5.4 FT
HARBOR CONFIGURATION PLAN 1A3
SOURCE CONCENTRATION 6,740 PPB
LEGEND
SURFACE
BOTTOM
LA-LB HARBORS MODEL
LNG DISCHARGE STUDY
DYE TRACER TEST OF DISCHARGE
INTO PROPOSED SLIP 302
87,000 GPM LNG DISCHARGE
STATION 3
PRELIMINARY DATA
PLATE L14



TEST CONDITIONS

TIDE RANGE	5.4 FT
HARBOR CONFIGURATION	PLAN 1A3
SOURCE CONCENTRATION	6,740 PPB

LEGEND

+ —·— SURFACE
× —··— BOTTOM

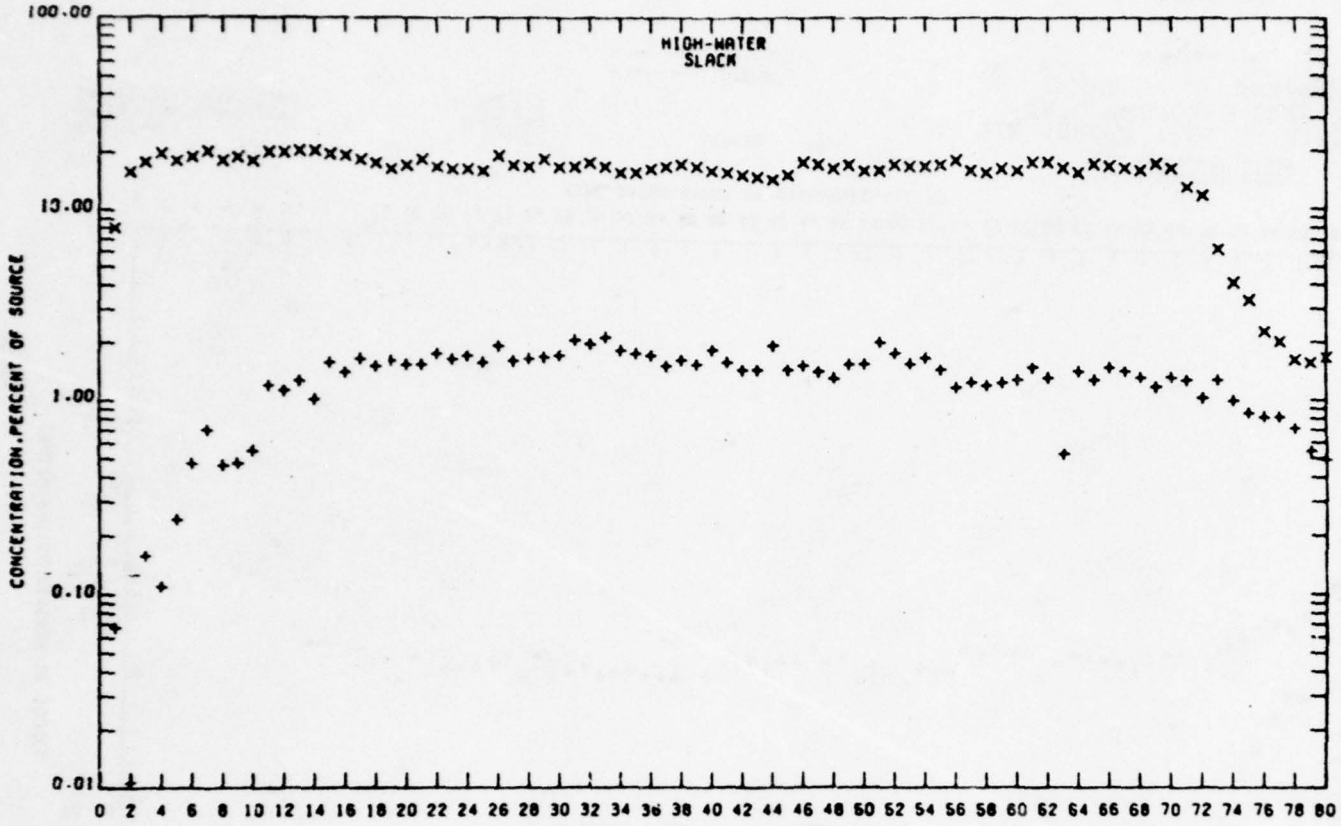
LA-LB HARBORS MODEL
LNG DISCHARGE STUDY

DYE TRACER TEST OF DISCHARGE
INTO PROPOSED SLIP 302
87,000 GPM LNG DISCHARGE

STATION 3

PRELIMINARY DATA

PLATE L15



TEST CONDITIONS

TIDE RANGE	5.4 FT
HARBOR CONFIGURATION	PLAN 1A3
SOURCE CONCENTRATION	6,740 PPB

LEGEND

+ —·— SURFACE

× —·— BOTTOM

LA-LB HARBORS MODEL
LNG DISCHARGE STUDY

DYE TRACER TEST OF DISCHARGE
INTO PROPOSED SLIP 302
87,000 GPM LNG DISCHARGE

STATION 4

PRELIMINARY DATA

PLATE L1o

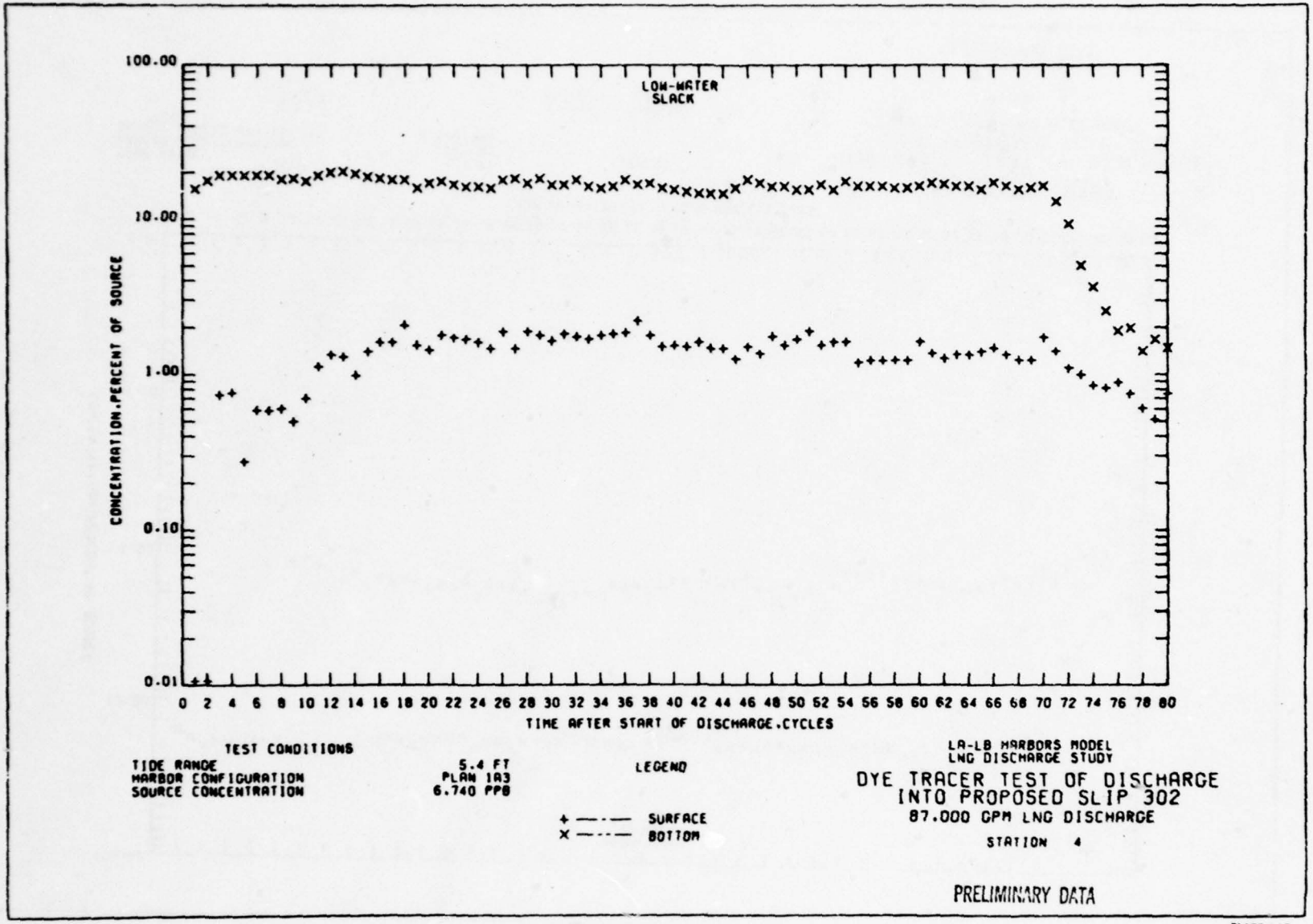

100.00
10.00
1.00
0.10
0.01
LOW-WATER
SLACK
CONCENTRATION, PERCENT OF SOURCE
0 2 4 6 8 10 12 14 16 18 20 22 24 26 28 30 32 34 36 38 40 42 44 46 48 50 52 54 56 58 60 62 64 66 68 70 72 74 76 78 80
TIME AFTER START OF DISCHARGE, CYCLES
TEST CONDITIONS
TIDE RANGE 5.4 FT
HARBOR CONFIGURATION PLAN 1A3
SOURCE CONCENTRATION 6.740 PPB
LEGEND
SURFACE
BOTTOM
LA-LB HARBORS MODEL
LNG DISCHARGE STUDY
DYE TRACER TEST OF DISCHARGE
INTO PROPOSED SLIP 302
87,000 GPM LNG DISCHARGE
STATION 4
PRELIMINARY DATA

PLATE L1

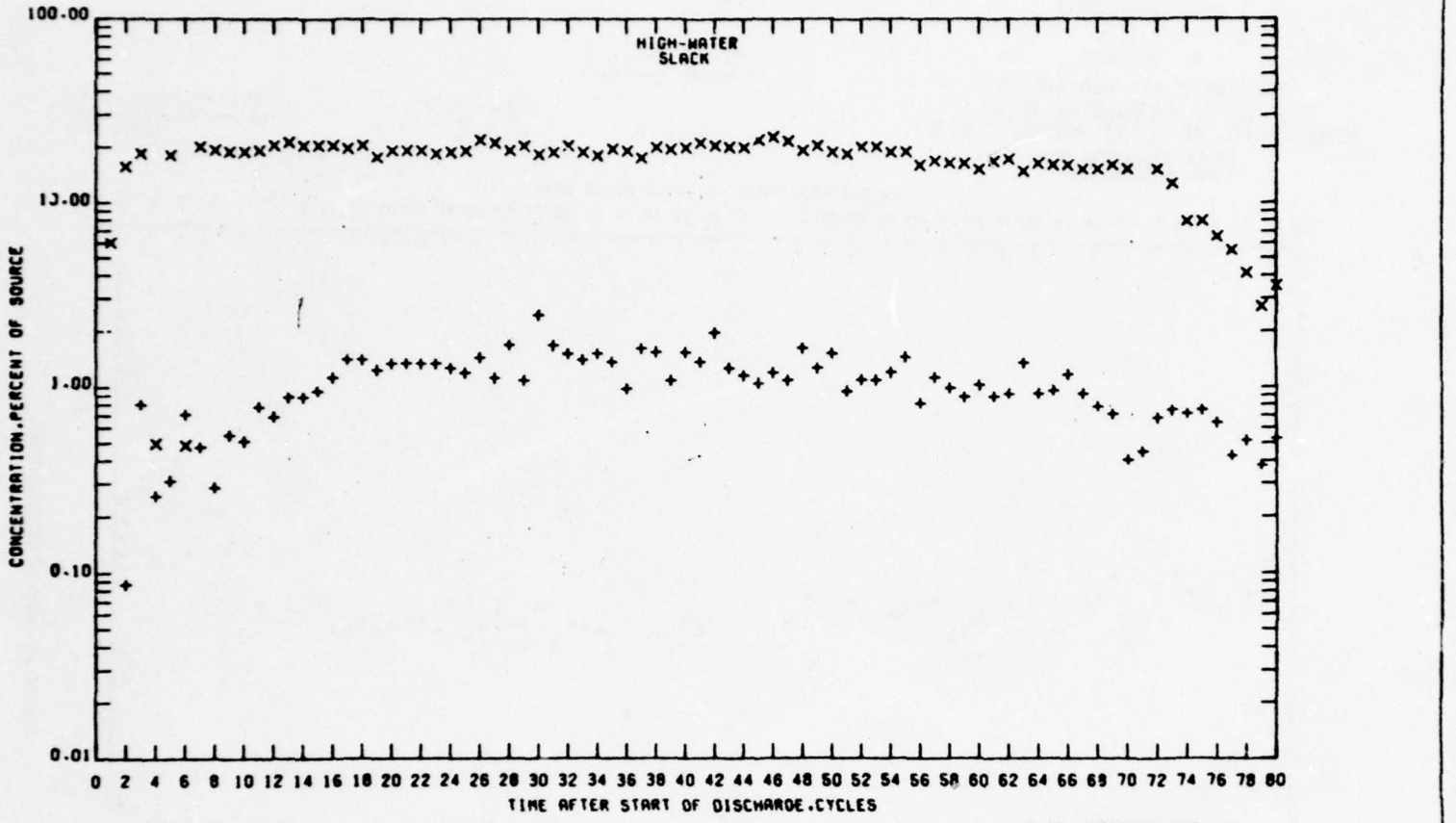
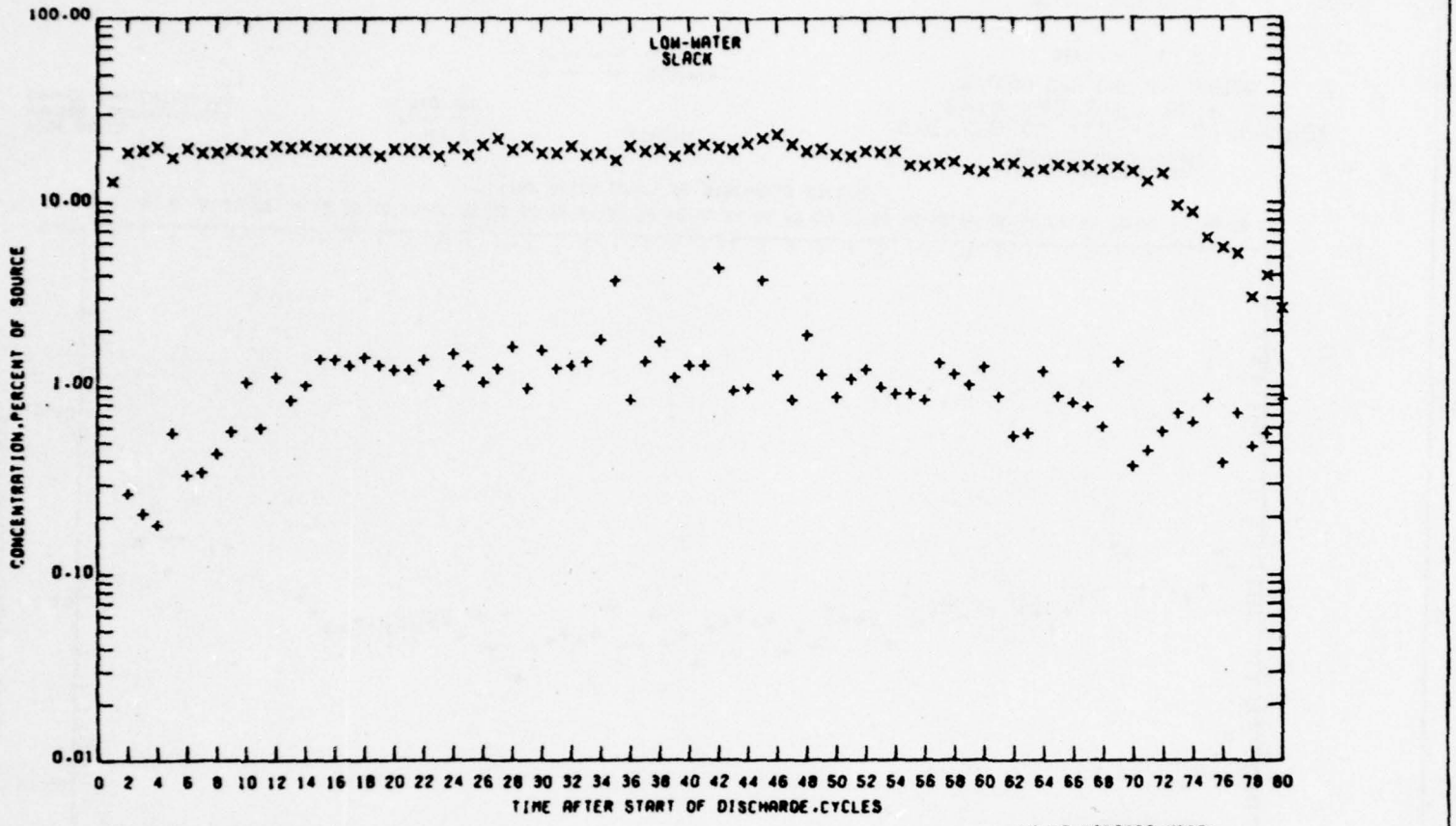

HIGH-WATER
SLACK
100.00
10.00
1.00
0.10
0.01
CONCENTRATION,PERCENT OF SOURCE
0 2 4 6 8 10 12 14 16 18 20 22 24 26 28 30 32 34 36 38 40 42 44 46 48 50 52 54 56 58 60 62 64 66 68 70 72 74 76 78 80
TIME AFTER START OF DISCHARGE,CYCLES
TEST CONDITIONS
TIDE RANGE 5.4 FT
HARBOR CONFIGURATION PLAN 1A3
SOURCE CONCENTRATION 6.740 PPB
LEGEND
+ —·— SURFACE
× —··— BOTTOM
LA-LB HARBORS MODEL
LNG DISCHARGE STUDY
DYE TRACER TEST OF DISCHARGE
INTO PROPOSED SLIP 302
87,000 GPM LNG DISCHARGE
STATION 5
PRELIMINARY DATA

PLATE E15



TEST CONDITIONS

TIDE RANGE	5.4 FT
HARBOR CONFIGURATION	PLAN 1A3
SOURCE CONCENTRATION	6,740 PPB

LEGEND

+ —·— SURFACE
× —·— BOTTOM

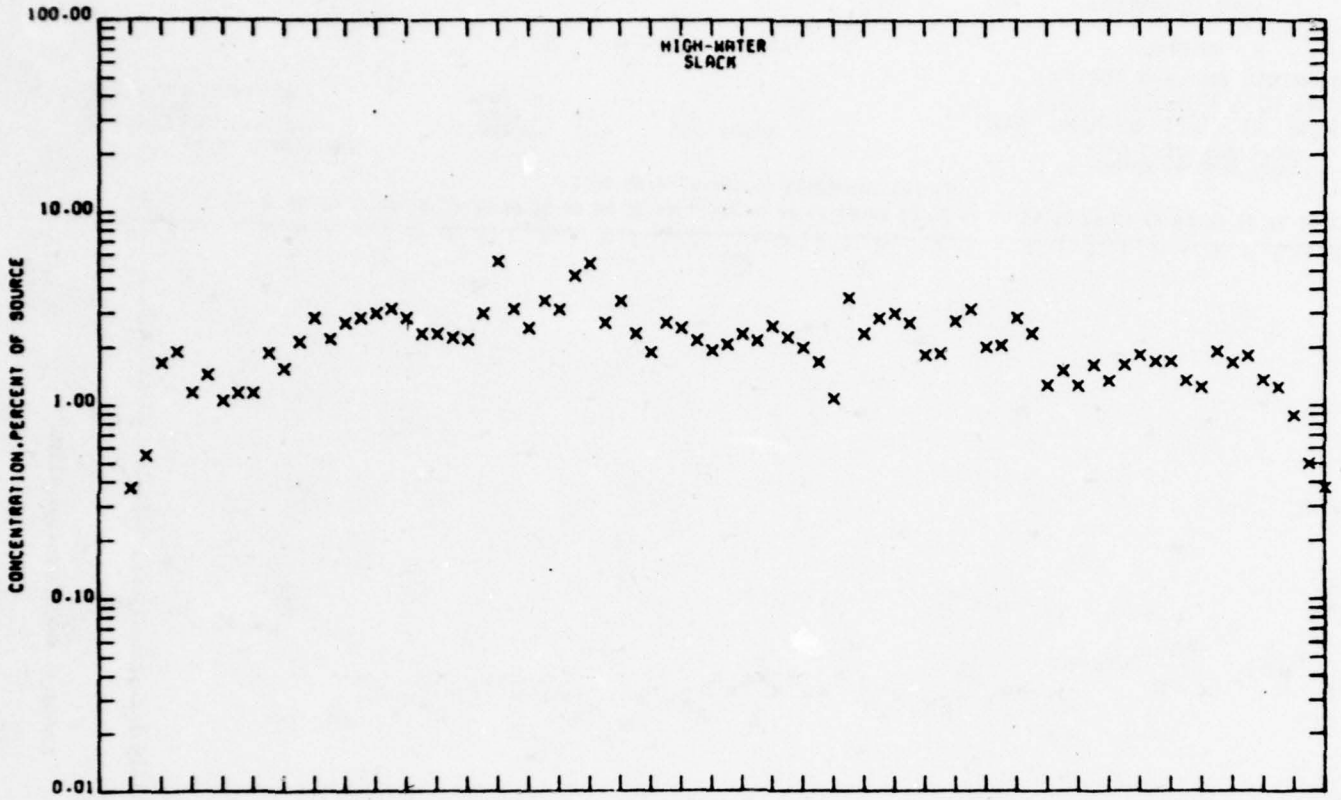
LA-LB HARBORS MODEL
LNG DISCHARGE STUDY

DYE TRACER TEST OF DISCHARGE
INTO PROPOSED SLIP 302
87,000 GPM LNG DISCHARGE

STATION 5

PRELIMINARY DATA

PLATE L19



TEST CONDITIONS

TIDE RANGE	5.4 FT
HARBOR CONFIGURATION	PLAN 1A3
SOURCE CONCENTRATION	6,740 PPB

LEGEND

× ---- BOTTOM

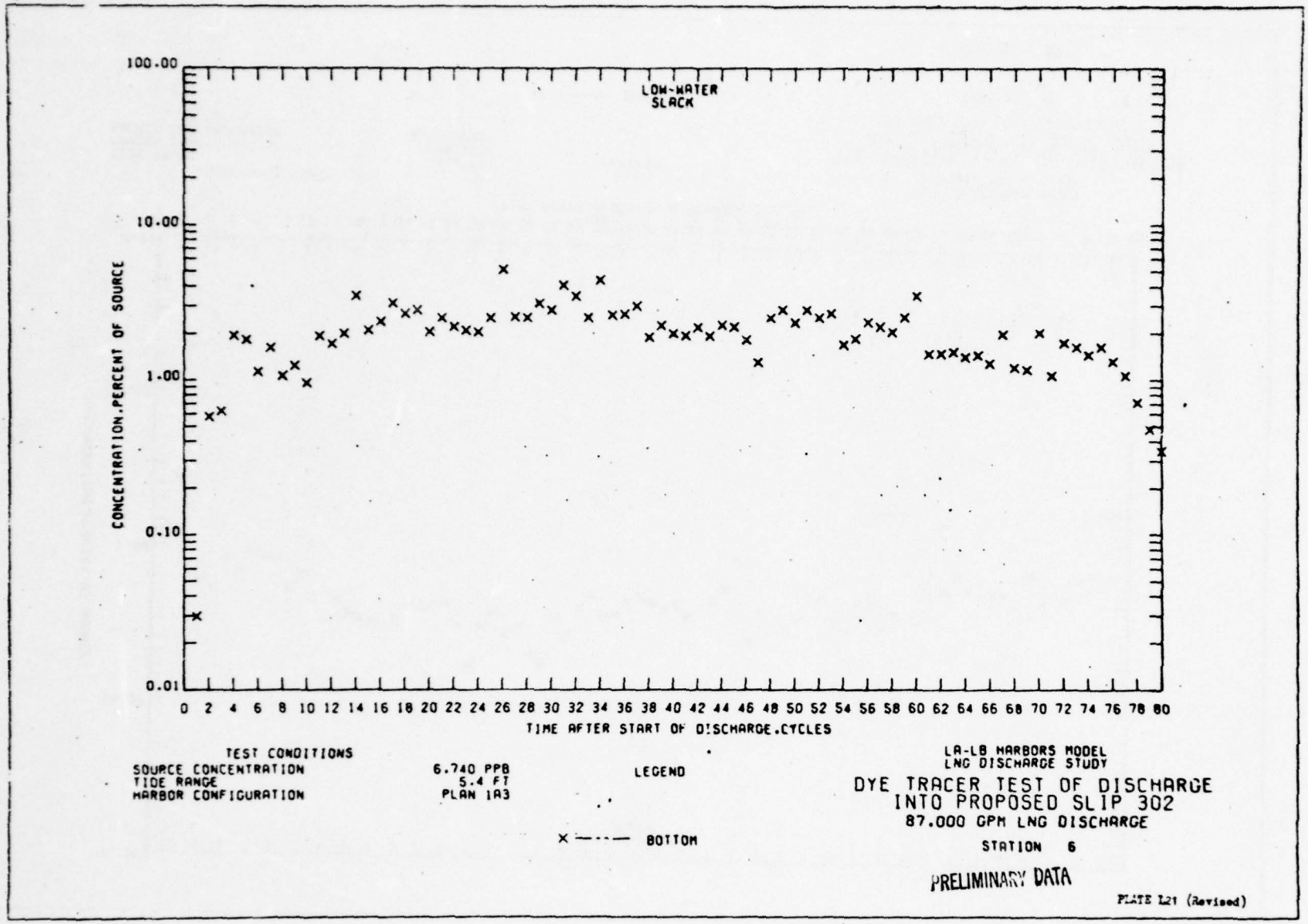
LA-LB HARBORS MODEL
LNG DISCHARGE STUDY

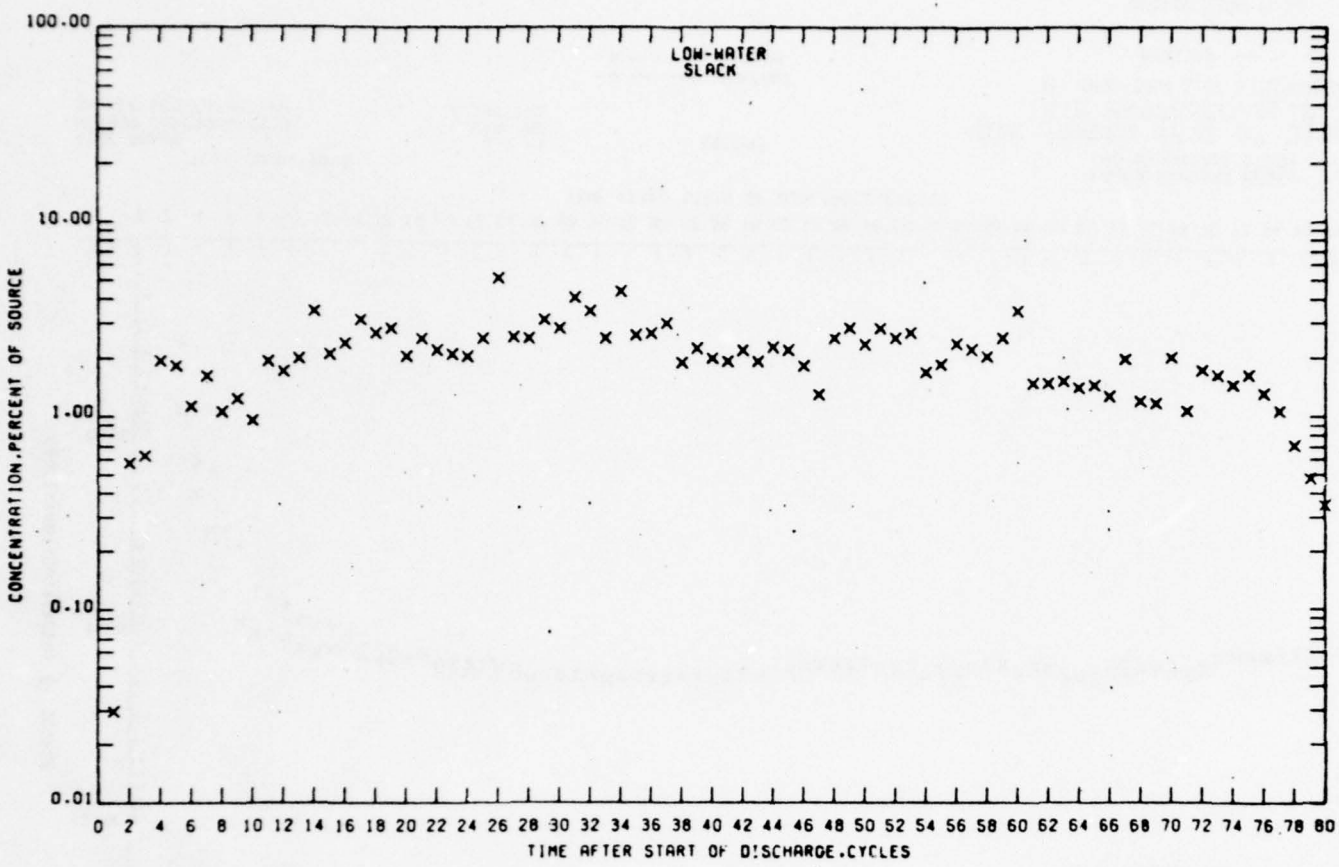
DYE TRACER TEST OF DISCHARGE
INTO PROPOSED SLIP 302
87,000 GPM LNG DISCHARGE

STATION 6

PRELIMINARY DATA

PLATE L20


100.00
10.00
1.00
0.10
0.01
LOW-WATER SLACK
CONCENTRATION, PERCENT OF SOURCE
0 2 4 6 8 10 12 14 16 18 20 22 24 26 28 30 32 34 36 38 40 42 44 46 48 50 52 54 56 58 60 62 64 66 68 70 72 74 76 78 80
TIME AFTER START OF DISCHARGE, CYCLES
TEST CONDITIONS
SOURCE CONCENTRATION 6,740 PPB
TIDE RANGE 5.4 FT
HARBOR CONFIGURATION PLAN 1A3
LEGEND
BOTTOM
LA-LB HARBORS MODEL
LNG DISCHARGE STUDY
DYE TRACER TEST OF DISCHARGE
INTO PROPOSED SLIP 302
87,000 GPM LNG DISCHARGE
STATION 6
PRELIMINARY DATA
PLATE L21 (Revised)



TEST CONDITIONS

SOURCE CONCENTRATION	6,740 PPB
TIDE RANGE	5.4 FT
HARBOR CONFIGURATION	PLAN 1A3

LEGEND

× —·—· BOTTOM

LA-LB HARBORS MODEL
LNG DISCHARGE STUDY

DYE TRACER TEST OF DISCHARGE
INTO PROPOSED SLIP 302
87,000 GPM LNG DISCHARGE

STATION 6

PRELIMINARY DATA

PLATE L21 (Revised)

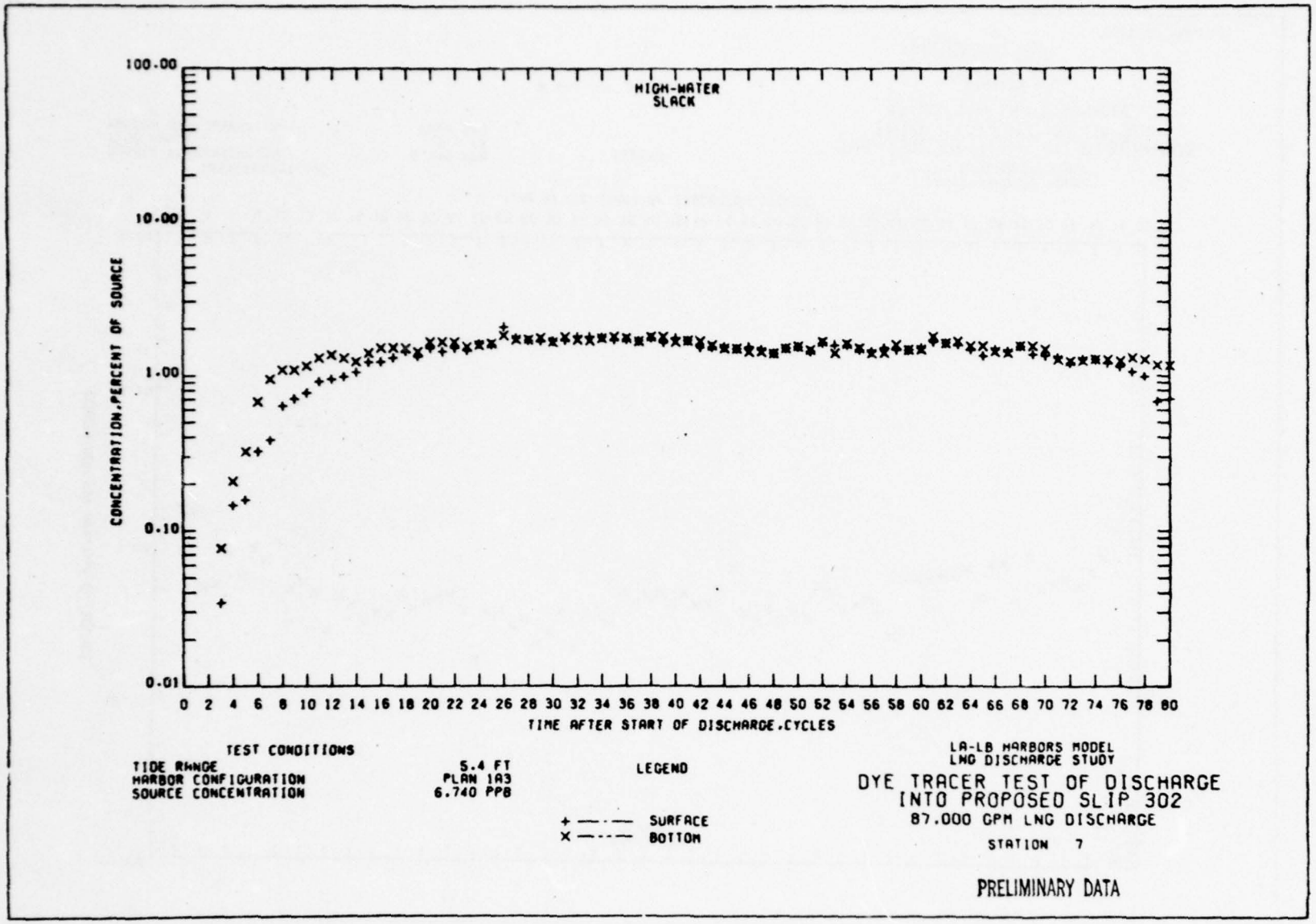

HIGH-WATER SLACK
100.00
10.00
1.00
0.10
0.01
CONCENTRATION, PERCENT OF SOURCE
0 2 4 6 8 10 12 14 16 18 20 22 24 26 28 30 32 34 36 38 40 42 44 46 48 50 52 54 56 58 60 62 64 66 68 70 72 74 76 78 80
TIME AFTER START OF DISCHARGE, CYCLES
TEST CONDITIONS
TIDE RANGE 5.4 FT
HARBOR CONFIGURATION PLAN 1A3
SOURCE CONCENTRATION 6,740 PPB
LEGEND
SURFACE
BOTTOM
LA-LB HARBORS MODEL
LNG DISCHARGE STUDY
DYE TRACER TEST OF DISCHARGE
INTO PROPOSED SLIP 302
87,000 GPM LNG DISCHARGE
STATION 7
PRELIMINARY DATA

PLATE L22

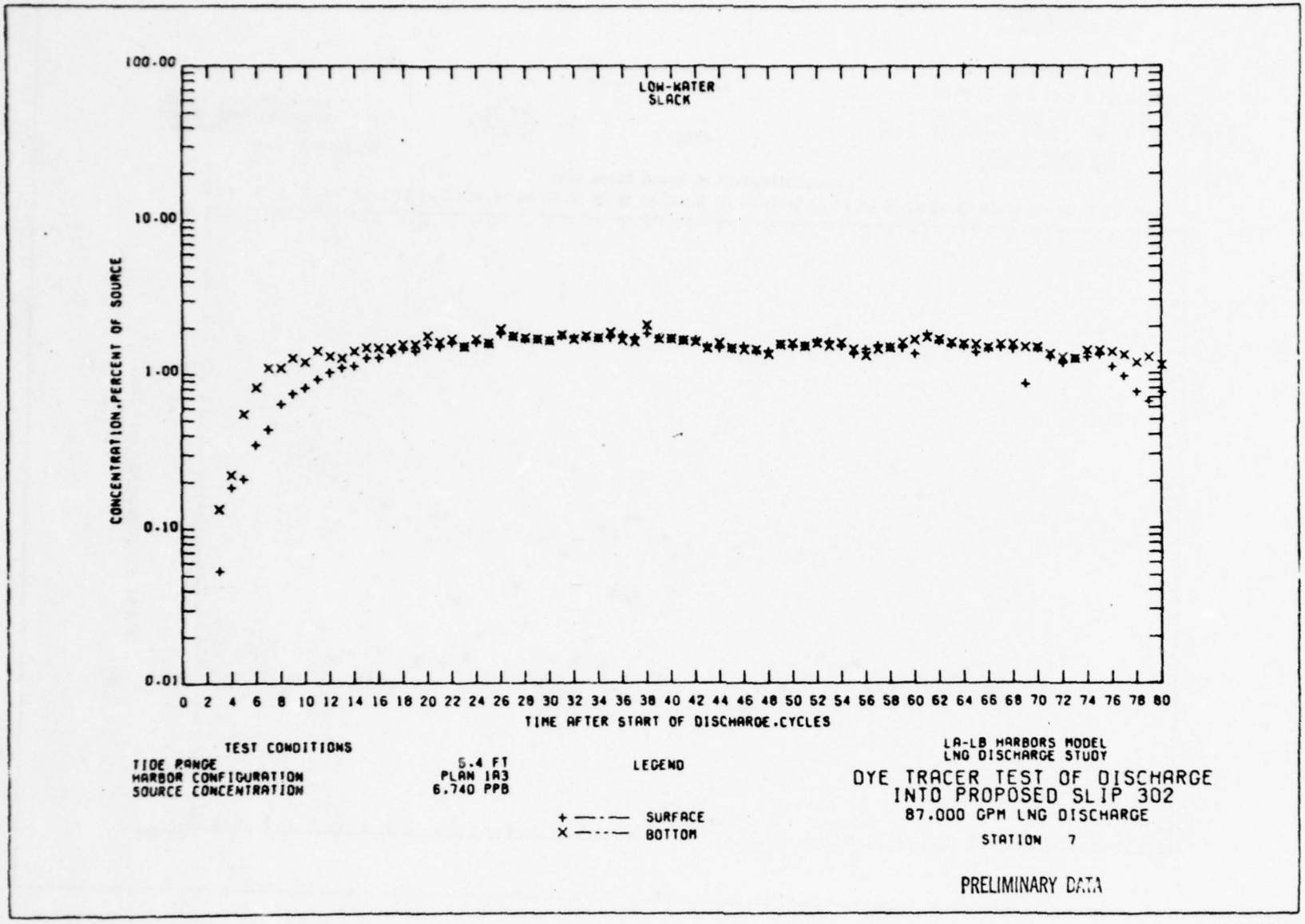
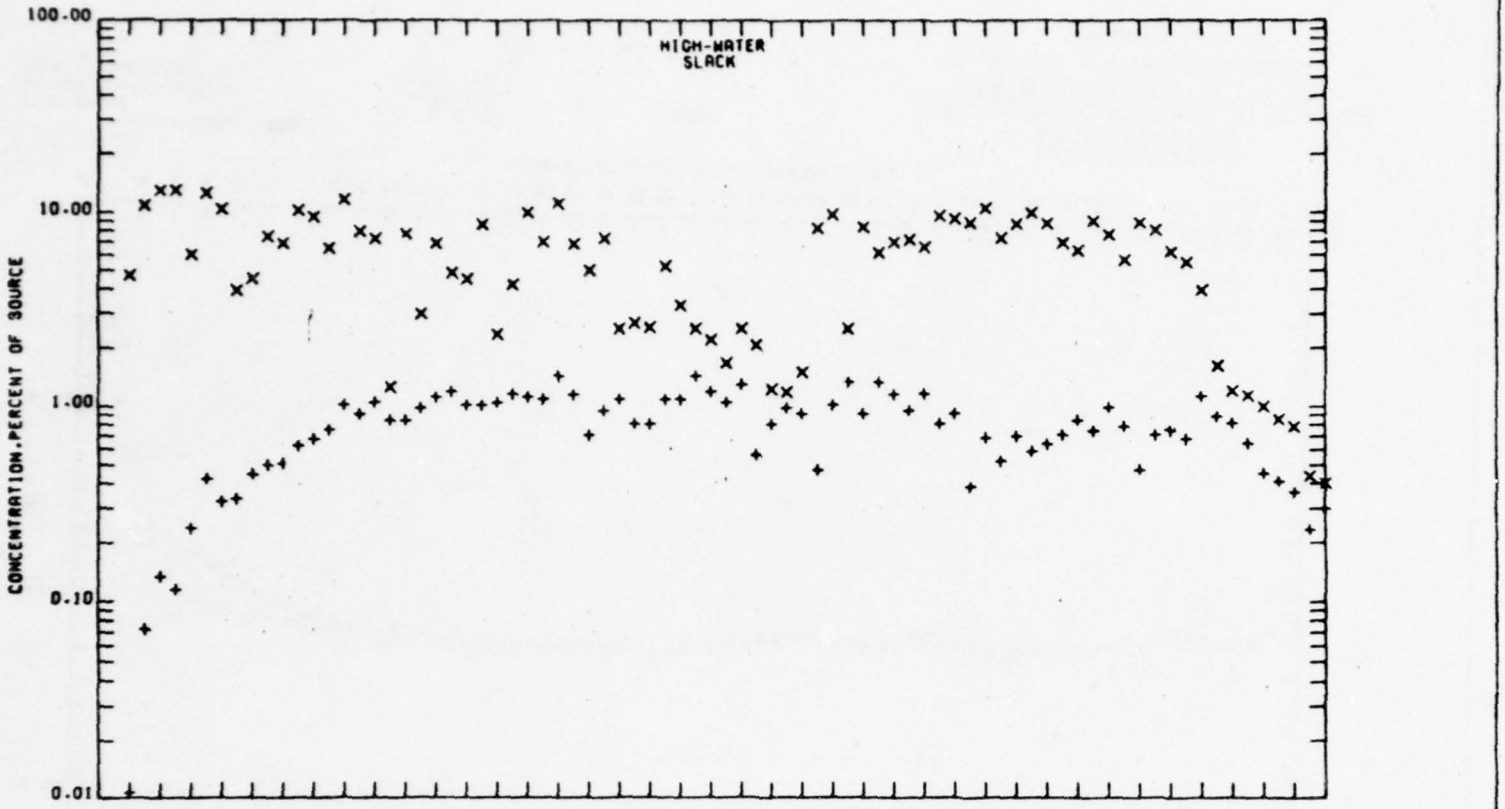

100.00
10.00
1.00
0.10
0.01
LOW-WATER
SLACK
CONCENTRATION,PERCENT OF SOURCE
0 2 4 6 8 10 12 14 16 18 20 22 24 26 28 30 32 34 36 38 40 42 44 46 48 50 52 54 56 58 60 62 64 66 68 70 72 74 76 78 80
TIME AFTER START OF DISCHARGE,CYCLES
TEST CONDITIONS
TIDE RANGE 5.4 FT
HARBOR CONFIGURATION PLAN 1A3
SOURCE CONCENTRATION 6,740 PPB
LEGEND
SURFACE
BOTTOM
LA-LB HARBORS MODEL
LNG DISCHARGE STUDY
DYE TRACER TEST OF DISCHARGE
INTO PROPOSED SLIP 302
87,000 GPM LNG DISCHARGE
STATION 7
PRELIMINARY DATA

PLATE L23



TEST CONDITIONS

TIDE RANGE	5.4 FT
HARBOR CONFIGURATION	PLAN 1A3
SOURCE CONCENTRATION	6,740 PPB

LEGEND

+ —·— SURFACE

× —·— BOTTOM

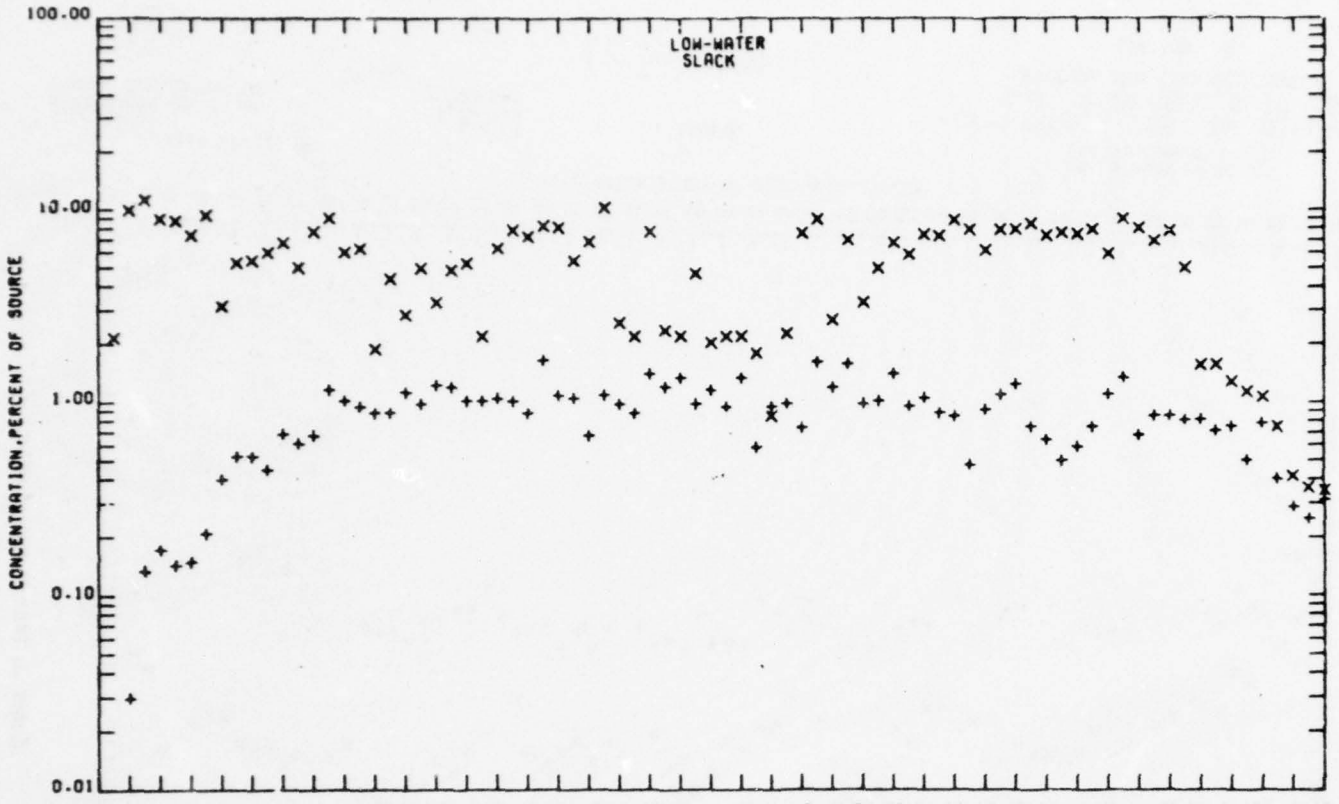
LA-LB HARBORS MODEL
LNG DISCHARGE STUDY

DYE TRACER TEST OF DISCHARGE
INTO PROPOSED SLIP 302
87,000 GPM LNG DISCHARGE

STATION 8

PRELIMINARY DATA

PLATE L-3



TEST CONDITIONS

TIDE RANGE	5.4 FT
HARBOR CONFIGURATION	PLAN 1A3
SOURCE CONCENTRATION	6,740 PPB

LEGEND

+ —·— SURFACE
× —·— BOTTOM

LA-LB HARBORS MODEL
LNG DISCHARGE STUDY

DYE TRACER TEST OF DISCHARGE INTO PROPOSED SLIP 302

87,000 GPM LNG DISCHARGE

STATION 8

PRELIMINARY DATA

PLATE L25

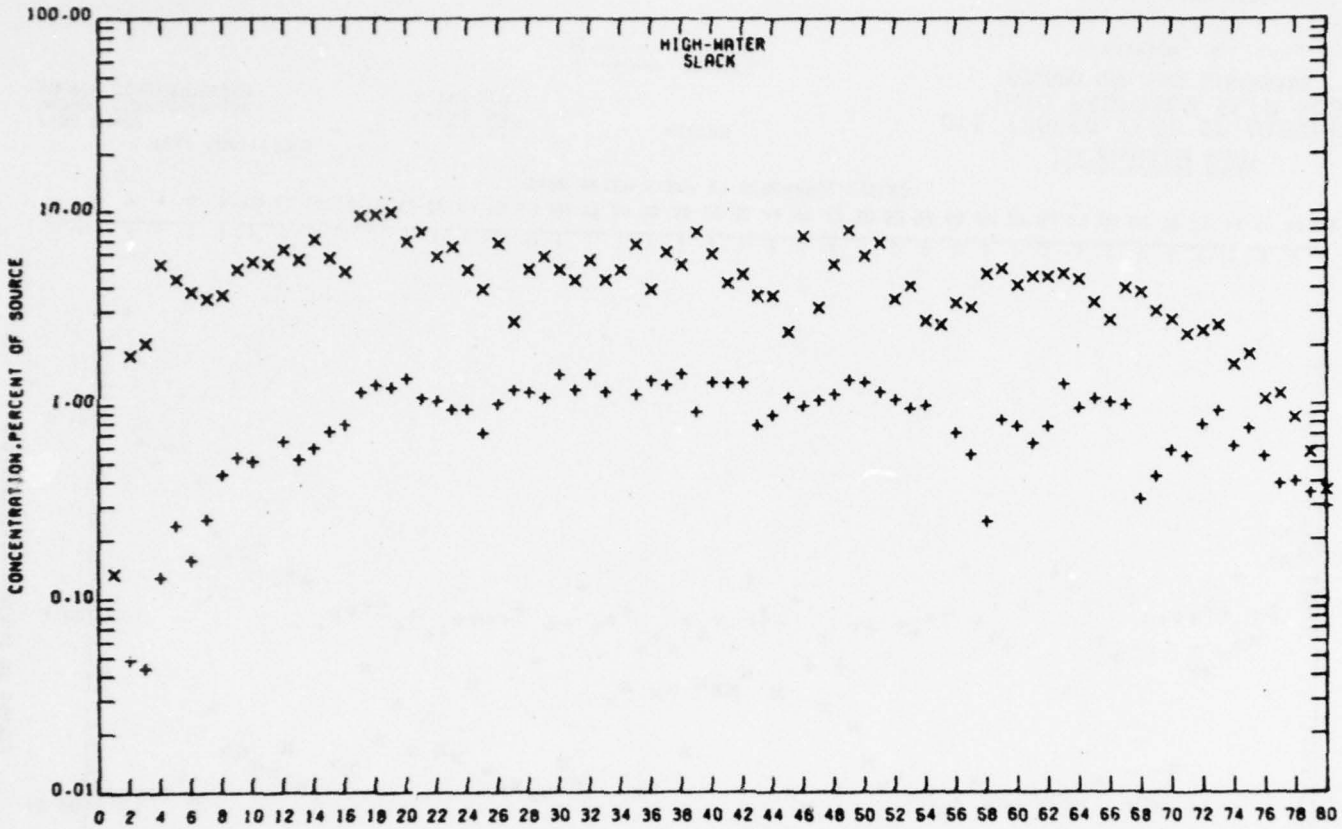
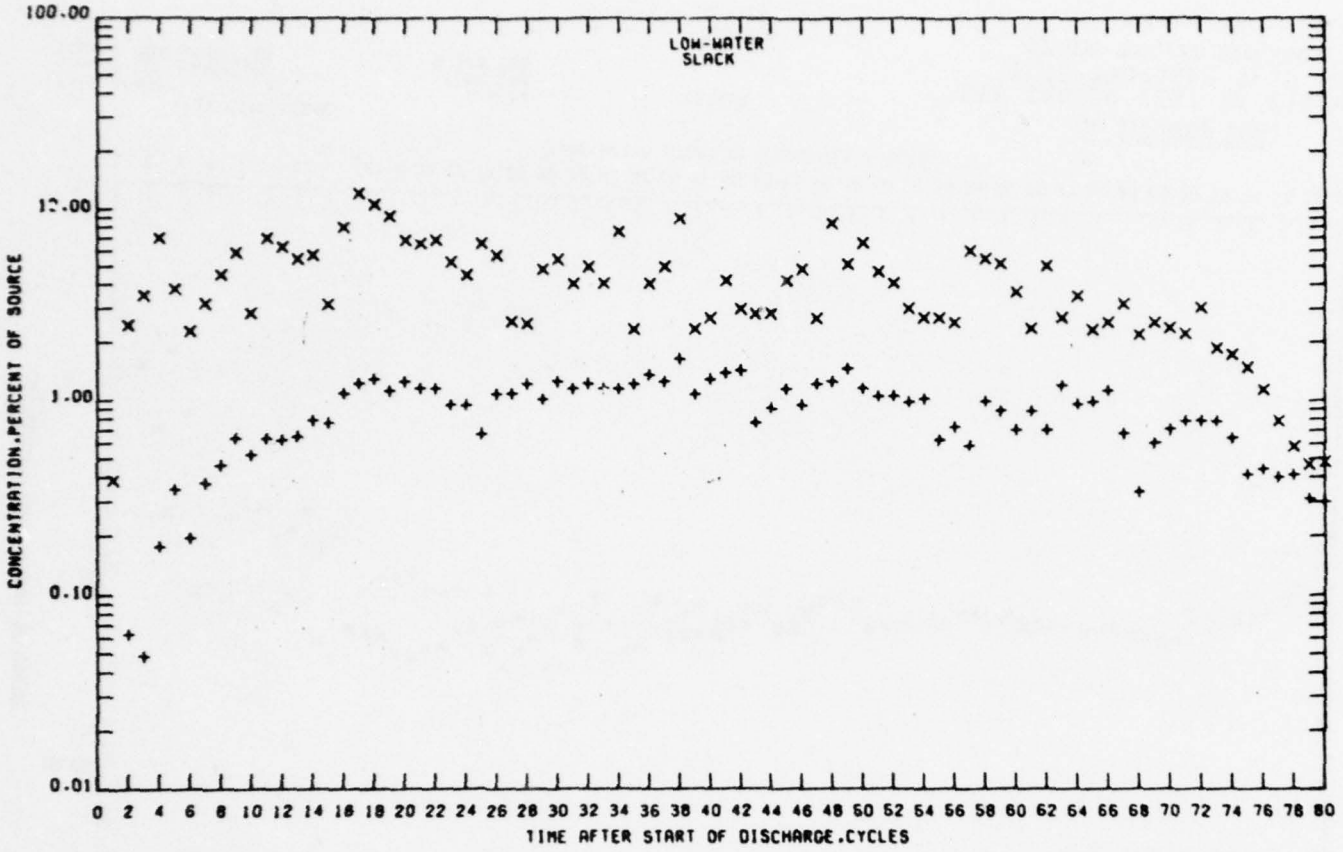

HIGH-WATER
SLACK
100.00
10.00
1.00
0.10
0.01
CONCENTRATION.PERCENT OF SOURCE
0 2 4 6 8 10 12 14 16 18 20 22 24 26 28 30 32 34 36 38 40 42 44 46 48 50 52 54 56 58 60 62 64 66 68 70 72 74 76 78 80
TIME AFTER START OF DISCHARGE.CYCLES
TEST CONDITIONS
TIDE RANGE 5.4 FT
HARBOR CONFIGURATION PLAN 1A3
SOURCE CONCENTRATION 6.740 PPB
LEGEND
SURFACE
BOTTOM
LA-LB HARBORS MODEL
LNG DISCHARGE STUDY
DYE TRACER TEST OF DISCHARGE
INTO PROPOSED SLIP 302
87.000 GPM LNG DISCHARGE
STATION 9
PRELIMINARY DATA

PLATE L26



TEST CONDITIONS

TIDE RANGE	5.4 FT
HARBOR CONFIGURATION	PLAN 1A3
SOURCE CONCENTRATION	6.740 PPB

LEGEND

+ —·— SURFACE
× —··— BOTTOM

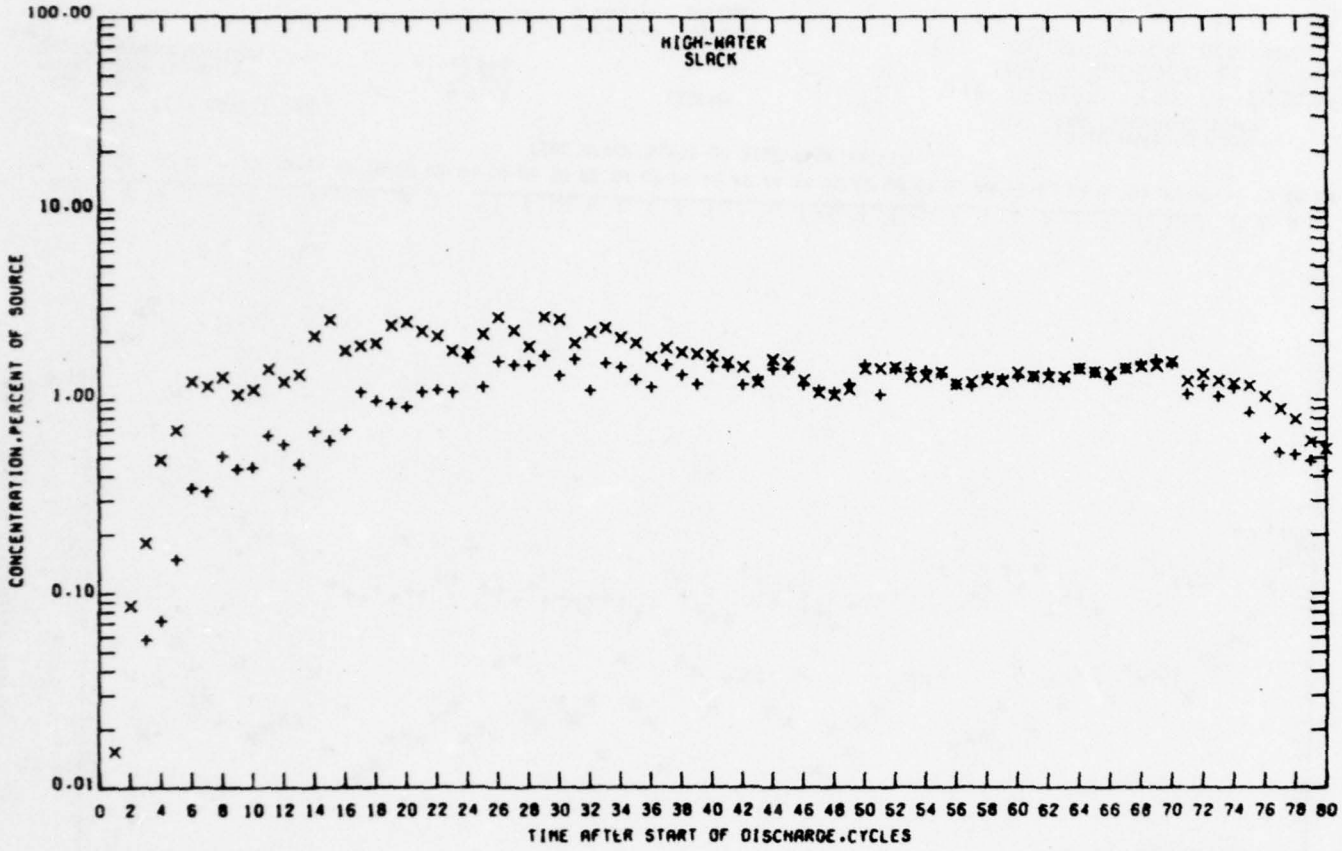
LA-LB HARBORS MODEL
LNG DISCHARGE STUDY

DYE TRACER TEST OF DISCHARGE
INTO PROPOSED SLIP 302
87,000 GPM LNG DISCHARGE

STATION 9

PRELIMINARY DATA

PLATE L27



TEST CONDITIONS

TIDE RANGE	5.4 FT
HARBOR CONFIGURATION	PLAN 1A3
SOURCE CONCENTRATION	6,740 PPB

LEGEND

+ —·— SURFACE
× —··— BOTTOM

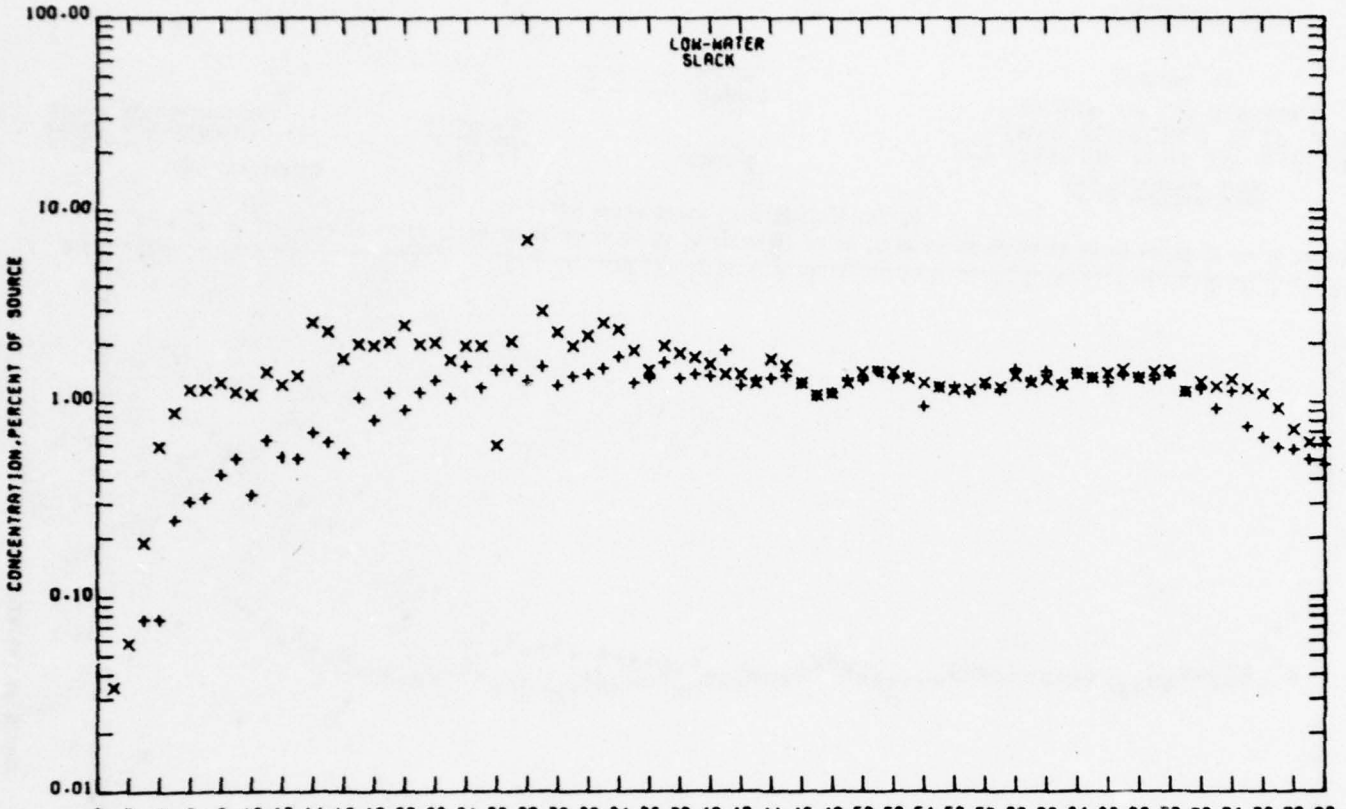
LA-LB HARBORS MODEL
LNG DISCHARGE STUDY

DYE TRACER TEST OF DISCHARGE
INTO PROPOSED SLIP 302
87,000 GPM LNG DISCHARGE

STATION 10

PRELIMINARY DATA

PLATE C25



TEST CONDITIONS

TIDE RANGE	5.4 FT
HARBOR CONFIGURATION	PLAN 1A3
SOURCE CONCENTRATION	6,740 PPB

LEGEND

+ —·— SURFACE
× —··— BOTTOM

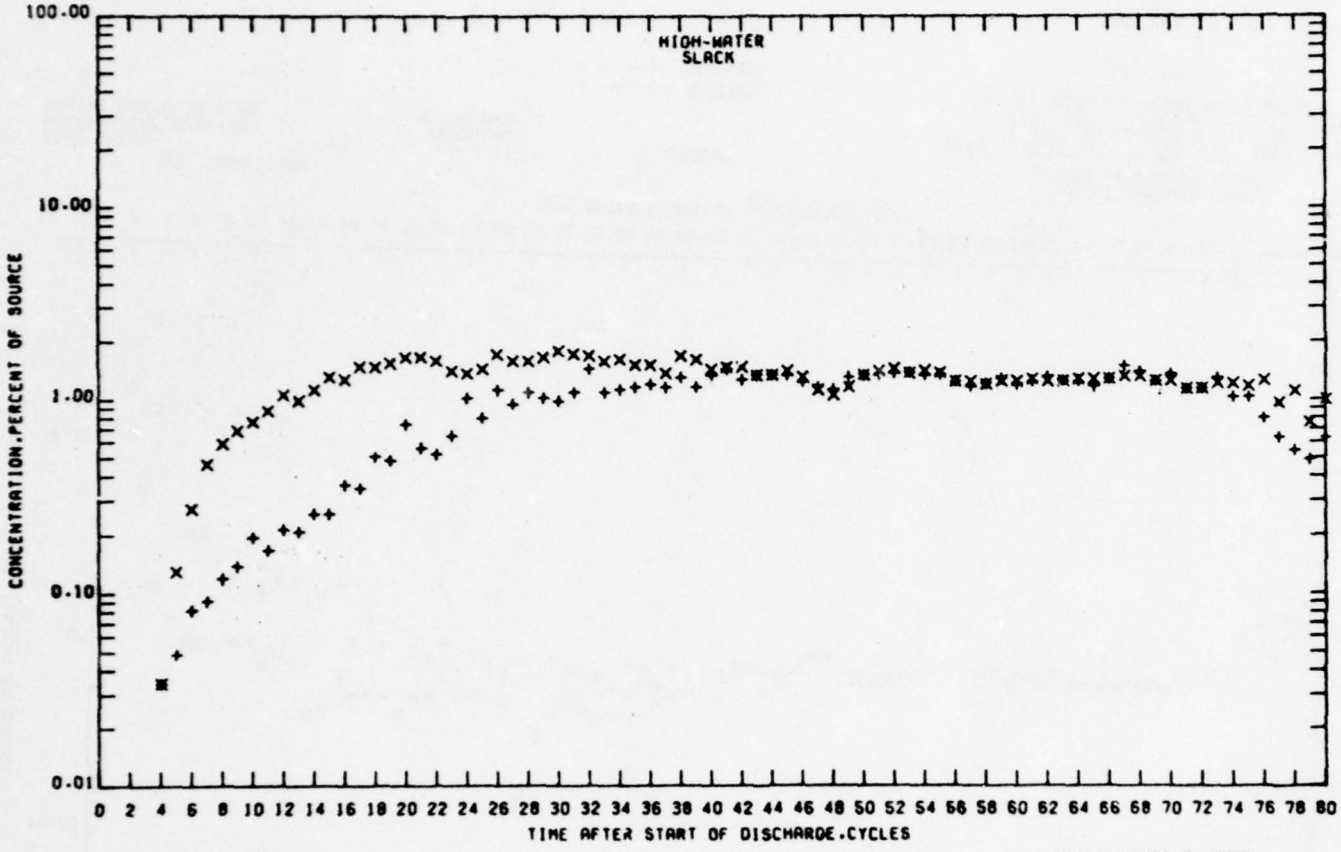
LA-LB HARBORS MODEL
LNG DISCHARGE STUDY

DYE TRACER TEST OF DISCHARGE
INTO PROPOSED SLIP 302
87,000 GPM LNG DISCHARGE

STATION 10

PRELIMINARY DATA

PLATE L29



TEST CONDITIONS

TIDE RANGE	5.4 FT
HARBOR CONFIGURATION	PLAN 1A3
SOURCE CONCENTRATION	6.740 PPB

LEGEND

+ ---- SURFACE
× ---- BOTTOM

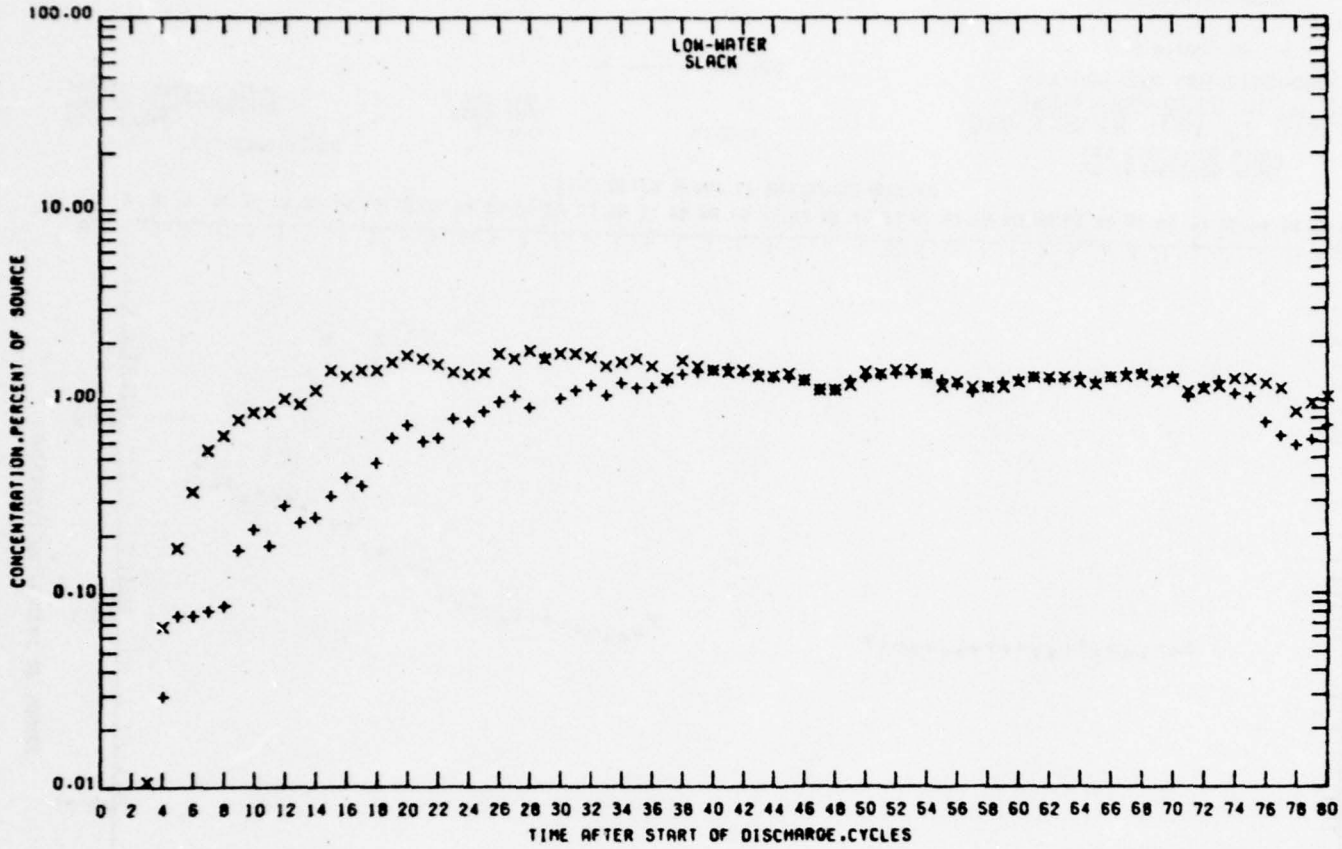
LA-LB HARBORS MODEL
LNG DISCHARGE STUDY

DYE TRACER TEST OF DISCHARGE
INTO PROPOSED SLIP 302
67.000 GPM LNG DISCHARGE

STATION 11

PRELIMINARY DATA

PLATE L30



TEST CONDITIONS

TIDE RANGE	5.4 FT
HARBOR CONFIGURATION	PLAN 1A3
SOURCE CONCENTRATION	6.740 PPB

LEGEND

\+ —·— SURFACE

× —·— BOTTOM

LA-LB HARBORS MODEL
LNG DISCHARGE STUDY

DYE TRACER TEST OF DISCHARGE
INTO PROPOSED SLIP 302
87.000 GPM LNG DISCHARGE

STATION 11

PRELIMINARY DATA

PLATE L51

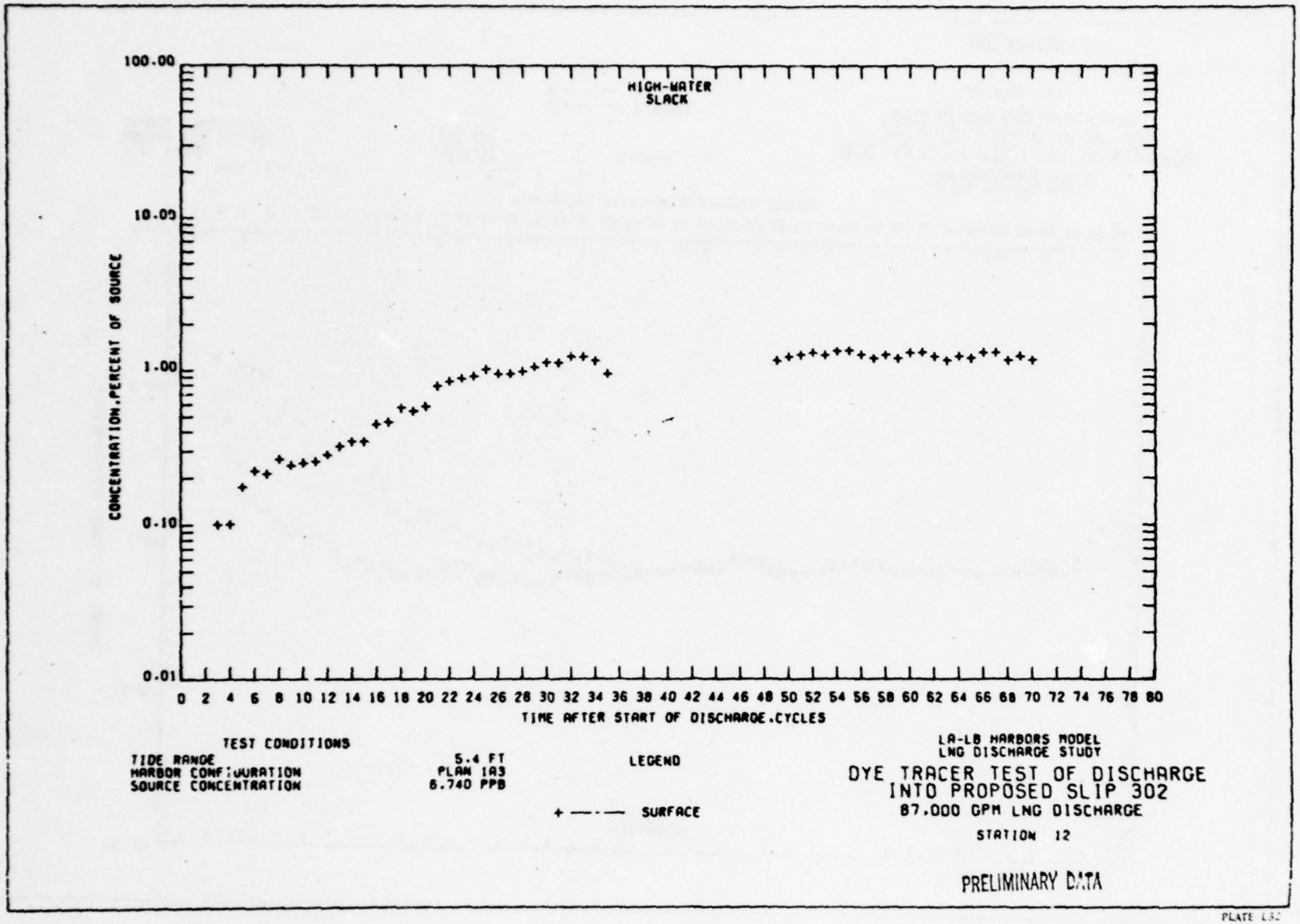

HIGH-WATER SLACK
100.00
10.00
1.00
0.10
0.01
CONCENTRATION, PERCENT OF SOURCE
0 2 4 6 8 10 12 14 16 18 20 22 24 26 28 30 32 34 36 38 40 42 44 46 48 50 52 54 56 58 60 62 64 66 68 70 72 74 76 78 80
TIME AFTER START OF DISCHARGE, CYCLES
TEST CONDITIONS
TIDE RANGE 5.4 FT
HARBOR CONFIGURATION PLAN 1A3
SOURCE CONCENTRATION 8,740 PPB
LEGEND
+ —·— SURFACE
LA-LB HARBORS MODEL
LNG DISCHARGE STUDY
DYE TRACER TEST OF DISCHARGE
INTO PROPOSED SLIP 302
87,000 GPM LNG DISCHARGE
STATION 12
PRELIMINARY DATA

PLATE L32

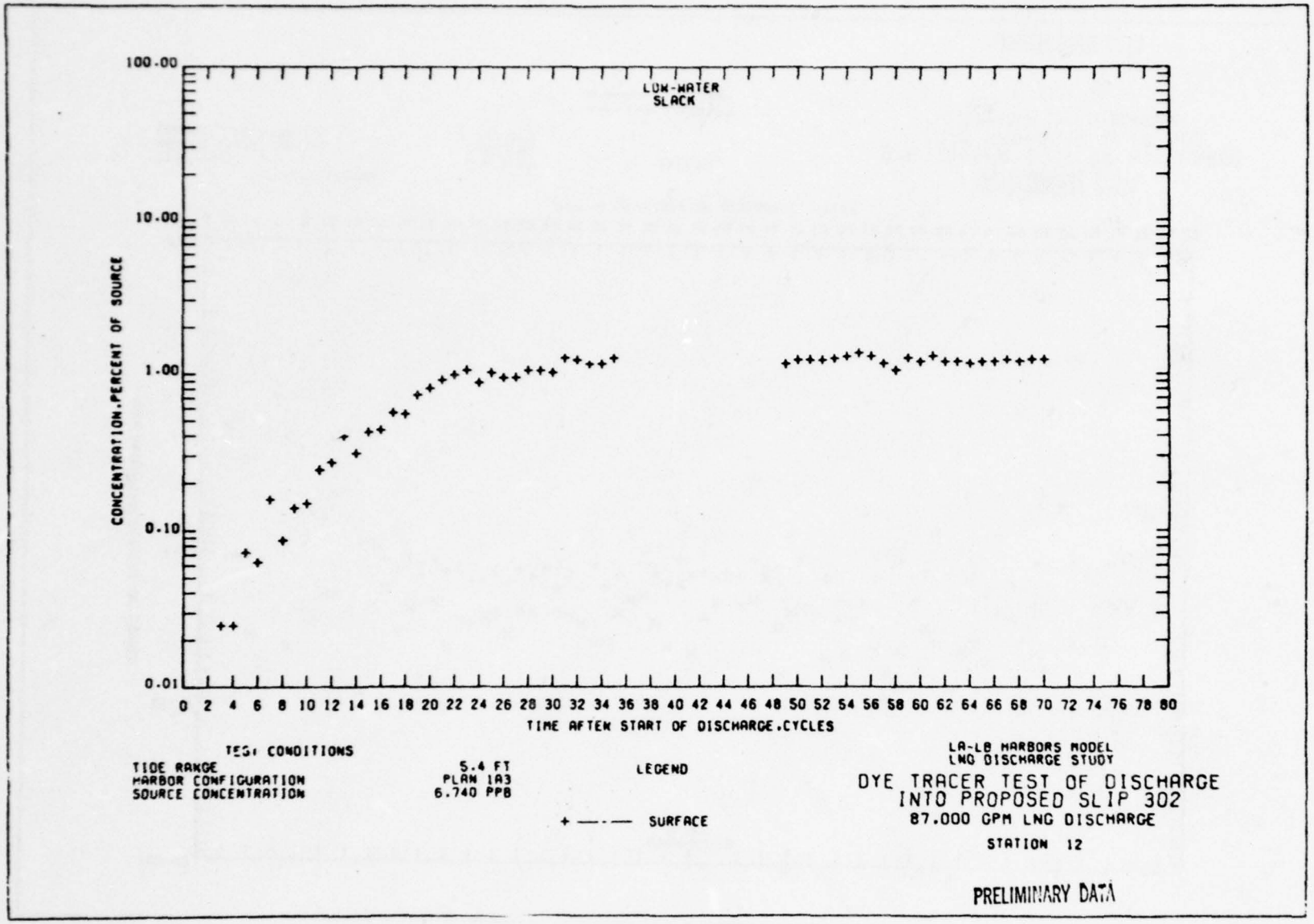
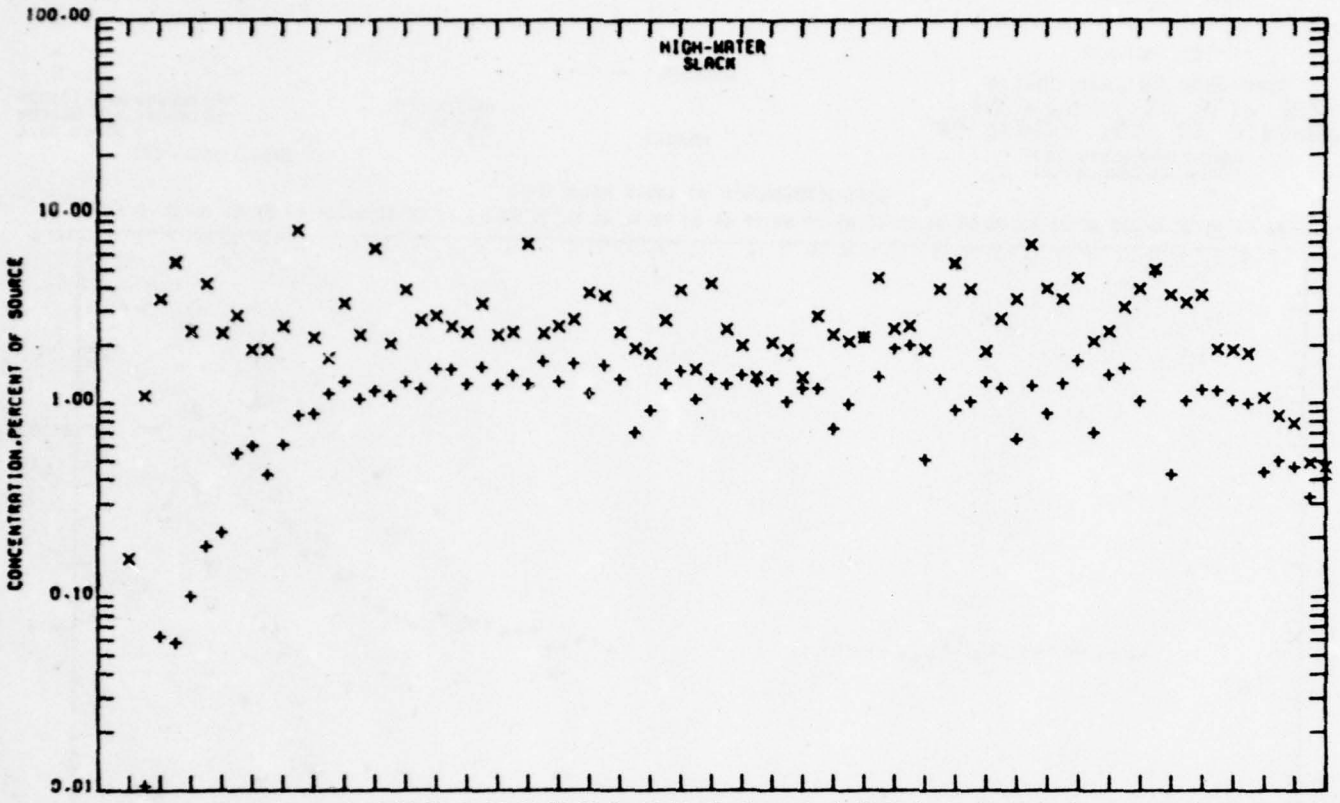

LOW-WATER
SLACK
100.00
10.00
1.00
0.10
0.01
CONCENTRATION.PERCENT OF SOURCE
0 2 4 6 8 10 12 14 16 18 20 22 24 26 28 30 32 34 36 38 40 42 44 46 48 50 52 54 56 58 60 62 64 66 68 70 72 74 76 78 80
TIME AFTER START OF DISCHARGE.CYCLES
TEST CONDITIONS
TIDE RANGE 5.4 FT
HARBOR CONFIGURATION PLAN 1A3
SOURCE CONCENTRATION 6.740 PPB
LEGEND
+ —·— SURFACE
LA-LB HARBORS MODEL
LNG DISCHARGE STUDY
DYE TRACER TEST OF DISCHARGE
INTO PROPOSED SLIP 302
87.000 GPM LNG DISCHARGE
STATION 12
PRELIMINARY DATA

PLATE L33



TEST CONDITIONS

TIDE RANGE	5.4 FT
HARBOR CONFIGURATION	PLAN 1A3
SOURCE CONCENTRATION	6.740 PPB

LEGEND

+ —·— SURFACE

× - - - BOTTOM

LA-LB HARBORS MODEL
LNG DISCHARGE STUDY

DYE TRACER TEST OF DISCHARGE
INTO PROPOSED SLIP 302
87,000 GPM LNG DISCHARGE

STATION 13

PRELIMINARY DATA

PLATE L34

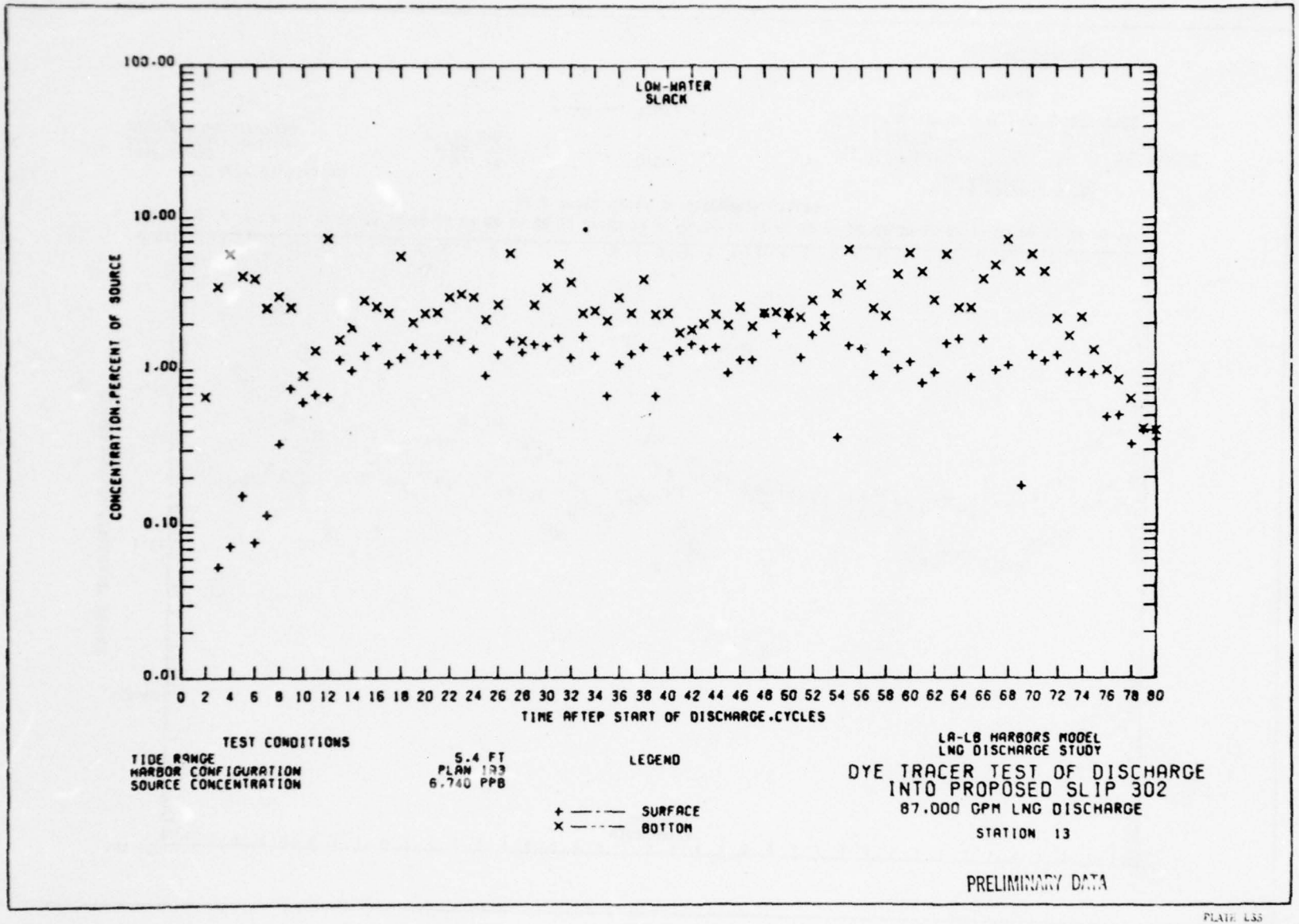

LOW-WATER SLACK
100.00
10.00
1.00
0.10
0.01
CONCENTRATION, PERCENT OF SOURCE
0 2 4 6 8 10 12 14 16 18 20 22 24 26 28 30 32 34 36 38 40 42 44 46 48 50 52 54 56 58 60 62 64 66 68 70 72 74 76 78 80
TIME AFTER START OF DISCHARGE, CYCLES
TEST CONDITIONS
TIDE RANGE 5.4 FT
HARBOR CONFIGURATION PLAN 1B3
SOURCE CONCENTRATION 6,740 PPB
LEGEND
+ SURFACE
× BOTTOM
LA-LB HARBORS MODEL
LNG DISCHARGE STUDY
DYE TRACER TEST OF DISCHARGE
INTO PROPOSED SLIP 302
87,000 GPM LNG DISCHARGE
STATION 13
PRELIMINARY DATA

PLATE E35

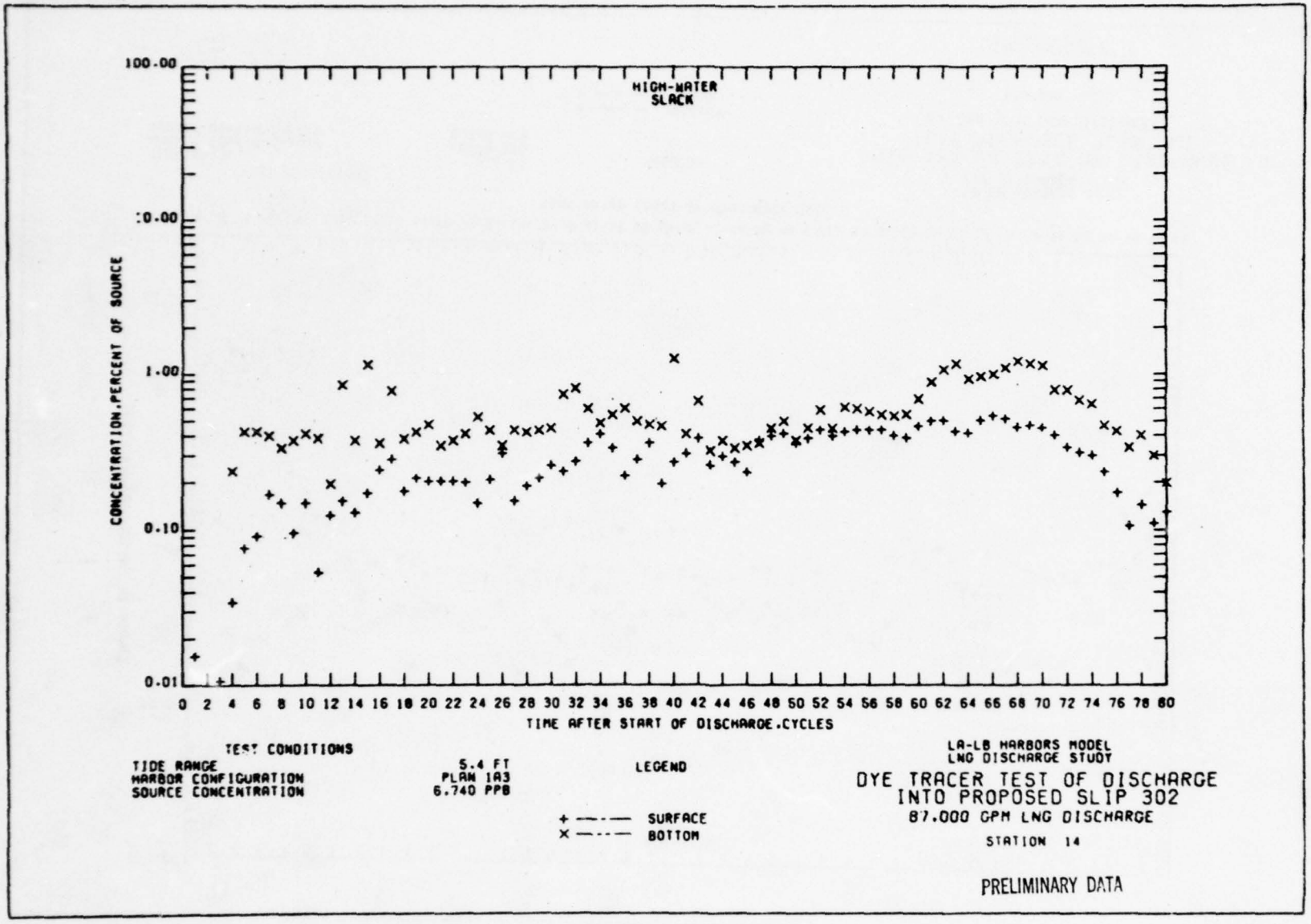
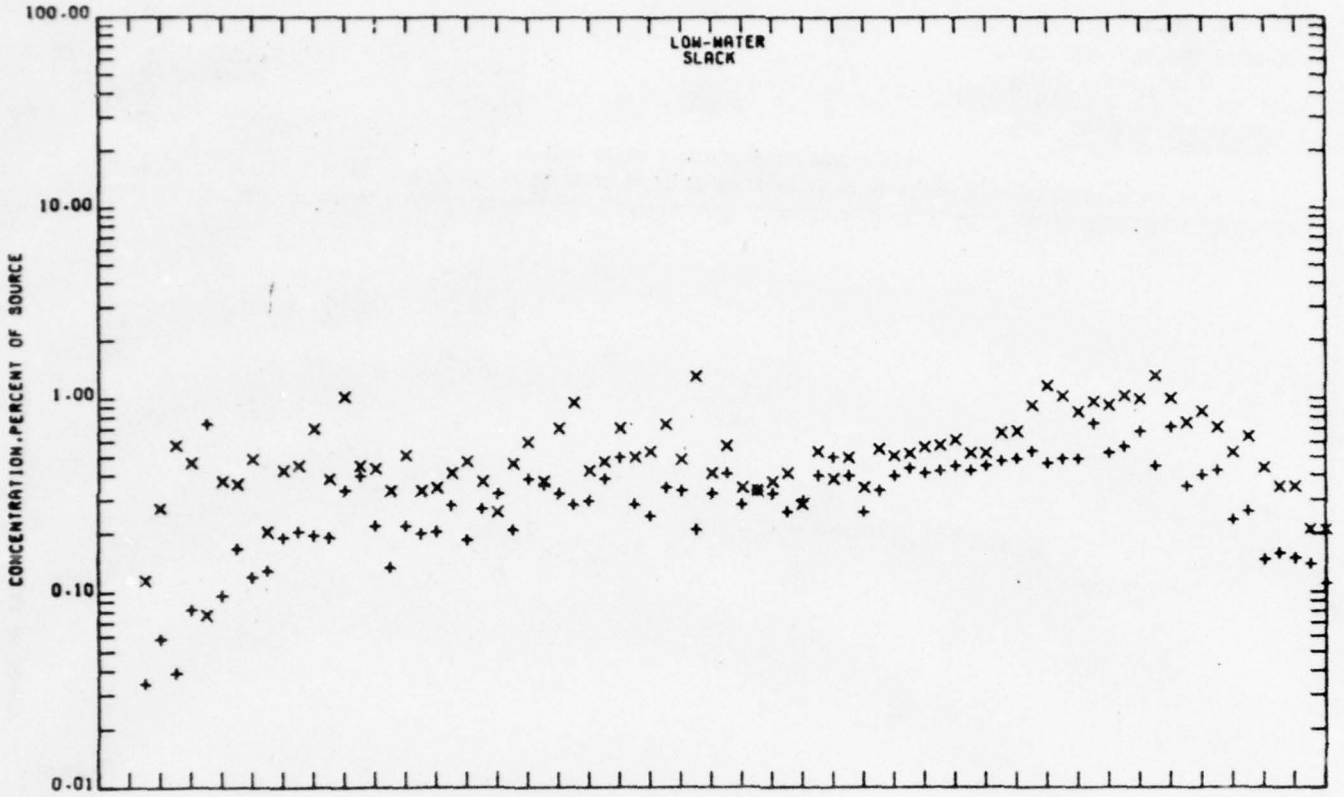

HIGH-WATER
SLACK
100.00
10.00
1.00
0.10
0.01
CONCENTRATION, PERCENT OF SOURCE
0 2 4 6 8 10 12 14 16 18 20 22 24 26 28 30 32 34 36 38 40 42 44 46 48 50 52 54 56 58 60 62 64 66 68 70 72 74 76 78 80
TIME AFTER START OF DISCHARGE, CYCLES
TEST CONDITIONS
TIDE RANGE 5.4 FT
HARBOR CONFIGURATION PLAN 1A3
SOURCE CONCENTRATION 6,740 PPB
LEGEND
+ —·— SURFACE
× —·— BOTTOM
LA-LB HARBORS MODEL
LNG DISCHARGE STUDY
DYE TRACER TEST OF DISCHARGE
INTO PROPOSED SLIP 302
87,000 GPM LNG DISCHARGE
STATION 14
PRELIMINARY DATA

PLATE L36



TEST CONDITIONS

TIDE RANGE	5.4 FT
HARBOR CONFIGURATION	PLAN 1A3
SOURCE CONCENTRATION	6,740 PPB

LEGEND

+ —·— SURFACE
× —··— BOTTOM

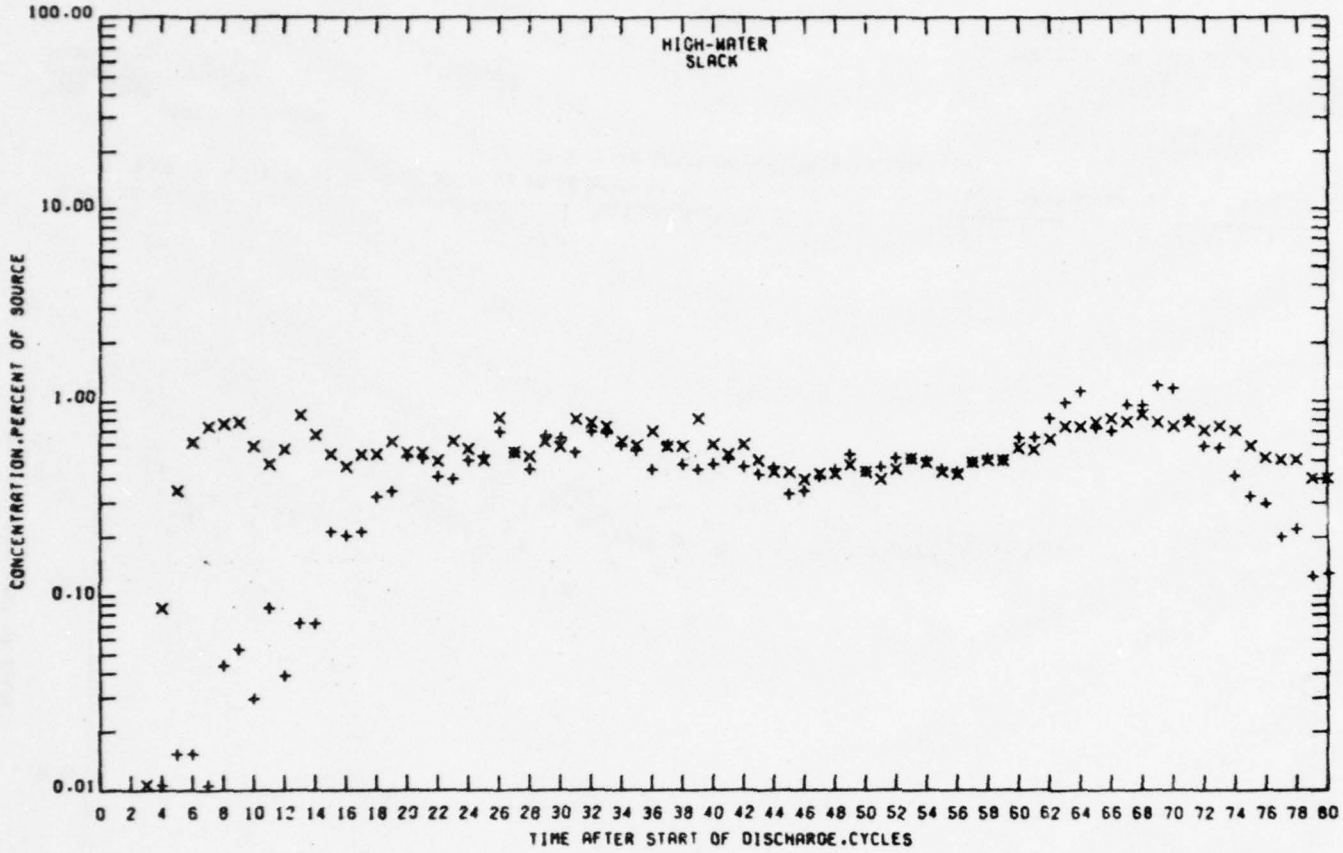
LA-LB HARBORS MODEL
LNG DISCHARGE STUDY

DYE TRACER TEST OF DISCHARGE
INTO PROPOSED SLIP 302
87,000 GPM LNG DISCHARGE

STATION 14

PRELIMINARY DATA

PLATE L37



TEST CONDITIONS

TIDE RANGE	5.4 FT
HARBOR CONFIGURATION	PLAN 1A3
SOURCE CONCENTRATION	6,740 PPB

LEGEND

+ —·—· SURFACE

× —·—· BOTTOM

LA-LB HARBORS MODEL
LNG DISCHARGE STUDY

DYE TRACER TEST OF DISCHARGE
INTO PROPOSED SLIP 302
87,000 GPM LNG DISCHARGE

STATION 15

PRELIMINARY DATA

PLATE L38

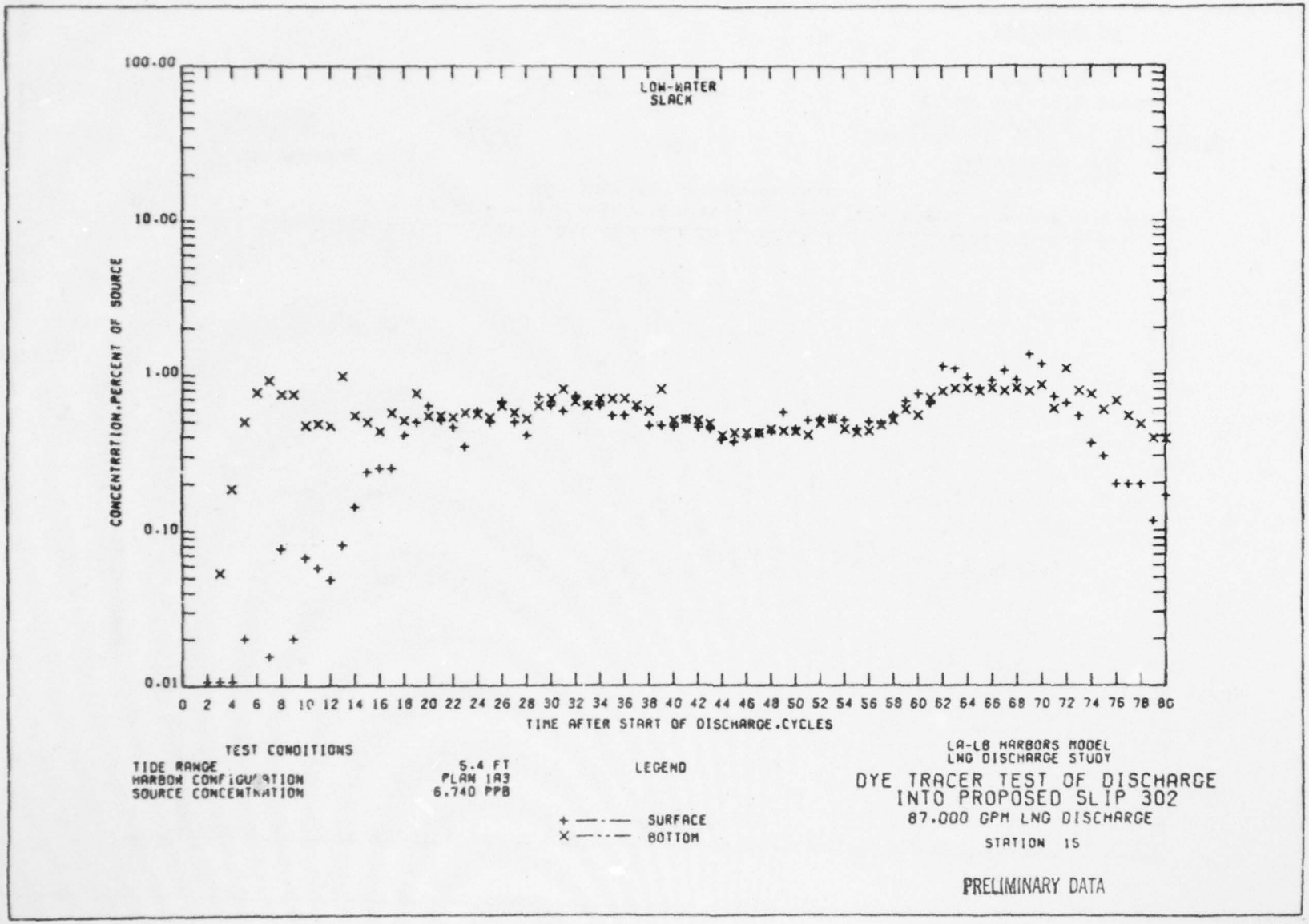
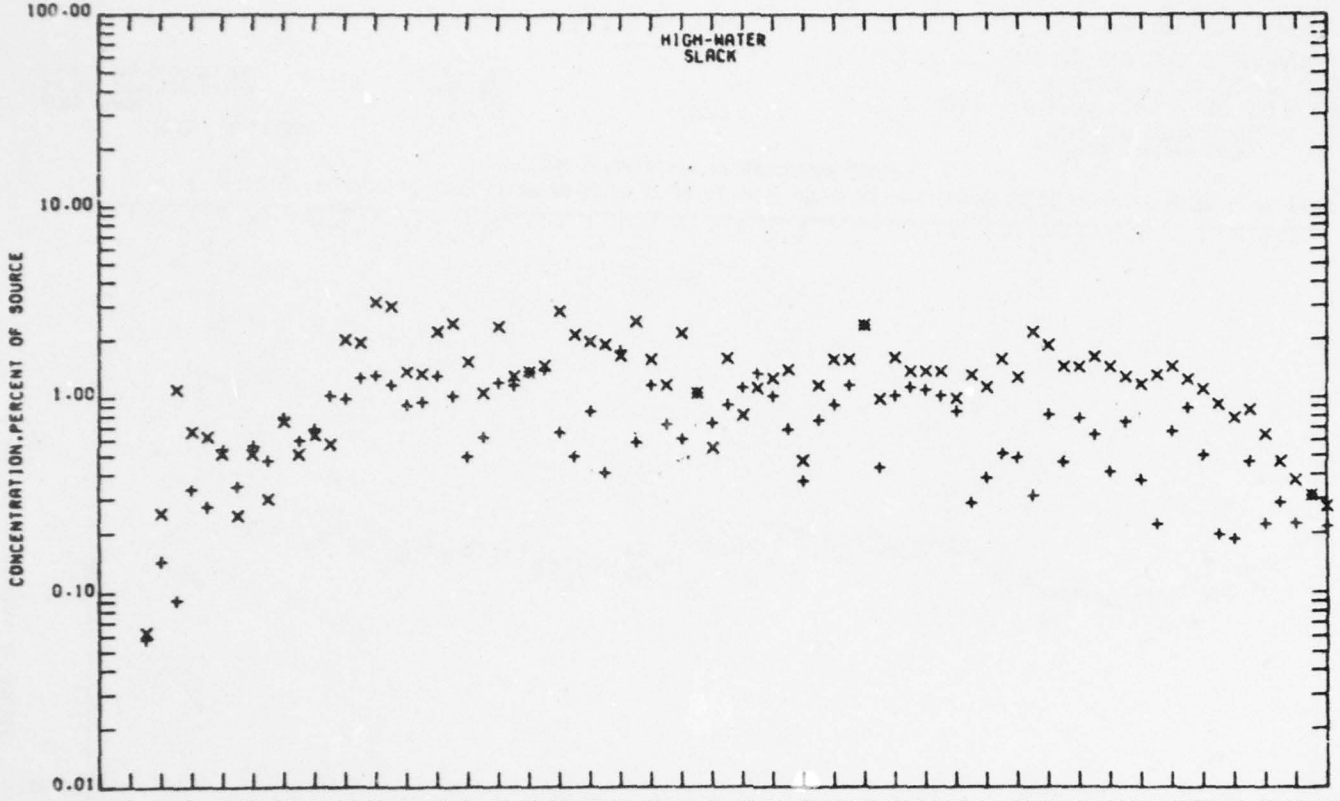

100.00
10.00
1.00
0.10
0.01
LOW-WATER
SLACK
CONCENTRATION,PERCENT OF SOURCE
0 2 4 6 8 10 12 14 16 18 20 22 24 26 28 30 32 34 36 38 40 42 44 46 48 50 52 54 56 58 60 62 64 66 68 70 72 74 76 78 80
TIME AFTER START OF DISCHARGE,CYCLES
TEST CONDITIONS
TIDE RANGE 5.4 FT
HARBOR CONFIGURATION PLAN 1A3
SOURCE CONCENTRATION 6,740 PPB
LEGEND
SURFACE
BOTTOM
LA-L8 HARBORS MODEL
LNG DISCHARGE STUDY
DYE TRACER TEST OF DISCHARGE
INTO PROPOSED SLIP 302
87,000 GPM LNG DISCHARGE
STATION 15
PRELIMINARY DATA

PLATE L39



TEST CONDITIONS

TIDE RANGE	5.4 FT
HARBOR CONFIGURATION	PLAN 1A3
SOURCE CONCENTRATION	6,740 PPB

LEGEND

+ —·— SURFACE
× —·— BOTTOM

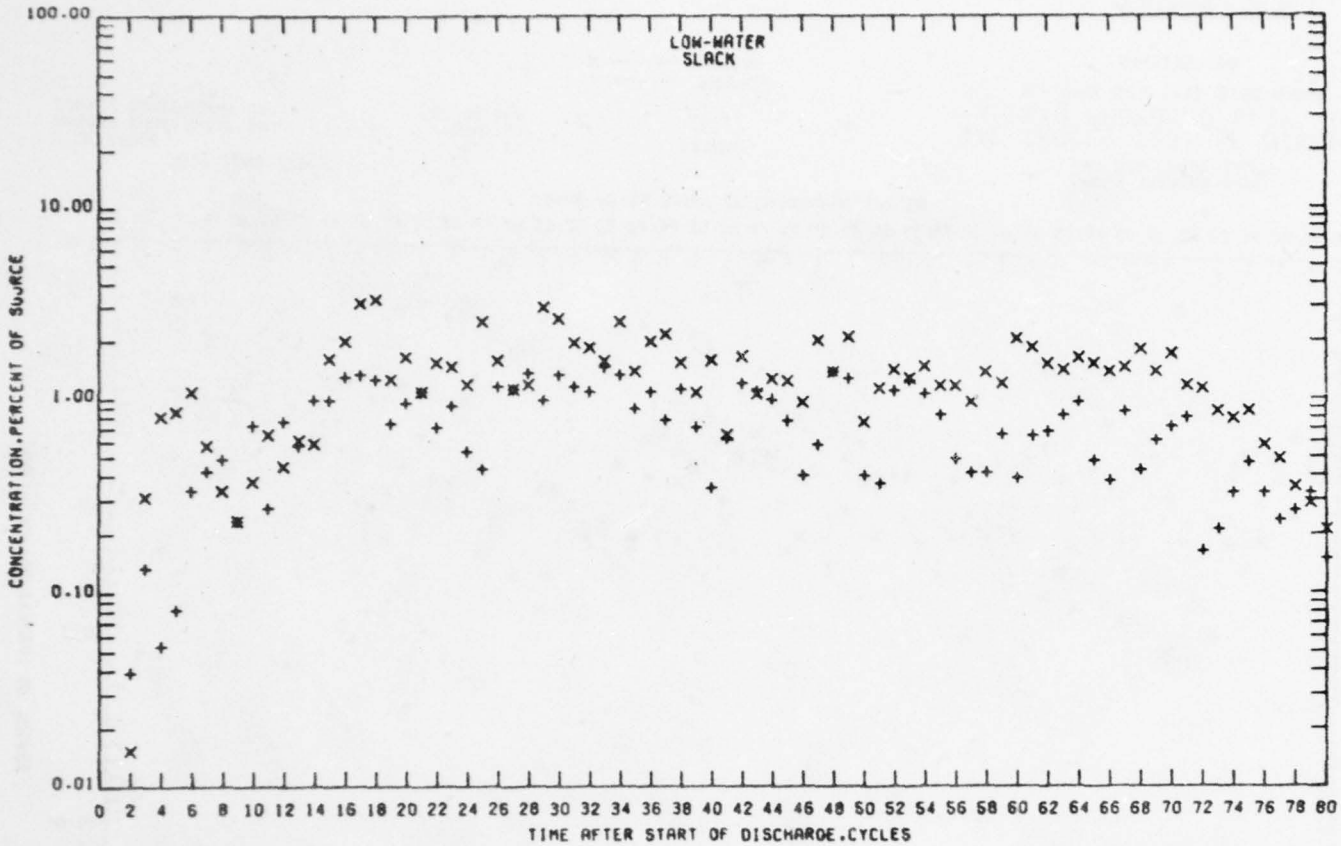
LA-LB HARBORS MODEL
LNG DISCHARGE STUDY

DYE TRACER TEST OF DISCHARGE
INTO PROPOSED SLIP 302
87,000 GPM LNG DISCHARGE

STATION 16A

PRELIMINARY DATA

PLATE L40



TEST CONDITIONS

TIDE RANGE	5.4 FT
HARBOR CONFIGURATION	PLAN 1A3
SOURCE CONCENTRATION	6,740 PPB

LEGEND

+ ——— SURFACE
× ——— BOTTOM

LA-LB HARBORS MODEL
LNG DISCHARGE STUDY

DYE TRACER TEST OF DISCHARGE
INTO PROPOSED SLIP 302
87,000 GPM LNG DISCHARGE

STATION 16A

PRELIMINARY DATA

PLATE L41

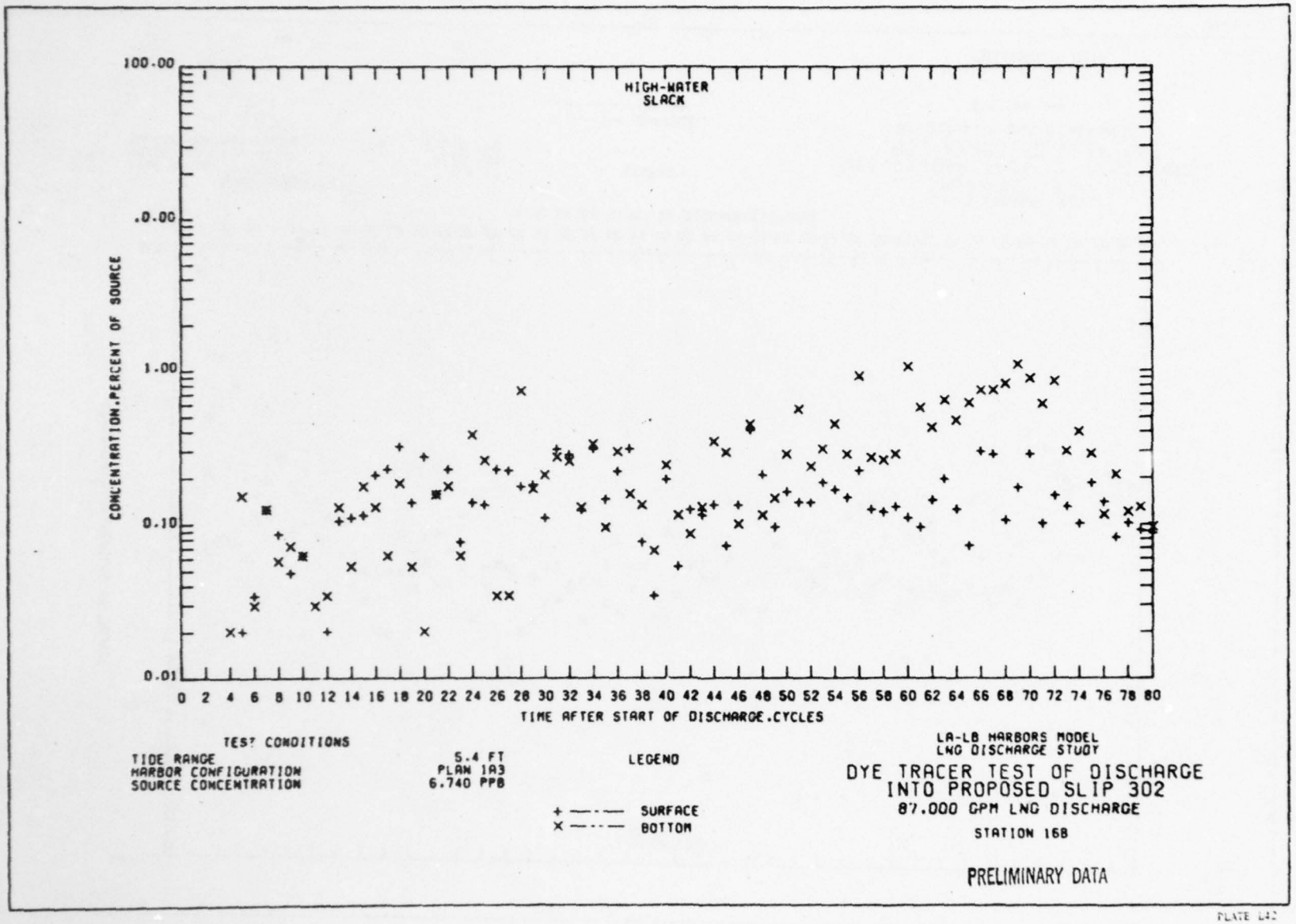

HIGH-WATER
SLACK
100.00
.0.00
1.00
0.10
0.01
CONCENTRATION.PERCENT OF SOURCE
0 2 4 6 8 10 12 14 16 18 20 22 24 26 28 30 32 34 36 38 40 42 44 46 48 50 52 54 56 58 60 62 64 66 68 70 72 74 76 78 80
TIME AFTER START OF DISCHARGE.CYCLES
TEST CONDITIONS
TIDE RANGE 5.4 FT
HARBOR CONFIGURATION PLAN 1A3
SOURCE CONCENTRATION 6.740 PPB
LEGEND
+ —·— SURFACE
× —··— BOTTOM
LA-LB HARBORS MODEL
LNG DISCHARGE STUDY
DYE TRACER TEST OF DISCHARGE
INTO PROPOSED SLIP 302
87.000 GPM LNG DISCHARGE
STATION 168
PRELIMINARY DATA

PLATE L42

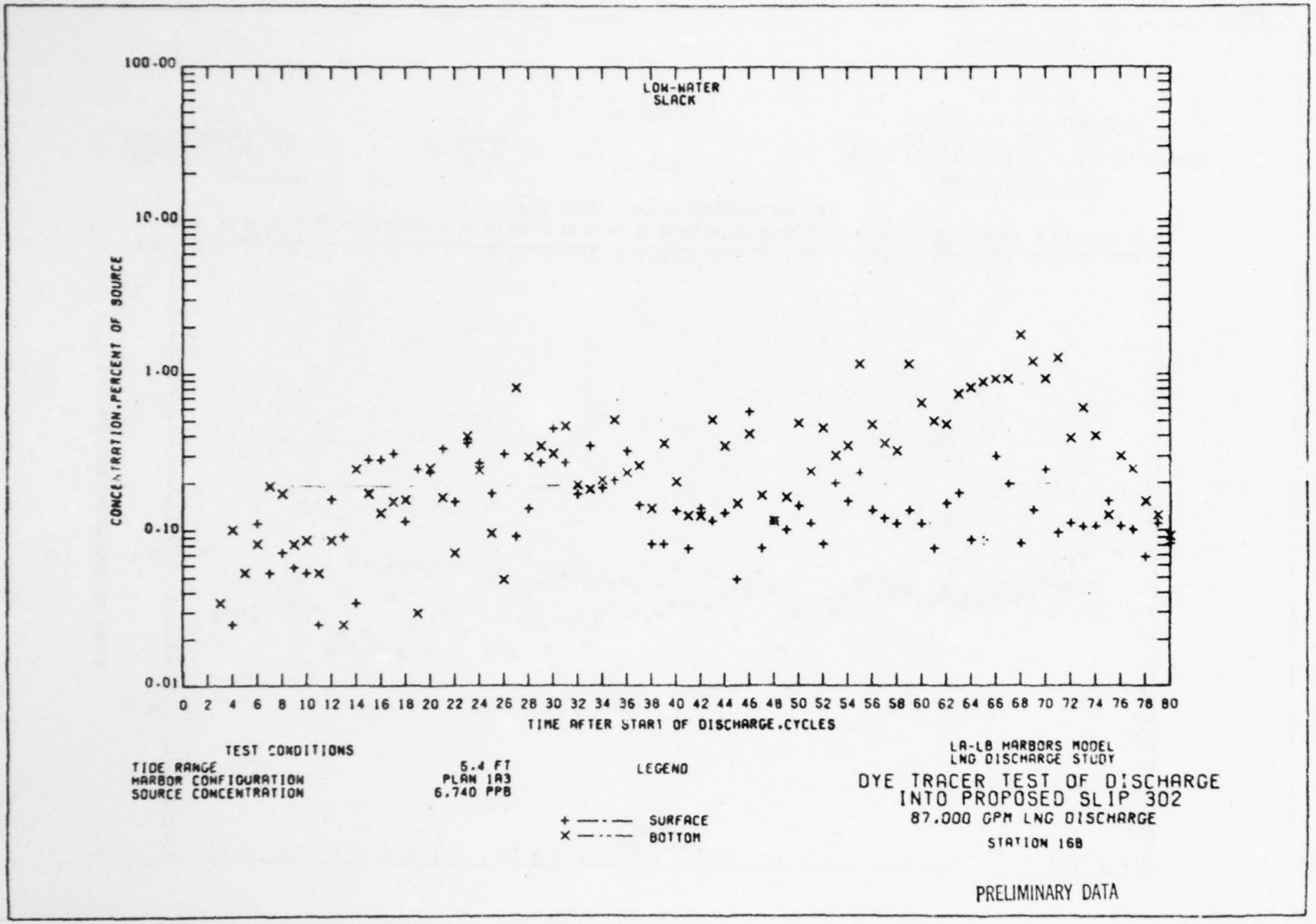
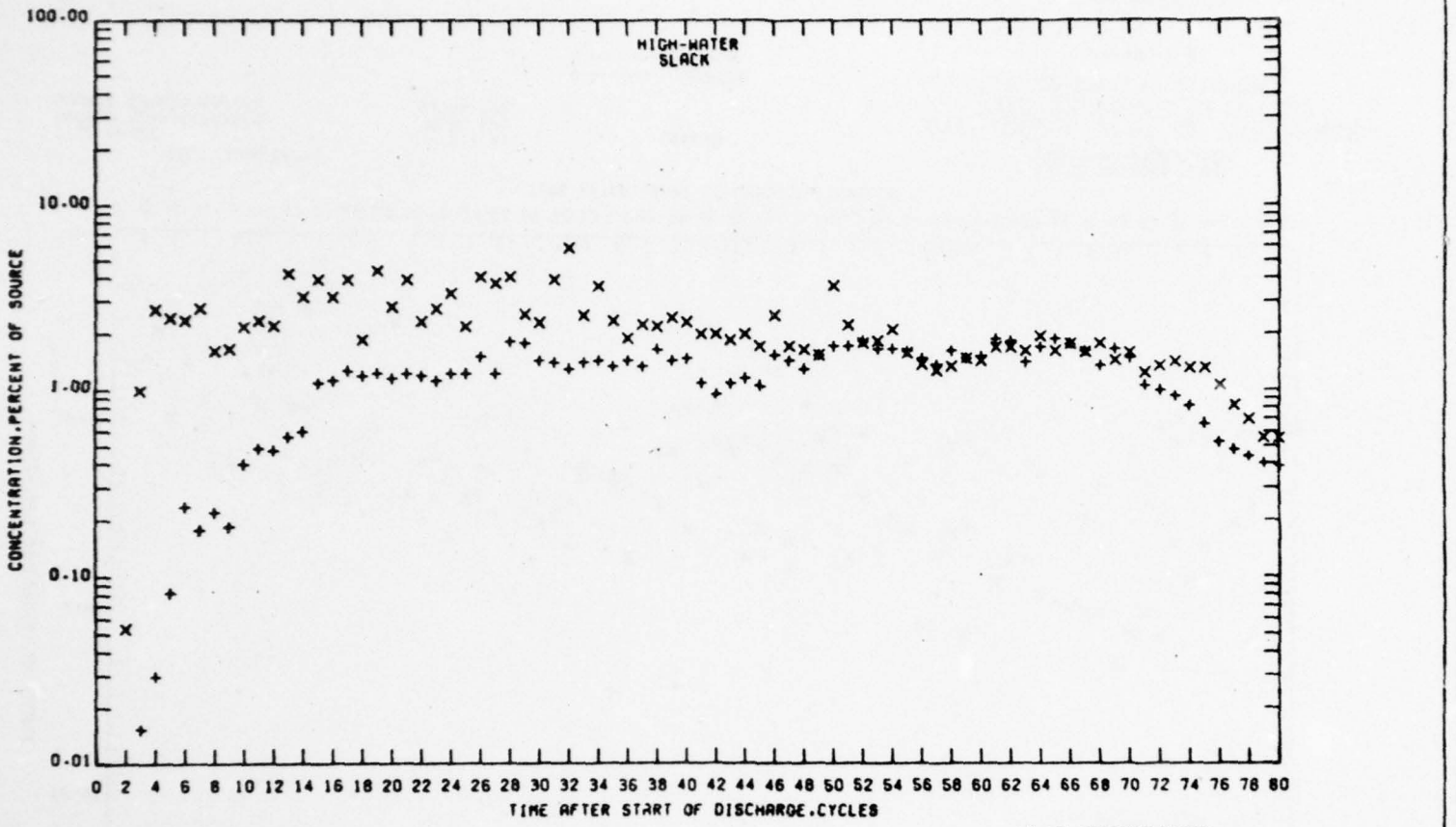

LOW-WATER
SLACK
100.00
10.00
1.00
0.10
0.01
CONCENTRATION, PERCENT OF SOURCE
0 2 4 6 8 10 12 14 16 18 20 22 24 26 28 30 32 34 36 38 40 42 44 46 48 50 52 54 56 58 60 62 64 66 68 70 72 74 76 78 80
TIME AFTER START OF DISCHARGE, CYCLES
TEST CONDITIONS
TIDE RANGE 5.4 FT
HARBOR CONFIGURATION PLAN 1A3
SOURCE CONCENTRATION 6,740 PPB
LEGEND
+ SURFACE
× BOTTOM
LA-LB HARBORS MODEL
LNG DISCHARGE STUDY
DYE TRACER TEST OF DISCHARGE
INTO PROPOSED SLIP 302
87,000 GPM LNG DISCHARGE
STATION 168
PRELIMINARY DATA

PLATE 1-5



TEST CONDITIONS

TIDE RANGE	5.4 FT
HARBOR CONFIGURATION	PLAN 1A3
SOURCE CONCENTRATION	6,740 PPB

LEGEND

+ —·— SURFACE
× —··— BOTTOM

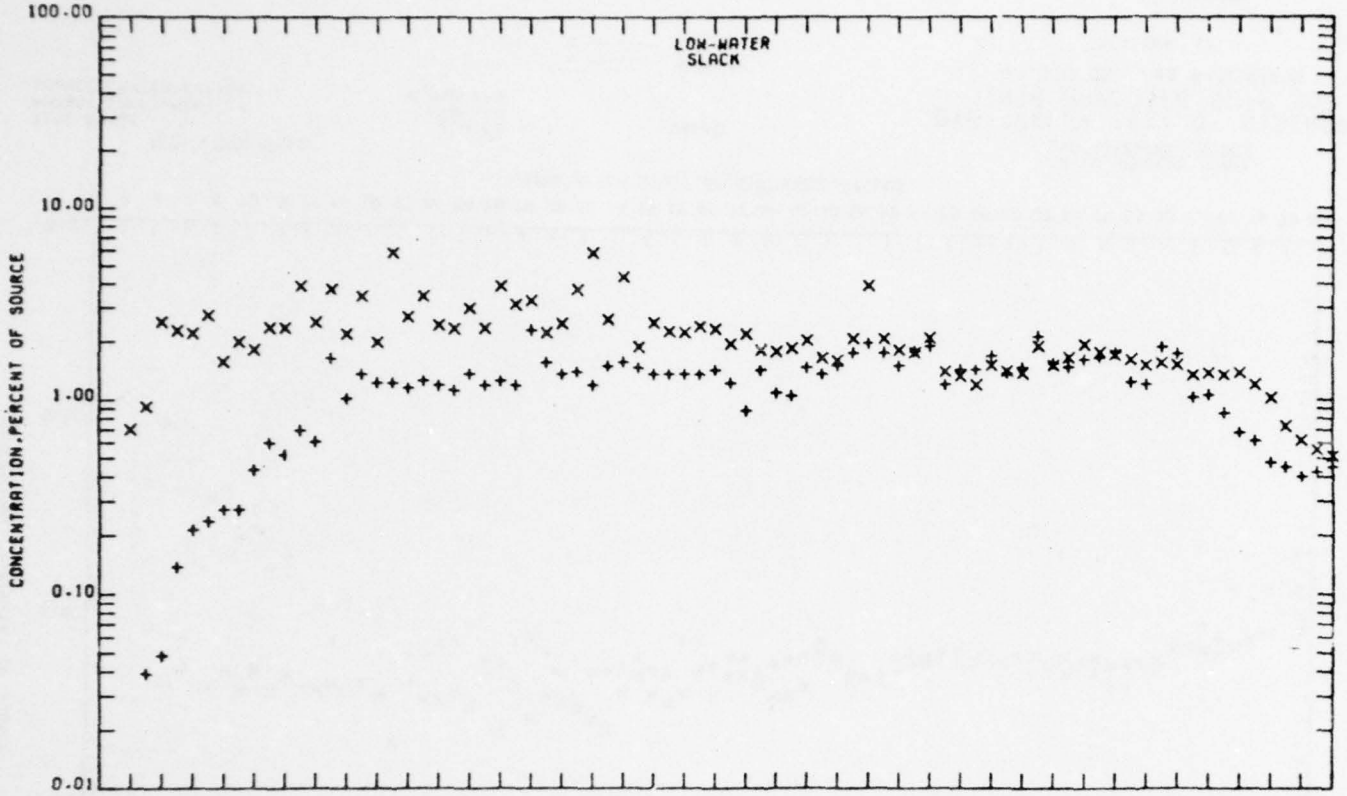
LA-LB HARBORS MODEL
LNG DISCHARGE STUDY

DYE TRACER TEST OF DISCHARGE
INTO PROPOSED SLIP 302
87,000 GPM LNG DISCHARGE

STATION 17

PRELIMINARY DATA

PLATE L44



TEST CONDITIONS

TIDE RANGE	5.4 FT
HARBOR CONFIGURATION	PLAN 1A3
SOURCE CONCENTRATION	6,740 PPB

LEGEND

\+ —·— SURFACE
× – – – BOTTOM

LA-LB HARBORS MODEL
LNG DISCHARGE STUDY

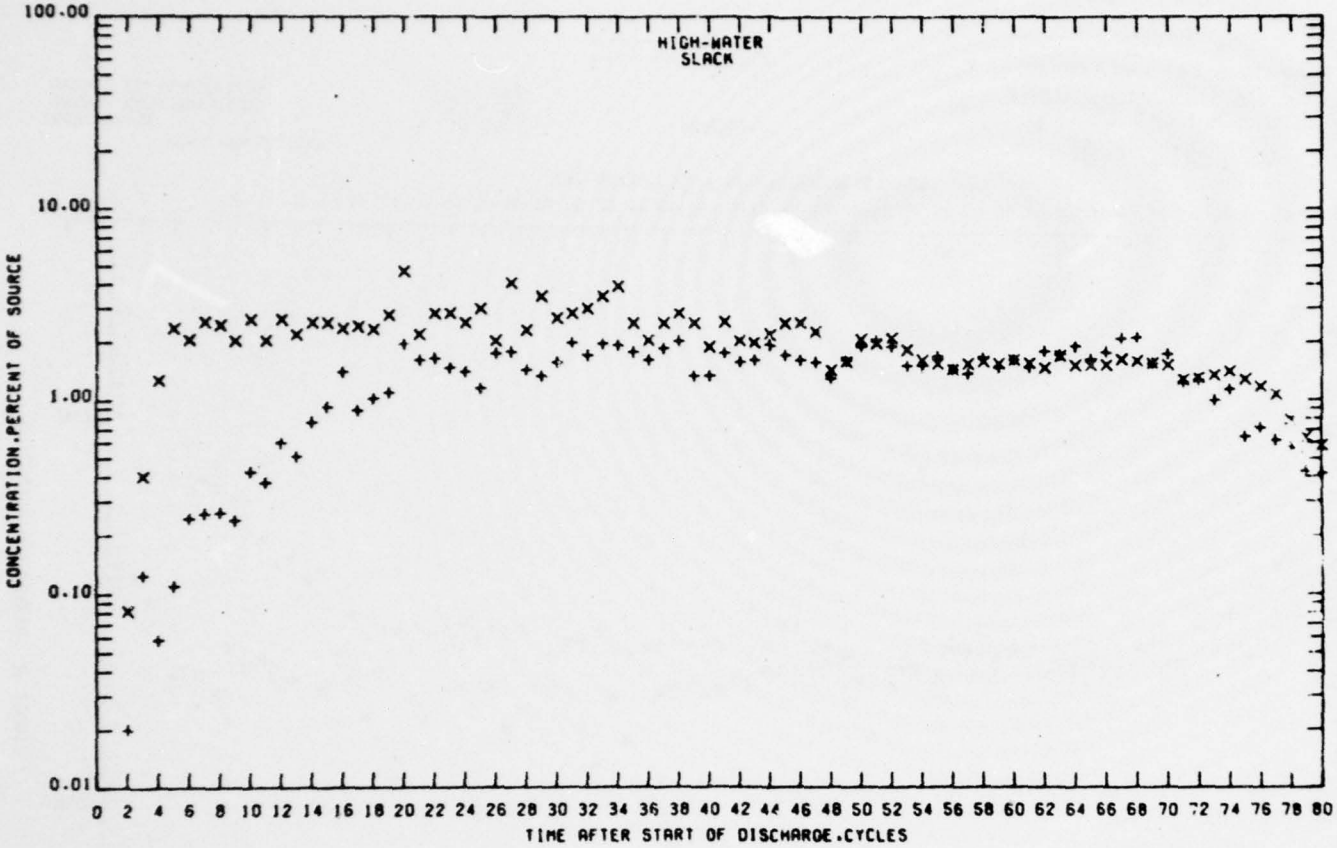
DYE TRACER TEST OF DISCHARGE INTO PROPOSED SLIP 302

87,000 GPM LNG DISCHARGE

STATION 17

PRELIMINARY DATA

PLATE L45



TEST CONDITIONS

TIDE RANGE	5.4 FT
HARBOR CONFIGURATION	PLAN 1A3
SOURCE CONCENTRATION	6,740 PPB

LEGEND

+ —·— SURFACE
× —··— BOTTOM

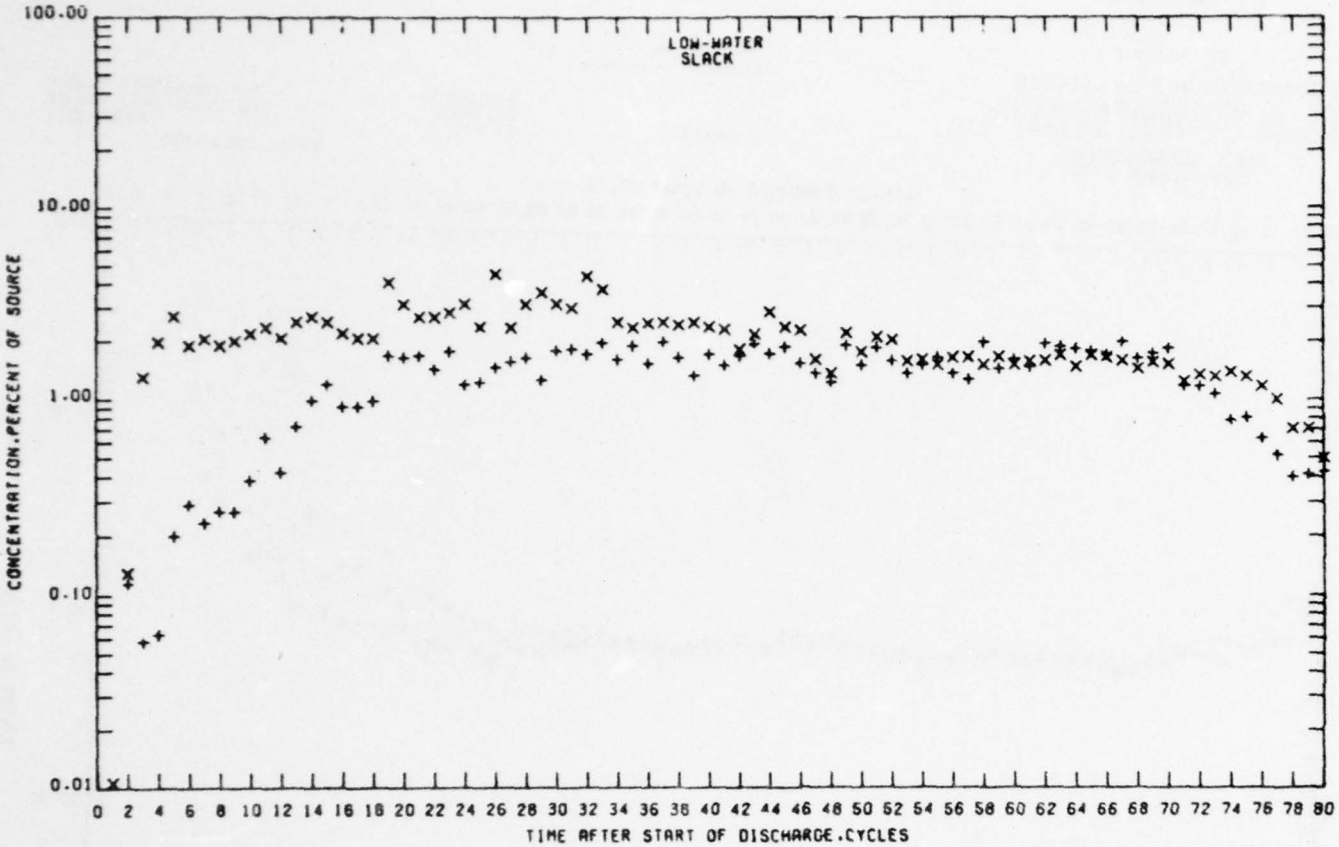
LA-LB HARBORS MODEL
LNG DISCHARGE STUDY

DYE TRACER TEST OF DISCHARGE INTO PROPOSED SLIP 302
87,000 GPM LNG DISCHARGE

STATION 18

PRELIMINARY DATA

PLATE 146



TEST CONDITIONS

TIDE RANGE	5.4 FT
HARBOR CONFIGURATION	PLAN 1A3
SOURCE CONCENTRATION	6,740 PPB

LEGEND

+ —·—·— SURFACE
× — - — - — BOTTOM

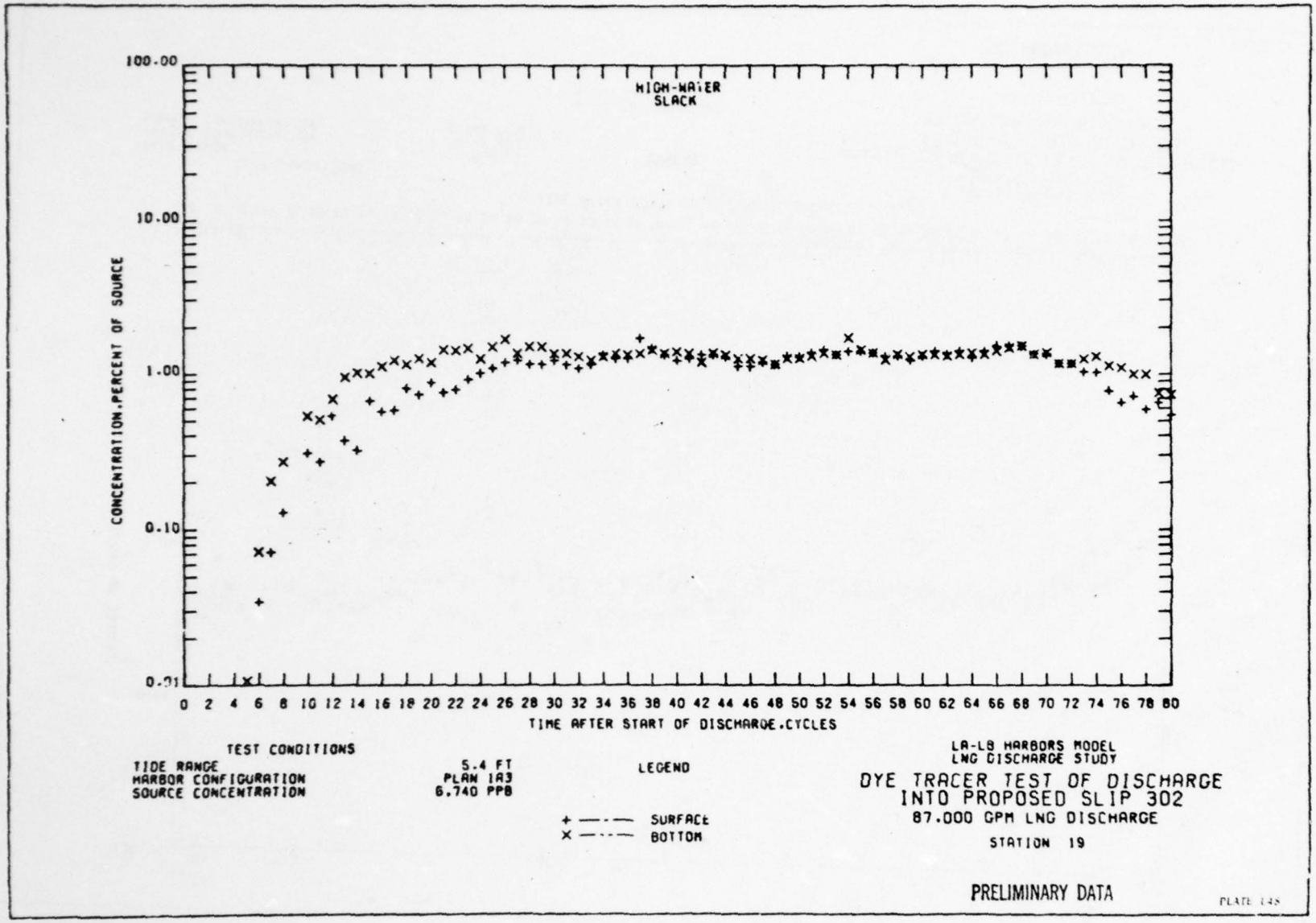
LA-LB HARBORS MODEL
LNG DISCHARGE STUDY

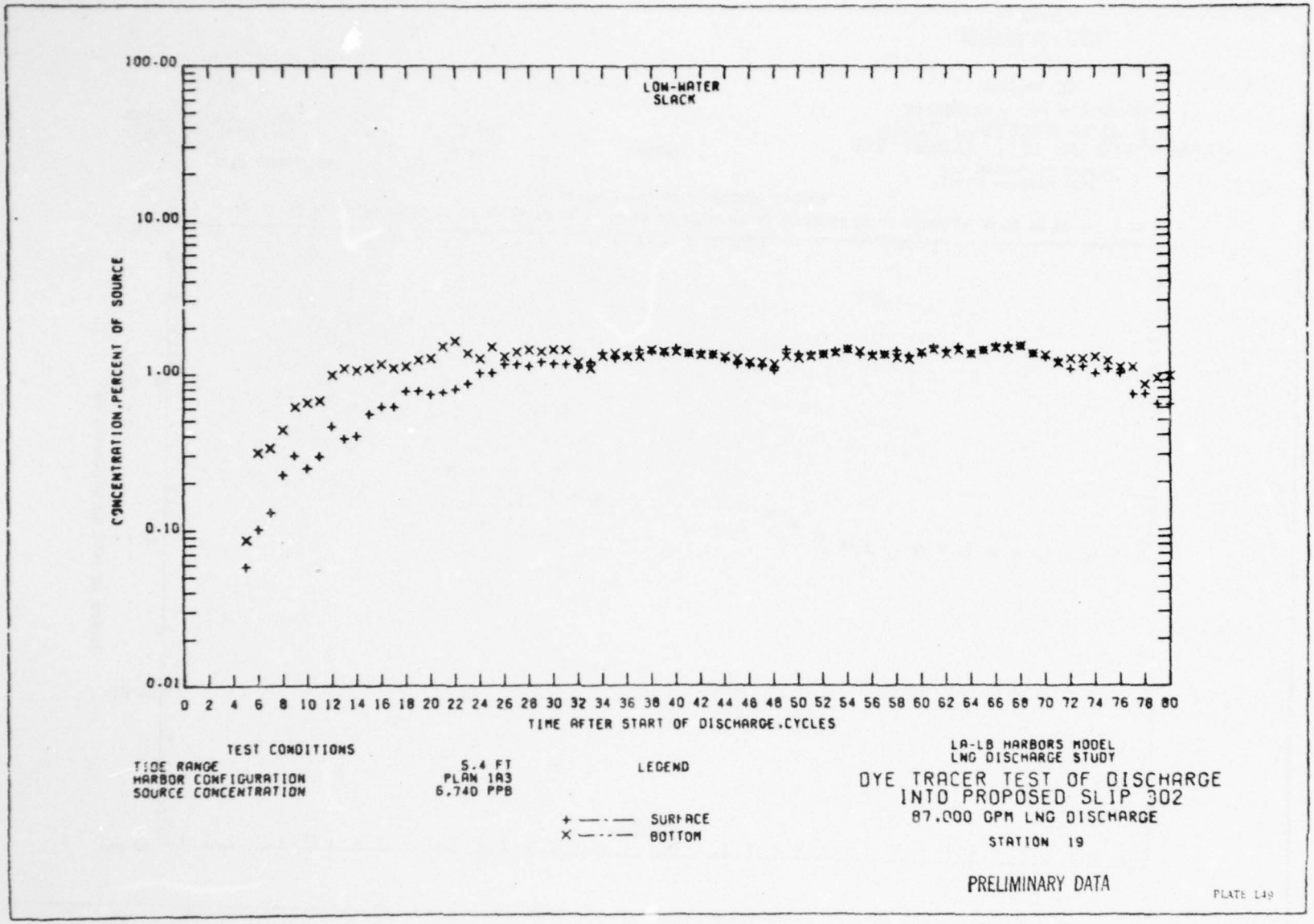
DYE TRACER TEST OF DISCHARGE
INTO PROPOSED SLIP 302
87,000 GPM LNG DISCHARGE

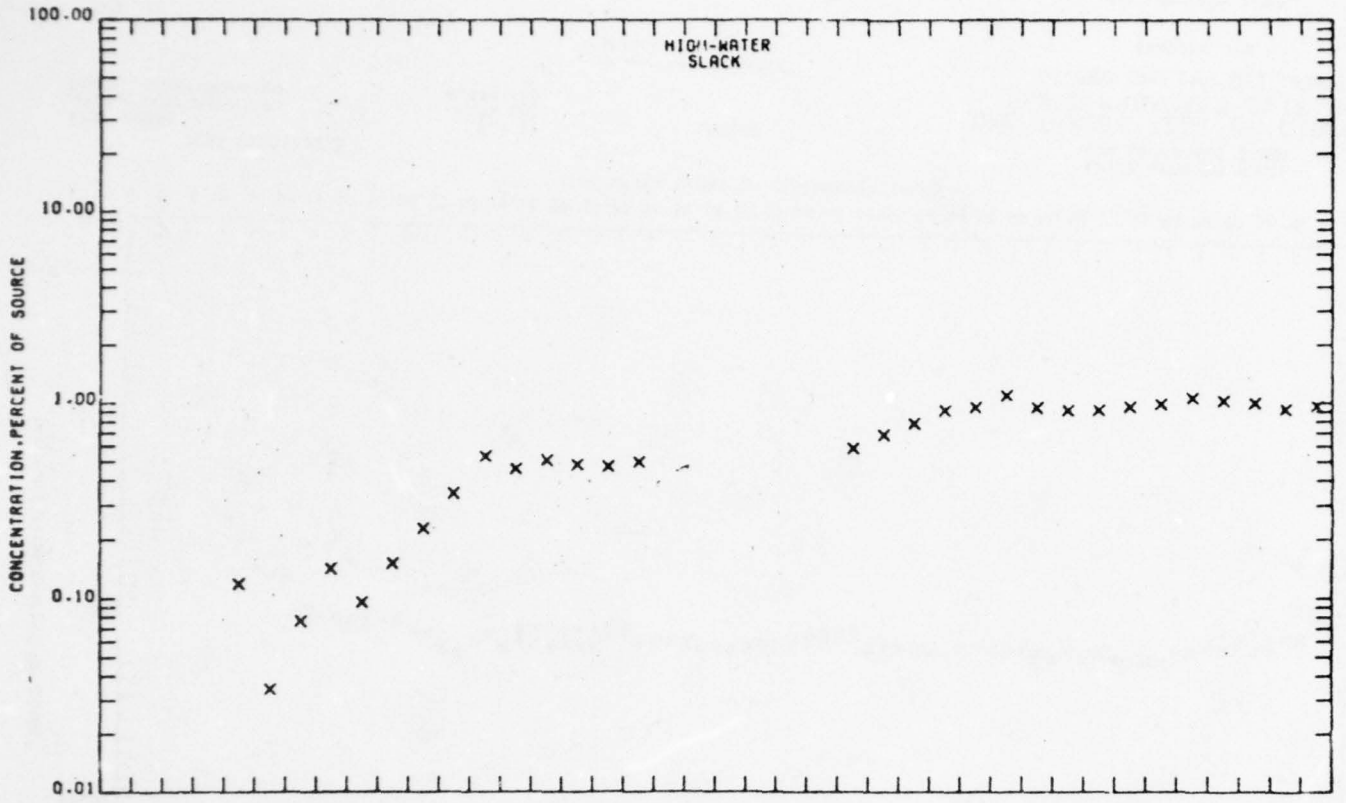
STATION 18

PRELIMINARY DATA

PLATE 14


HIGH-WATER SLACK
100.00
10.00
1.00
0.10
0.01
CONCENTRATION, PERCENT OF SOURCE
0 2 4 6 8 10 12 14 16 18 20 22 24 26 28 30 32 34 36 38 40 42 44 46 48 50 52 54 56 58 60 62 64 66 68 70 72 74 76 78 80
TIME AFTER START OF DISCHARGE, CYCLES
TEST CONDITIONS
TIDE RANGE 5.4 FT
HARBOR CONFIGURATION PLAN 1A3
SOURCE CONCENTRATION 6,740 PPB
LEGEND
SURFACE
BOTTOM
LA-LB HARBORS MODEL
LNG DISCHARGE STUDY
DYE TRACER TEST OF DISCHARGE
INTO PROPOSED SLIP 302
87,000 GPM LNG DISCHARGE
STATION 19
PRELIMINARY DATA
PLATE 145


LOW-WATER SLACK
100.00
10.00
1.00
0.10
0.01
CONCENTRATION, PERCENT OF SOURCE
0 2 4 6 8 10 12 14 16 18 20 22 24 26 28 30 32 34 36 38 40 42 44 46 48 50 52 54 56 58 60 62 64 66 68 70 72 74 76 78 80
TIME AFTER START OF DISCHARGE, CYCLES
TEST CONDITIONS
TIDE RANGE 5.4 FT
HARBOR CONFIGURATION PLAN 1A3
SOURCE CONCENTRATION 6,740 PPB
LEGEND
+ SURFACE
× BOTTOM
LA-LB HARBORS MODEL
LNG DISCHARGE STUDY
DYE TRACER TEST OF DISCHARGE
INTO PROPOSED SLIP 302
87,000 GPM LNG DISCHARGE
STATION 19
PRELIMINARY DATA
PLATE L49



TEST CONDITIONS

TIDE RANGE	5.4 FT
HARBOR CONFIGURATION	PLAN 1A3
SOURCE CONCENTRATION	6,740 PPB

LEGEND

× ---- BOTTOM

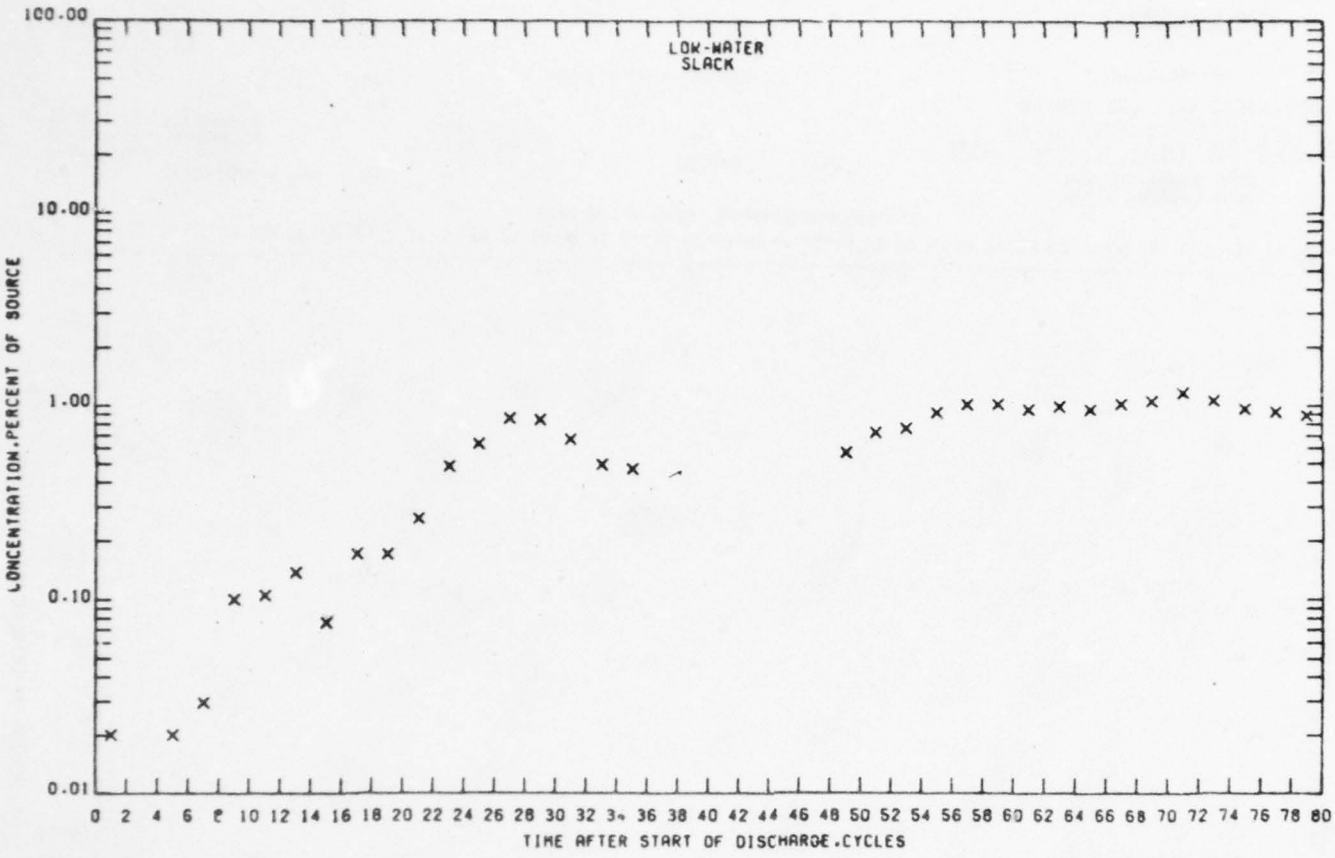
LA-LB HARBORS MODEL
LNG DISCHARGE STUDY

DYE TRACER TEST OF DISCHARGE
INTO PROPOSED SLIP 302
87,000 GPM LNG DISCHARGE

STATION 20

PRELIMINARY DATA

PLATE 150



TEST CONDITIONS

TIDE RANGE	5.4 FT
HARBOR CONFIGURATION	PLAN 1A3
SOURCE CONCENTRATION	6,740 PPB

LEGEND

× ---- BOTTOM

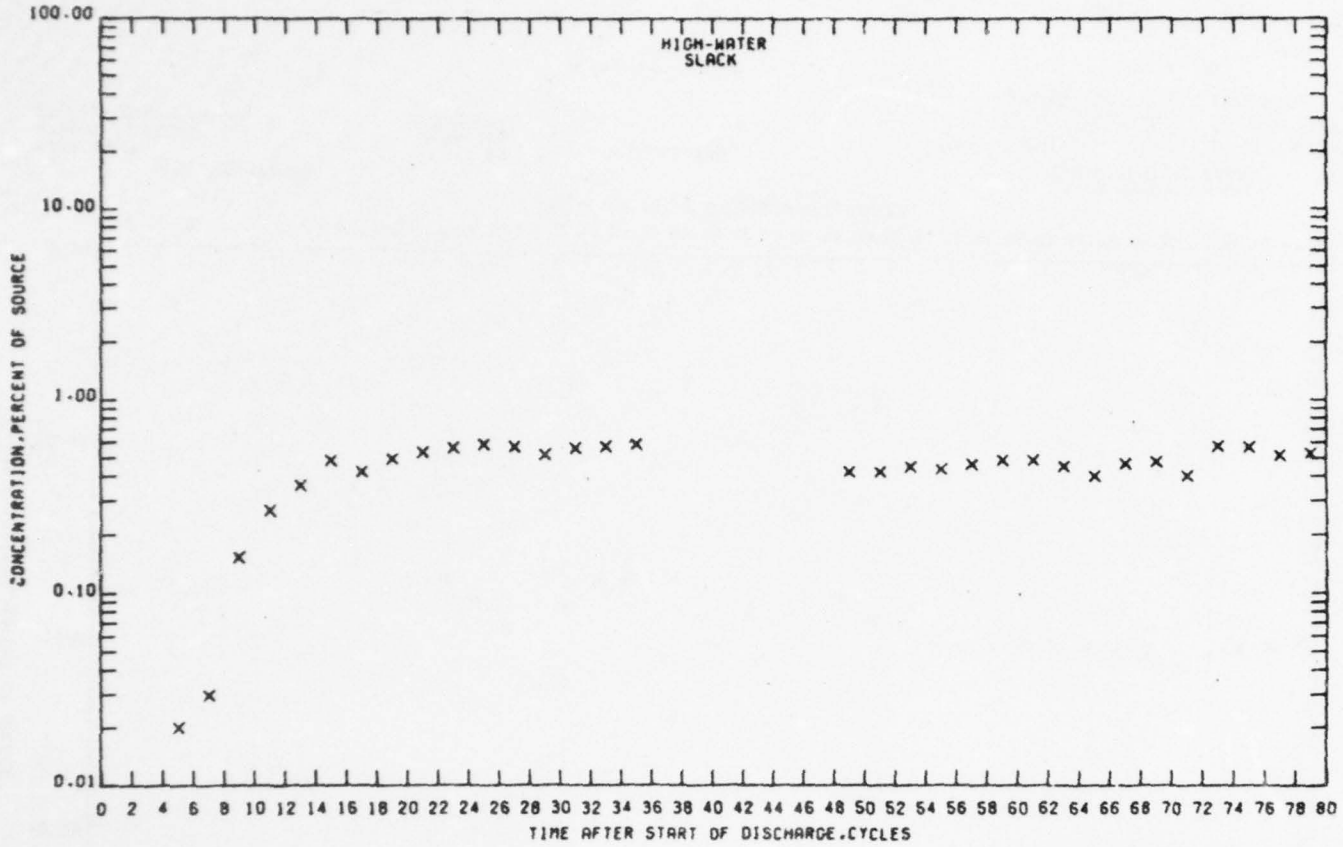
LA-LB HARBORS MODEL
LNG DISCHARGE STUDY

DYE TRACER TEST OF DISCHARGE
INTO PROPOSED SLIP 302
87,000 GPM LNG DISCHARGE

STATION 20

PRELIMINARY DATA

PLATE L31



TEST CONDITIONS

TIDE RANGE	5.4 FT
HARBOR CONFIGURATION	PLAN 1A3
SOURCE CONCENTRATION	6,740 PPB

LEGEND

× —·—·— BOTTOM

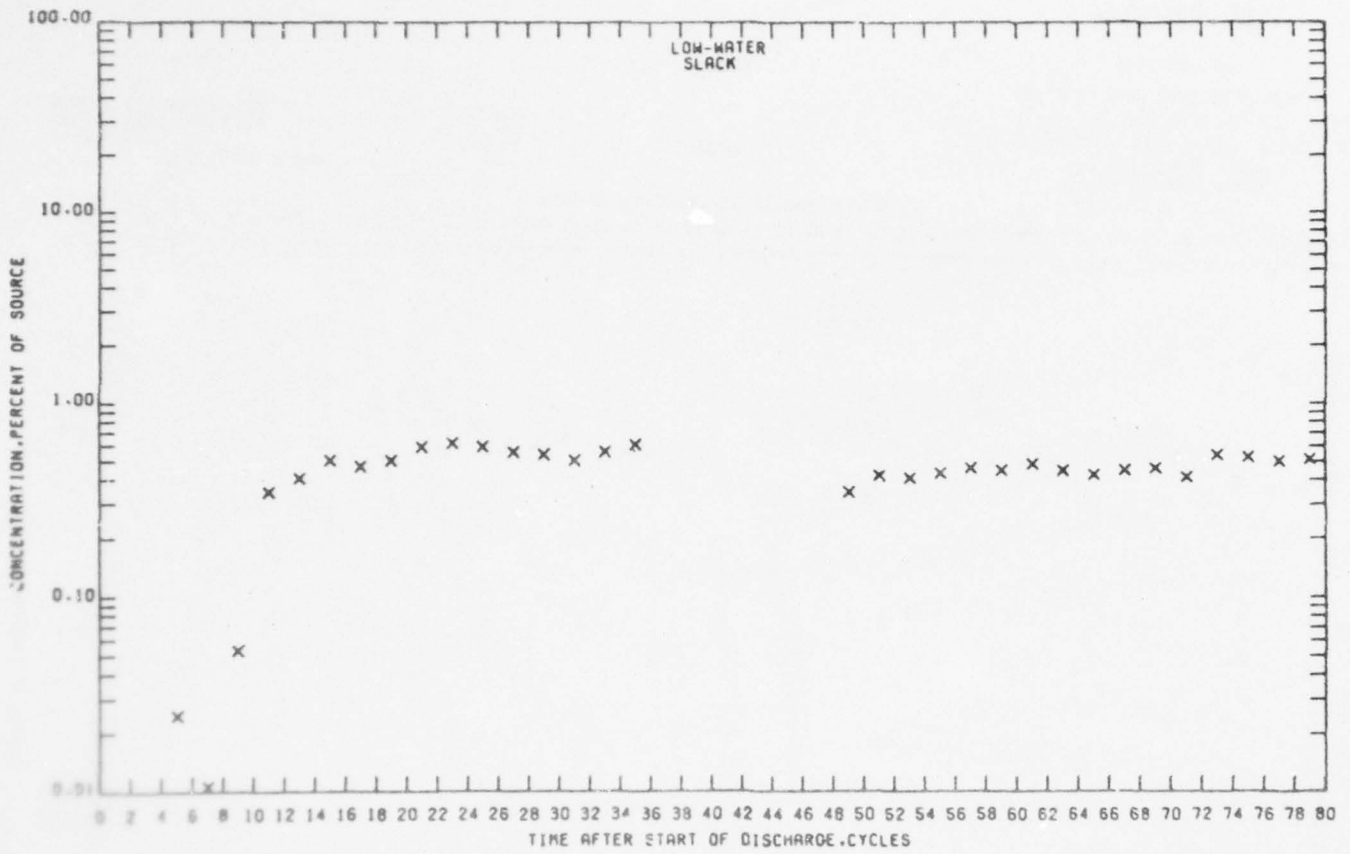
LA-LB HARBORS MODEL
LNG DISCHARGE STUDY

DYE TRACER TEST OF DISCHARGE
INTO PROPOSED SLIP 302
87,000 GPM LNG DISCHARGE

STATION 21

PRELIMINARY DATA

PLATE L5.



TEST CONDITIONS

5.4 FT
PLAN 1A3
6,740 PPB

LEGEND

× —·—·— BOTTOM

LA-LB HARBORS MODEL
LNG DISCHARGE STUDY

DYE TRACER TEST OF DISCHARGE
INTO PROPOSED SLIP 302
87,000 GPM LNG DISCHARGE

STATION 21

PRELIMINARY DATA

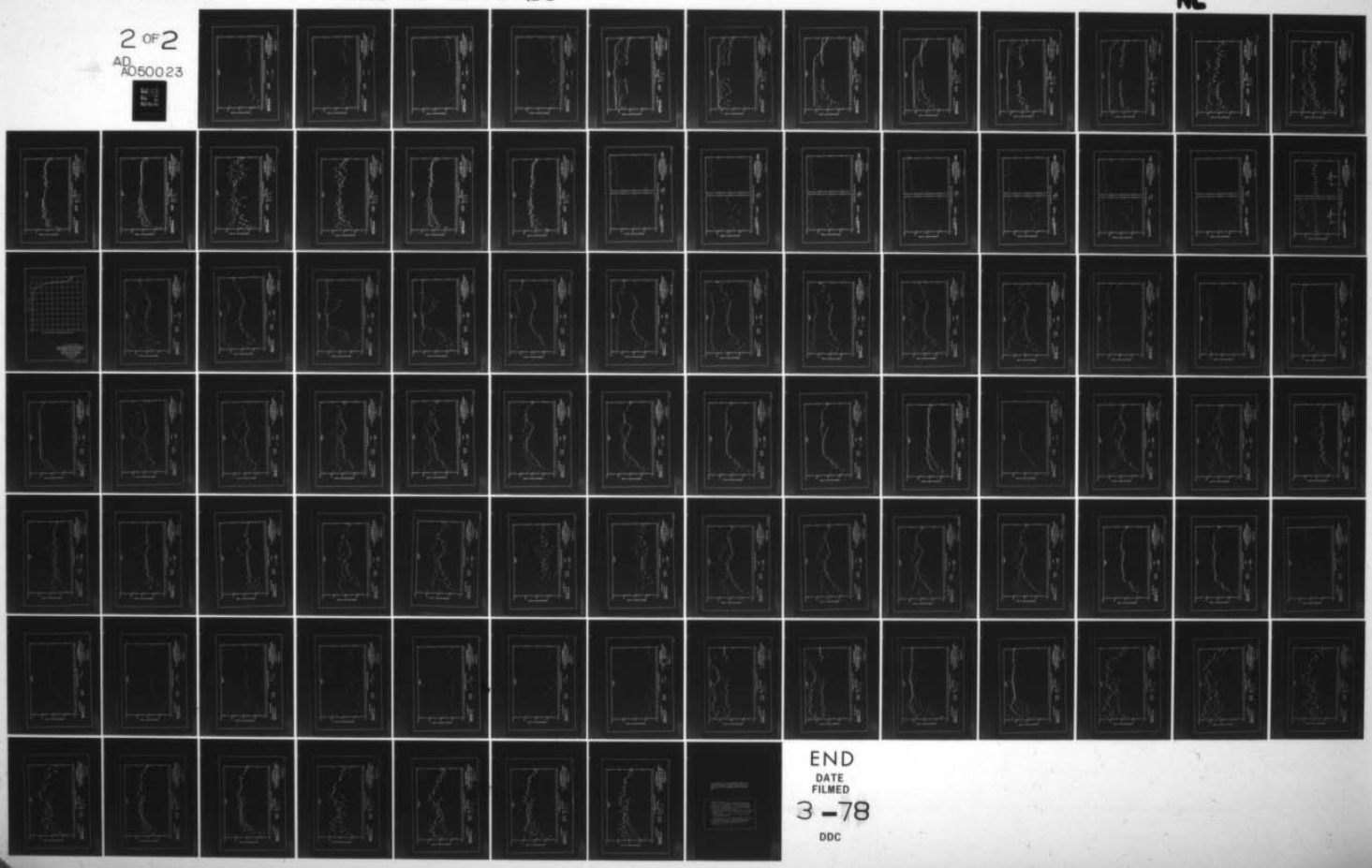
PLATE L 3

AD-A050 023 ARMY ENGINEER WATERWAYS EXPERIMENT STATION VICKSBURG MISS F/G 14/2
MODEL STUDY OF COOL WATER DISCHARGE FROM PROPOSED LNG FACILITY --ETC(U)
NOV 77 W H MCANALLY

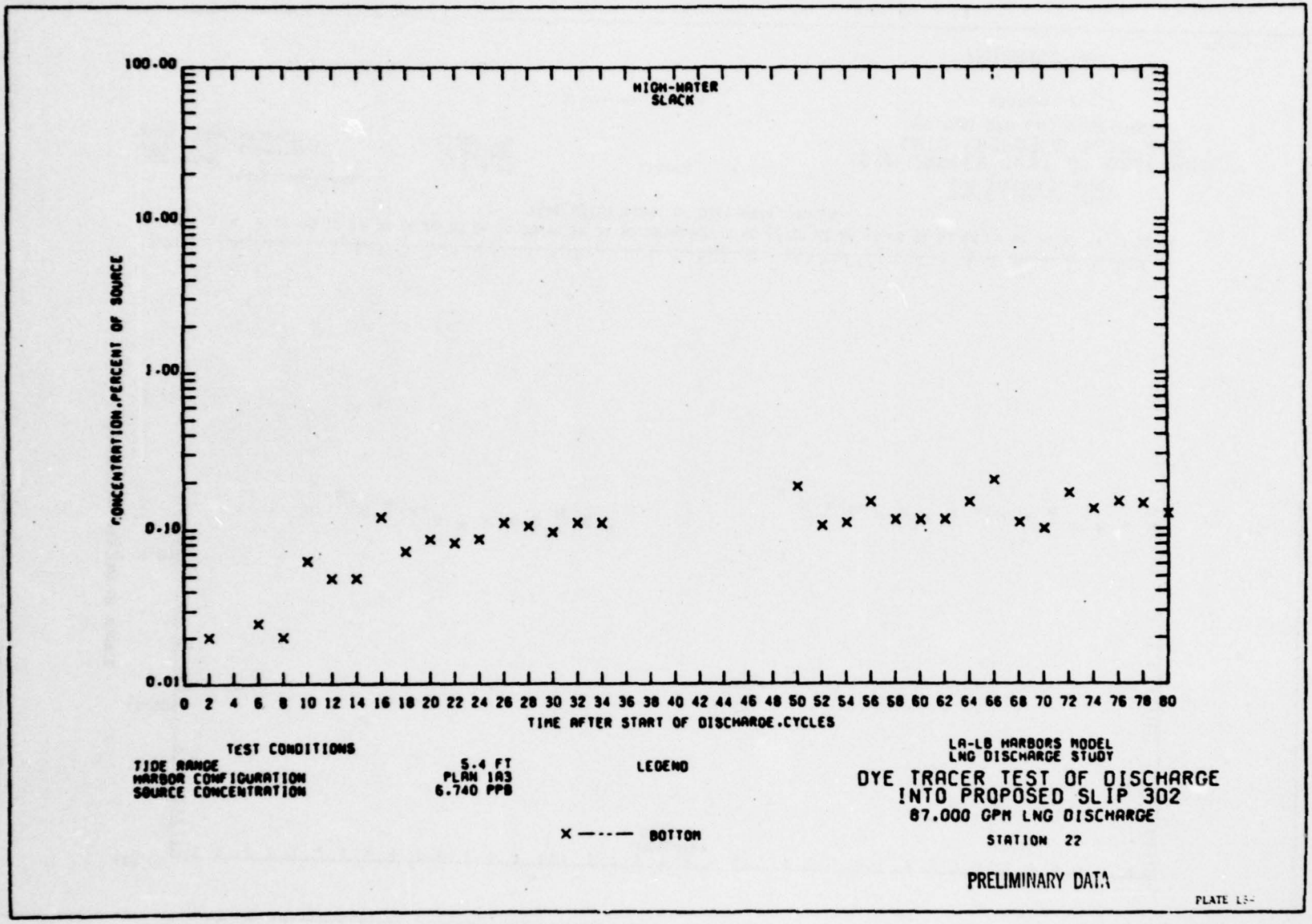
UNCLASSIFIED WES-MP-H-77-13

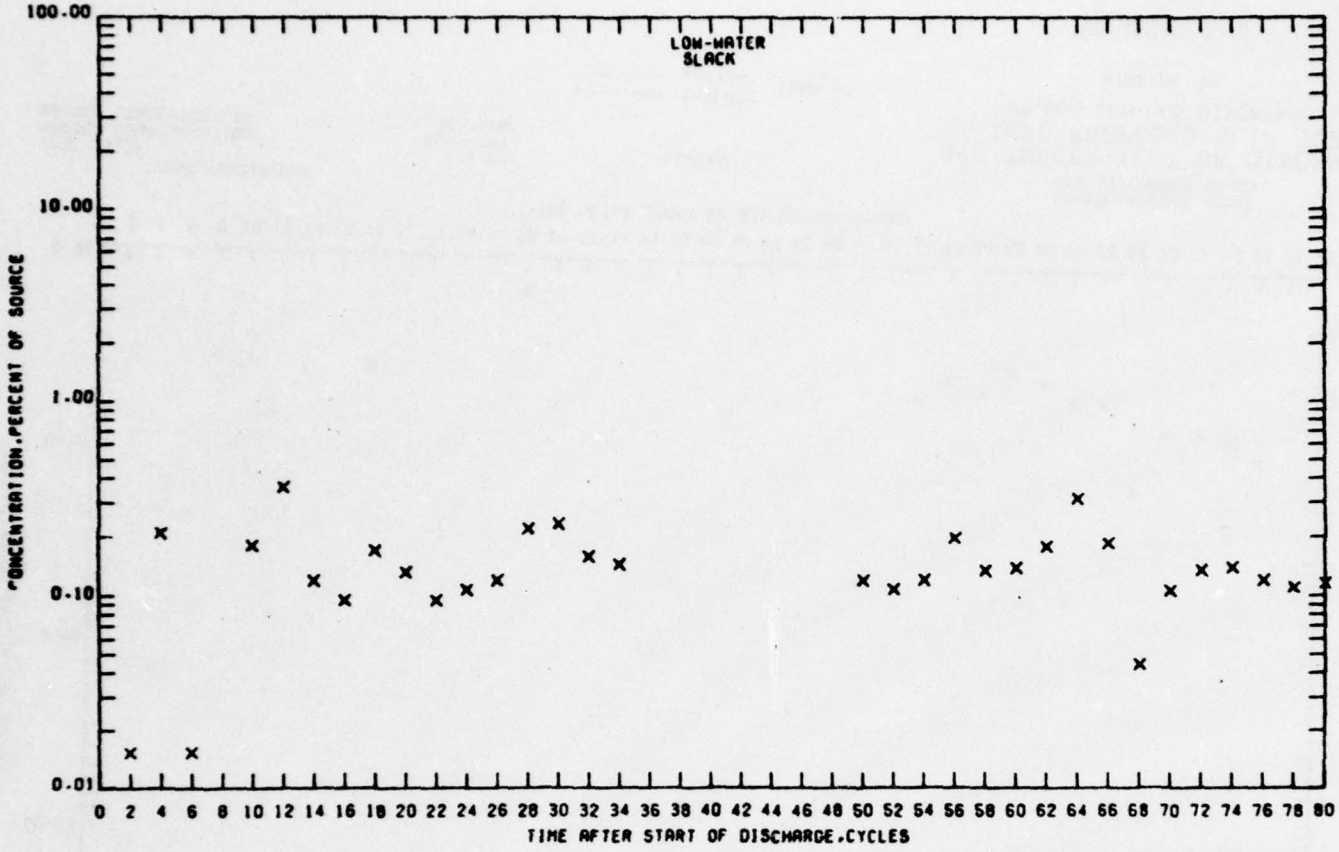
NL

2 OF 2
AD A050023



END
DATE FILMED
3-78
DDC


HIGH-WATER SLACK
100.00
10.00
1.00
0.10
0.01
CONCENTRATION, PERCENT OF SOURCE
0 2 4 6 8 10 12 14 16 18 20 22 24 26 28 30 32 34 36 38 40 42 44 46 48 50 52 54 56 58 60 62 64 66 68 70 72 74 76 78 80
TIME AFTER START OF DISCHARGE, CYCLES
TEST CONDITIONS
TIDE RANGE 5.4 FT
HARBOR CONFIGURATION PLAN 1A3
SOURCE CONCENTRATION 6.740 PPB
LEGEND
BOTTOM
LA-LB HARBORS MODEL
LNG DISCHARGE STUDY
DYE TRACER TEST OF DISCHARGE
INTO PROPOSED SLIP 302
87,000 GPM LNG DISCHARGE
STATION 22
PRELIMINARY DATA
PLATE L5-



TEST CONDITIONS

TIDE RANGE	5.4 FT
HARBOR CONFIGURATION	PLAN 1A3
SOURCE CONCENTRATION	8,740 PPB

LEGEND

× —·—·— BOTTOM

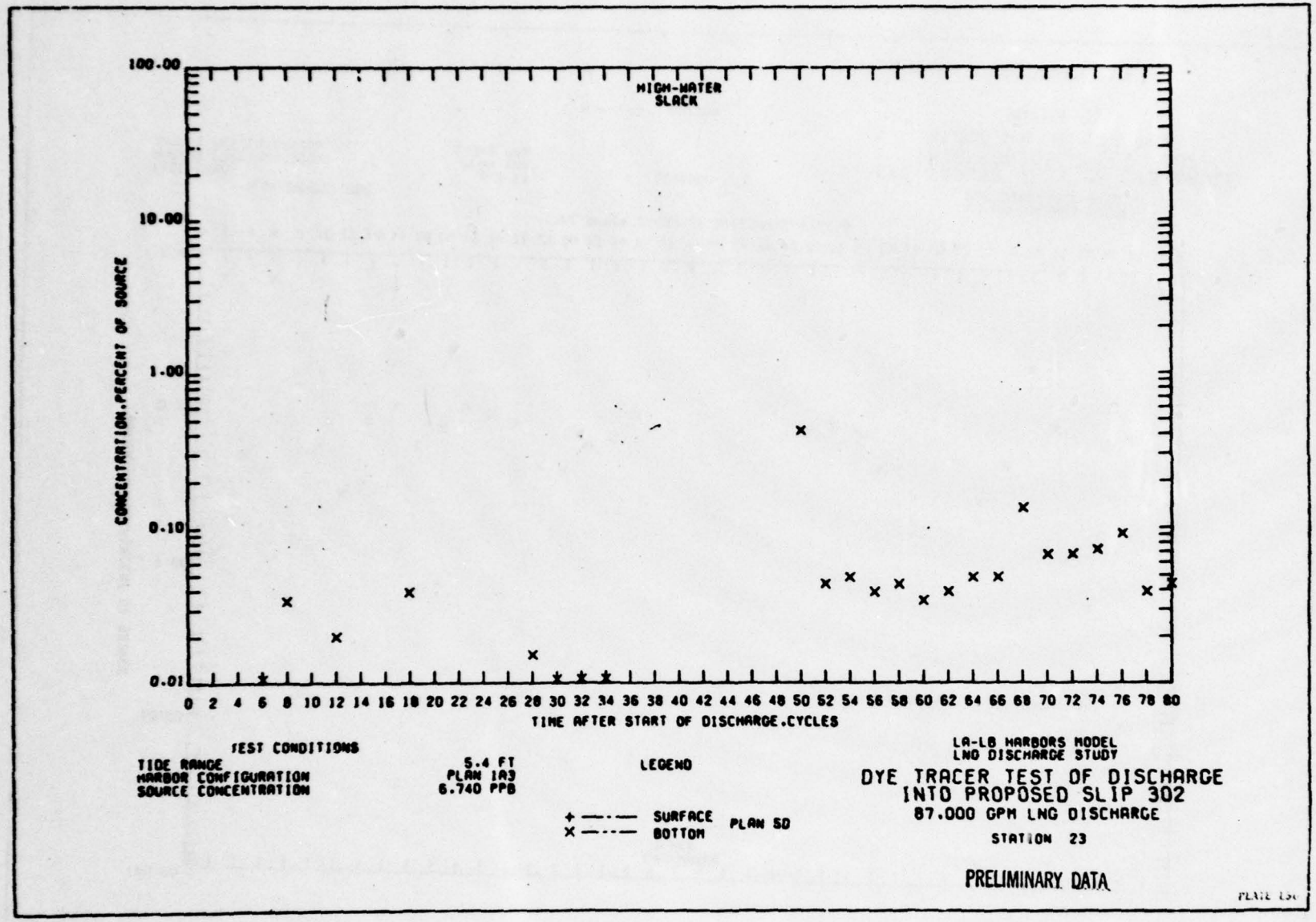
LA-LB HARBORS MODEL
LNG DISCHARGE STUDY

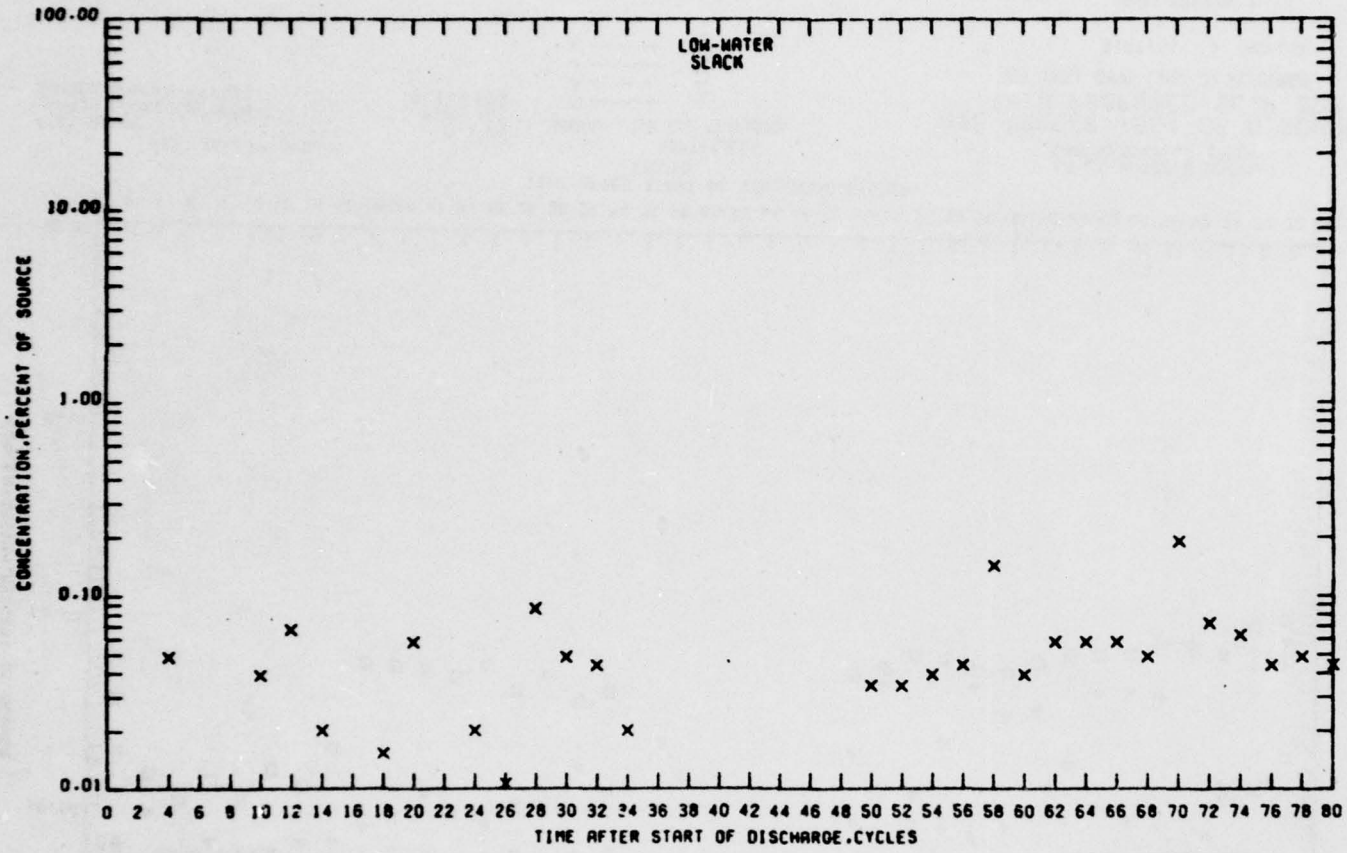
DYE TRACER TEST OF DISCHARGE
INTO PROPOSED SLIP 302
87,000 GPM LNG DISCHARGE

STATION 22

PRELIMINARY DATA

PLATE L-5


HIGH-WATER SLACK
100.00
10.00
1.00
0.10
0.01
CONCENTRATION, PERCENT OF SOURCE
0 2 4 6 8 10 12 14 16 18 20 22 24 26 28 30 32 34 36 38 40 42 44 46 48 50 52 54 56 58 60 62 64 66 68 70 72 74 76 78 80
TIME AFTER START OF DISCHARGE, CYCLES
TEST CONDITIONS
TIDE RANGE 5.4 FT
HARBOR CONFIGURATION PLAN 1A3
SOURCE CONCENTRATION 6,740 PPB
LEGEND
SURFACE
BOTTOM
PLAN 5D
LA-LB HARBORS MODEL
LNG DISCHARGE STUDY
DYE TRACER TEST OF DISCHARGE
INTO PROPOSED SLIP 302
87,000 GPM LNG DISCHARGE
STATION 23
PRELIMINARY DATA



TEST CONDITIONS

TIDE RANGE	5.4 FT
HARBOR CONFIGURATION	PLAN 1A3
SOURCE CONCENTRATION	6.740 PPB

LEGEND

× —·—·— BOTTOM

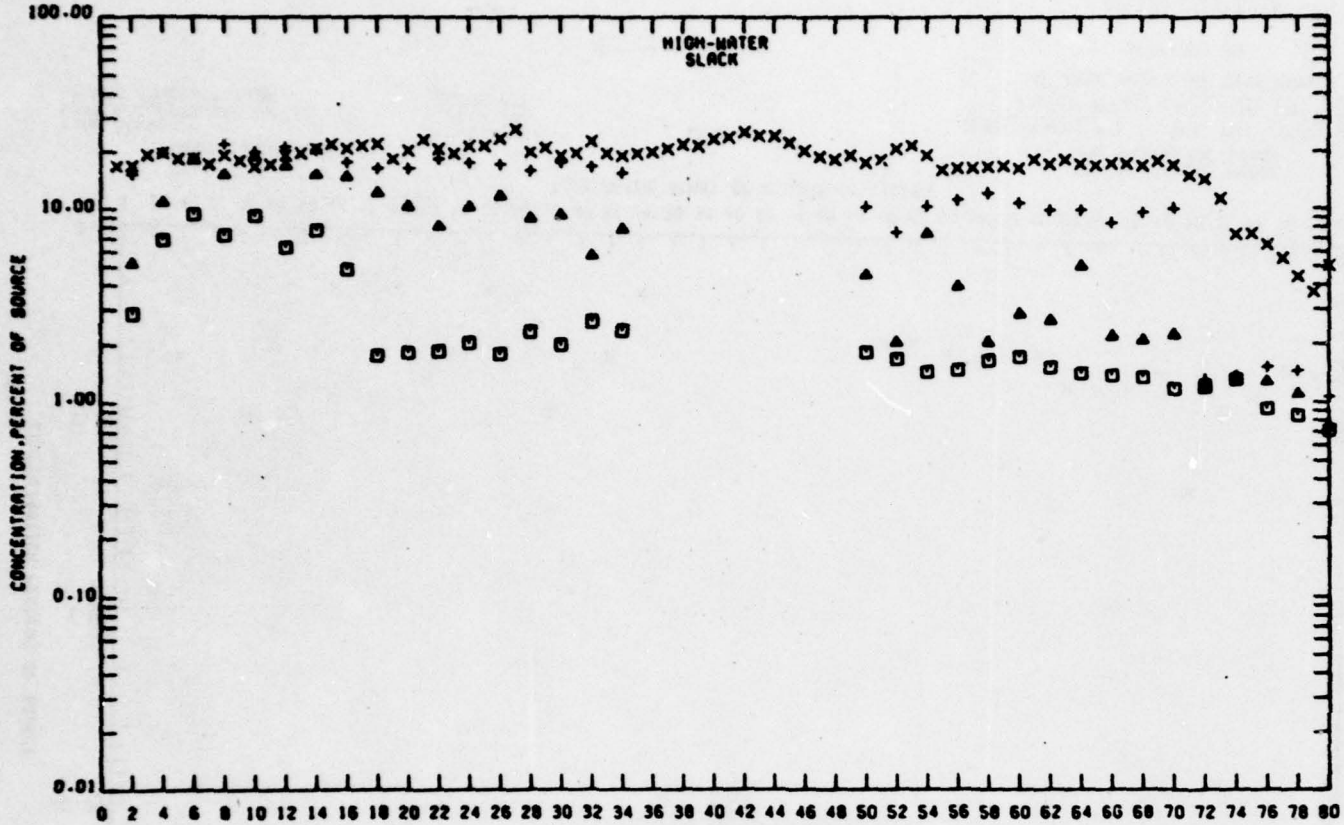
LA-LB HARBORS MODEL
LNG DISCHARGE STUDY

DYE TRACER TEST OF DISCHARGE
INTO PROPOSED SLIP 302
87,000 GPM LNG DISCHARGE

STATION 23

PRELIMINARY DATA

PLATE L5?



TEST CONDITIONS

TIDE RANGE	5.4 FT
HARBOR CONFIGURATION	PLAN 1A3
SOURCE CONCENTRATION	6.740 PPB

LEGEND

SYMBOL	DEPTH BELOW SURFACE, FT (PROTO)
☐	11
△	22
+	34
×	44

LA-LB HARBORS MODEL
LNG DISCHARGE STUDY

DYE TRACER TEST OF DISCHARGE
INTO PROPOSED SLIP 302
87,000 GPM LNG DISCHARGE

STATION 1 PROFILES

PRELIMINARY DATA

PLATE L58

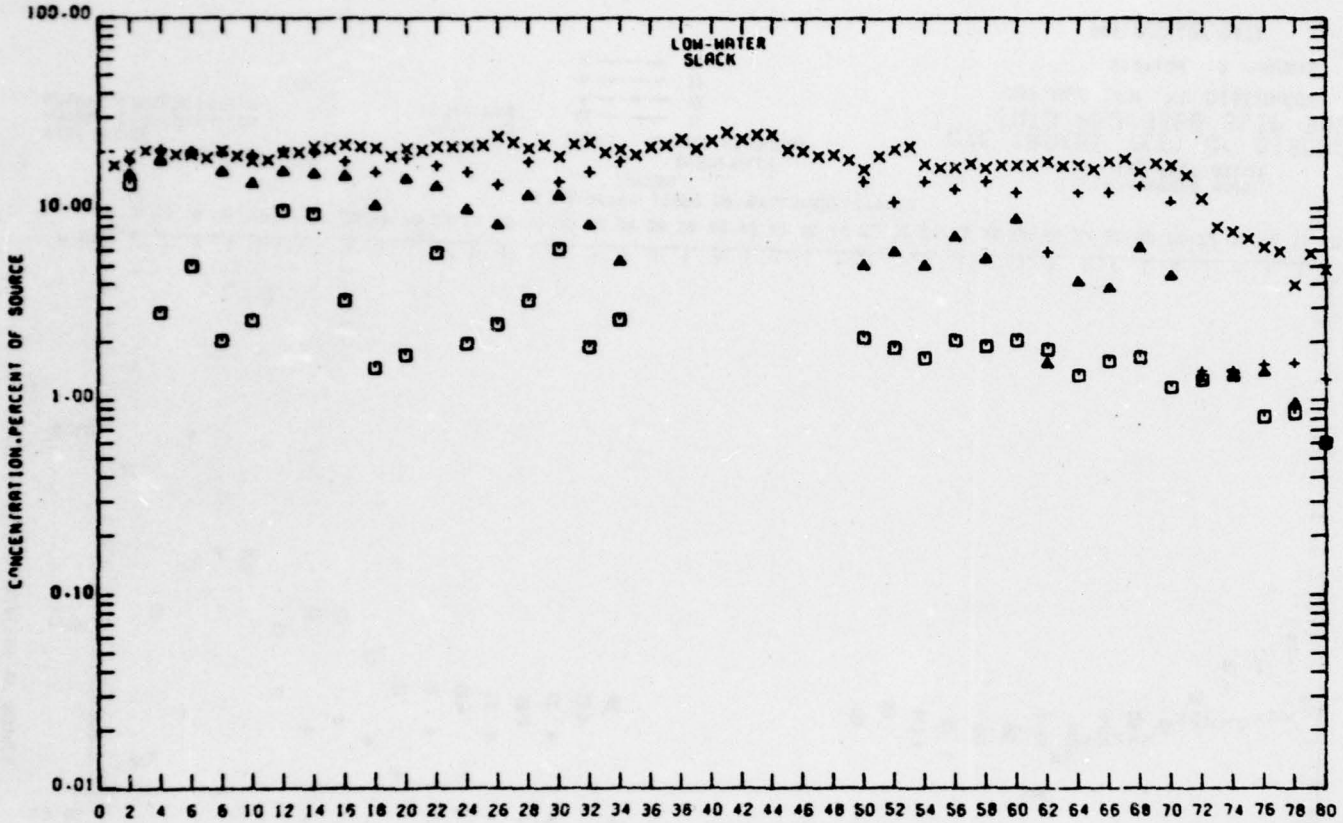
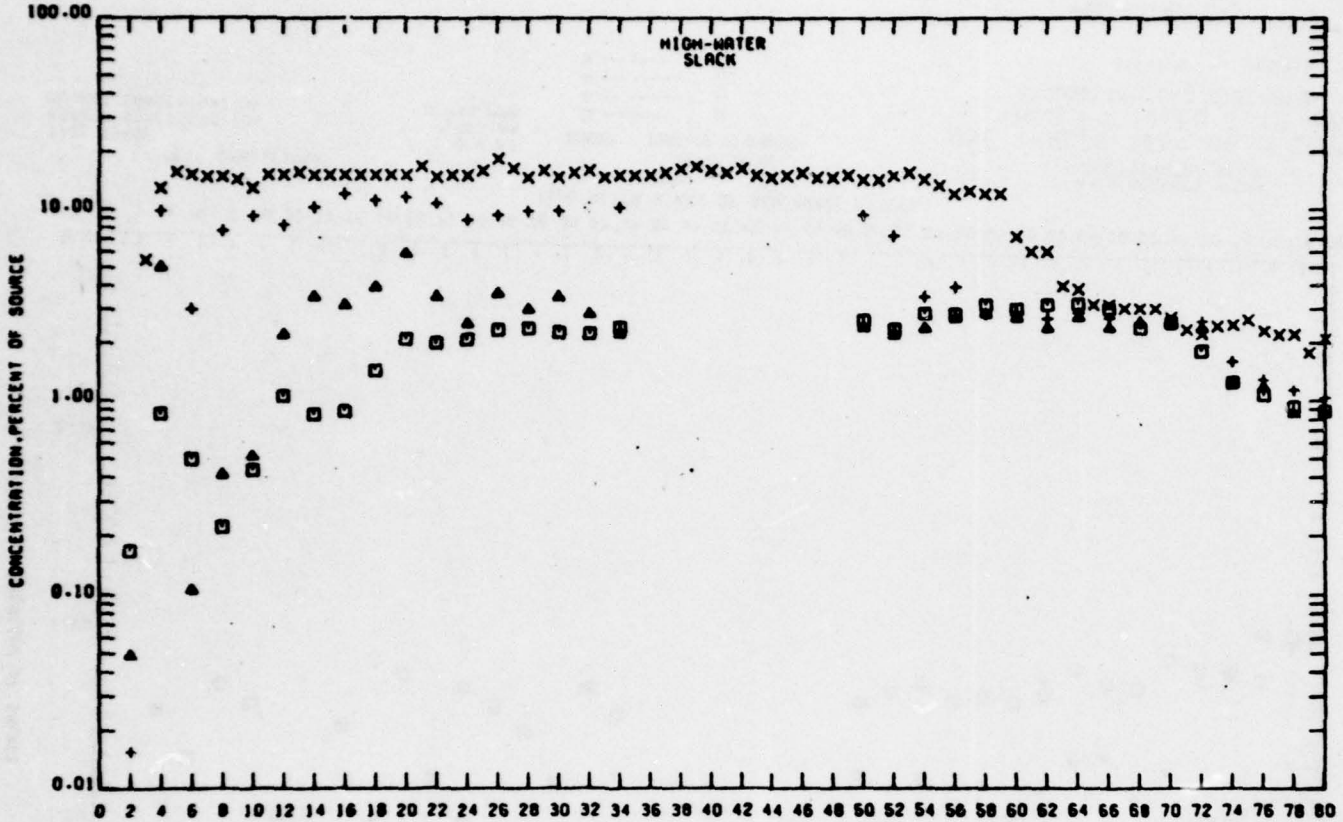

LOW-WATER SLACK
100.00
10.00
1.00
0.10
0.01
CONCENTRATION, PERCENT OF SOURCE
0 2 4 6 8 10 12 14 16 18 20 22 24 26 28 30 32 34 36 38 40 42 44 46 48 50 52 54 56 58 60 62 64 66 68 70 72 74 76 78 80
TIME AFTER START OF DISCHARGE, CYCLES
TEST CONDITIONS
TIDE RANGE 5.4 FT
HARBOR CONFIGURATION PLAN 1A3
SOURCE CONCENTRATION 6,740 PPB
LEGEND
SYMBOL DEPTH BELOW SURFACE, FT (PROTO)
11
22
34
44
LA-LB HARBORS MODEL
LNG DISCHARGE STUDY
DYE TRACER TEST OF DISCHARGE INTO PROPOSED SLIP 302
87,000 GPM LNG DISCHARGE
STATION 1 PROFILES
PRELIMINARY DATA

PLATE L59



TEST CONDITIONS

TIDE RANGE	5.4 FT	
HARBOR CONFIGURATION	PLAN 1A3	
SOURCE CONCENTRATION	6,740 PPB	

LEGEND

SYMBOL	DEPTH BELOW SURFACE, FT (PROTO)
□	11
△	22
+	34
×	44

LA-LB HARBORS MODEL
LNG DISCHARGE STUDY

DYE TRACER TEST OF DISCHARGE
INTO PROPOSED SLIP 302
87,000 GPM LNG DISCHARGE

STATION 2 PROFILES

PRELIMINARY DATA

PLATE L6J

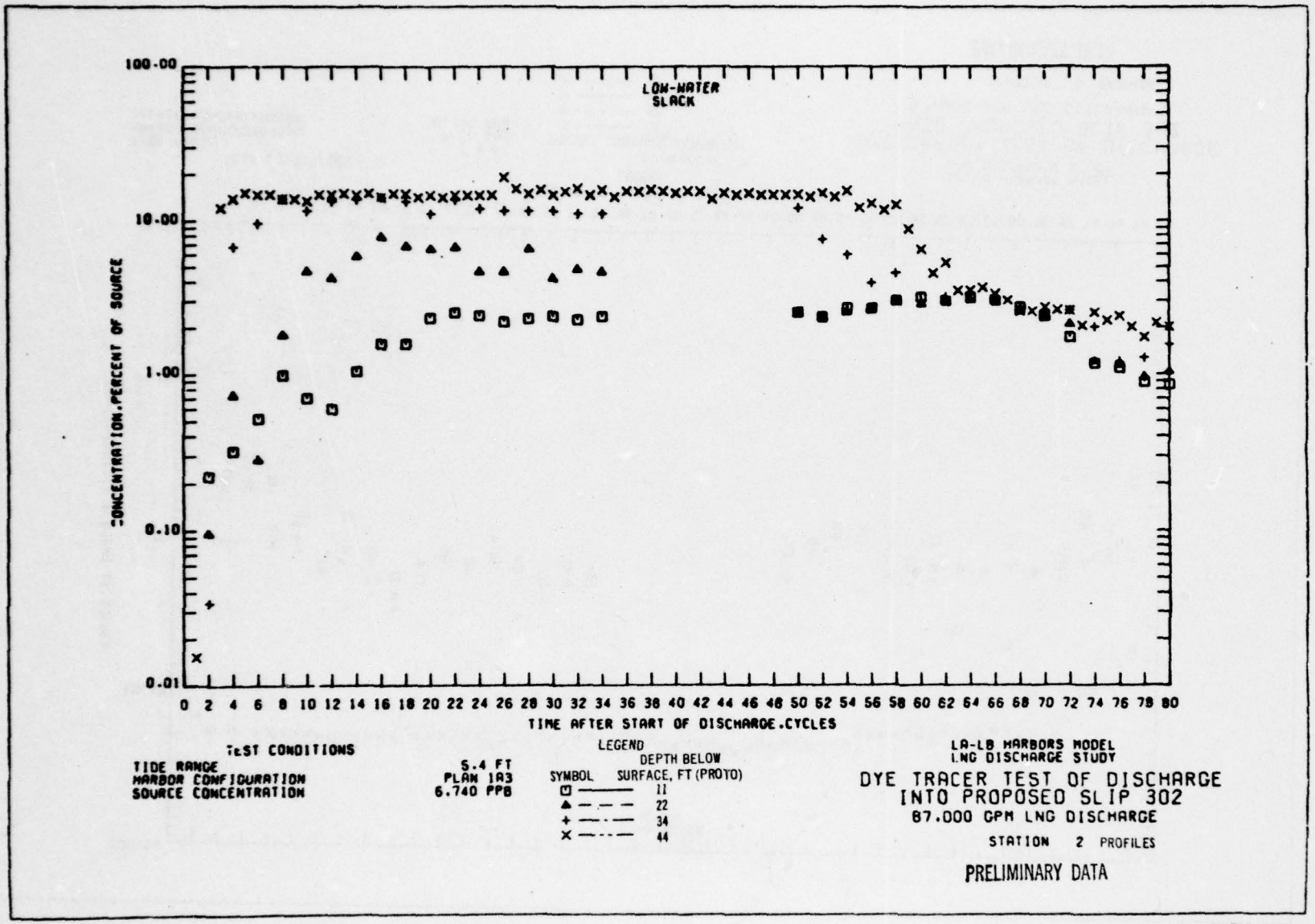
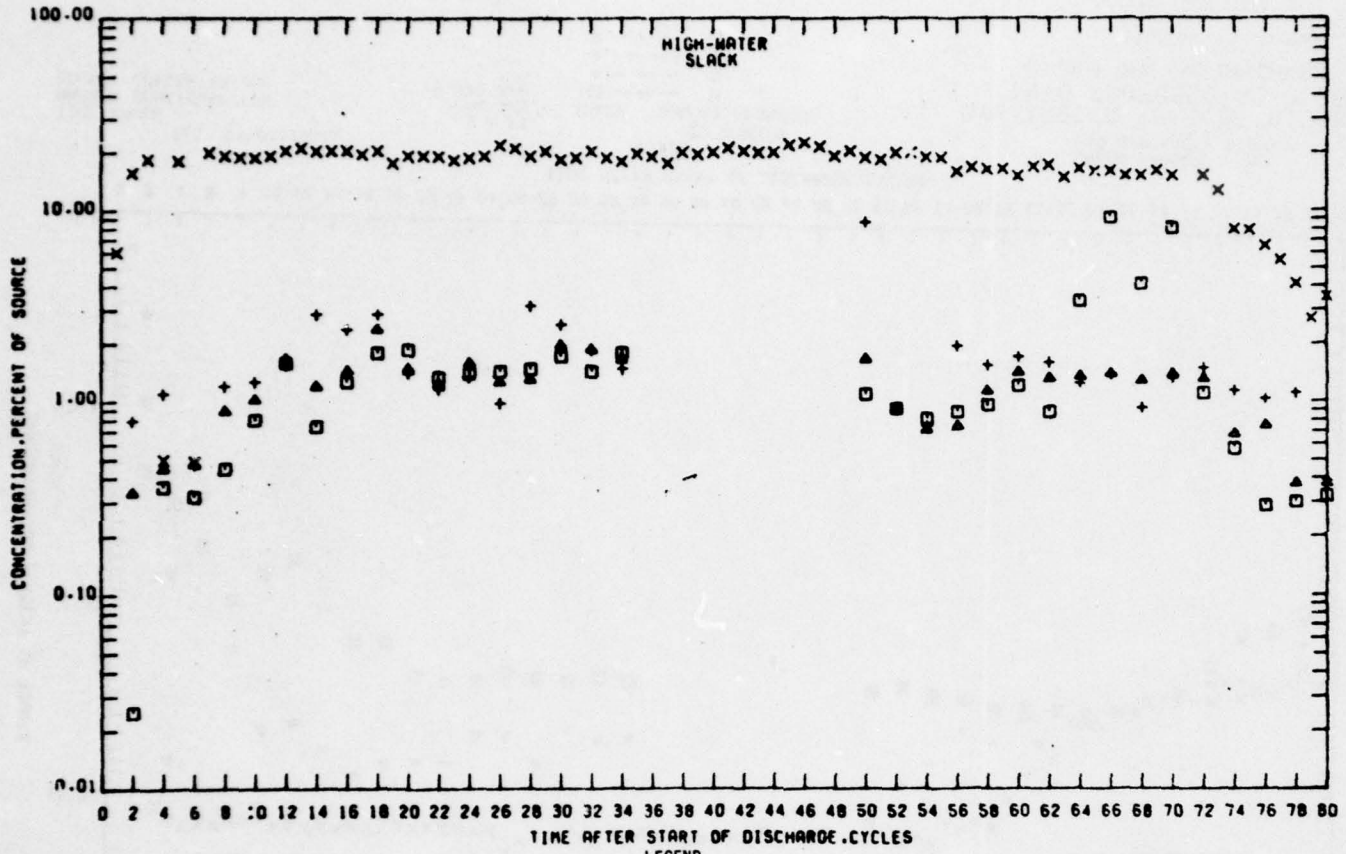

100.00
10.00
1.00
0.10
0.01
LOW-WATER SLACK
CONCENTRATION, PERCENT OF SOURCE
0 2 4 6 8 10 12 14 16 18 20 22 24 26 28 30 32 34 36 38 40 42 44 46 48 50 52 54 56 58 60 62 64 66 68 70 72 74 76 78 80
TIME AFTER START OF DISCHARGE, CYCLES
TEST CONDITIONS
TIDE RANGE 5.4 FT
HARBOR CONFIGURATION PLAN 1A3
SOURCE CONCENTRATION 6,740 PPB
LEGEND
DEPTH BELOW SURFACE, FT (PROTO)
SYMBOL
11
22
34
44
LA-LB HARBORS MODEL
LNG DISCHARGE STUDY
DYE TRACER TEST OF DISCHARGE INTO PROPOSED SLIP 302
87,000 GPM LNG DISCHARGE
STATION 2 PROFILES
PRELIMINARY DATA

PLATE [illegible]



TEST CONDITIONS

TIDE RANGE	5.4 FT	
HARBOR CONFIGURATION	PLAN 1A3	
SOURCE CONCENTRATION	6.740 PPB	

LEGEND

SYMBOL	DEPTH BELOW SURFACE, FT (PROTO)
□ ———	11
△ – – –	22
+ —·—	34
× —··—	44

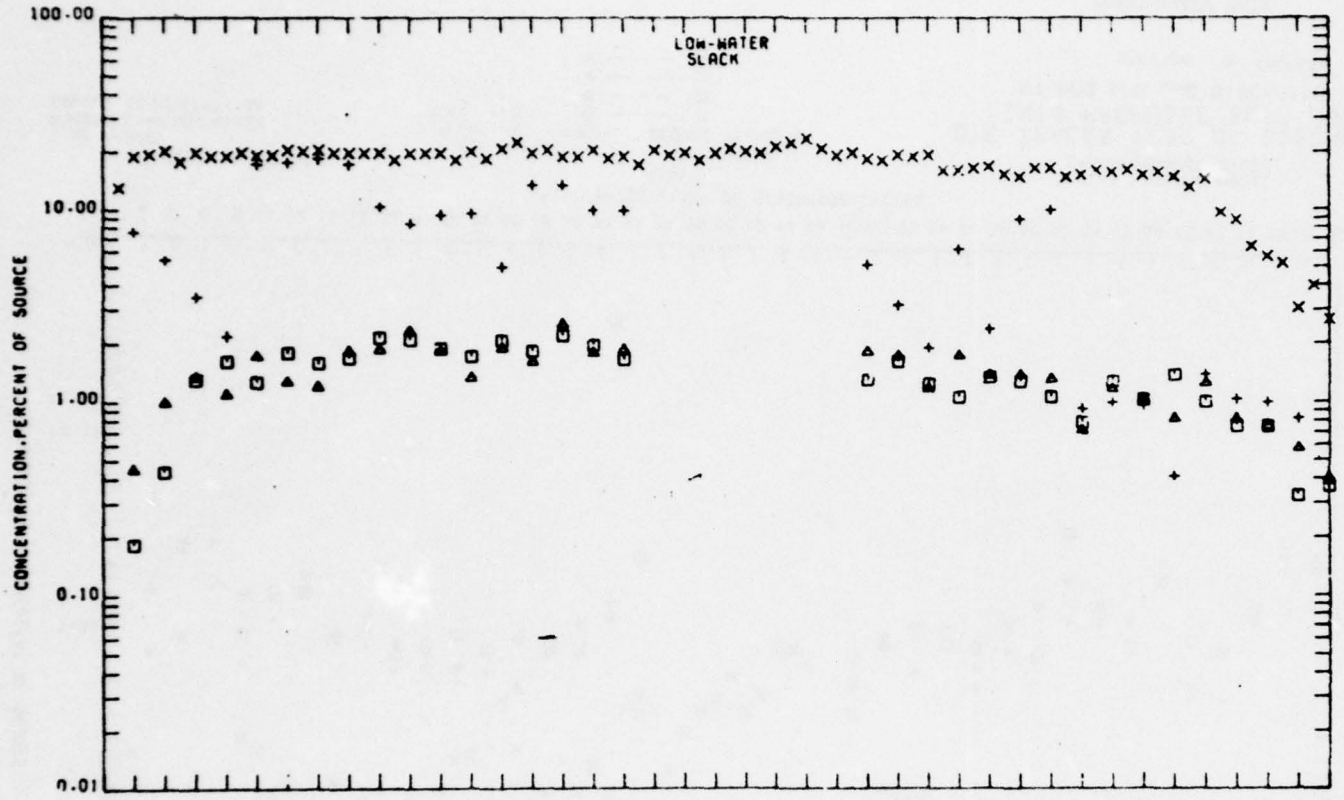
LA-LB HARBORS MODEL
LNG DISCHARGE STUDY

DYE TRACER TEST OF DISCHARGE
INTO PROPOSED SLIP 302
87,000 GPM LNG DISCHARGE

STATION 5 PROFILES

PRELIMINARY DATA

PLATE L-2



TEST CONDITIONS

TIDE RANGE	5.4 FT
HARBOR CONFIGURATION	PLAN 1A3
SOURCE CONCENTRATION	6,740 PPB

LEGEND

SYMBOL	DEPTH BELOW SURFACE, FT (PROTO)
□	11
△	22
+	34
×	44

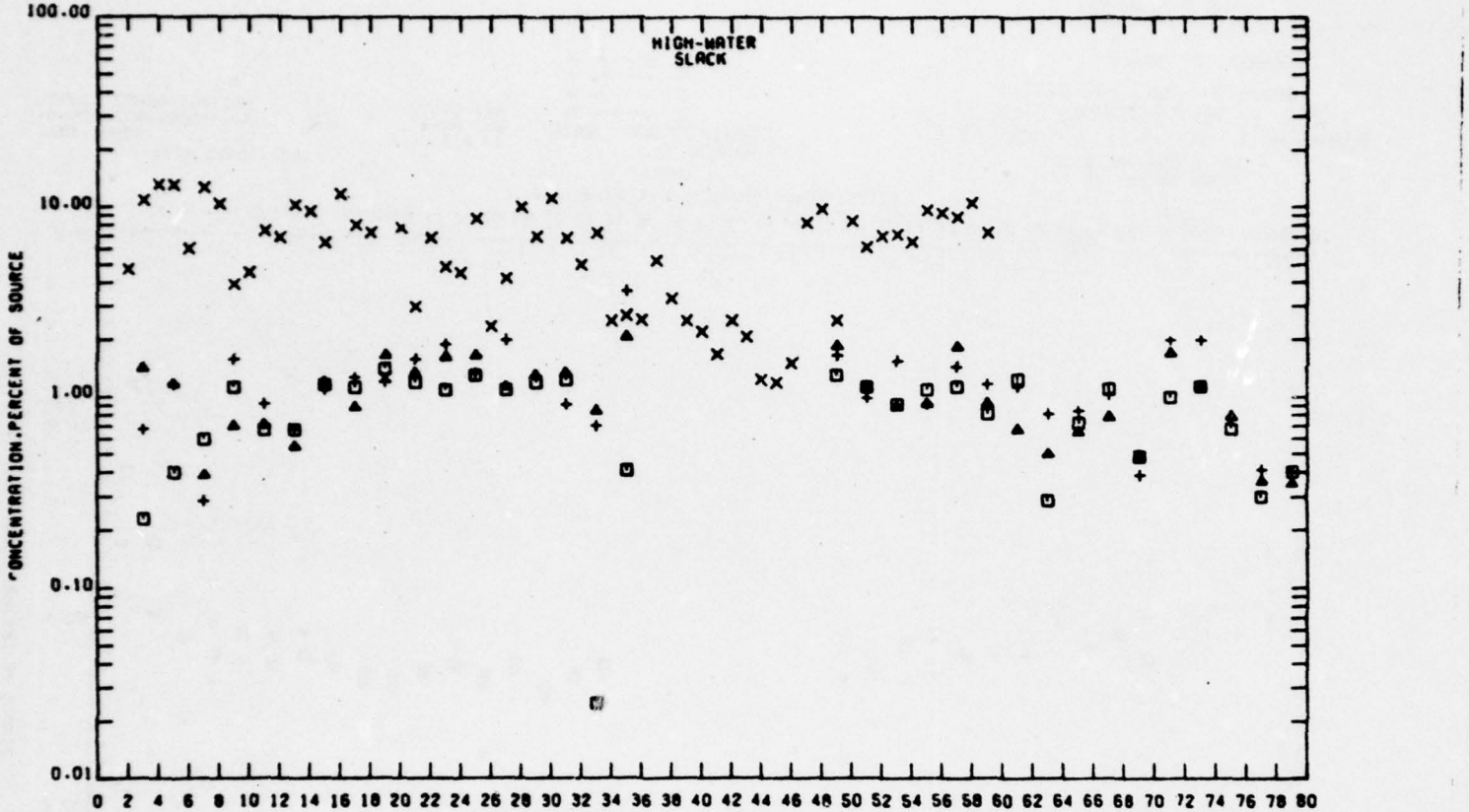
LA-LB HARBORS MODEL
LNG DISCHARGE STUDY

DYE TRACER TEST OF DISCHARGE
INTO PROPOSED SLIP 302
87,000 GPM LNG DISCHARGE

STATION 5 PROFILES

PRELIMINARY DATA

PLATE L05



TEST CONDITIONS

TIDE RANGE	5.4 FT
HARBOR CONFIGURATION	PLAN 1A3
SOURCE CONCENTRATION	6,740 PPB

LEGEND

SYMBOL	DEPTH BELOW SURFACE, FT (PROTO)
□ ———	11
△ – – –	22
+ —·—	34
× —··—	44

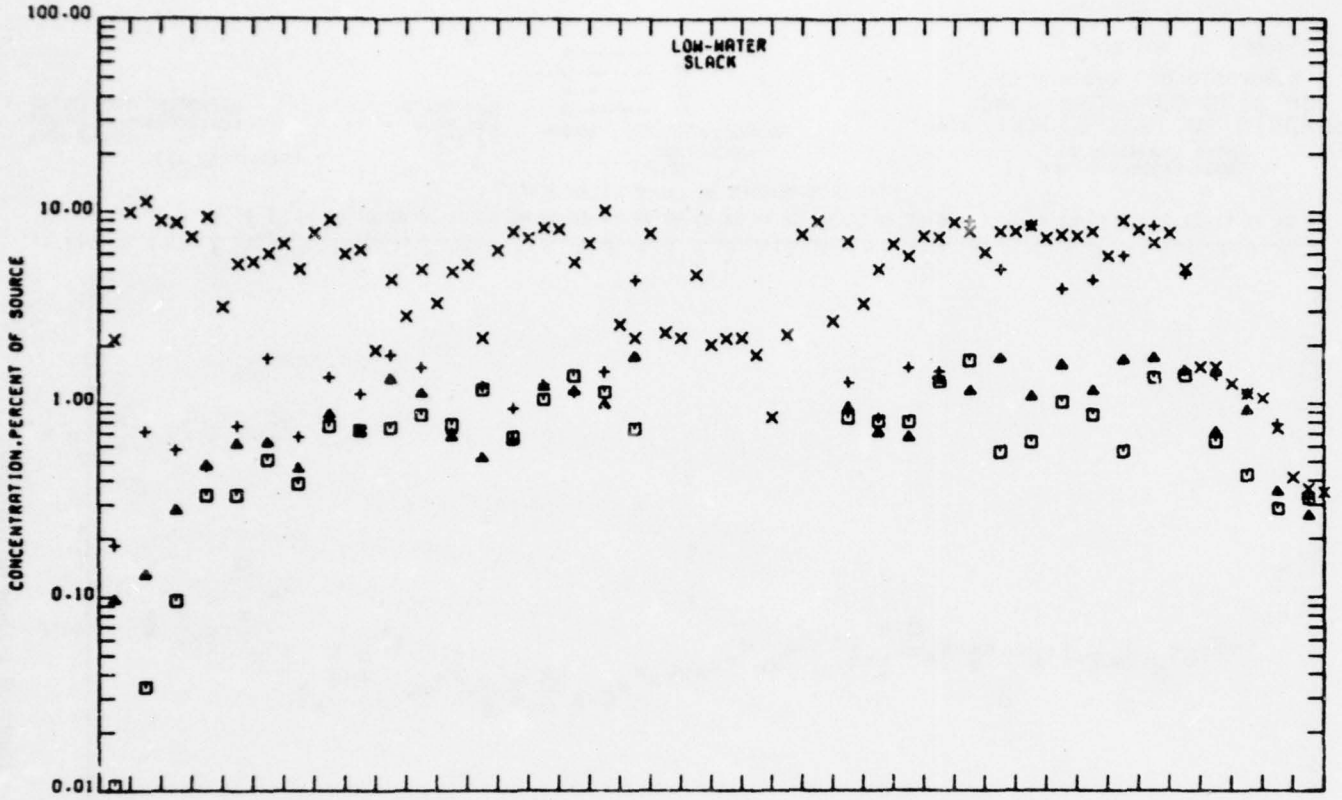
LA-LB HARBORS MODEL
LNG DISCHARGE STUDY

DYE TRACER TEST OF DISCHARGE
INTO PROPOSED SLIP 302
87,000 GPM LNG DISCHARGE

STATION 8 PROFILES

PRELIMINARY DATA

PLATE [illegible]



TEST CONDITIONS

TIDE RANGE	5.4 FT
HARBOR CONFIGURATION	PLAN 1A3
SOURCE CONCENTRATION	6.740 PPB

LEGEND

SYMBOL	DEPTH BELOW SURFACE, FT (PROTO)
□ ———	11
△ — — —	22
+ —·—	34
× —··—	44

LA-LB HARBORS MODEL
LNG DISCHARGE STUDY

DYE TRACER TEST OF DISCHARGE INTO PROPOSED SLIP 302
87,000 GPM LNG DISCHARGE

STATION 8 PROFILES

PRELIMINARY DATA

PLATE Lb3

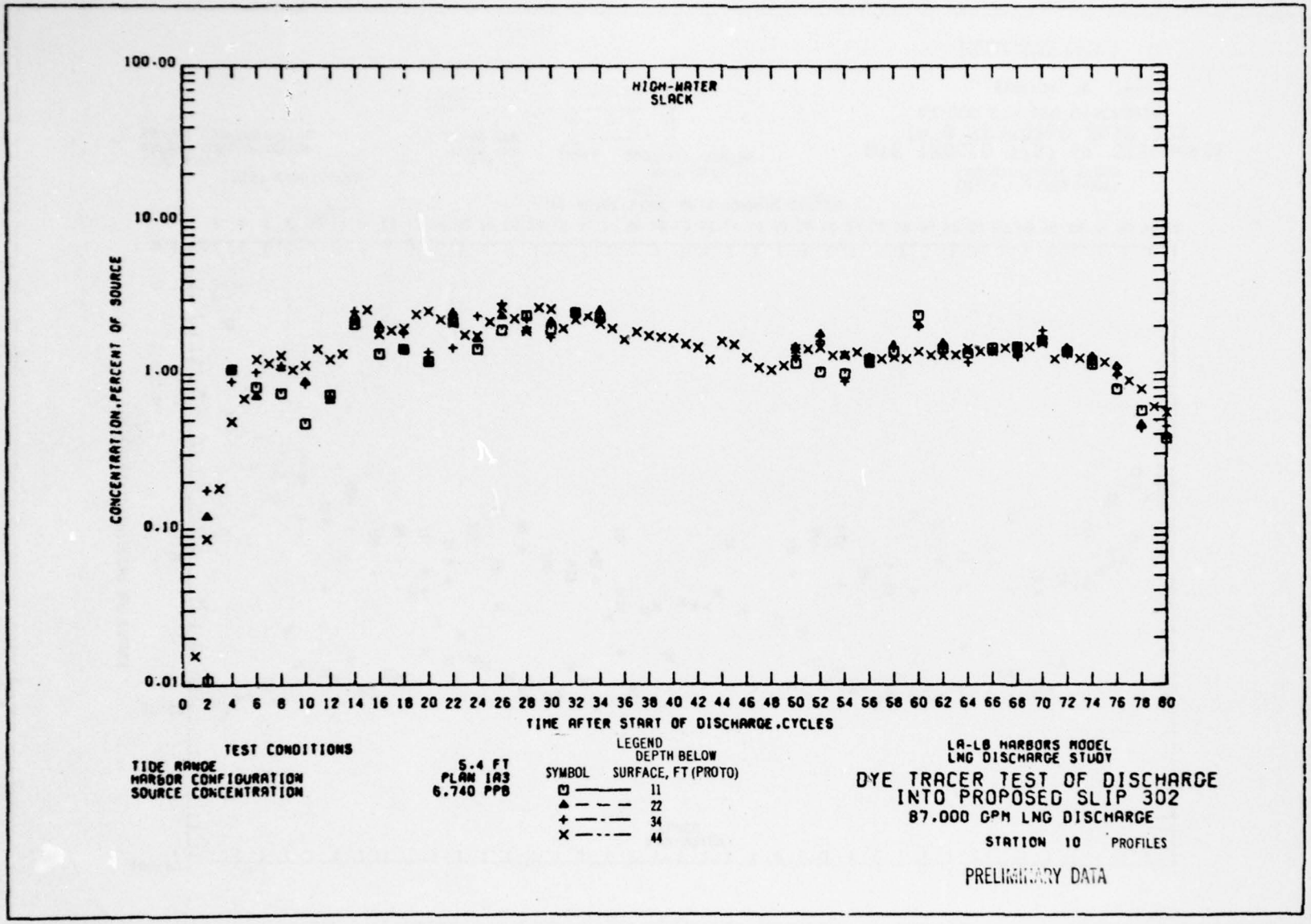
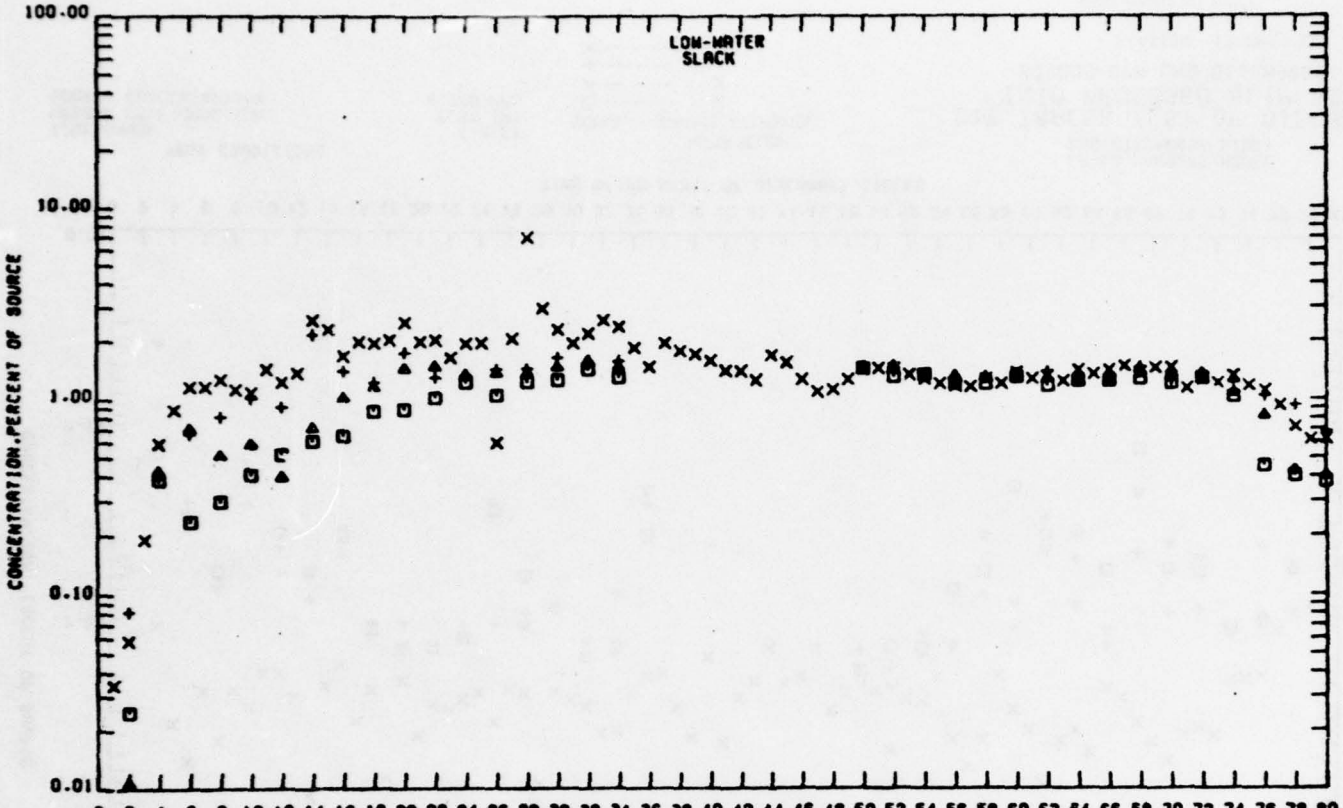

HIGH-WATER SLACK
100.00
10.00
1.00
0.10
0.01
CONCENTRATION, PERCENT OF SOURCE
0 2 4 6 8 10 12 14 16 18 20 22 24 26 28 30 32 34 36 38 40 42 44 46 48 50 52 54 56 58 60 62 64 66 68 70 72 74 76 78 80
TIME AFTER START OF DISCHARGE, CYCLES
TEST CONDITIONS
TIDE RANGE 5.4 FT
HARBOR CONFIGURATION PLAN 1A3
SOURCE CONCENTRATION 6,740 PPB
LEGEND
DEPTH BELOW
SYMBOL SURFACE, FT (PROTO)
11
22
34
44
LA-LB HARBORS MODEL
LNG DISCHARGE STUDY
DYE TRACER TEST OF DISCHARGE
INTO PROPOSED SLIP 302
87,000 GPM LNG DISCHARGE
STATION 10 PROFILES
PRELIMINARY DATA

PLATE L66



TEST CONDITIONS

TIDE RANGE	5.4 FT
HARBOR CONFIGURATION	PLAN 1A3
SOURCE CONCENTRATION	6.740 PPB

LEGEND

SYMBOL	DEPTH BELOW SURFACE, FT (PROTO)
□ ———	11
△ – – –	22
+ —·—	34
× —··—	44

LA-LB HARBORS MODEL
LNG DISCHARGE STUDY

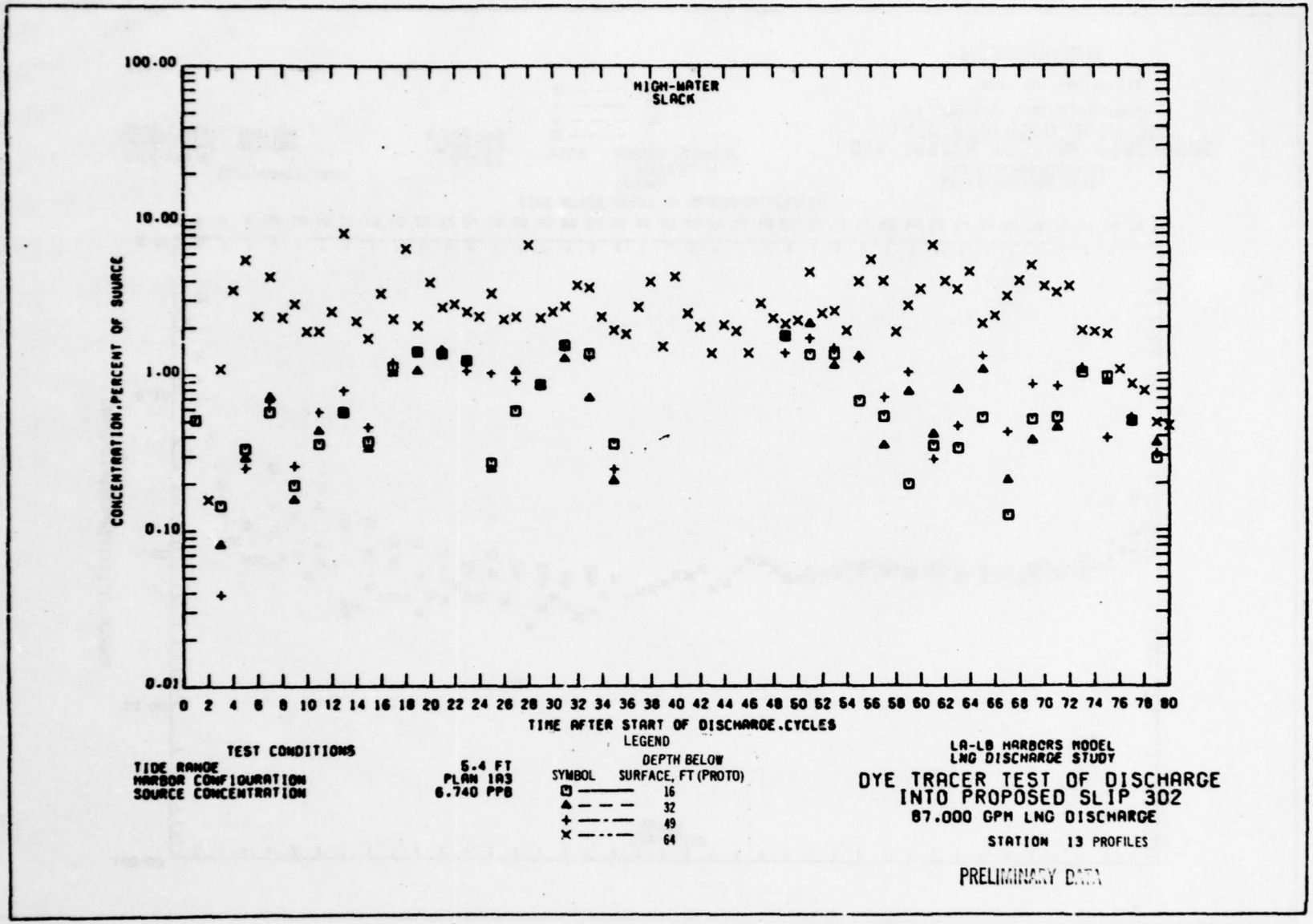
DYE TRACER TEST OF DISCHARGE INTO PROPOSED SLIP 302

87,000 GPM LNG DISCHARGE

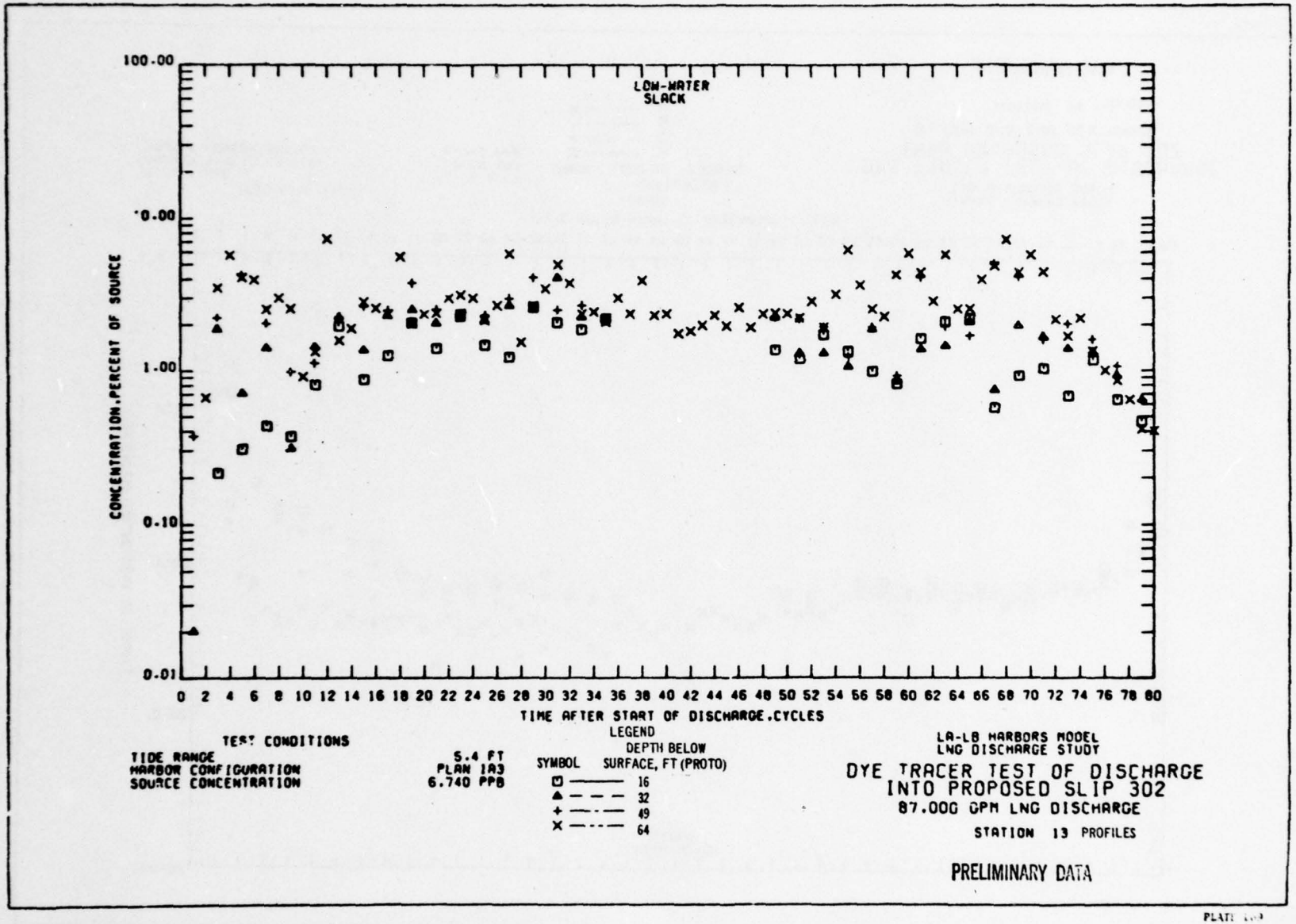
STATION 10 PROFILES

PRELIMINARY DATA

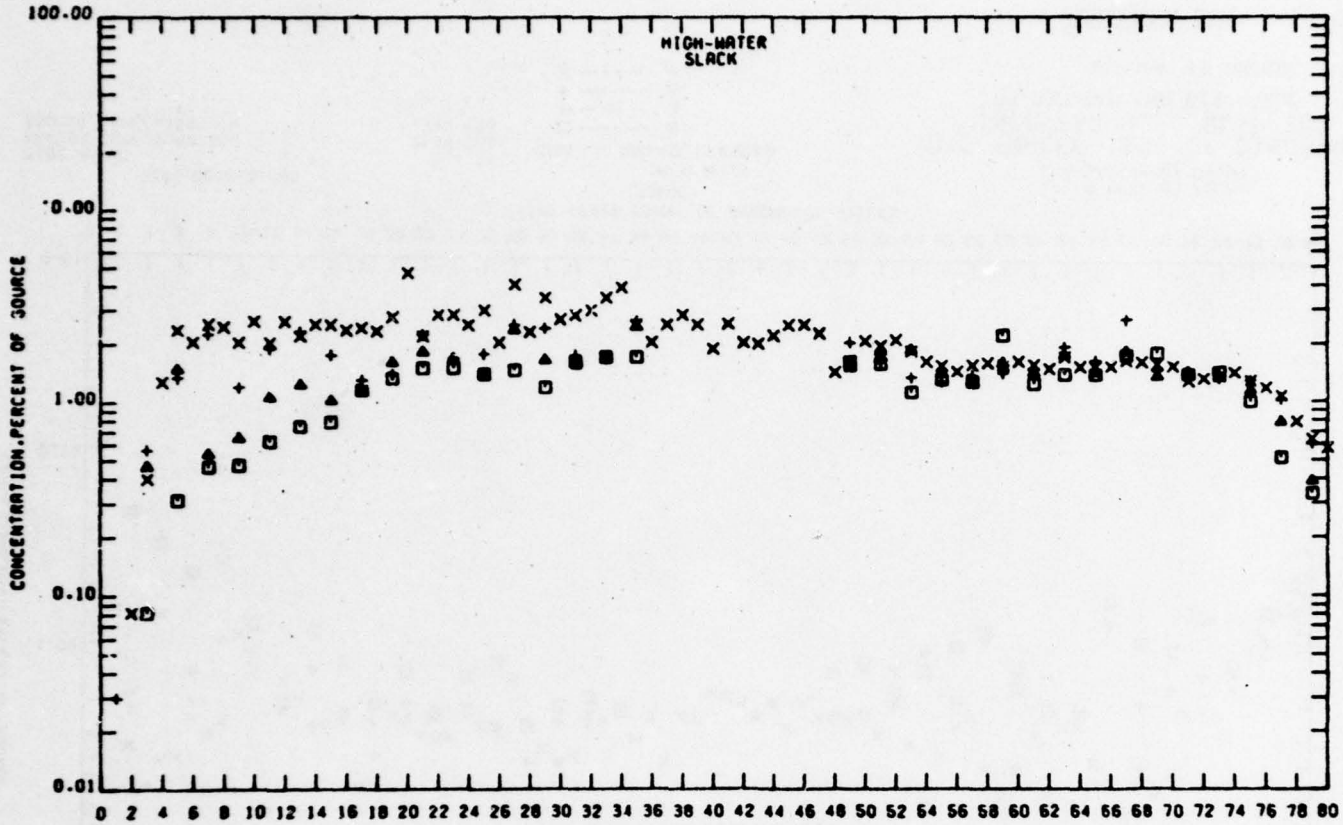
PLATE L67


HIGH-WATER SLACK
100.00
10.00
1.00
0.10
0.01
CONCENTRATION, PERCENT OF SOURCE
0 2 4 6 8 10 12 14 16 18 20 22 24 26 28 30 32 34 36 38 40 42 44 46 48 50 52 54 56 58 60 62 64 66 68 70 72 74 76 78 80
TIME AFTER START OF DISCHARGE, CYCLES
TEST CONDITIONS
TIDE RANGE 5.4 FT
HARBOR CONFIGURATION PLAN 1A3
SOURCE CONCENTRATION 6.740 PPB
LEGEND
DEPTH BELOW SURFACE, FT (PROTO)
SYMBOL
16
32
49
64
LA-LB HARBORS MODEL
LNG DISCHARGE STUDY
DYE TRACER TEST OF DISCHARGE INTO PROPOSED SLIP 302
87,000 GPM LNG DISCHARGE
STATION 13 PROFILES
PRELIMINARY DATA

DRAFT Lo3


100.00
10.00
1.00
0.10
0.01
CONCENTRATION, PERCENT OF SOURCE
LOW-WATER SLACK
0 2 4 6 8 10 12 14 16 18 20 22 24 26 28 30 32 34 36 38 40 42 44 46 48 50 52 54 56 58 60 62 64 66 68 70 72 74 76 78 80
TIME AFTER START OF DISCHARGE, CYCLES
TEST CONDITIONS
TIDE RANGE 5.4 FT
HARBOR CONFIGURATION PLAN 1A3
SOURCE CONCENTRATION 6.740 PPB
LEGEND
SYMBOL DEPTH BELOW SURFACE, FT (PROTO)
16
32
49
64
LA-LB HARBORS MODEL
LNG DISCHARGE STUDY
DYE TRACER TEST OF DISCHARGE INTO PROPOSED SLIP 302
87,000 GPM LNG DISCHARGE
STATION 13 PROFILES
PRELIMINARY DATA

PLATE



TEST CONDITIONS

TIDE RANGE	5.4 FT
HARBOR CONFIGURATION	PLAN 1A3
SOURCE CONCENTRATION	6.740 PPB

LEGEND

SYMBOL	DEPTH BELOW SURFACE, FT (PROTO)
□ ———	11
△ – – –	22
+ —·—	34
× —··—	44

LA-LB HARBORS MODEL
LNG DISCHARGE STUDY

DYE TRACER TEST OF DISCHARGE INTO PROPOSED SLIP 302

87,000 GPM LNG DISCHARGE

STATION 18 PROFILES

PRELIMINARY DATA

PLATE [illegible]

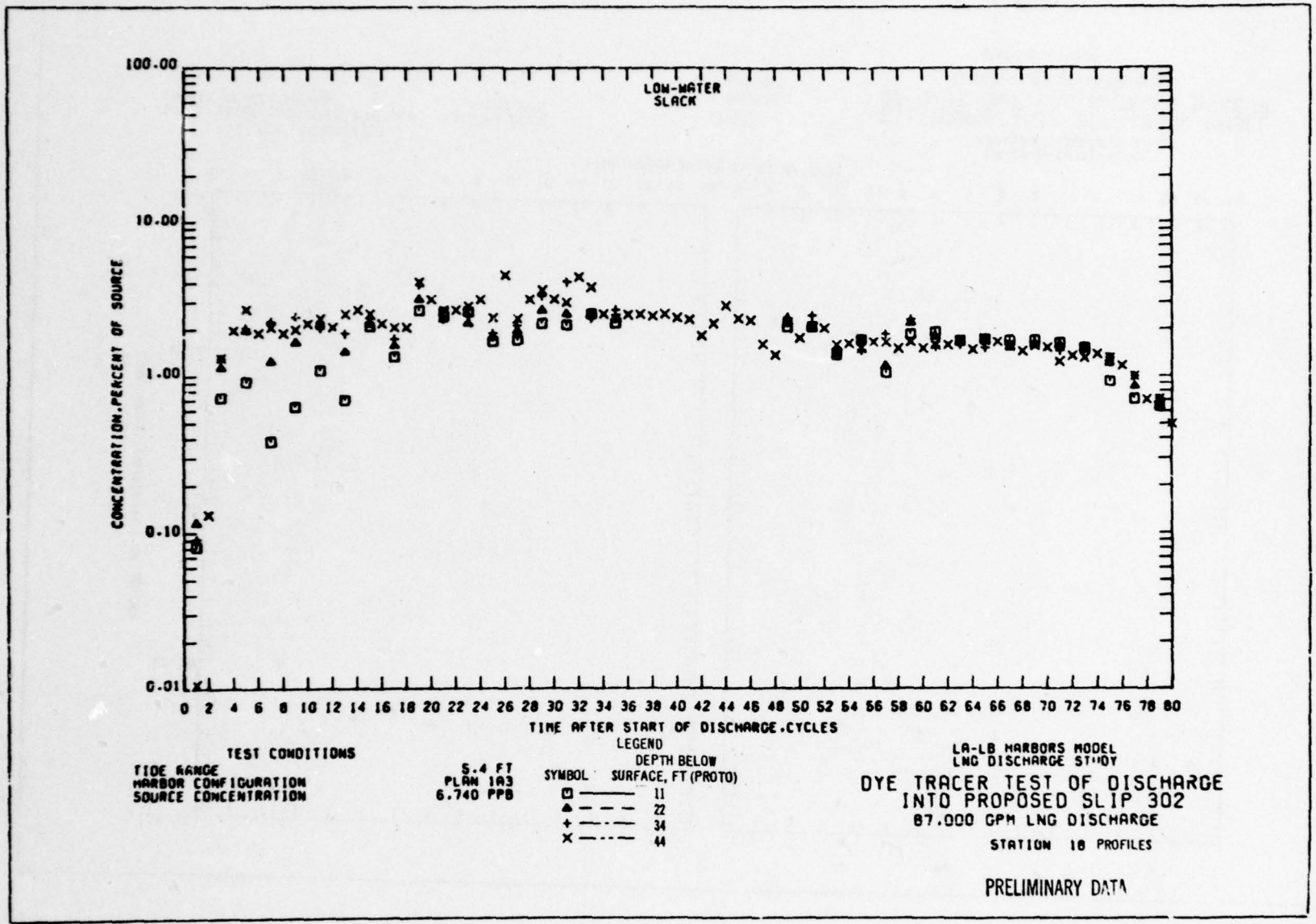
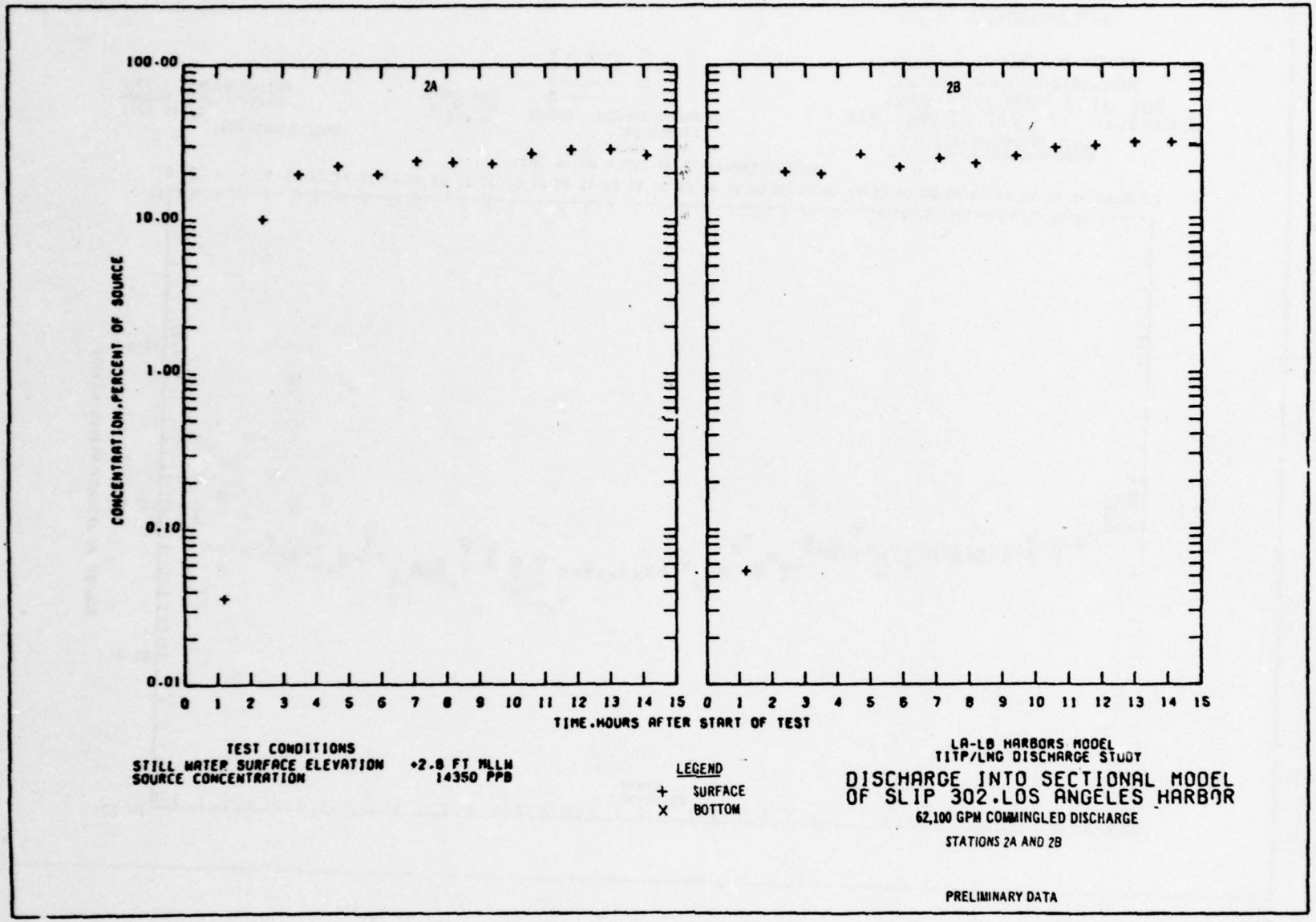

100.00
10.00
1.00
0.10
0.01
LOW-WATER
SLACK
CONCENTRATION, PERCENT OF SOURCE
0 2 4 6 8 10 12 14 16 18 20 22 24 26 28 30 32 34 36 38 40 42 44 46 48 50 52 54 56 58 60 62 64 66 68 70 72 74 76 78 80
TIME AFTER START OF DISCHARGE, CYCLES
TEST CONDITIONS
TIDE RANGE 5.4 FT
HARBOR CONFIGURATION PLAN 1A3
SOURCE CONCENTRATION 6.740 PPB
LEGEND
DEPTH BELOW
SYMBOL SURFACE, FT (PROTO)
11
22
34
44
LA-LB HARBORS MODEL
LNG DISCHARGE STUDY
DYE TRACER TEST OF DISCHARGE
INTO PROPOSED SLIP 302
87,000 GPM LNG DISCHARGE
STATION 18 PROFILES
PRELIMINARY DATA

PLATE E-1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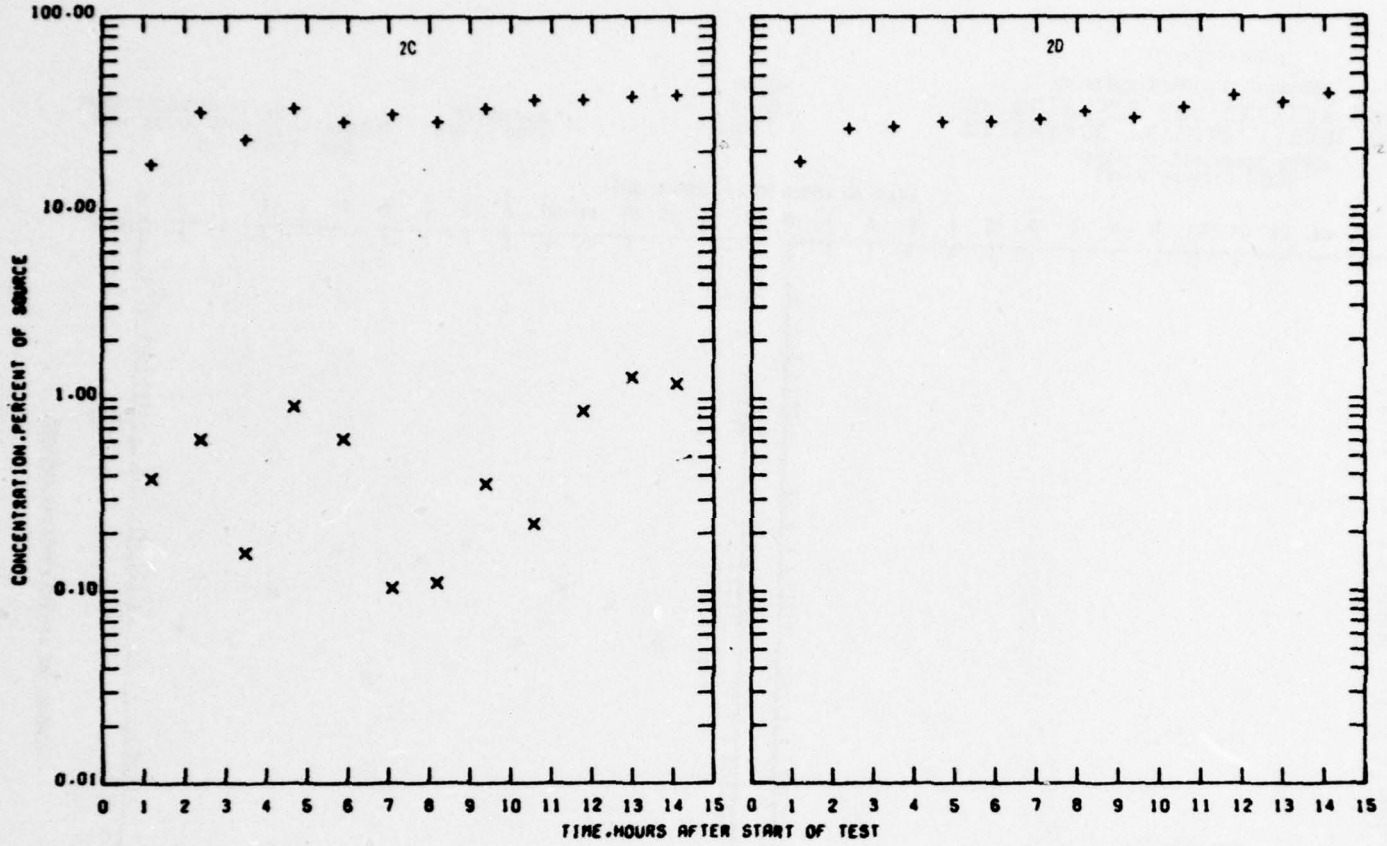
1.00
0.10
0.01
CONCENTRATION.PERCENT OF SOURCE
2A
2B
0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15
TIME.HOURS AFTER START OF TEST
TEST CONDITIONS
STILL WATER SURFACE ELEVATION +2.8 FT MLLW
SOURCE CONCENTRATION 14350 PPB
LEGEND
+ SURFACE
X BOTTOM
LA-LB HARBORS MODEL
TITP/LNG DISCHARGE STUDY
DISCHARGE INTO SECTIONAL MODEL
OF SLIP 302.LOS ANGELES HARBOR
62,100 GPM COMMINGLED DISCHARGE
STATIONS 2A AND 2B
PRELIMINARY DATA

PLATE SL1



TEST CONDITIONS

STILL WATER SURFACE ELEVATION +2.8 FT MLLW
SOURCE CONCENTRATION 14350 PPB

LEGEND

\+ SURFACE
X BOTTOM

LA-LB HARBORS MODEL
TITP/LNG DISCHARGE STUDY

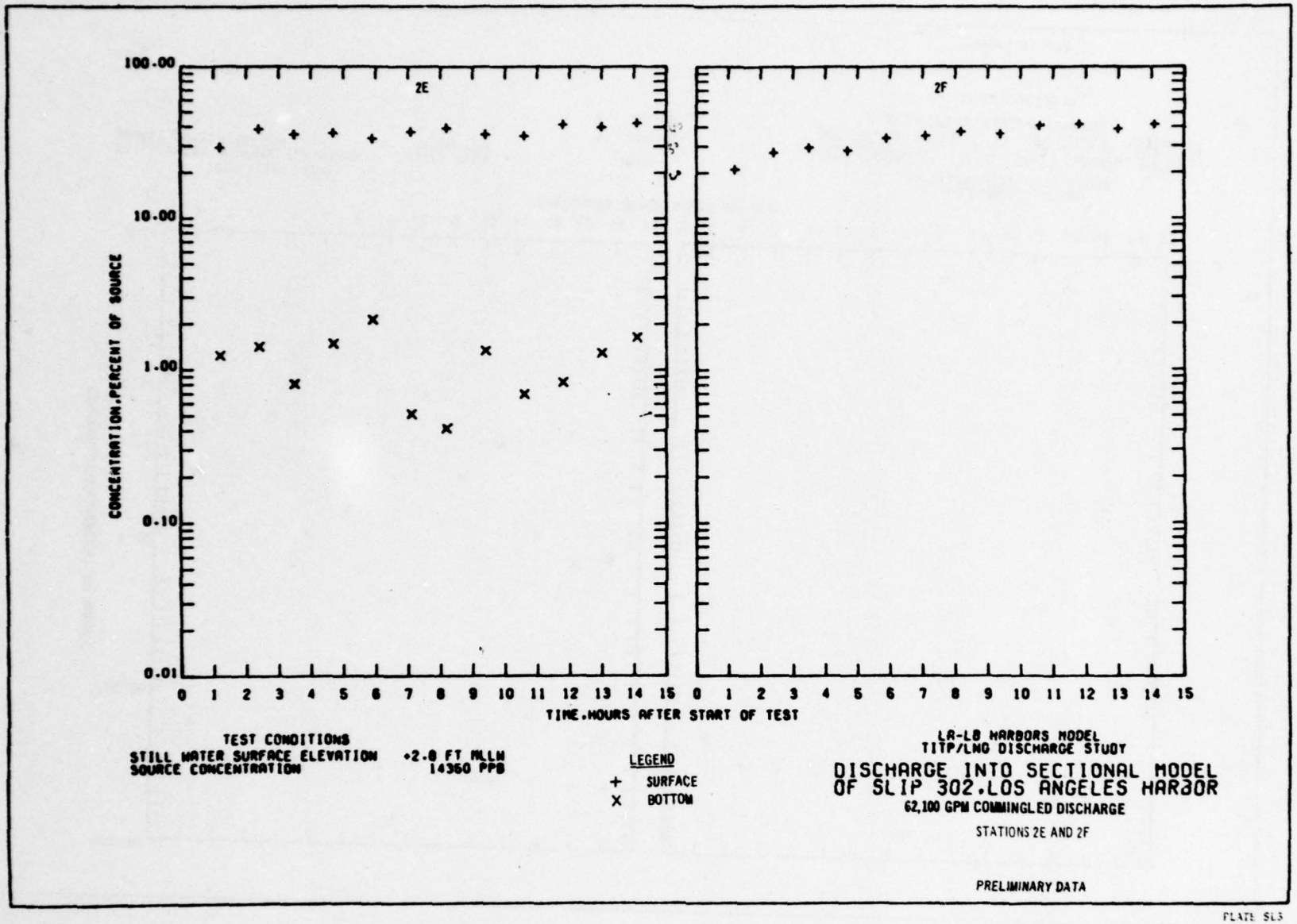
DISCHARGE INTO SECTIONAL MODEL OF SLIP 302, LOS ANGELES HARBOR

62,100 GPM COMMINGLED DISCHARGE

STATIONS 2C AND 2D

PRELIMINARY DATA

PLATE SL-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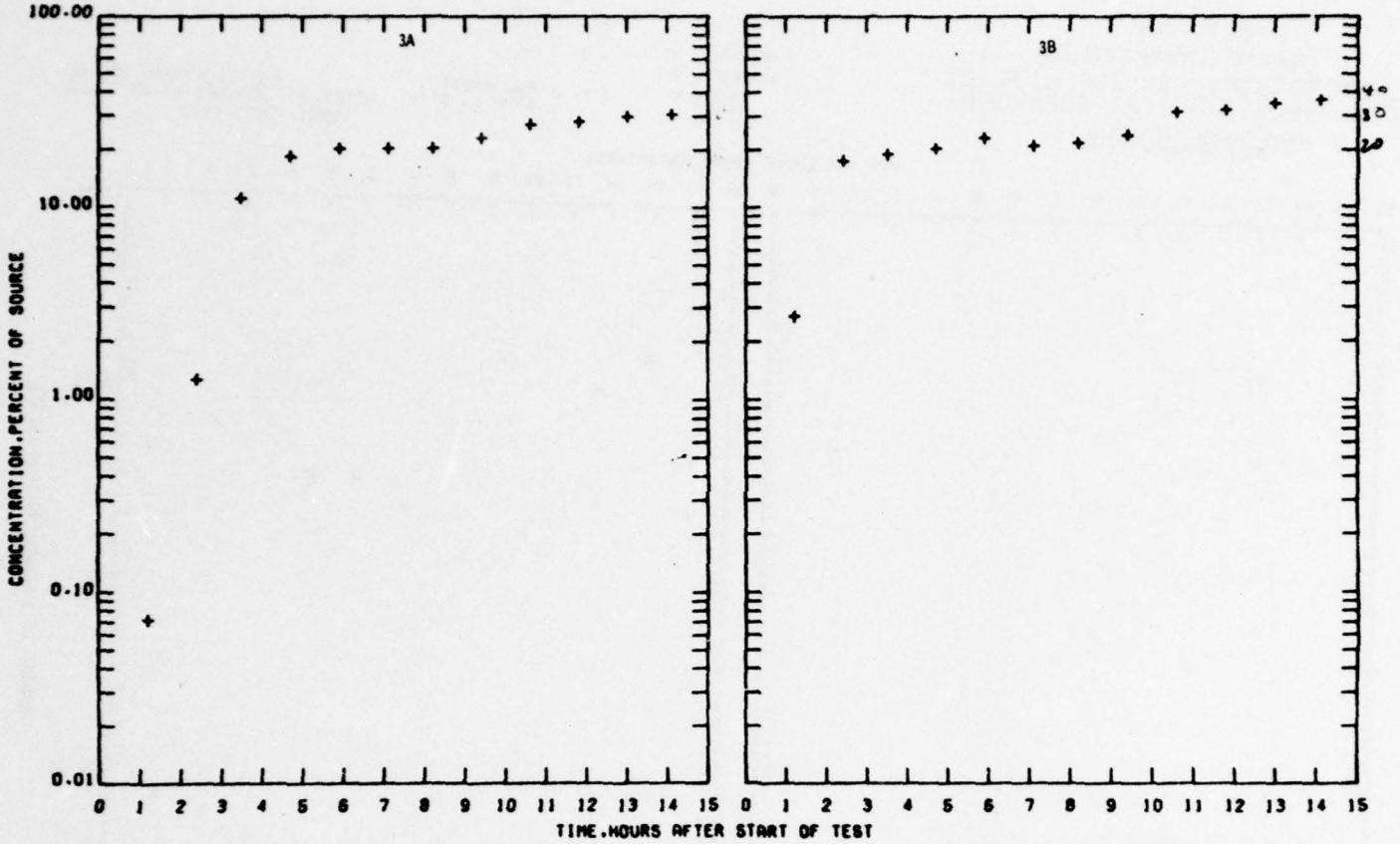
0.10
0.01
CONCENTRATION, PERCENT OF SOURCE
2E
2F
0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15
TIME, HOURS AFTER START OF TEST
TEST CONDITIONS
STILL WATER SURFACE ELEVATION +2.8 FT MLLW
SOURCE CONCENTRATION 14360 PPB
LEGEND
+ SURFACE
X BOTTOM
LA-LB HARBORS MODEL
TITP/LNG DISCHARGE STUDY
DISCHARGE INTO SECTIONAL MODEL
OF SLIP 302, LOS ANGELES HARBOR
62,100 GPM COMMINGLED DISCHARGE
STATIONS 2E AND 2F
PRELIMINARY DATA

PLATE SL3



TEST CONDITIONS

STILL WATER SURFACE ELEVATION +2.8 FT MLLW
SOURCE CONCENTRATION 14350 PPB

LEGEND

\+ SURFACE
X BOTTOM

LA-LB HARBORS MODEL
TITP/LNG DISCHARGE STUDY

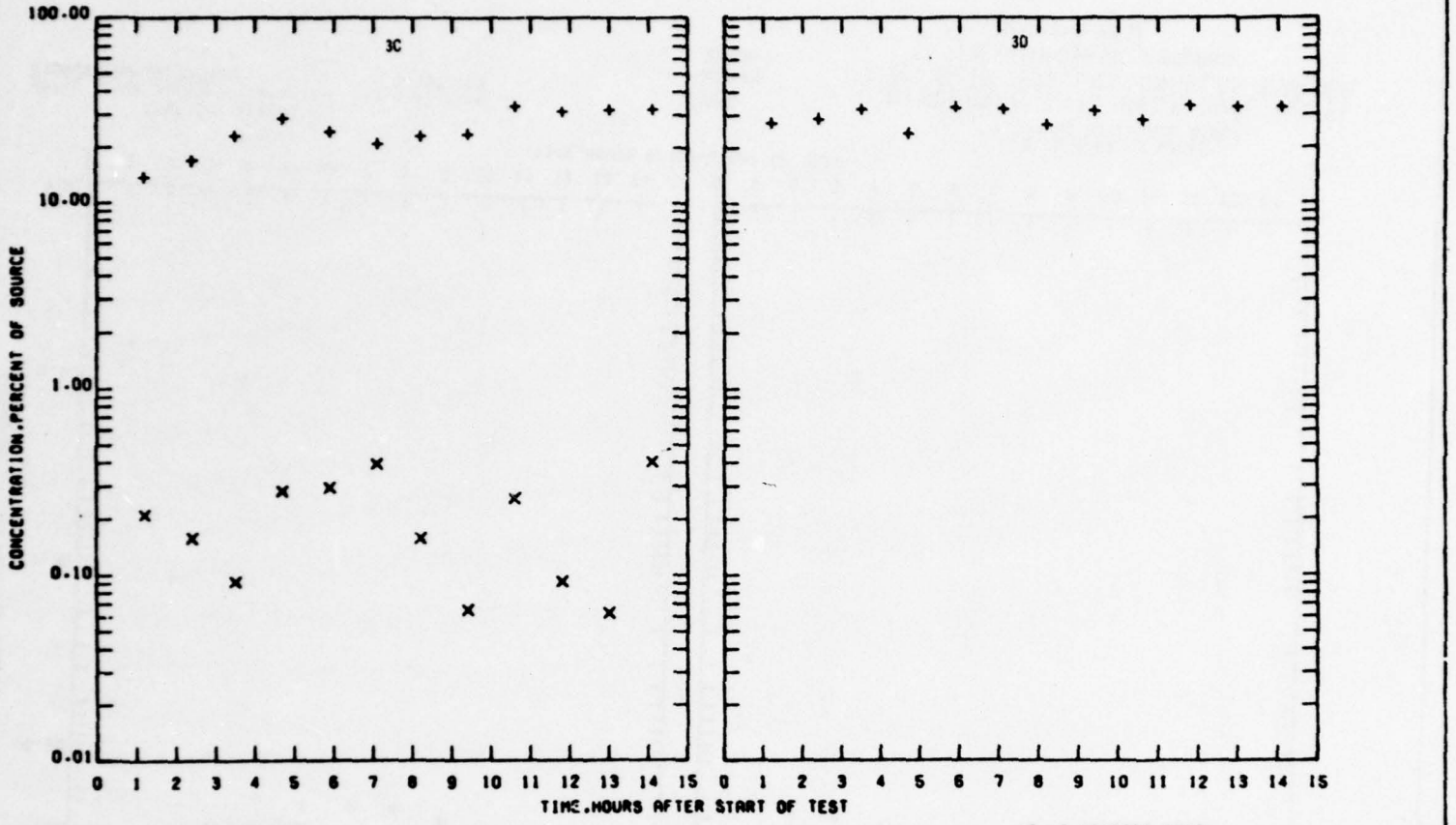
DISCHARGE INTO SECTIONAL MODEL OF SLIP 302, LOS ANGELES HARBOR

62,100 GPM COMMINGLED DISCHARGE

STATIONS 3A AND 3B

PRELIMINARY DATA

PLATE SL4



TEST CONDITIONS
STILL WATER SURFACE ELEVATION +2.8 FT MLLW
SOURCE CONCENTRATION 14350 PPB

LEGEND
+ SURFACE
× BOTTOM

LA-LB HARBORS MODEL
TITP/LNG DISCHARGE STUDY

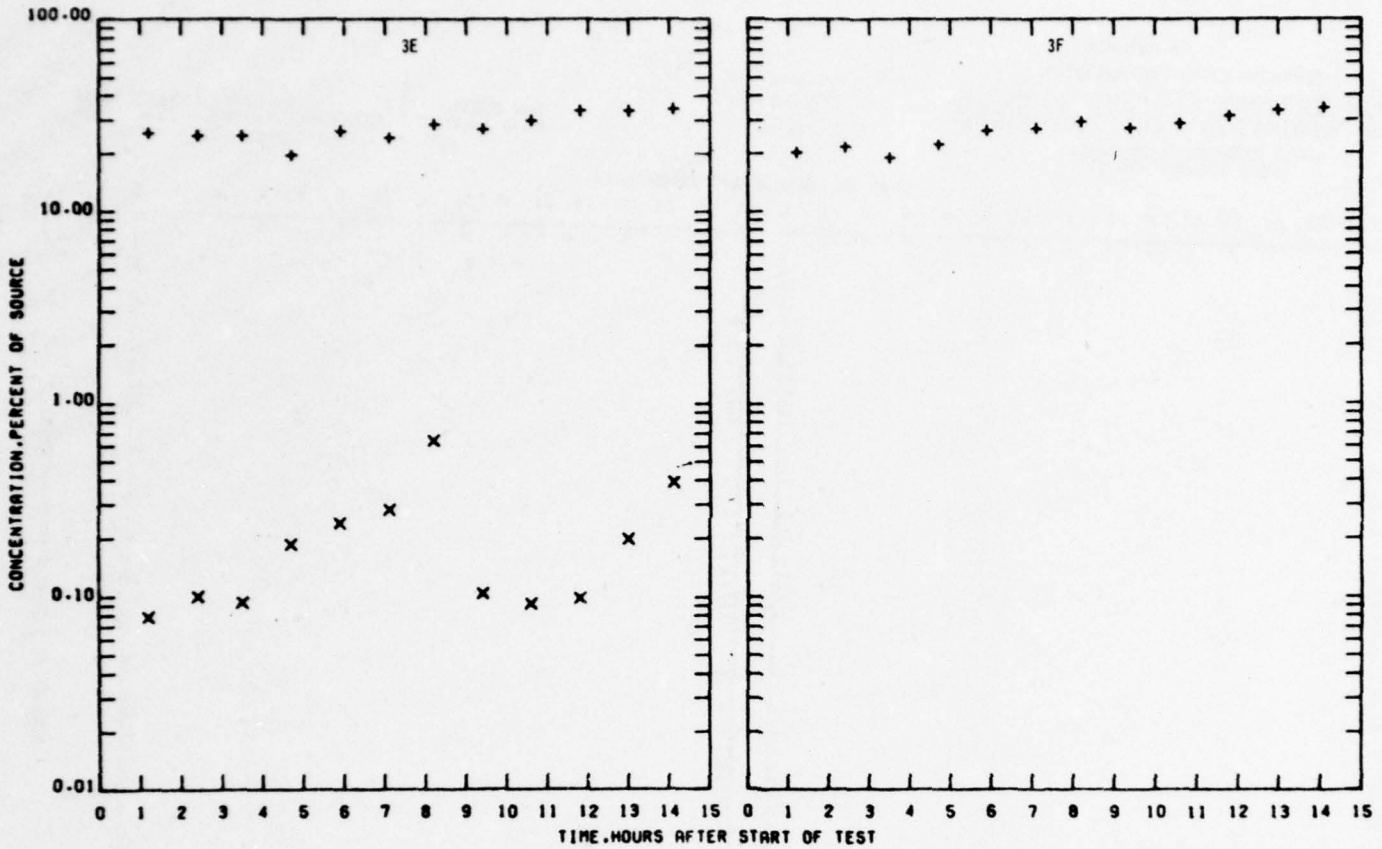
DISCHARGE INTO SECTIONAL MODEL OF SLIP 302, LOS ANGELES HARBOR

62,100 GPM COMMINGLED DISCHARGE

STATIONS 3C AND 3D

PRELIMINARY DATA

PLATE SL3



TEST CONDITIONS
STILL WATER SURFACE ELEVATION +2.8 FT MLLW
SOURCE CONCENTRATION 14350 PPB

LEGEND
+ SURFACE
X BOTTOM

LA-LB HARBORS MODEL
TITP/LNG DISCHARGE STUDY

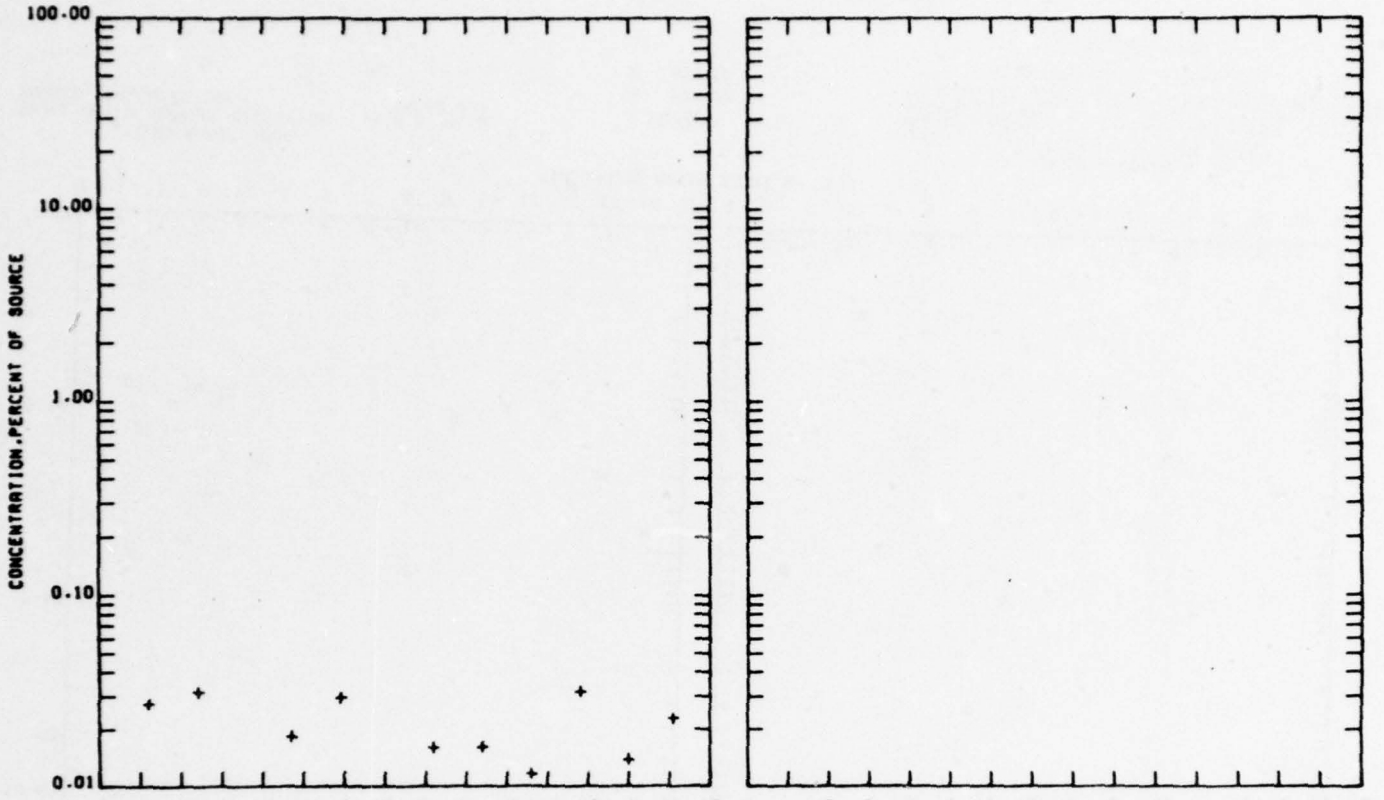
DISCHARGE INTO SECTIONAL MODEL OF SLIP 302.LOS ANGELES HARBOR

62,100 GPM COMMINGLED DISCHARGE

STATIONS 3E AND 3F

PRELIMINARY DATA

PLATE SL9



TEST CONDITIONS
STILL WATER SURFACE ELEVATION +2.8 FT MLLW
SOURCE CONCENTRATION 14350 PPB

LEGEND
+ SURFACE
X BOTTOM

LA-LB HARBORS MODEL
TITP/LNG DISCHARGE STUDY

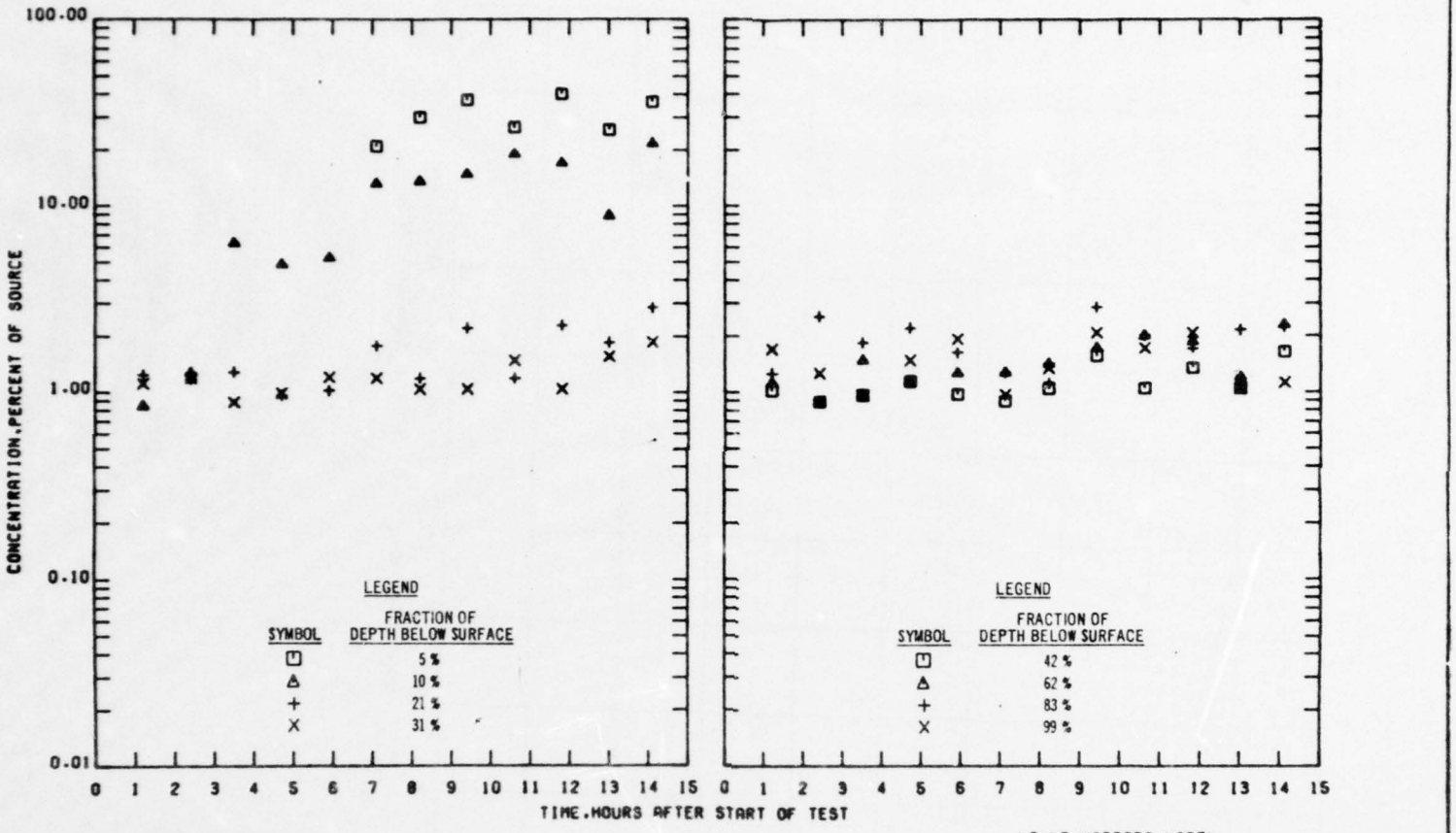
DISCHARGE INTO SECTIONAL MODEL OF SLIP 302, LOS ANGELES HARBOR

62,100 GPM COMMINGLED DISCHARGE

STATION BM

PRELIMINARY DATA

PLATE SL7



TEST CONDITIONS
STILL WATER SURFACE ELEVATION +2.8 FT MLLW
SOURCE CONCENTRATION 14350 PPB

LA-LB HARBORS MODEL
TITP/LNG DISCHARGE STUDY

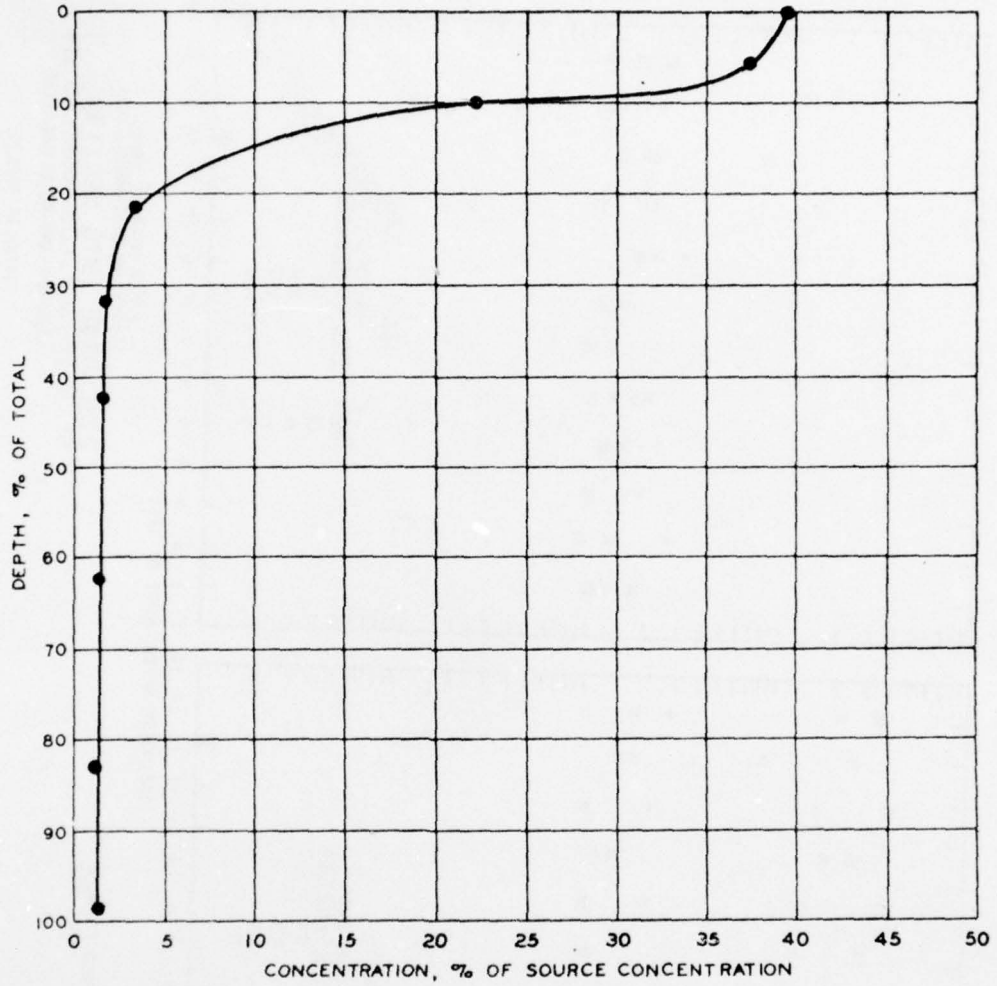
DISCHARGE INTO SECTIONAL MODEL OF SLIP 302, LOS ANGELES HARBOR

62,100 GPM COMMINGLED DISCHARGE

STATION 2D PROFILES

PRELIMINARY DATA

PLATE 5E8



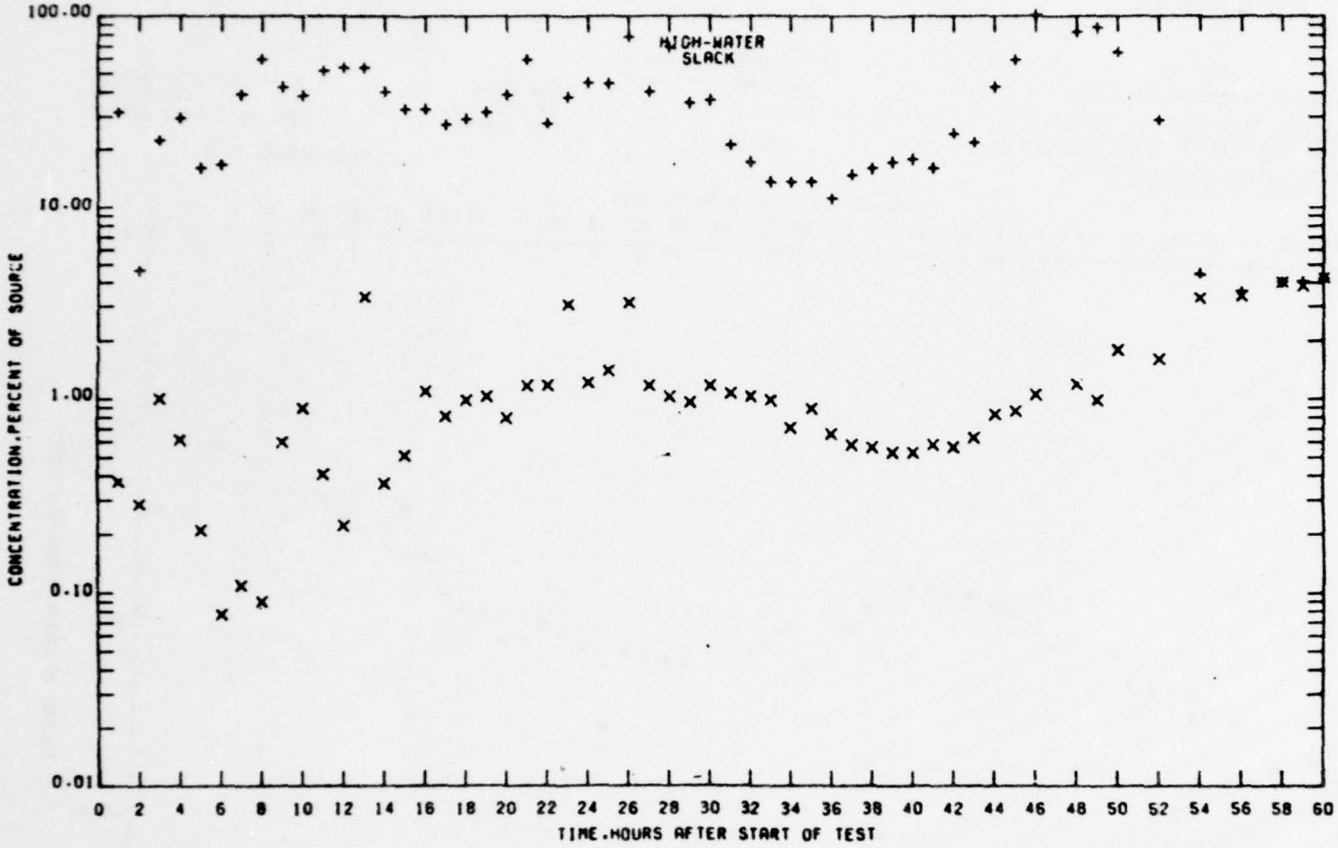
LA - LB HARBORS MODEL

DYE CONCENTRATION PROFILE
DISCHARGE INTO SECTIONAL
MODEL OF SLIP 302,
LOS ANGELES HARBOR

TEST NO. SM3

STATION 2D

PLATE SL 8A


100.00
10.00
1.00
0.10
0.01
CONCENTRATION, PERCENT OF SOURCE
HIGH-WATER SLACK
0 2 4 6 8 10 12 14 16 18 20 22 24 26 28 30 32 34 36 38 40 42 44 46 48 50 52 54 56 58 60
TIME, HOURS AFTER START OF TEST
TEST CONDITIONS
SOURCE CONCENTRATION 5,064 PPB
TIDE RANGE 5.4 FT
HARBOR CONFIGURATION PLAN 1A3
LEGEND
+ —·— SURFACE
× —··— BOTTOM
LA-LB HARBORS MODEL
TITP/LNG DISCHARGE STUDY
DYE TRACER TEST OF DISCHARGE
INTO PROPOSED SLIP 302
62,100 GPM COMMINGLED DISCHARGE
STATION 1
PRELIMINARY DATA

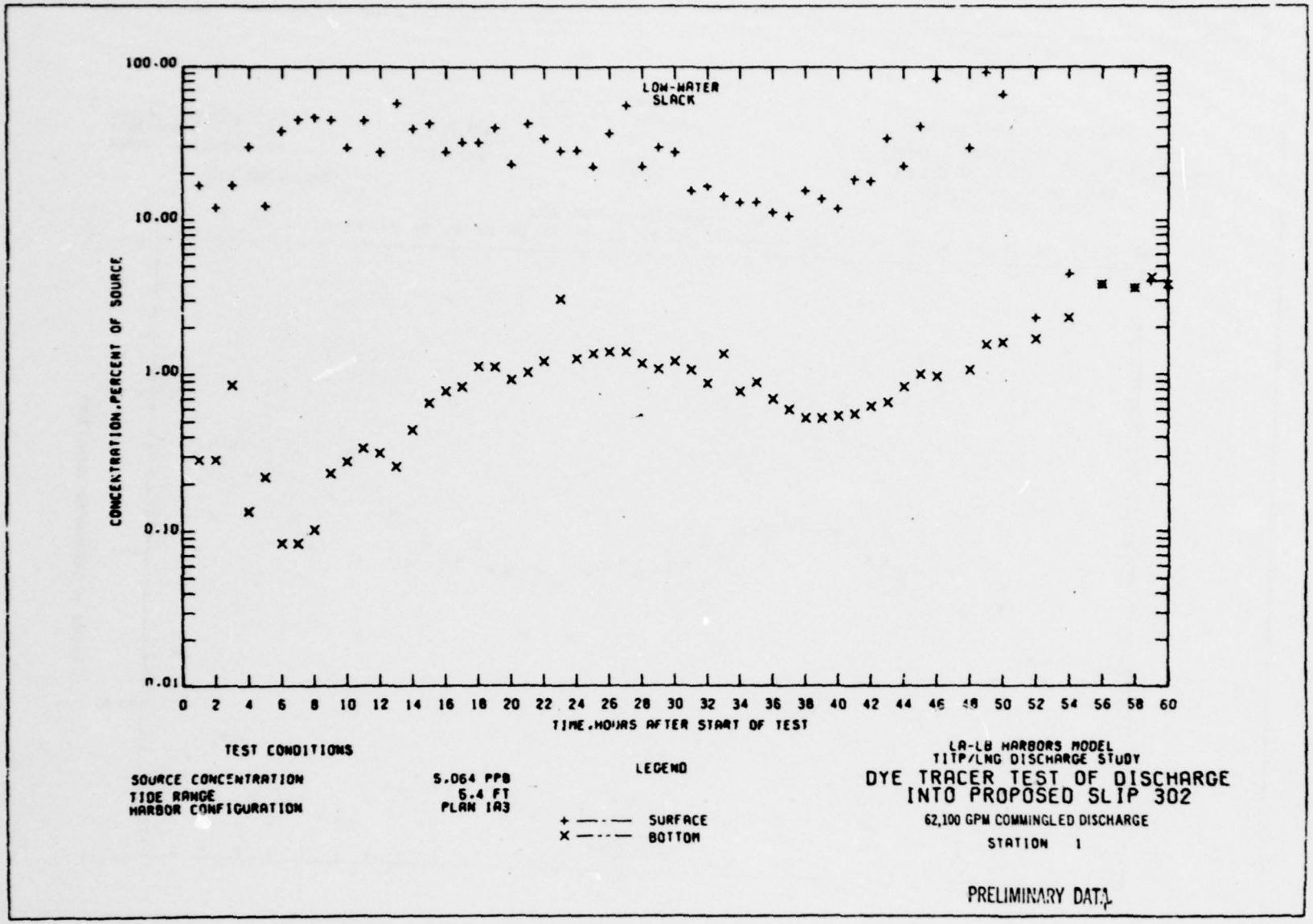
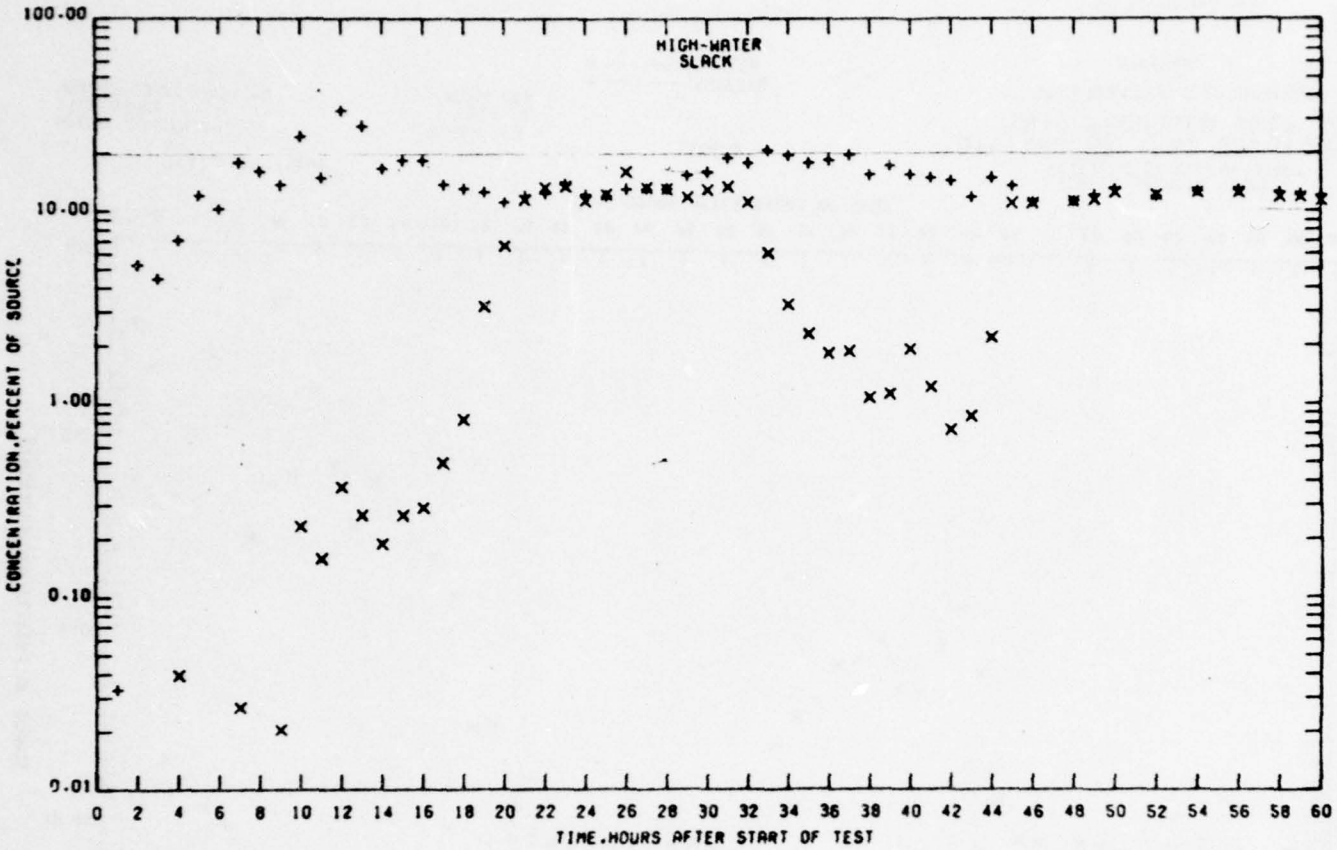

100.00
10.00
1.00
0.10
0.01
CONCENTRATION, PERCENT OF SOURCE
LOW-WATER SLACK
0 2 4 6 8 10 12 14 16 18 20 22 24 26 28 30 32 34 36 38 40 42 44 46 48 50 52 54 56 58 60
TIME, HOURS AFTER START OF TEST
TEST CONDITIONS
SOURCE CONCENTRATION 5.064 PPB
TIDE RANGE 5.4 FT
HARBOR CONFIGURATION PLAN IA3
LEGEND
SURFACE
BOTTOM
LA-LB HARBORS MODEL
TITP/LNG DISCHARGE STUDY
DYE TRACER TEST OF DISCHARGE INTO PROPOSED SLIP 302
62,100 GPM COMMINGLED DISCHARGE
STATION 1
PRELIMINARY DATA

PLATE [illegible]



TEST CONDITIONS

SOURCE CONCENTRATION	5.064 PPB
TIDE RANGE	5.4 FT
HARBOR CONFIGURATION	PLAN 1A3

LEGEND

+ —·— SURFACE
× ---- BOTTOM

LA-LB HARBORS MODEL
TITP/LNG DISCHARGE STUDY

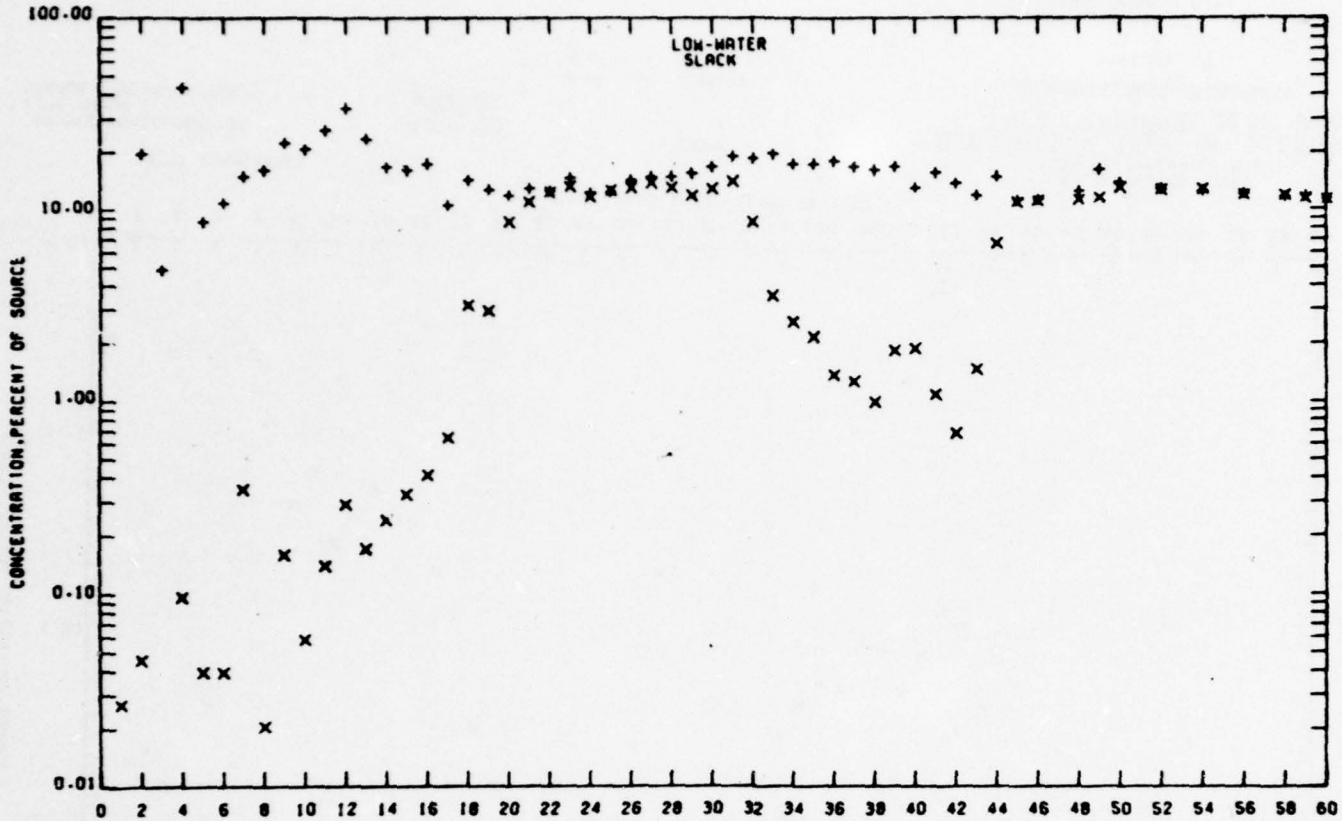
DYE TRACER TEST OF DISCHARGE INTO PROPOSED SLIP 302

62,100 GPM COMMINGLED DISCHARGE

STATION 2

PRELIMINARY DATA

PLATE SL11



TEST CONDITIONS

SOURCE CONCENTRATION	5.064 PPB
TIDE RANGE	5.4 FT
HARBOR CONFIGURATION	PLAN 1A3

LEGEND

+ —·— SURFACE

× —·— BOTTOM

LA-LB HARBORS MODEL
TITP/LNG DISCHARGE STUDY

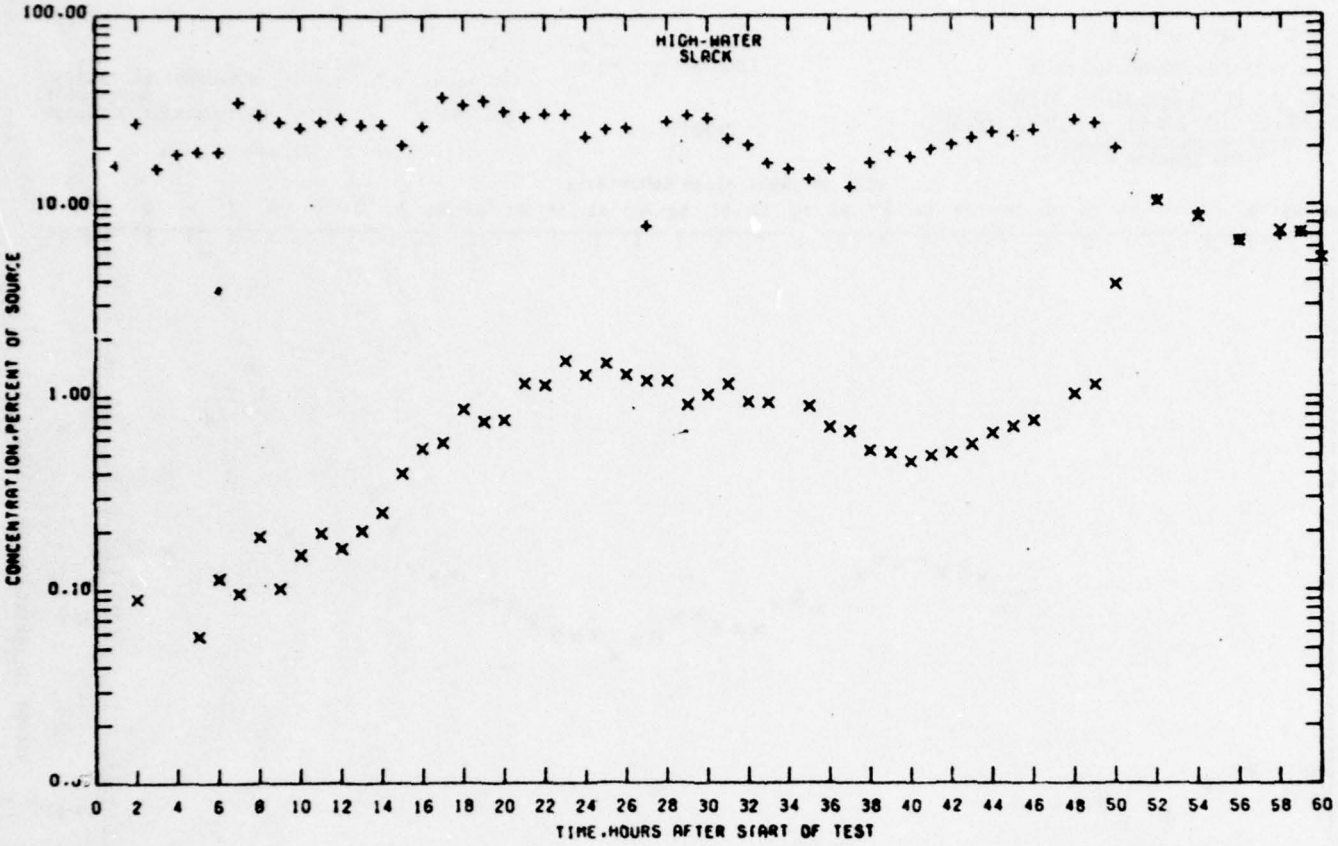
DYE TRACER TEST OF DISCHARGE INTO PROPOSED SLIP 302

62,100 GPM COMMINGLED DISCHARGE

STATION 2

PRELIMINARY DATA

PLATE SL12



TEST CONDITIONS

SOURCE CONCENTRATION	5.064 PPB
TIDE RANGE	5.4 FT
HARBOR CONFIGURATION	PLAN 1A3

LEGEND

+ —·— SURFACE

× —·— BOTTOM

LA-LB HARBORS MODEL
TITP/LNG DISCHARGE STUDY

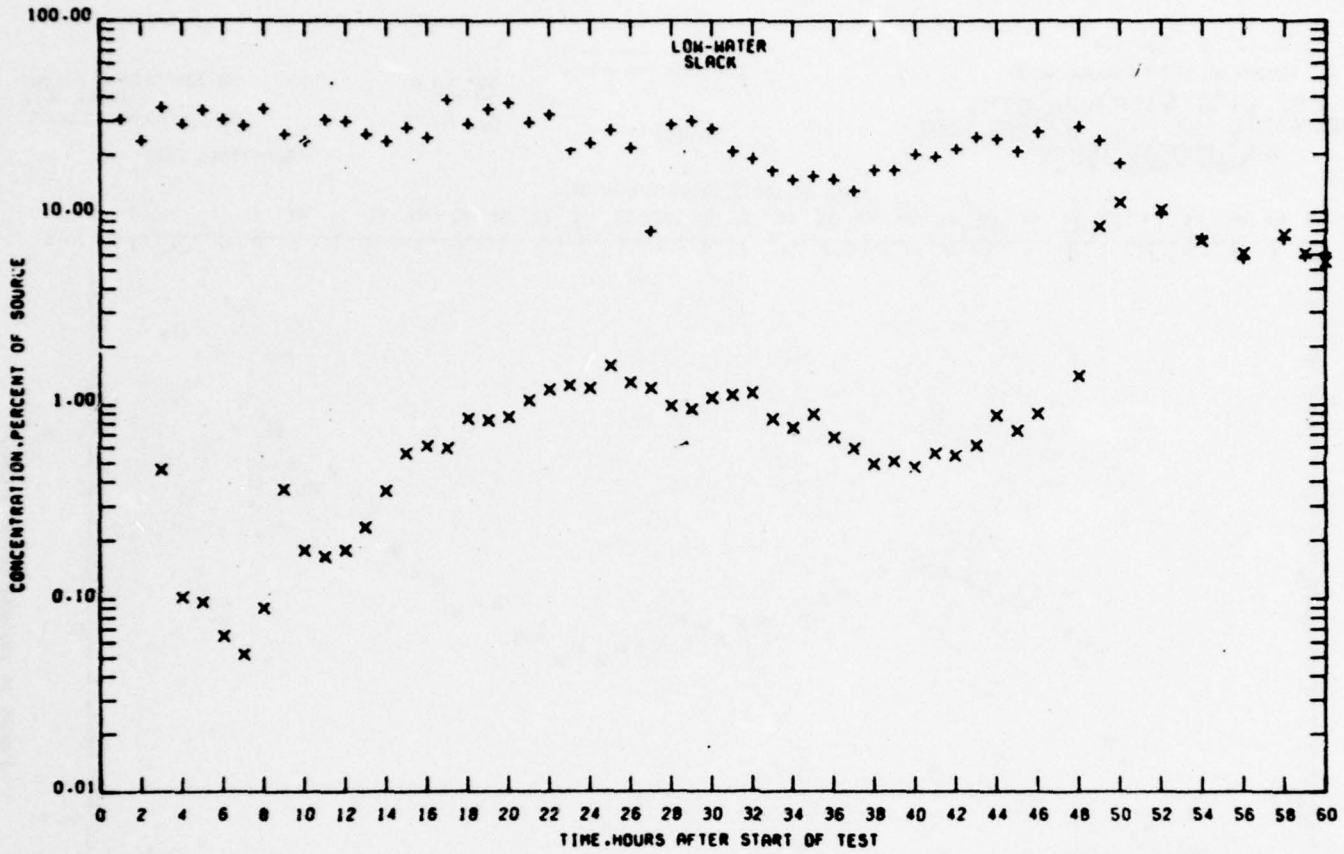
DYE TRACER TEST OF DISCHARGE INTO PROPOSED SLIP 302

62,100 GPM COMMINGLED DISCHARGE

STATION 3

PRELIMINARY DATA

PLATE SL13



TEST CONDITIONS

SOURCE CONCENTRATION	5.064 PPB
TIDE RANGE	5.4 FT
HARBOR CONFIGURATION	PLAN 1A3

LEGEND

+ —·— SURFACE
× —··— BOTTOM

LA-LB HARBORS MODEL
TITP/LNG DISCHARGE STUDY

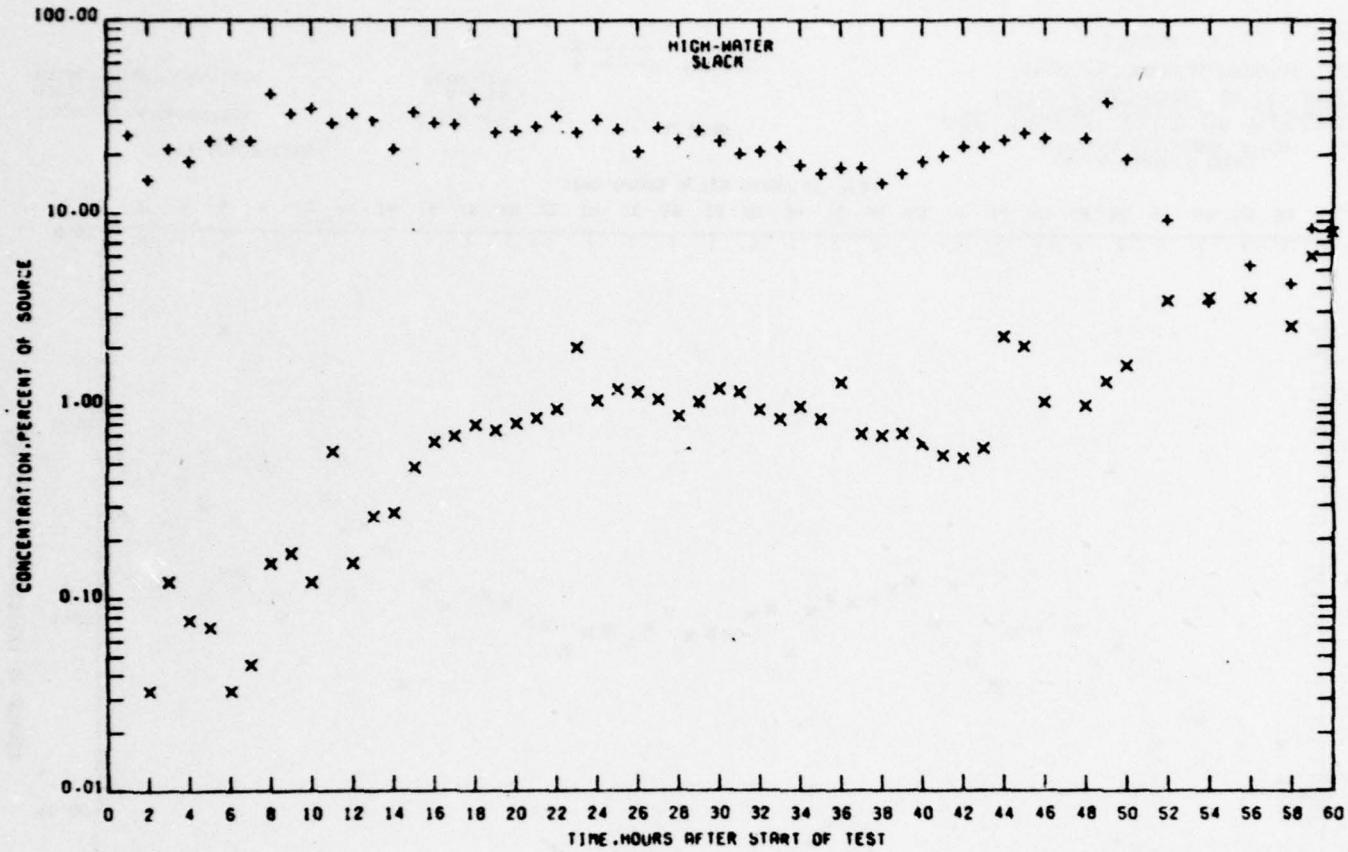
DYE TRACER TEST OF DISCHARGE INTO PROPOSED SLIP 302

62,100 GPM COMMINGLED DISCHARGE

STATION 3

PRELIMINARY DATA

PLATE SL14



TEST CONDITIONS

SOURCE CONCENTRATION	5.064 PPB
TIDE RANGE	5.4 FT
HARBOR CONFIGURATION	PLAN 1A3

LEGEND

+ —·— SURFACE
× —·— BOTTOM

LA-LB HARBORS MODEL
TITP/LNG DISCHARGE STUDY

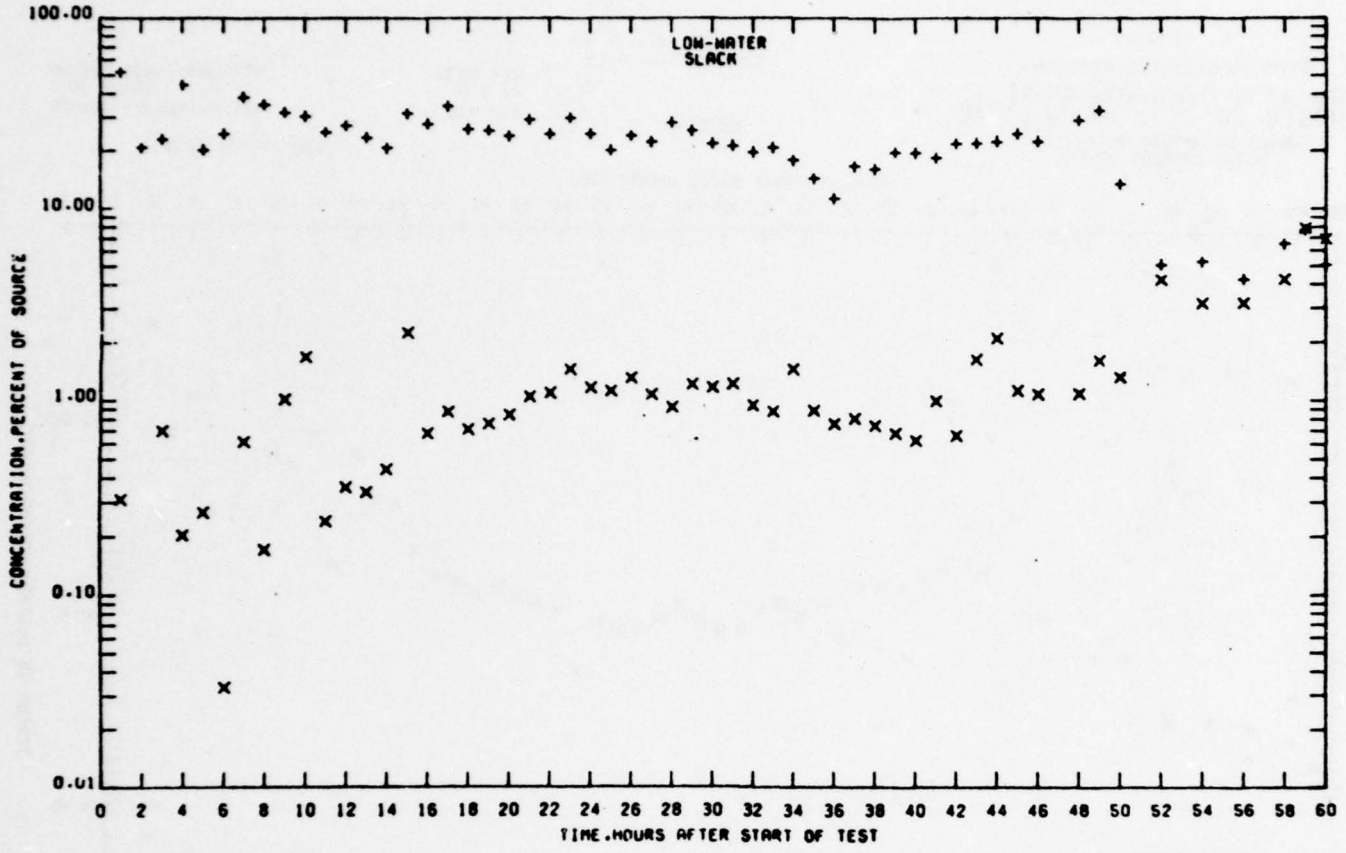
DYE TRACER TEST OF DISCHARGE INTO PROPOSED SLIP 302

62,100 GPM COMMINGLED DISCHARGE

STATION 4

PRELIMINARY DATA

PLATE SL15



TEST CONDITIONS

SOURCE CONCENTRATION	5.064 PPB
TIDE RANGE	5.4 FT
HARBOR CONFIGURATION	PLAN 1A3

LEGEND

+ —·— SURFACE

× — - — BOTTOM

LA-LB HARBORS MODEL
TITP/LNG DISCHARGE STUDY

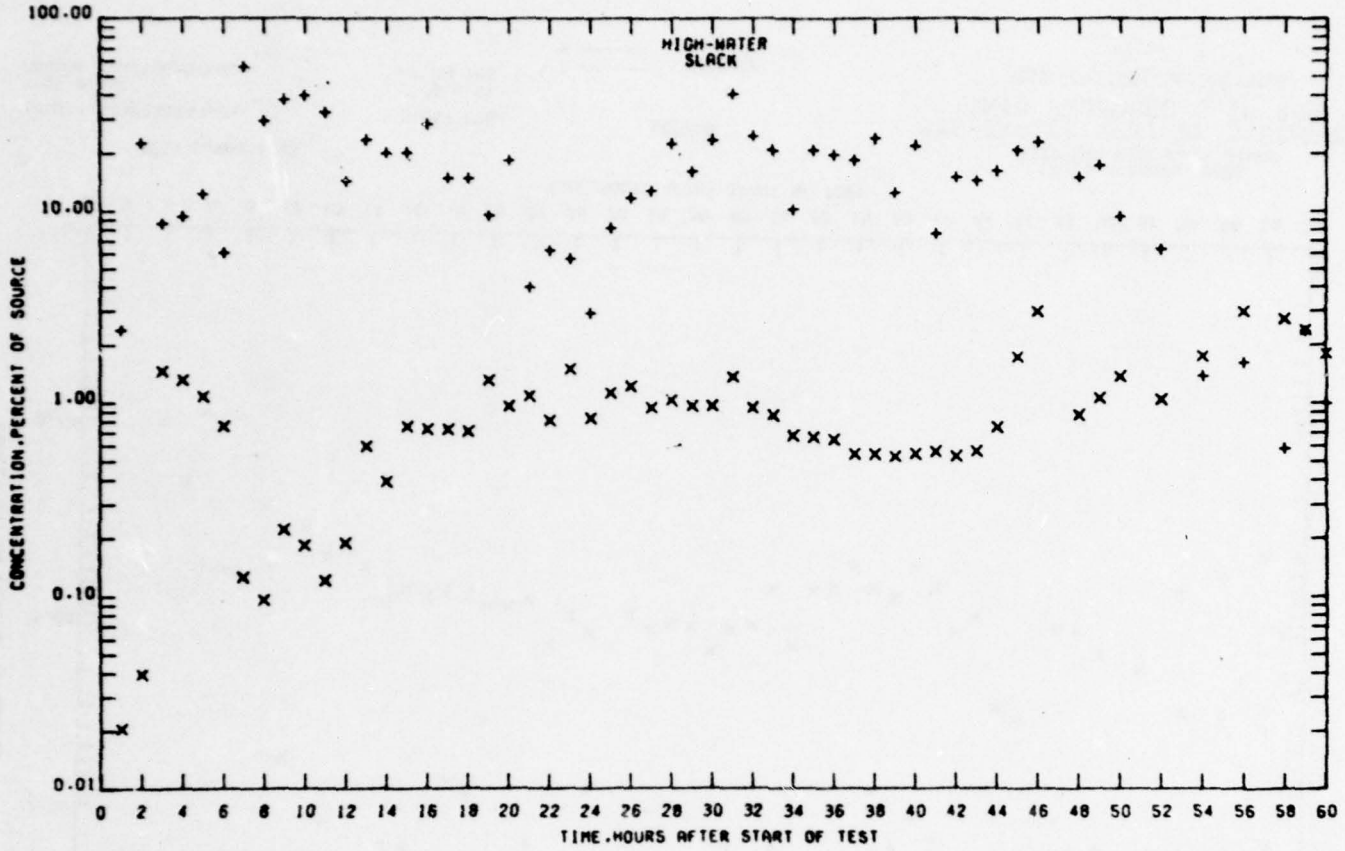
DYE TRACER TEST OF DISCHARGE INTO PROPOSED SLIP 302

62,100 GPM COMMINGLED DISCHARGE

STATION 4

PRELIMINARY DATA

PLATE SL16



TEST CONDITIONS

SOURCE CONCENTRATION	5.064 PPB
TIDE RANGE	5.4 FT
HARBOR CONFIGURATION	PLAN 1A3

LEGEND

\+ —·— SURFACE
× – – – BOTTOM

LA-LB HARBORS MODEL
TITP/LNG DISCHARGE STUDY

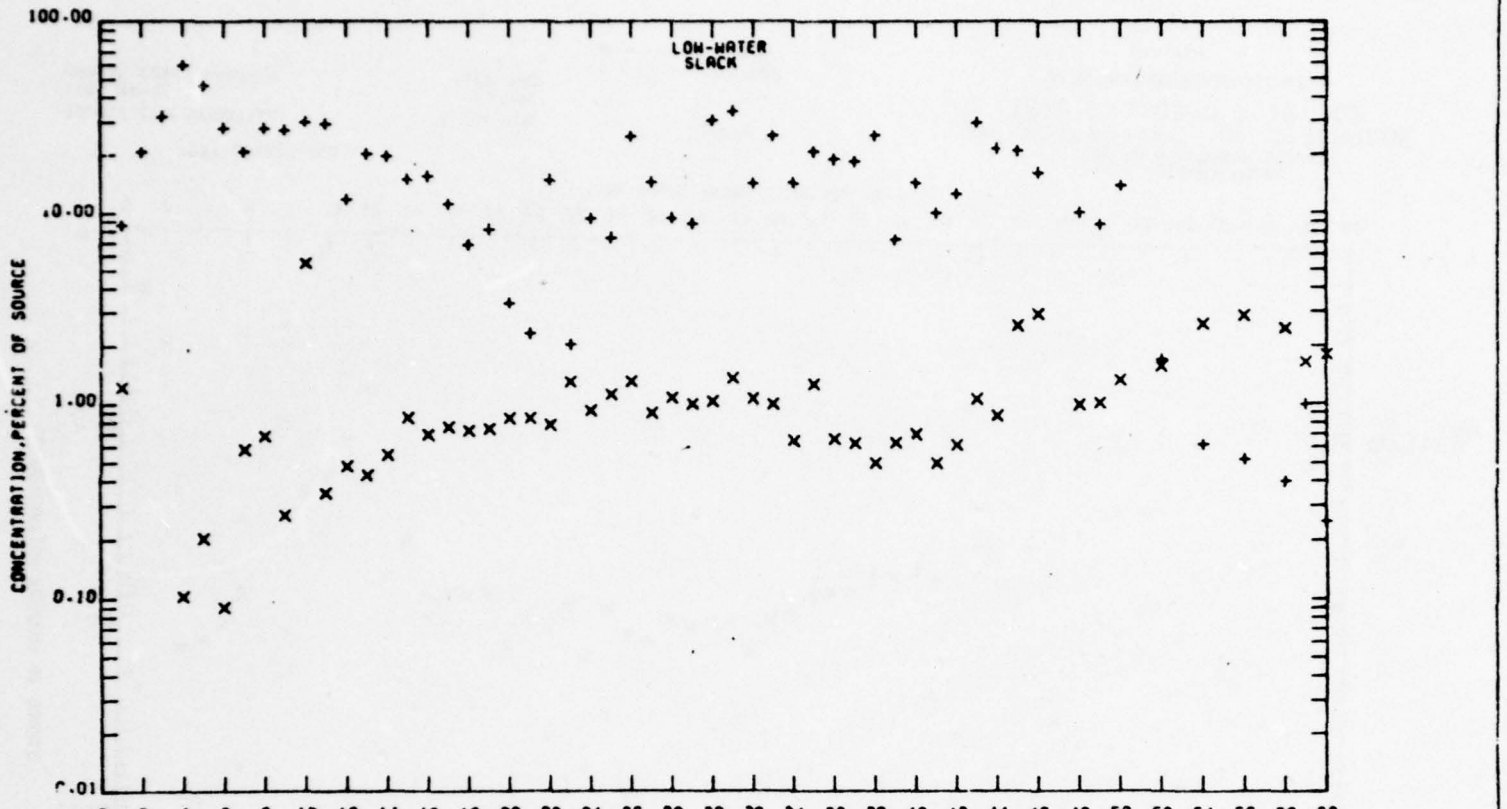
DYE TRACER TEST OF DISCHARGE INTO PROPOSED SLIP 302

62,100 GPM COMMINGLED DISCHARGE

STATION 5

PRELIMINARY DATA

PLATE SL1



TEST CONDITIONS

SOURCE CONCENTRATION	5.064 PPB
TIDE RANGE	5.4 FT
HARBOR CONFIGURATION	PLAN 1A3

LEGEND

+ — · — SURFACE
× — · · — BOTTOM

LA-LB HARBORS MODEL
TITP/LNG DISCHARGE STUDY

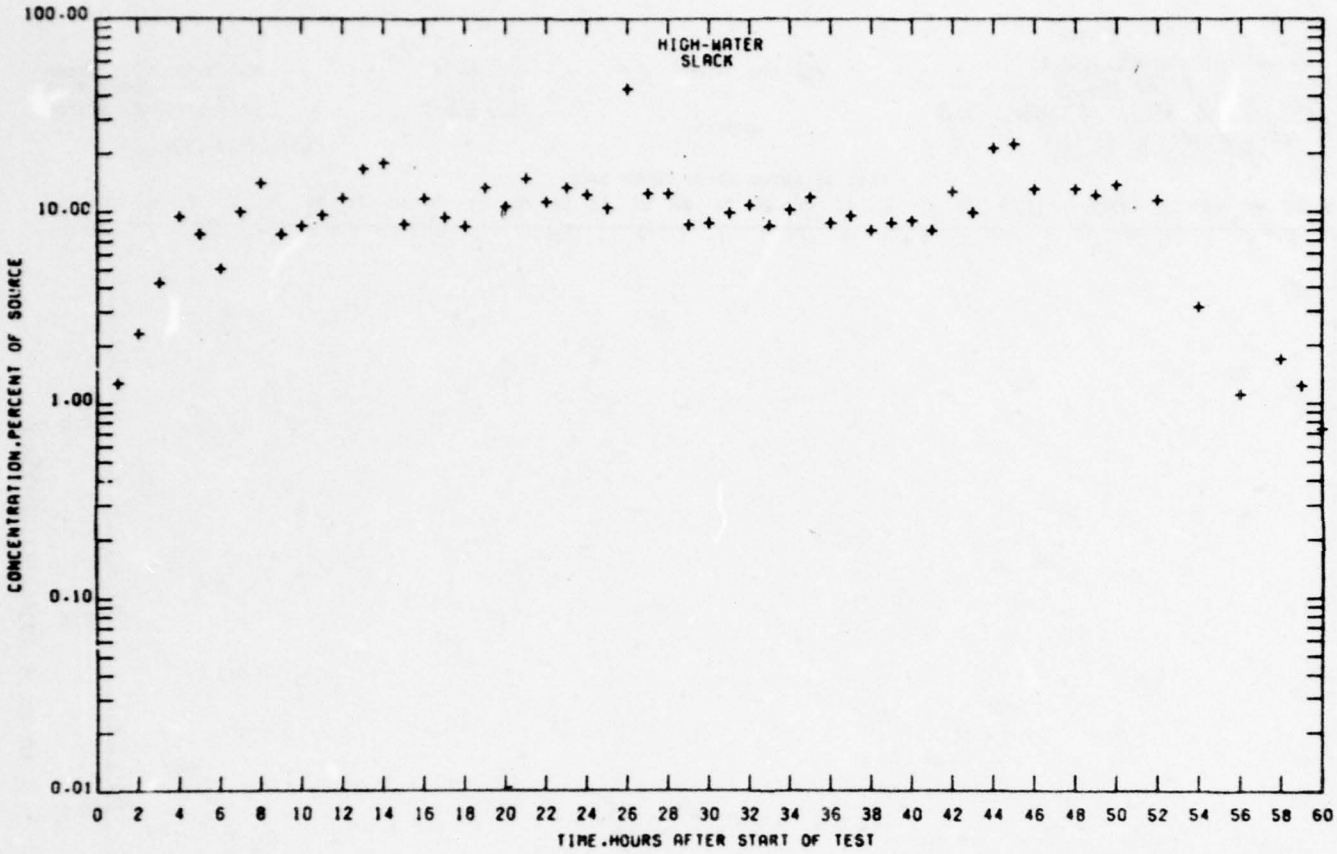
DYE TRACER TEST OF DISCHARGE INTO PROPOSED SLIP 302

62,100 GPM COMMINGLED DISCHARGE

STATION 5

PRELIMINARY DATA

PLATE SL15



TEST CONDITIONS

SOURCE CONCENTRATION	5.064 PPB
TIDE RANGE	5.4 FT
HARBOR CONFIGURATION	PLAN 1A3

LEGEND

\+ —·— SURFACE

LA-LB HARBORS MODEL
TITP/LNG DISCHARGE STUDY

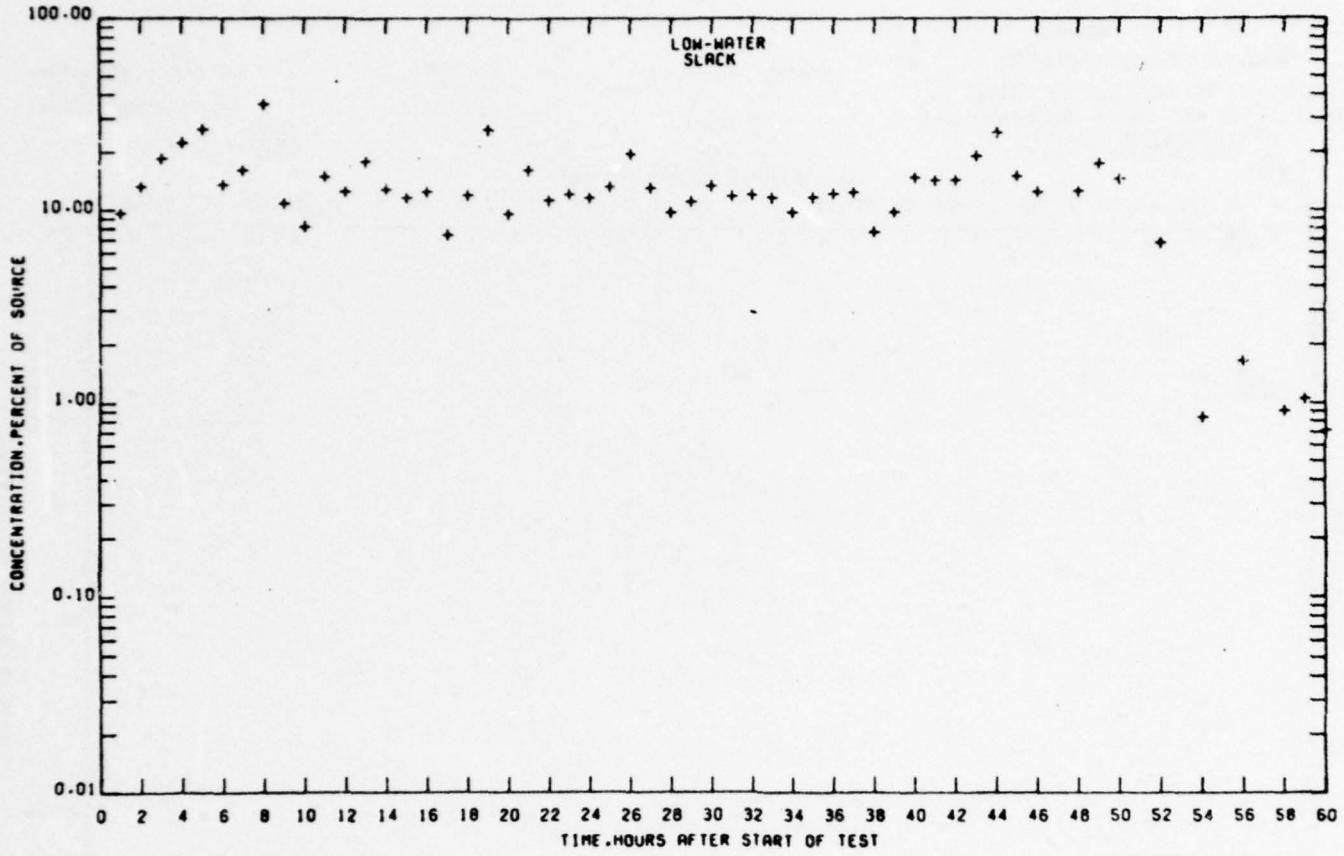
DYE TRACER TEST OF DISCHARGE INTO PROPOSED SLIP 302

62,100 GPM COMMINGLED DISCHARGE

STATION 6

PRELIMINARY DATA

PLATE SL19



TEST CONDITIONS

SOURCE CONCENTRATION	5.064 PPB
TIDE RANGE	5.4 FT
HARBOR CONFIGURATION	PLAN 1A3

LEGEND

+ —·— SURFACE

LA-LB HARBORS MODEL
TITP/LNG DISCHARGE STUDY

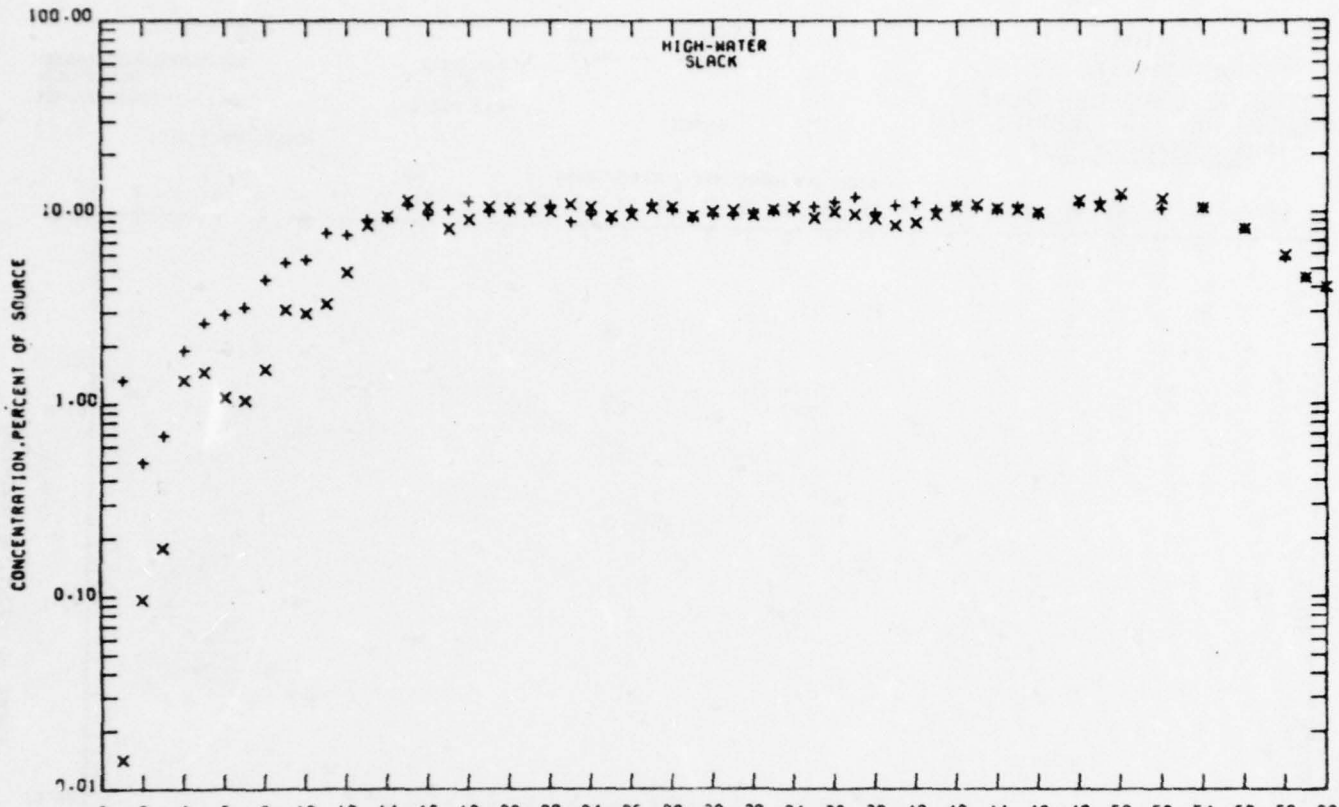
DYE TRACER TEST OF DISCHARGE INTO PROPOSED SLIP 302

62,100 GPM COMMINGLED DISCHARGE

STATION 6

PRELIMINARY DATA

PLATE SL20



TEST CONDITIONS

SOURCE CONCENTRATION	5.064 PPB
TIDE RANGE	5.4 FT
HARBOR CONFIGURATION	PLAN 1A3

LEGEND

\+ —·— SURFACE
× — - — BOTTOM

LA-LB HARBORS MODEL
TITP/LNG DISCHARGE STUDY

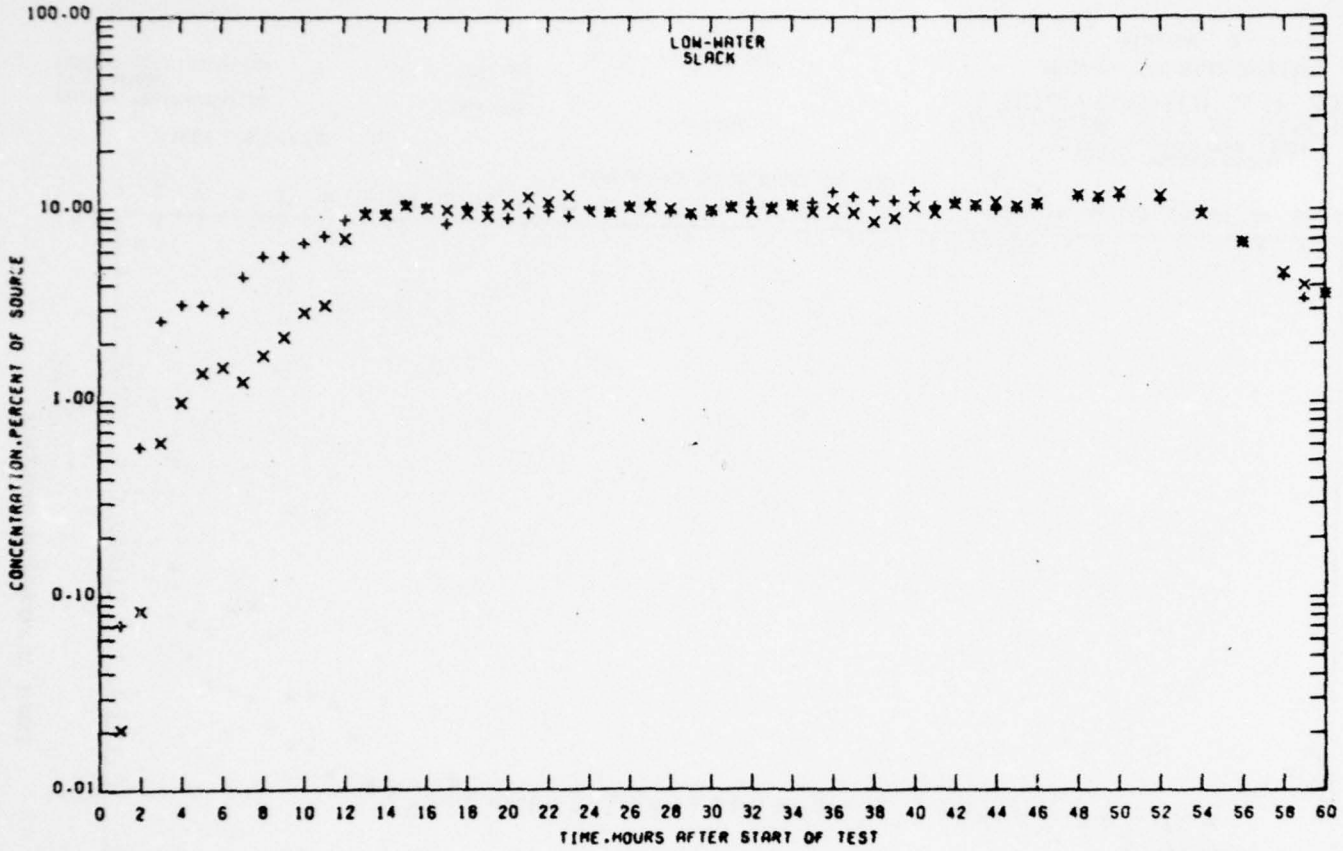
DYE TRACER TEST OF DISCHARGE INTO PROPOSED SLIP 302

62,100 GPM COMMINGLED DISCHARGE

STATION 7

PRELIMINARY DATA

PLATE SL-21



TEST CONDITIONS

SOURCE CONCENTRATION	5.064 PPB
TIDE RANGE	5.4 FT
HARBOR CONFIGURATION	PLAN 1A3

LEGEND

+ —·— SURFACE
× ---- BOTTOM

LA-LB HARBORS MODEL
TITP/LNG DISCHARGE STUDY

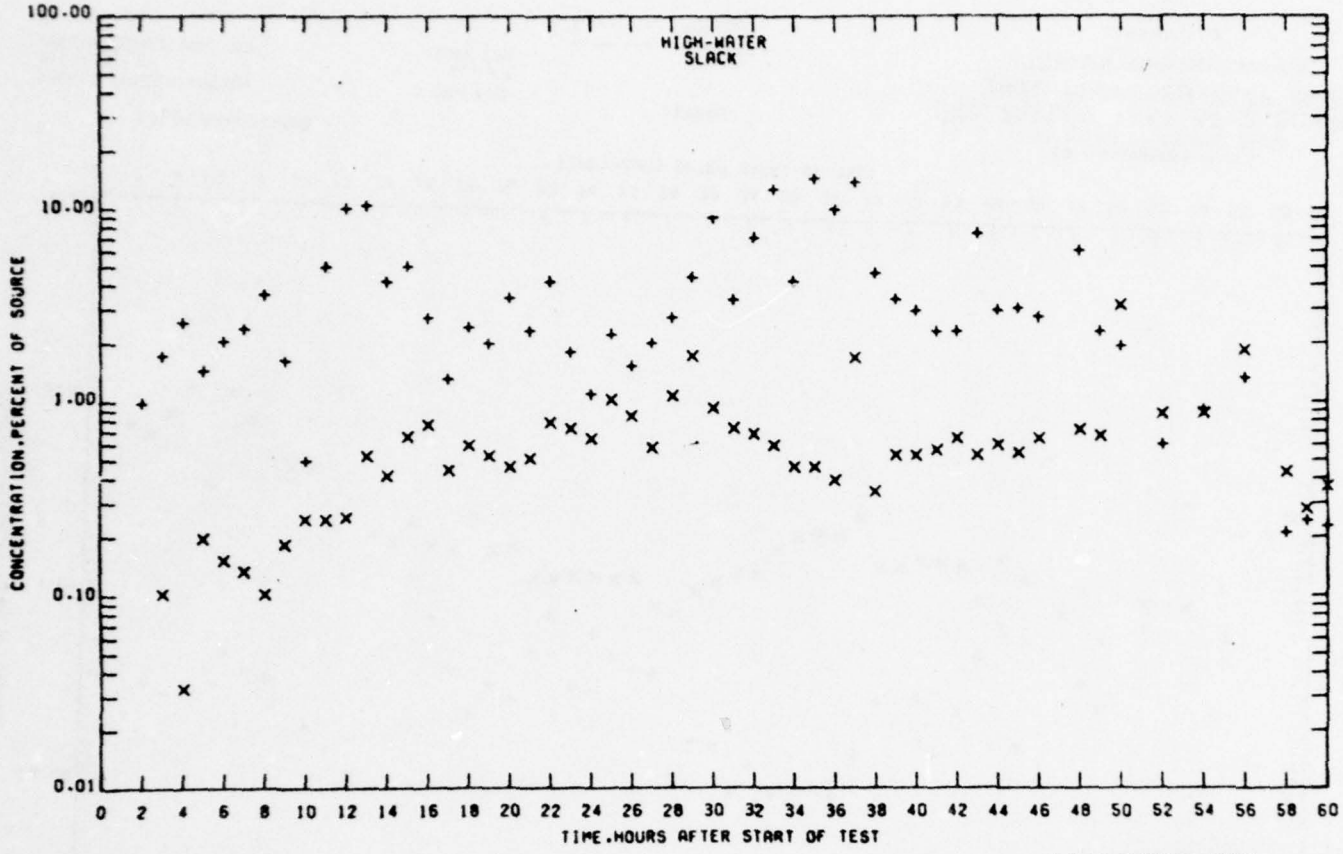
DYE TRACER TEST OF DISCHARGE INTO PROPOSED SLIP 302

62,100 GPM COMMINGLED DISCHARGE

STATION 7

PRELIMINARY DATA

PLATE SL22



TEST CONDITIONS

SOURCE CONCENTRATION	5,064 PPB
TIDE RANGE	5.4 FT
HARBOR CONFIGURATION	PLAN 1A3

LEGEND

+ —·— SURFACE
× —··— BOTTOM

LA-LB HARBORS MODEL
TITP/LNG DISCHARGE STUDY

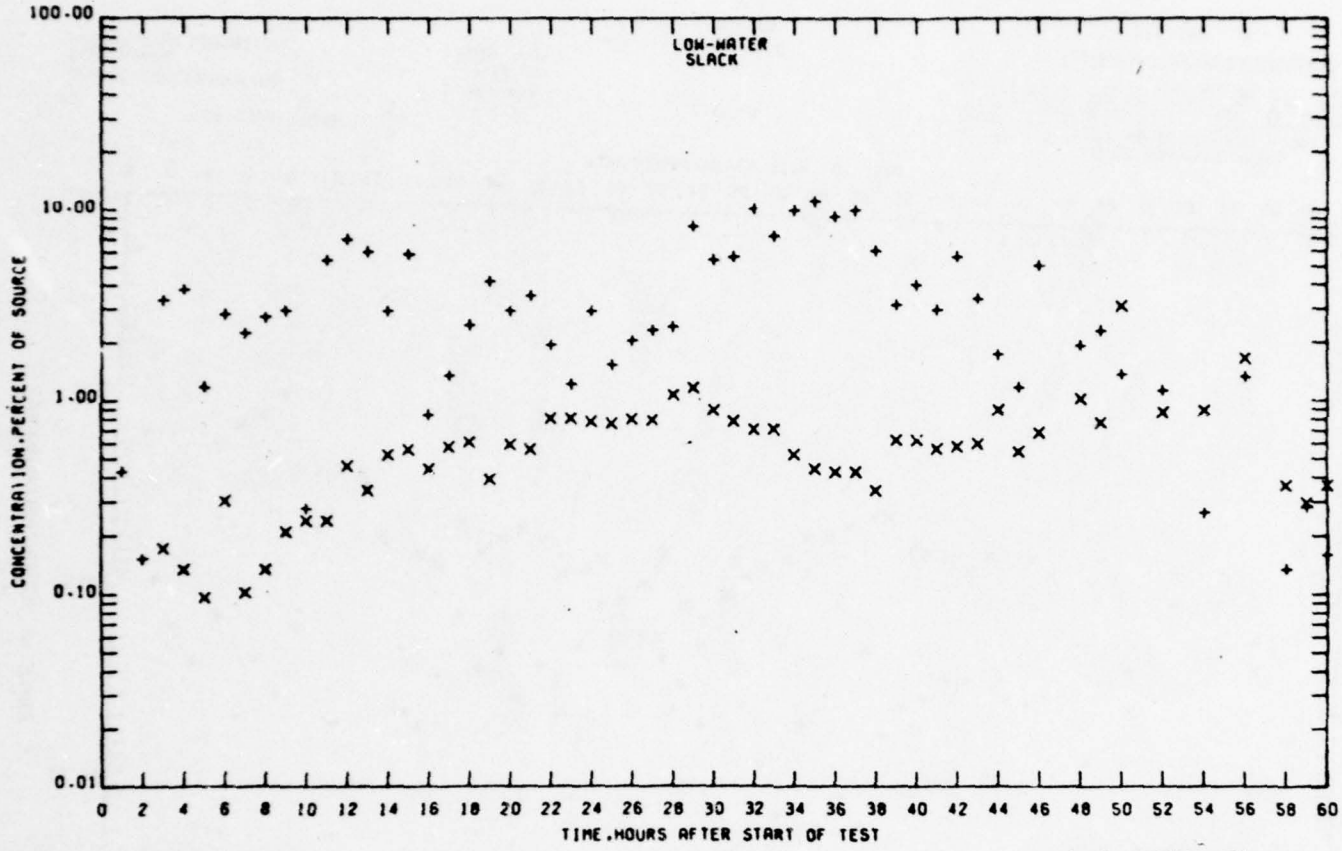
DYE TRACER TEST OF DISCHARGE INTO PROPOSED SLIP 302

62,100 GPM COMMINGLED DISCHARGE

STATION 8

PRELIMINARY DATA

PLATE SL-3



TEST CONDITIONS

SOURCE CONCENTRATION	5.064 PPB
TIDE RANGE	5.4 FT
HARBOR CONFIGURATION	PLAN 1A3

LEGEND

+ — · — SURFACE

× — · — BOTTOM

LA-LB HARBORS MODEL
TITP/LNG DISCHARGE STUDY

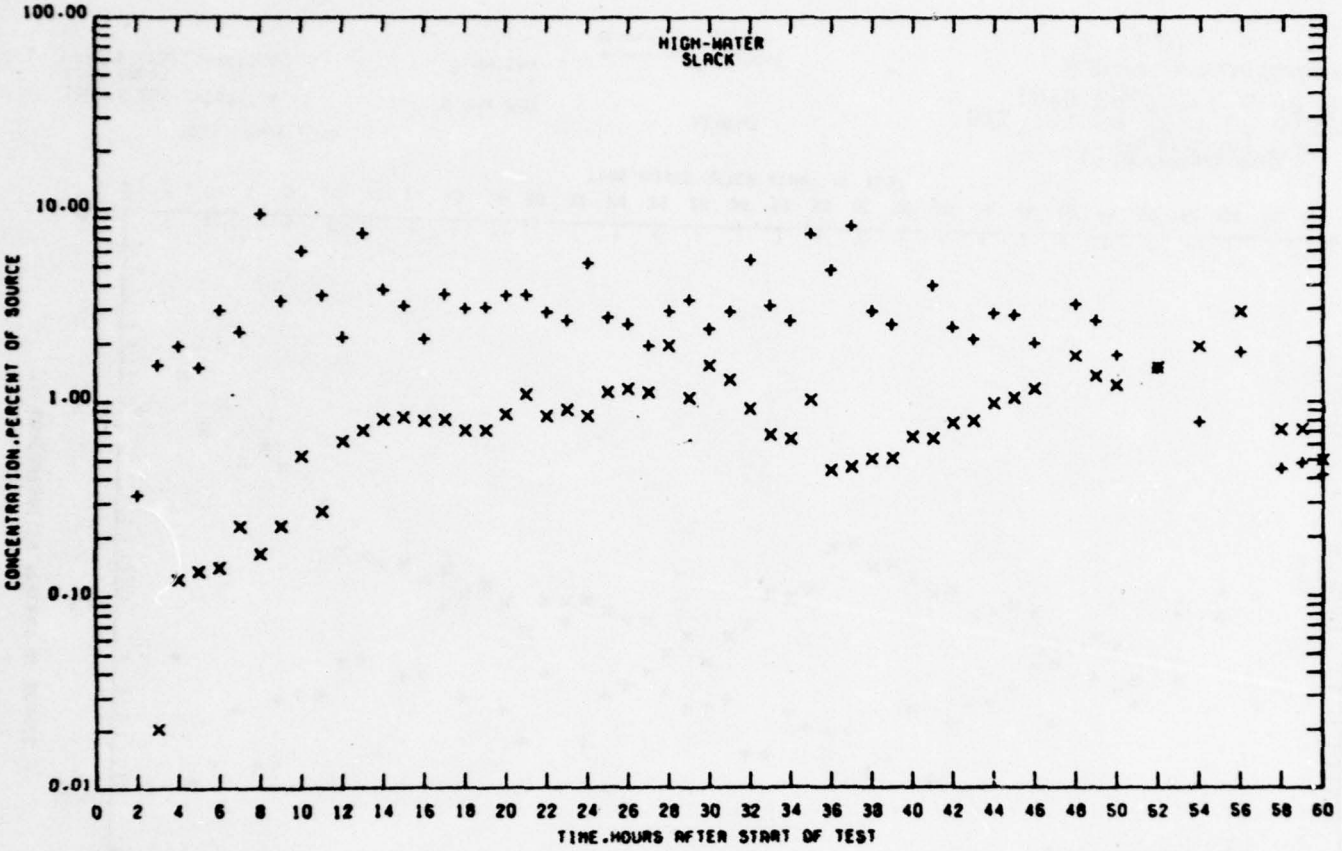
DYE TRACER TEST OF DISCHARGE INTO PROPOSED SLIP 302

62,100 GPM COMMINGLED DISCHARGE

STATION 8

PRELIMINARY DATA

PLATE SL24



TEST CONDITIONS

SOURCE CONCENTRATION	5.084 PPB
TIDE RANGE	5.4 FT
HARBOR CONFIGURATION	PLAN 1A3

LEGEND

+ —·— SURFACE
× —··— BOTTOM

LA-LB HARBORS MODEL
TITP/LNG DISCHARGE STUDY

DYE TRACER TEST OF DISCHARGE INTO PROPOSED SLIP 302

62,100 GPM COMMINGLED DISCHARGE

STATION 9

PRELIMINARY DATA

PLATE SL35

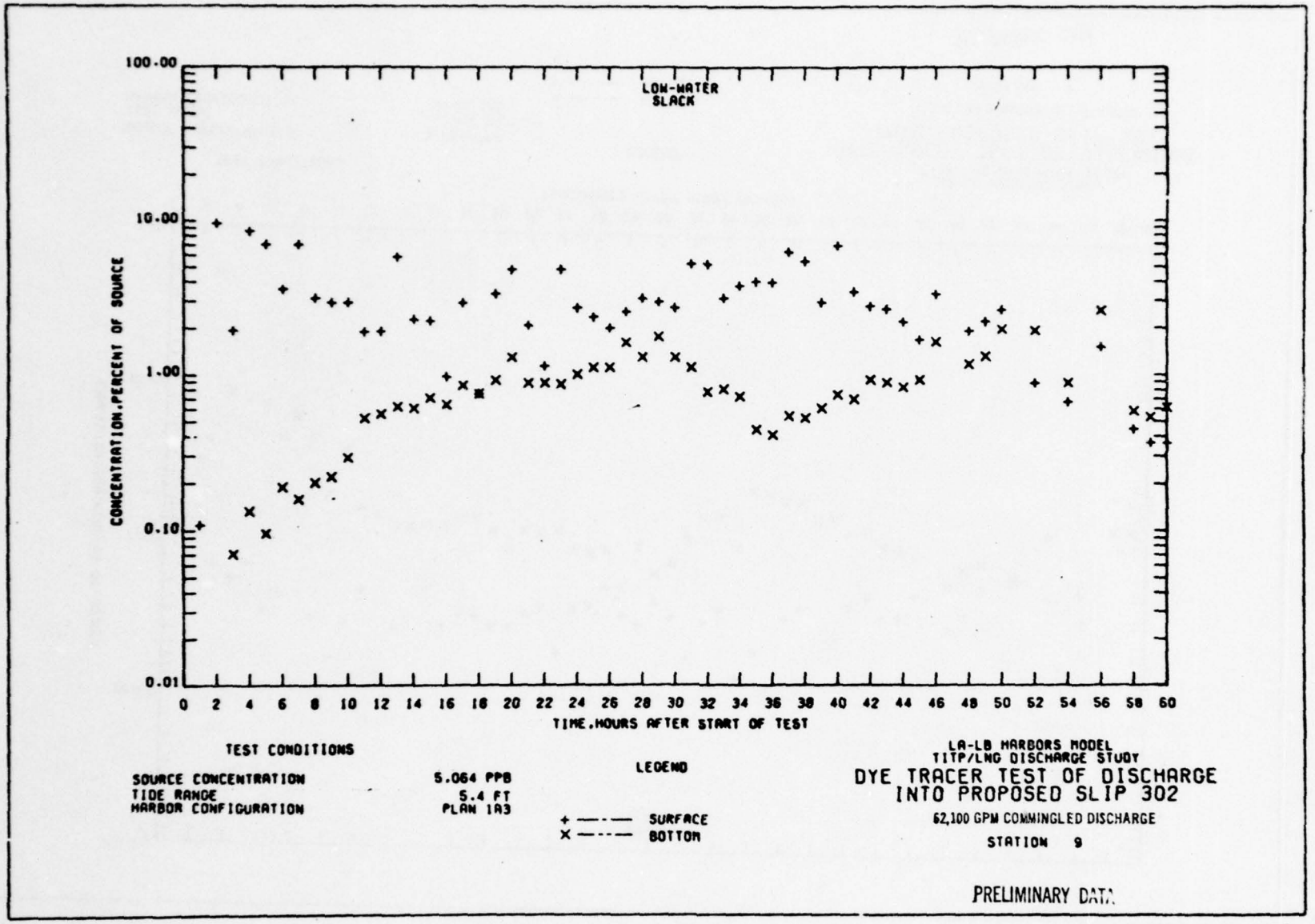
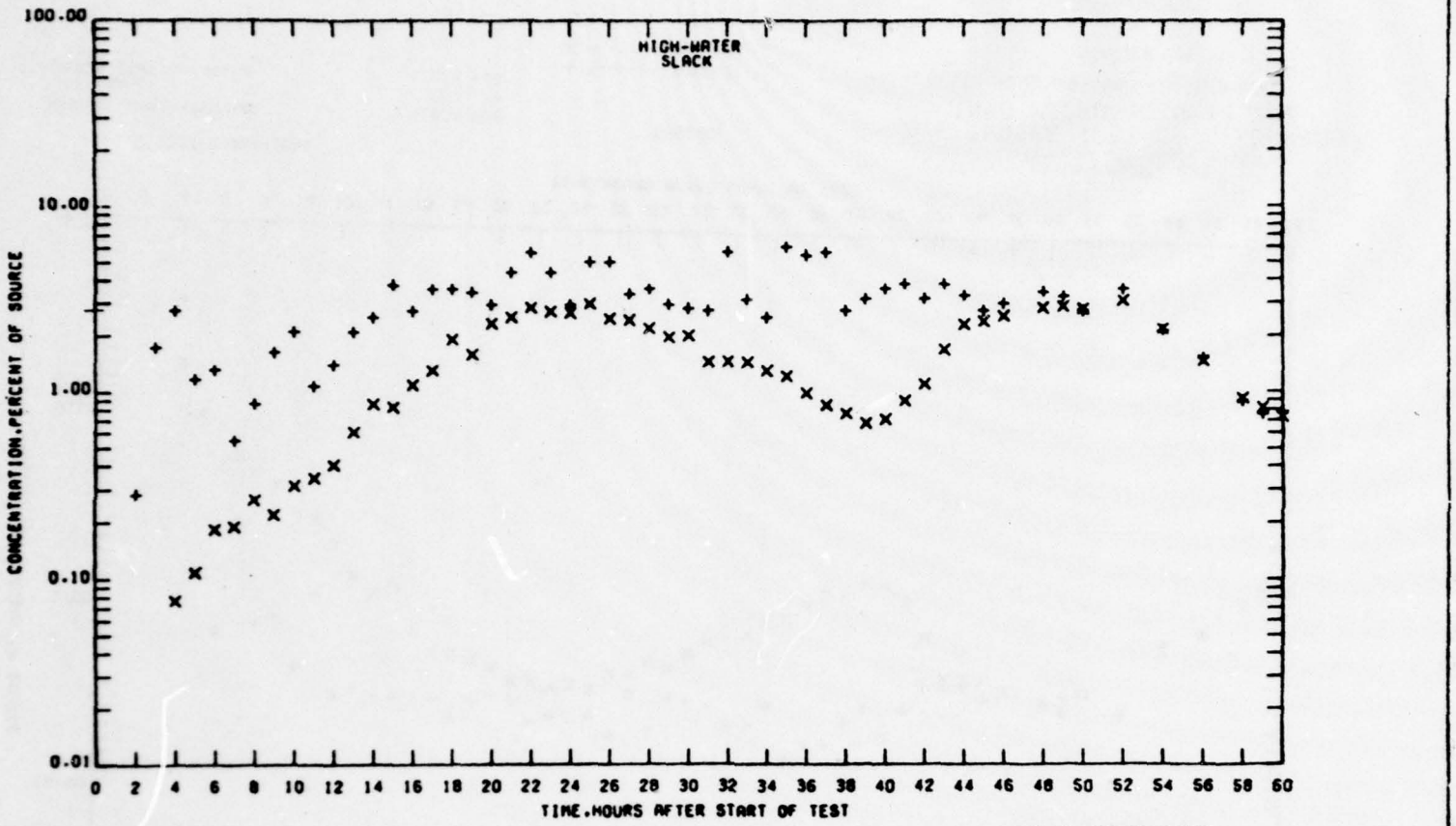

LOW-WATER SLACK
100.00
10.00
1.00
0.10
0.01
CONCENTRATION, PERCENT OF SOURCE
0 2 4 6 8 10 12 14 16 18 20 22 24 26 28 30 32 34 36 38 40 42 44 46 48 50 52 54 56 58 60
TIME, HOURS AFTER START OF TEST
TEST CONDITIONS
SOURCE CONCENTRATION 5.064 PPB
TIDE RANGE 5.4 FT
HARBOR CONFIGURATION PLAN 1A3
LEGEND
+ —·— SURFACE
× —·— BOTTOM
LA-LB HARBORS MODEL
TITP/LNG DISCHARGE STUDY
DYE TRACER TEST OF DISCHARGE
INTO PROPOSED SLIP 302
62,100 GPM COMMINGLED DISCHARGE
STATION 9
PRELIMINARY DATA

PLATE SL2b



TEST CONDITIONS

SOURCE CONCENTRATION	5.064 PPB
TIDE RANGE	5.4 FT
HARBOR CONFIGURATION	PLAN 1A3

LEGEND

+ —·— SURFACE
× — - — BOTTOM

LA-LB HARBORS MODEL
TITP/LNG DISCHARGE STUDY

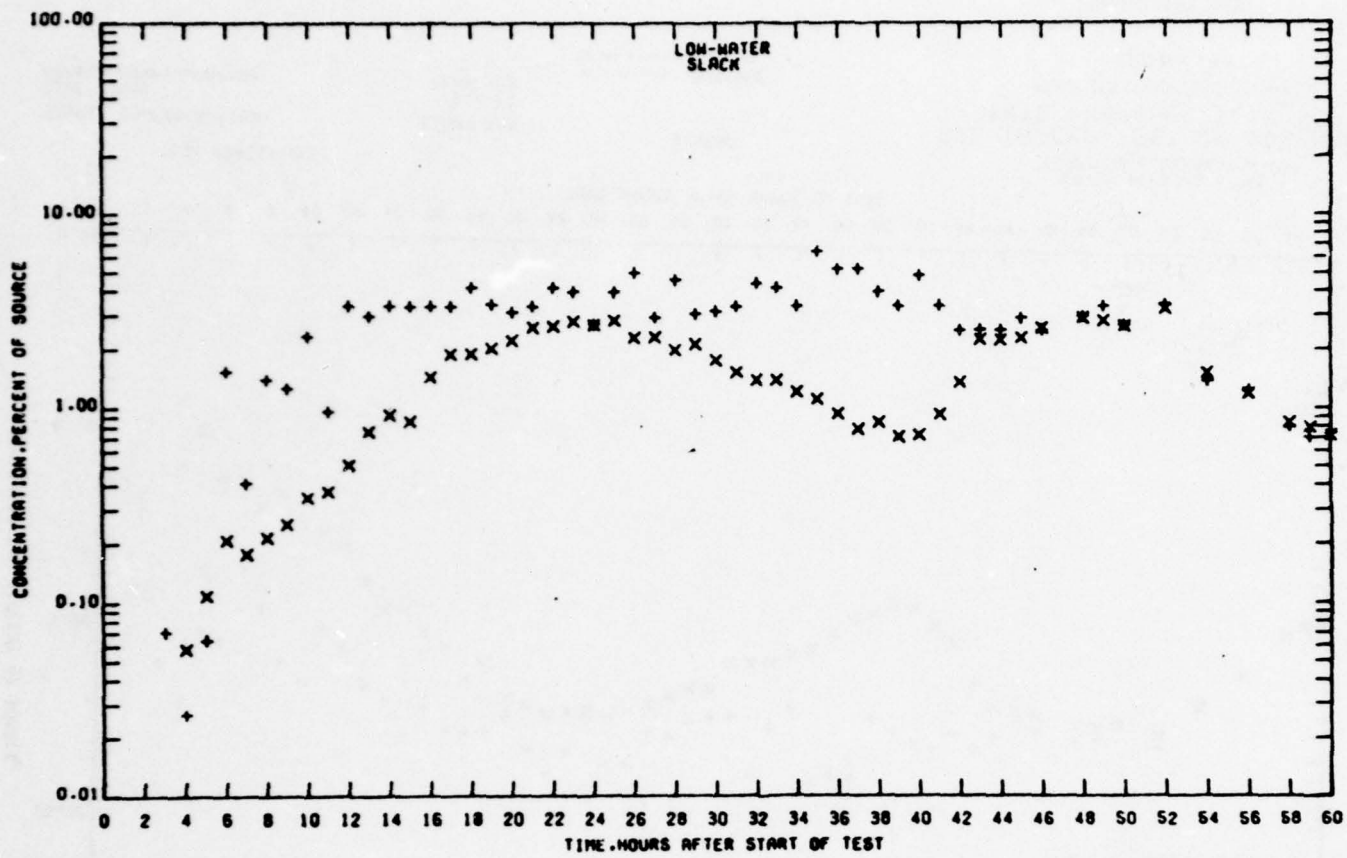
DYE TRACER TEST OF DISCHARGE INTO PROPOSED SLIP 302

62,100 GPM COMMINGLED DISCHARGE

STATION 10

PRELIMINARY DATA

PLATE SL27



TEST CONDITIONS

SOURCE CONCENTRATION	5.064 PPB
TIDE RANGE	5.4 FT
HARBOR CONFIGURATION	PLAN 1A3

LEGEND

+ —·— SURFACE
× ---- BOTTOM

LA-LB HARBORS MODEL
TITP/LNG DISCHARGE STUDY

DYE TRACER TEST OF DISCHARGE INTO PROPOSED SLIP 302

62,100 GPM COMMINGLED DISCHARGE

STATION 10

PRELIMINARY DATA

PLATE SL28

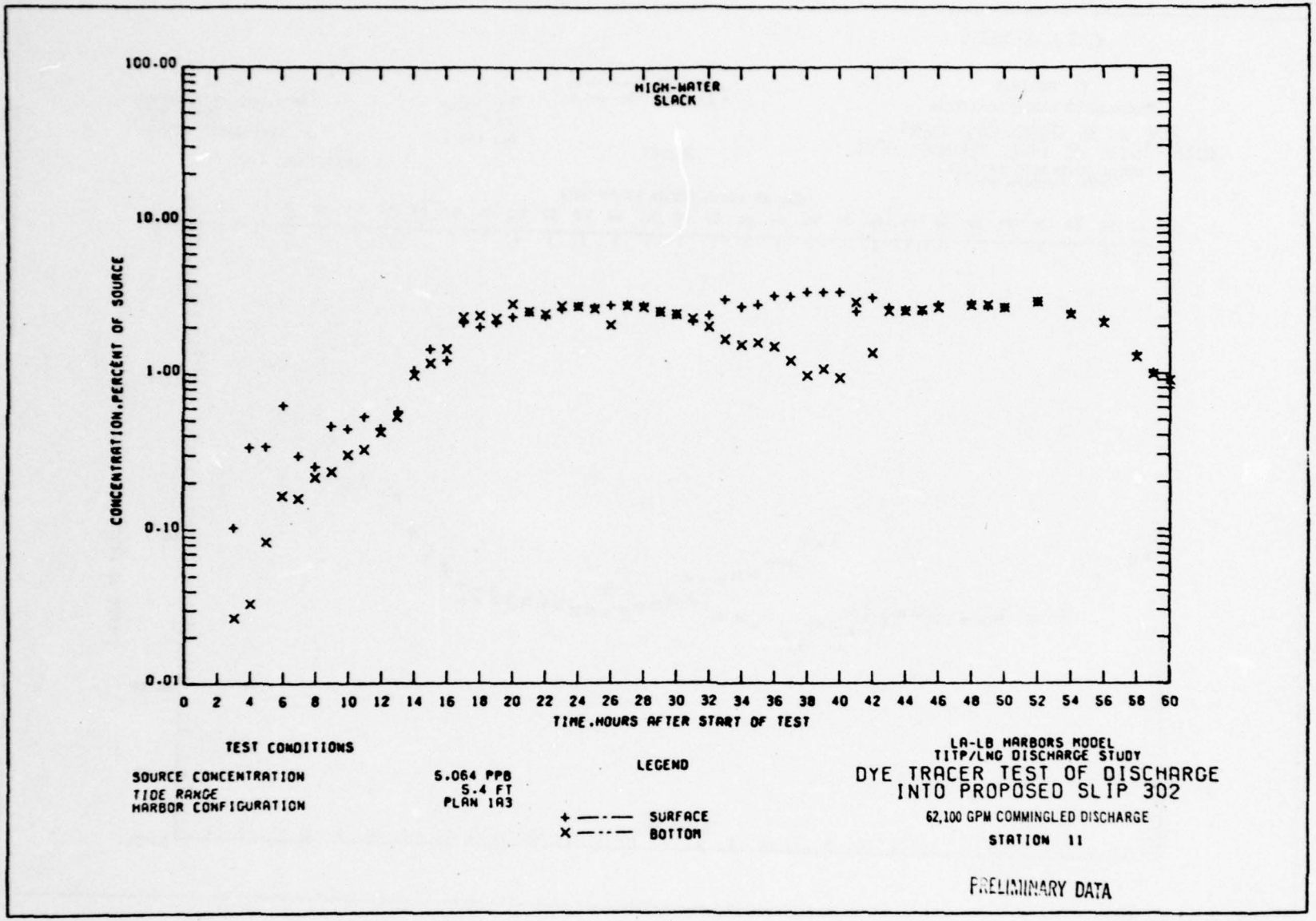
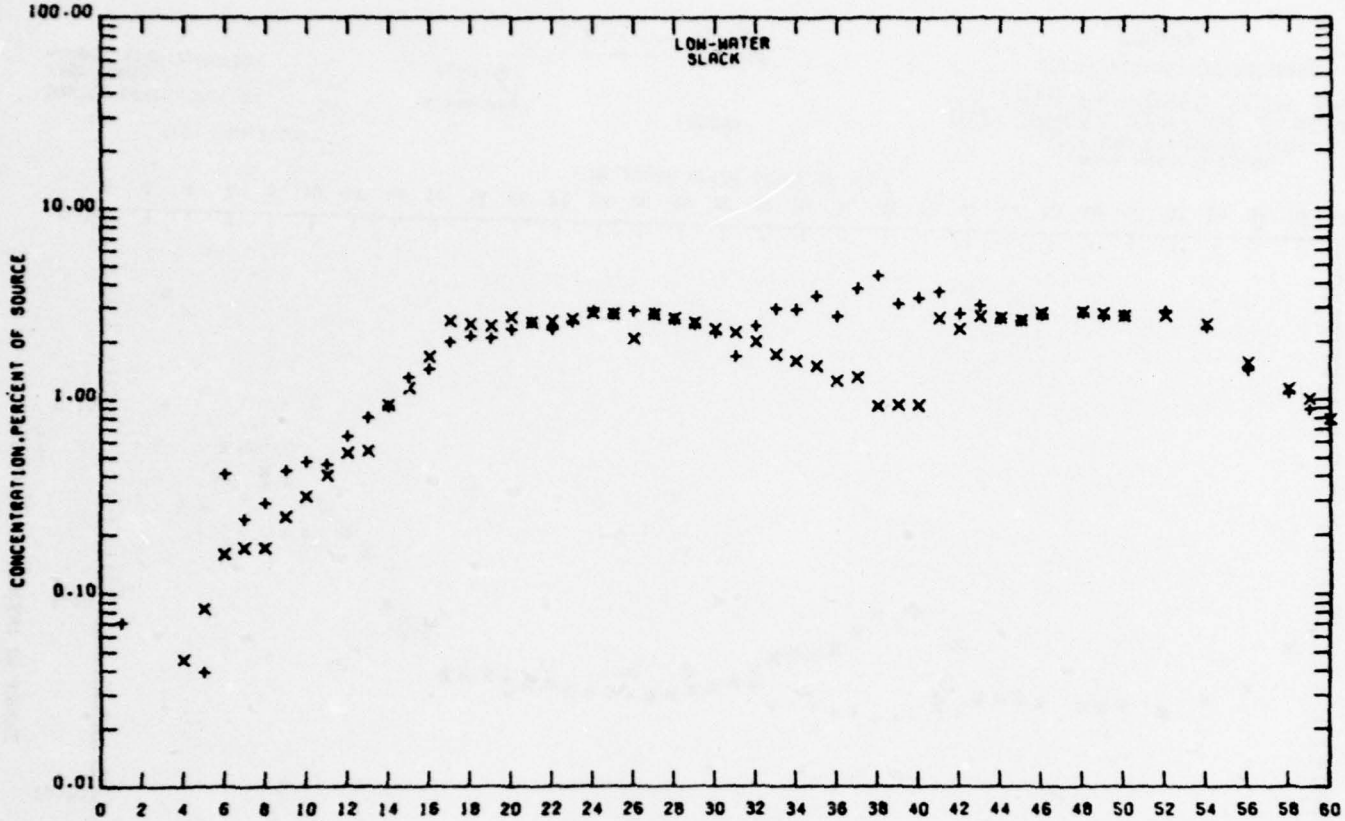

HIGH-WATER SLACK
100.00
10.00
1.00
0.10
0.01
CONCENTRATION, PERCENT OF SOURCE
0 2 4 6 8 10 12 14 16 18 20 22 24 26 28 30 32 34 36 38 40 42 44 46 48 50 52 54 56 58 60
TIME, HOURS AFTER START OF TEST
TEST CONDITIONS
SOURCE CONCENTRATION 5.064 PPB
TIDE RANGE 5.4 FT
HARBOR CONFIGURATION PLAN 1A3
LEGEND
SURFACE
BOTTOM
LA-LB HARBORS MODEL
TITP/LNG DISCHARGE STUDY
DYE TRACER TEST OF DISCHARGE INTO PROPOSED SLIP 302
62,100 GPM COMMINGLED DISCHARGE
STATION 11
PRELIMINARY DATA

PLATE SL29



TEST CONDITIONS

SOURCE CONCENTRATION	5.064 PPB
TIDE RANGE	5.4 FT
HARBOR CONFIGURATION	PLAN 1A3

LEGEND

+ —·— SURFACE
× —·— BOTTOM

LA-LB HARBORS MODEL
TITP/LNG DISCHARGE STUDY

DYE TRACER TEST OF DISCHARGE INTO PROPOSED SLIP 302

62,100 GPM COMMINGLED DISCHARGE

STATION 11

PRELIMINARY DATA

PLATE SL50

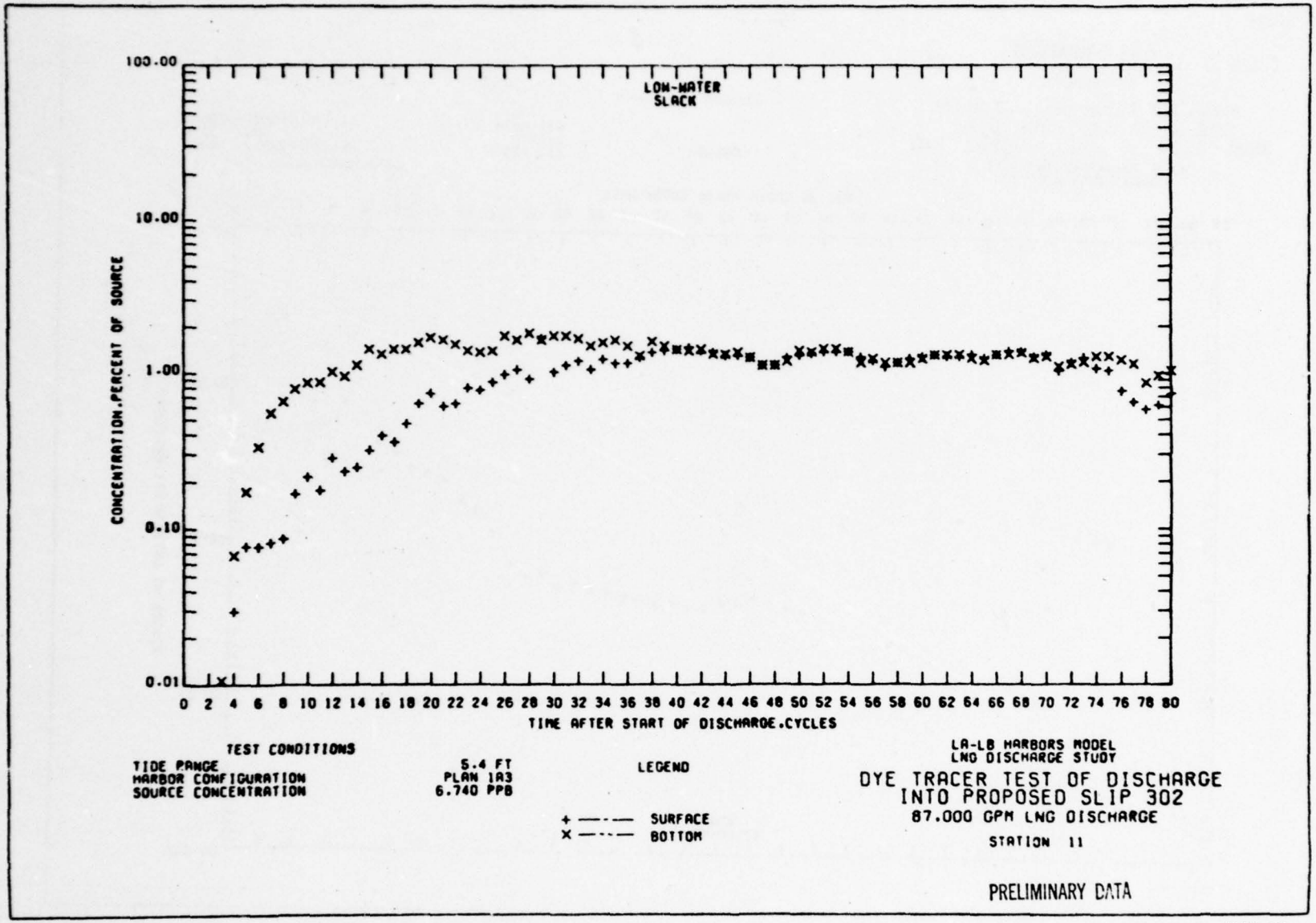
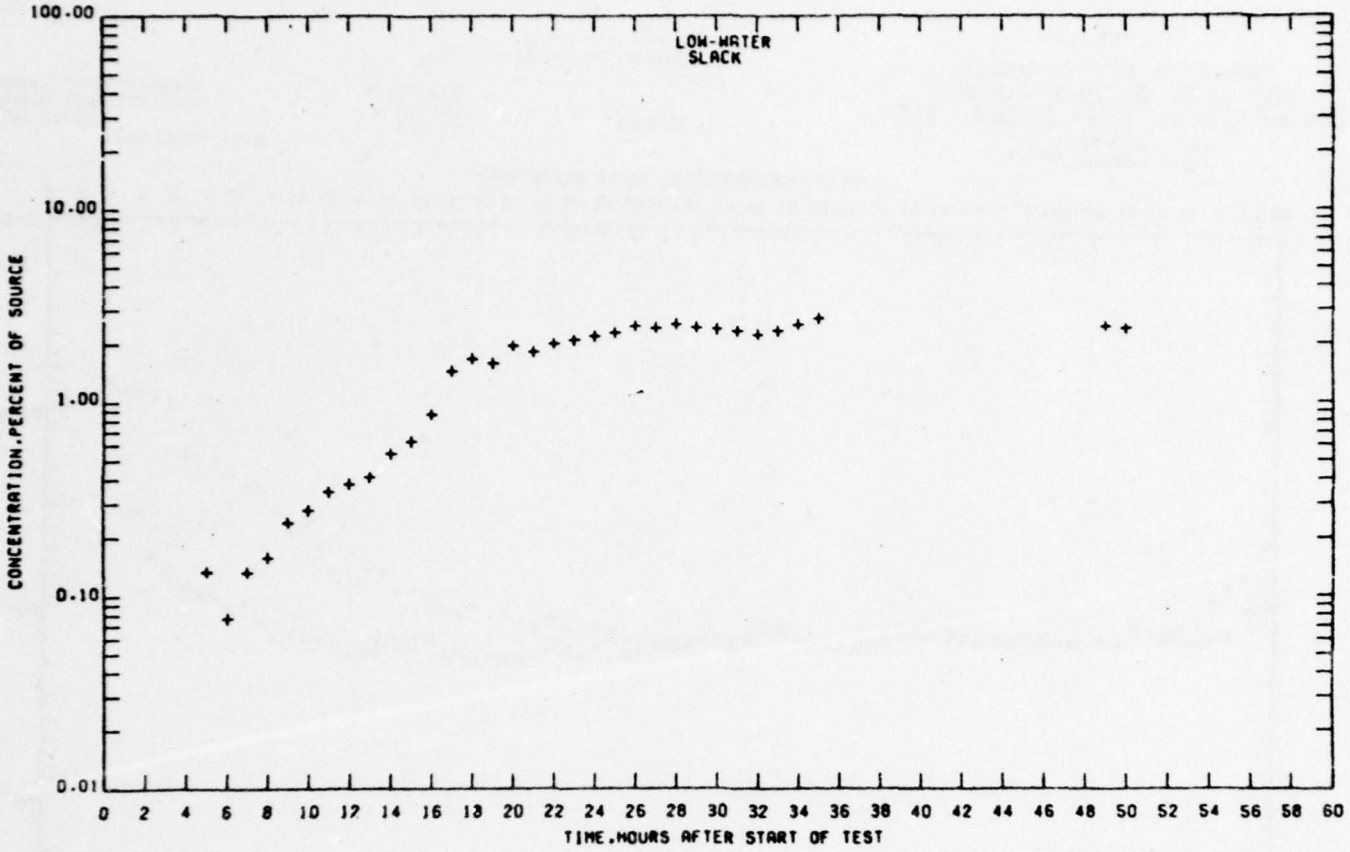

100.00
10.00
1.00
0.10
0.01
LOW-WATER
SLACK
CONCENTRATION, PERCENT OF SOURCE
0 2 4 6 8 10 12 14 16 18 20 22 24 26 28 30 32 34 36 38 40 42 44 46 48 50 52 54 56 58 60 62 64 66 68 70 72 74 76 78 80
TIME AFTER START OF DISCHARGE, CYCLES
TEST CONDITIONS
TIDE RANGE 5.4 FT
HARBOR CONFIGURATION PLAN 1A3
SOURCE CONCENTRATION 6,740 PPB
LEGEND
+ SURFACE
× BOTTOM
LA-LB HARBORS MODEL
LNG DISCHARGE STUDY
DYE TRACER TEST OF DISCHARGE
INTO PROPOSED SLIP 302
87,000 GPM LNG DISCHARGE
STATION 11
PRELIMINARY DATA

PLATE L31



TEST CONDITIONS

SOURCE CONCENTRATION	5.064 PPB
TIDE RANGE	5.4 FT
HARBOR CONFIGURATION	PLAN 1A3

LEGEND

+ —·—· SURFACE

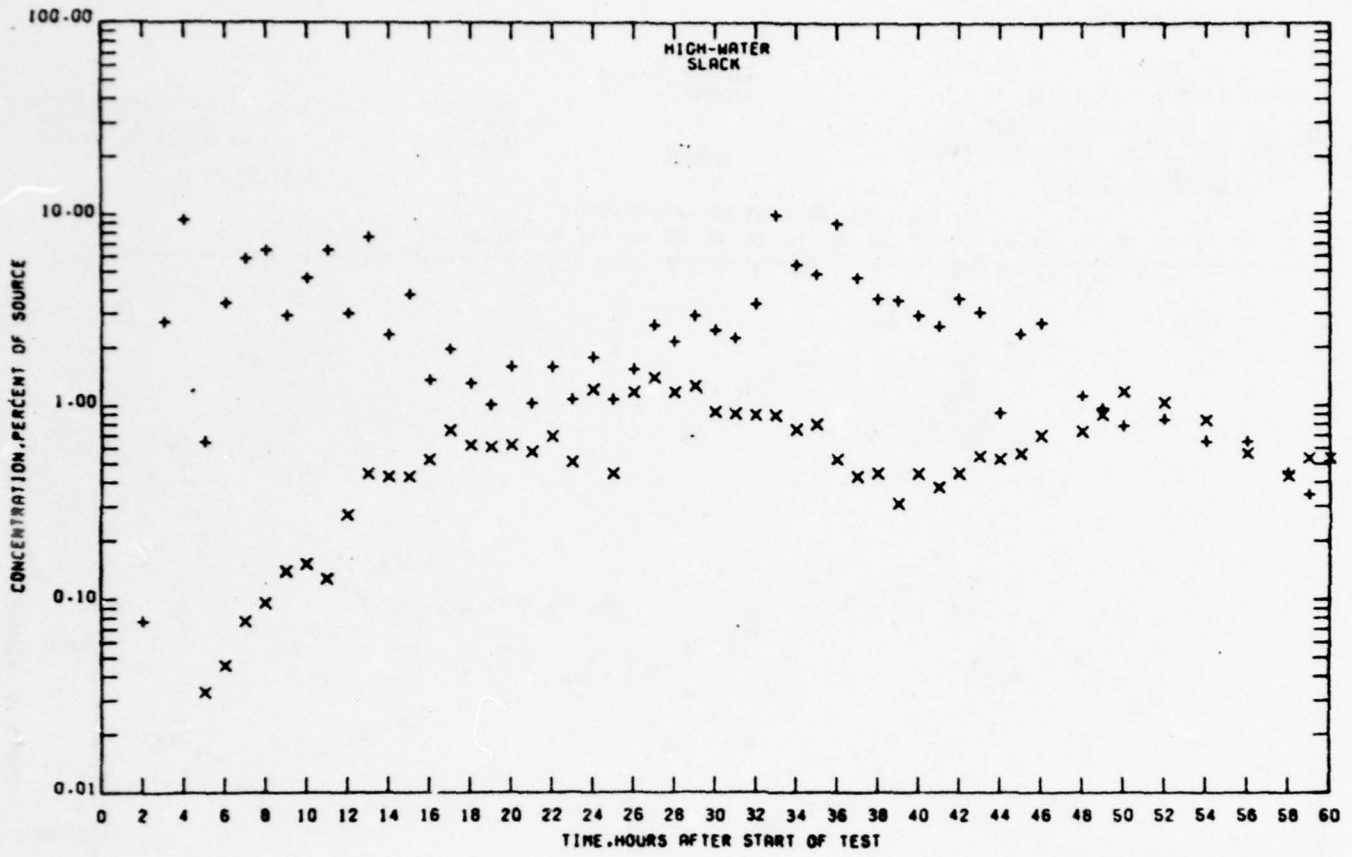
LA-LB HARBORS MODEL
TITP/LNG DISCHARGE STUDY

DYE TRACER TEST OF DISCHARGE
INTO PROPOSED SLIP 302
62100 GPM COMMINGLED DISCHARGE

STATION 12

PRELIMINARY DATA

PLATE SL32



TEST CONDITIONS

SOURCE CONCENTRATION	5.064 PPB
TIDE RANGE	5.4 FT
HARBOR CONFIGURATION	PLAN 1A3

LEGEND

+ —·— SURFACE
× —·— BOTTOM

LA-LB HARBORS MODEL
TITP/LNG DISCHARGE STUDY

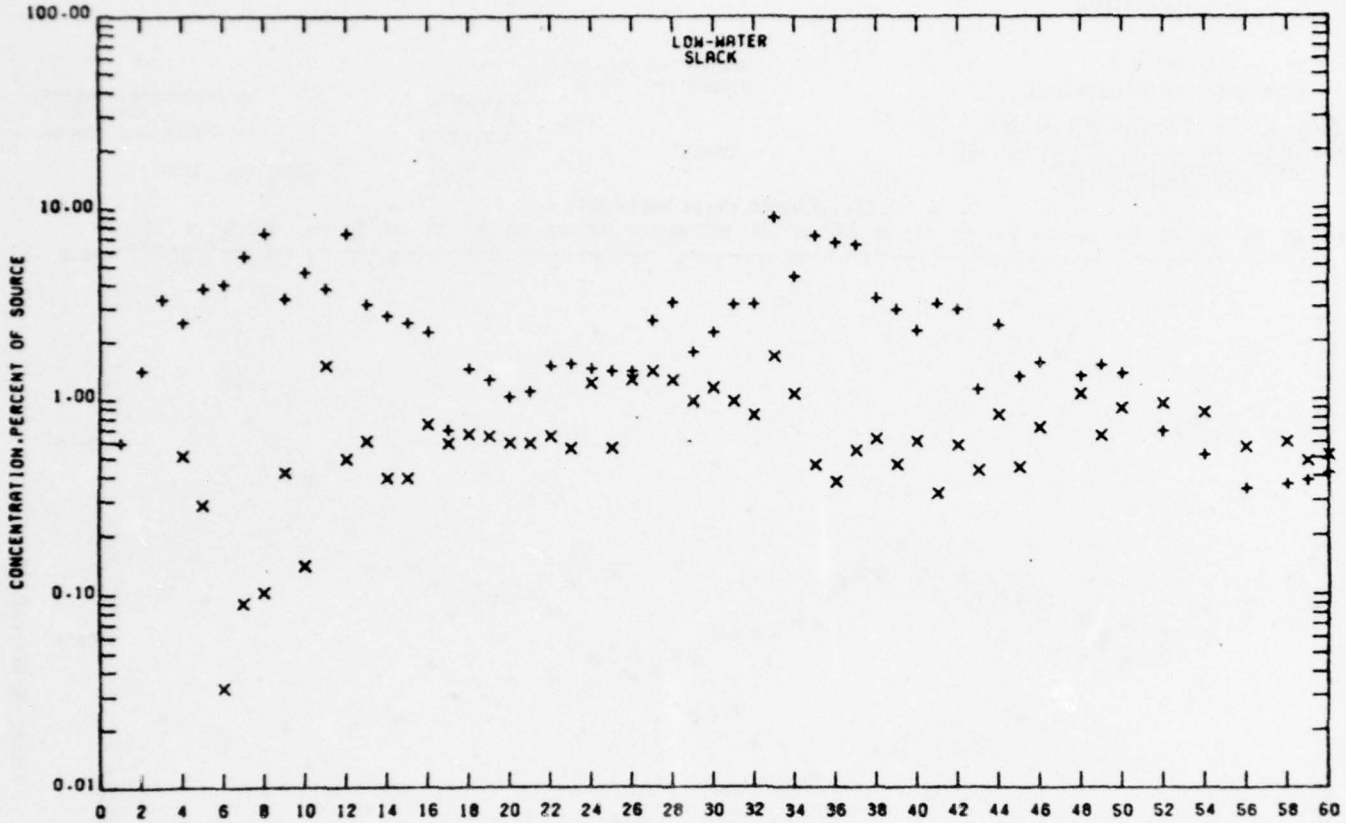
DYE TRACER TEST OF DISCHARGE INTO PROPOSED SLIP 302

62,100 GPM COMMINGLED DISCHARGE

STATION 13

PRELIMINARY DATA

PLATE SL33



TEST CONDITIONS

SOURCE CONCENTRATION 5.064 PPB
TIDE RANGE 5.4 FT
HARBOR CONFIGURATION PLAN 1A3

LEGEND

+ —·— SURFACE
× —·— BOTTOM

LA-LB HARBORS MODEL
TITP/LNG DISCHARGE STUDY

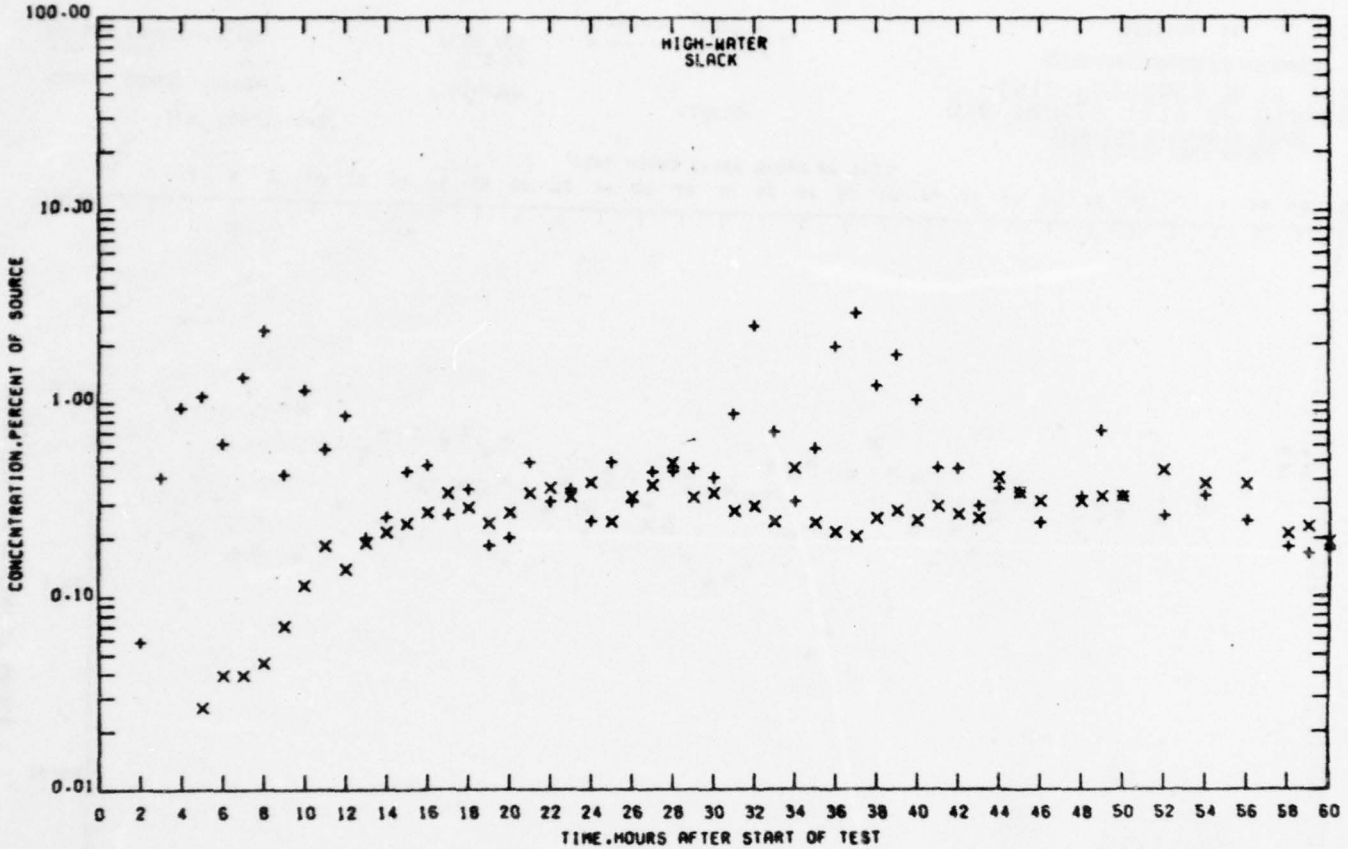
DYE TRACER TEST OF DISCHARGE
INTO PROPOSED SLIP 302

62,100 GPM COMMINGLED DISCHARGE

STATION 13

PRELIMINARY DATA

PLATE SL34



TEST CONDITIONS

SOURCE CONCENTRATION	5.064 PPB
TIDE RANGE	5.4 FT
HARBOR CONFIGURATION	PLAN 1A3

LEGEND

+ —·— SURFACE

× ---- BOTTOM

LA-LB HARBORS MODEL
TITP/LNG DISCHARGE STUDY

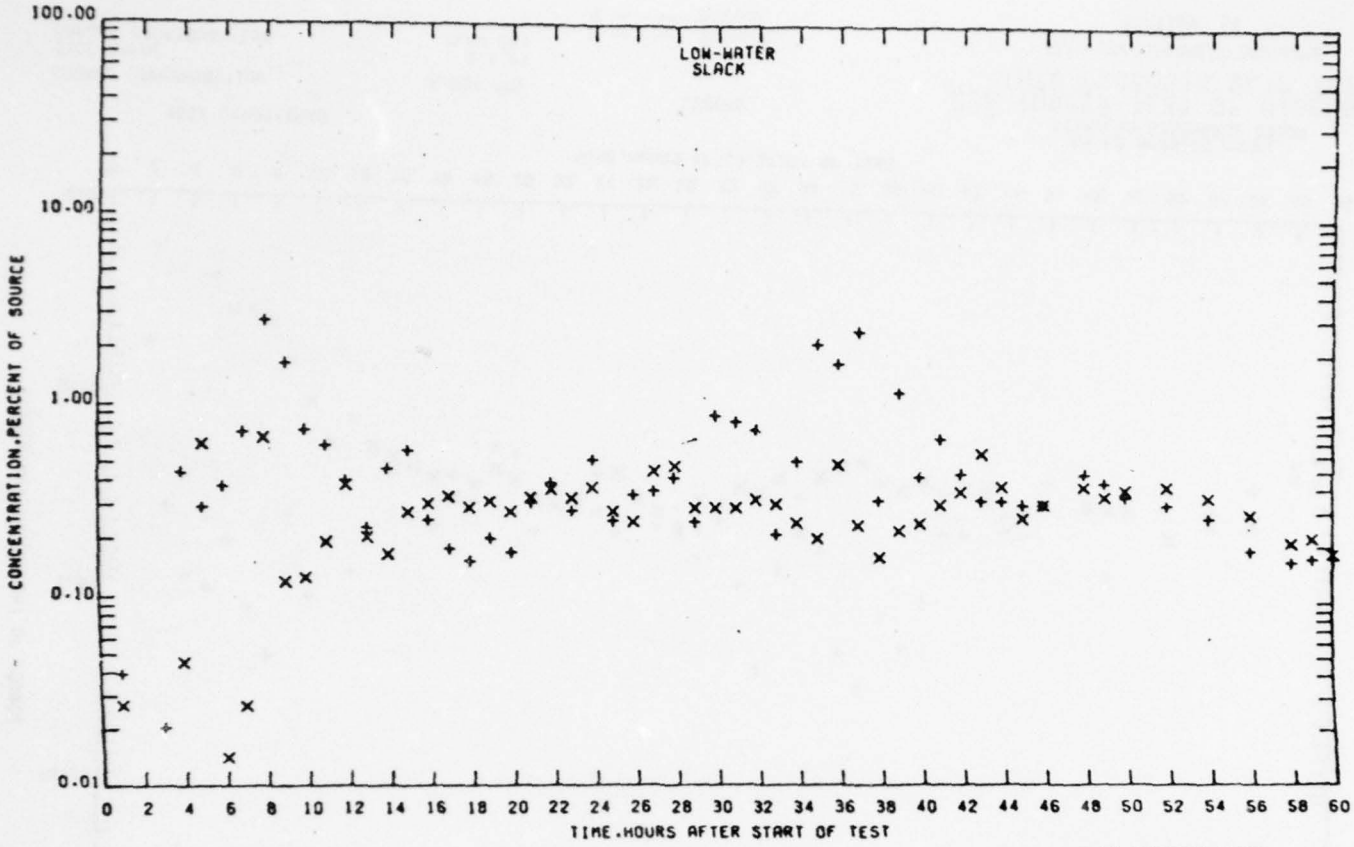
DYE TRACER TEST OF DISCHARGE INTO PROPOSED SLIP 302

62,100 GPM COMMINGLED DISCHARGE

STATION 14

PRELIMINARY DATA

PLATE SL3-



TEST CONDITIONS

SOURCE CONCENTRATION	5.064 PPB
TIDE RANGE	5.4 FT
HARBOR CONFIGURATION	PLAN 1A3

LEGEND

+ —·—·— SURFACE

× —·—·— BOTTOM

LA-LB HARBORS MODEL
TITP/LNG DISCHARGE STUDY

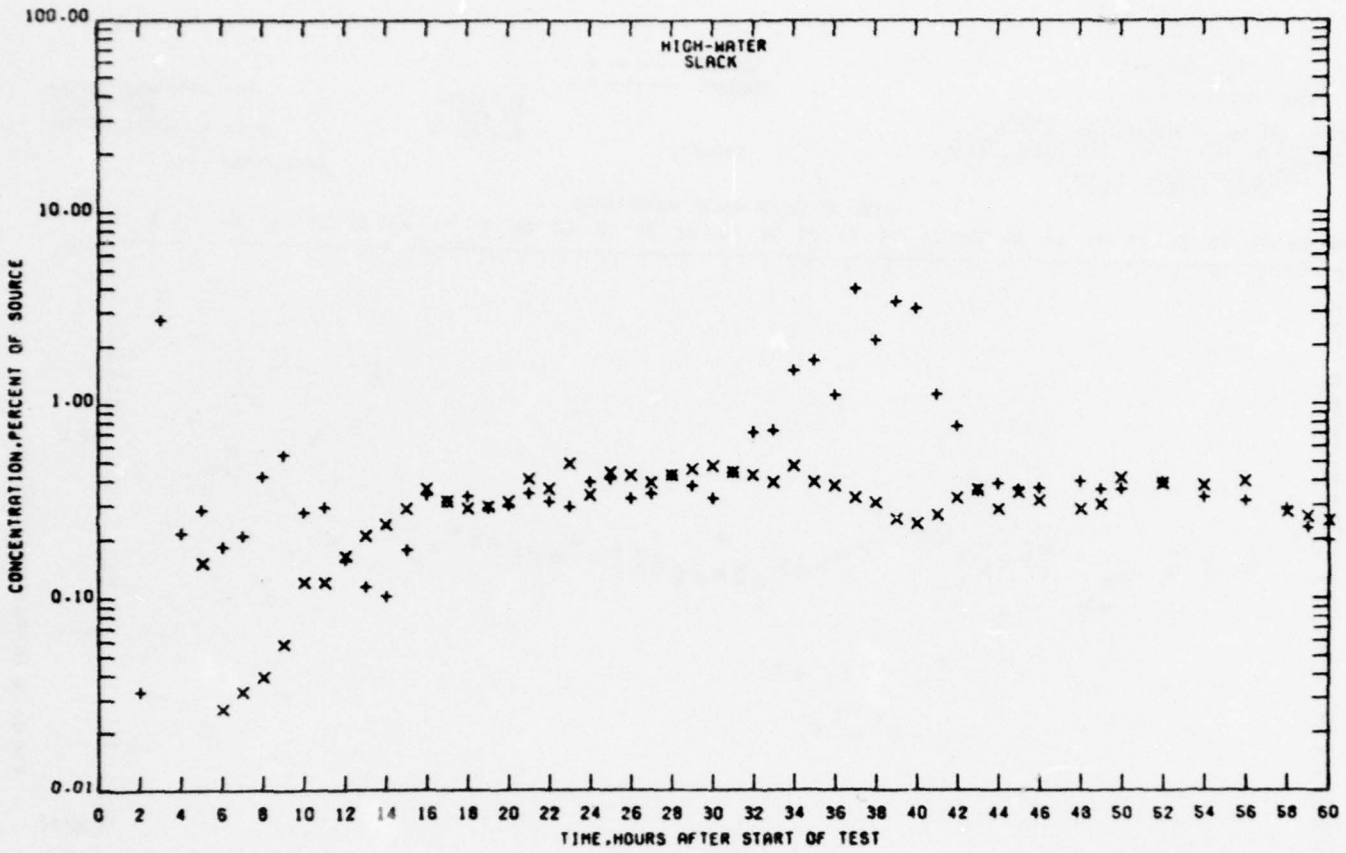
DYE TRACER TEST OF DISCHARGE INTO PROPOSED SLIP 302

62,100 GPM COMMINGLED DISCHARGE

STATION 14

PRELIMINARY DATA

PLATE SL36



TEST CONDITIONS

SOURCE CONCENTRATION	5,054 PPB
TIDE RANGE	5.4 FT
HARBOR CONFIGURATION	PLAN 1A3

LEGEND

+ —·— SURFACE
× — - — BOTTOM

LA-LB HARBORS MODEL
TITP/LNG DISCHARGE STUDY

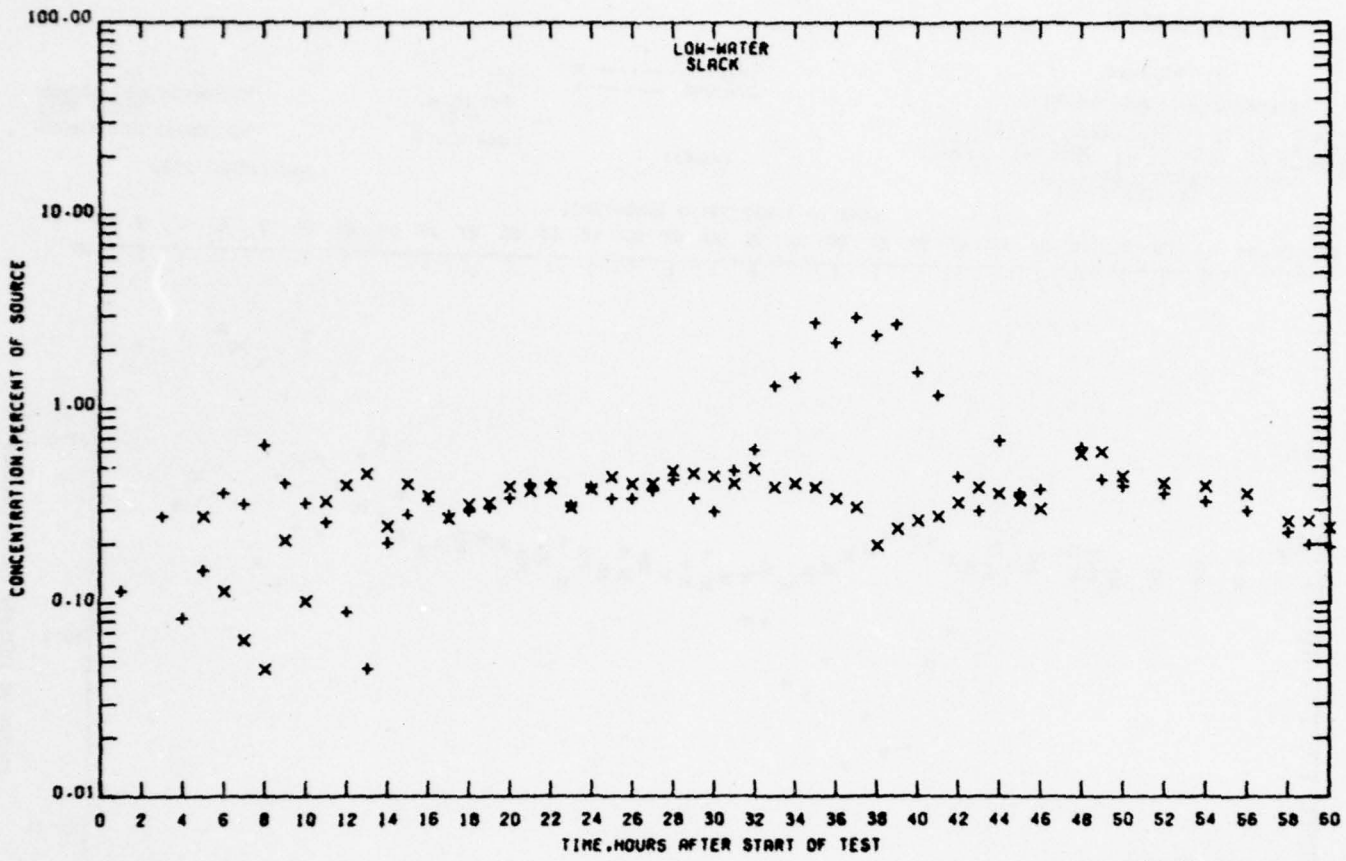
DYE TRACER TEST OF DISCHARGE INTO PROPOSED SLIP 302

62,100 GPM COMMINGLED DISCHARGE

STATION 15

PRELIMINARY DATA

PLATE SL37



TEST CONDITIONS

SOURCE CONCENTRATION	5.064 PPB
TIDE RANGE	5.4 FT
HARBOR CONFIGURATION	PLAN 1A3

LEGEND

+ —·—·— SURFACE

× —·—·— BOTTOM

LA-LB HARBORS MODEL
TITP/LNG DISCHARGE STUDY

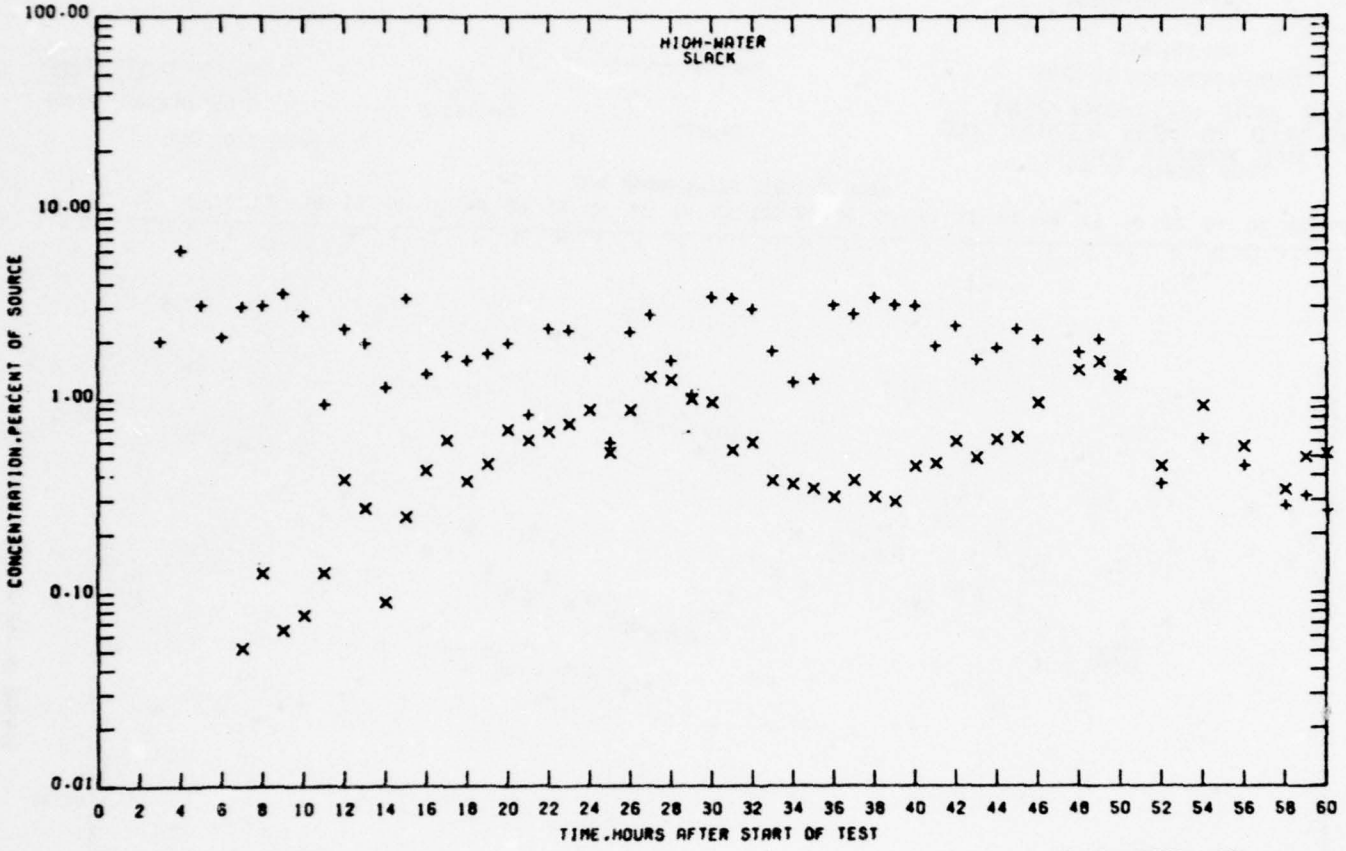
DYE TRACER TEST OF DISCHARGE INTO PROPOSED SLIP 302

62,100 GPM COMMINGLED DISCHARGE

STATION 15

PRELIMINARY DATA

PLATE SL35



TEST CONDITIONS

SOURCE CONCENTRATION	5.064 PPB
TIDE RANGE	5.4 FT
HARBOR CONFIGURATION	PLAN 1A3

LEGEND

+ —·— SURFACE
× — - — BOTTOM

LA-LB HARBORS MODEL
TITP/LNG DISCHARGE STUDY

DYE TRACER TEST OF DISCHARGE INTO PROPOSED SLIP 302

62,100 GPM COMMINGLED DISCHARGE

STATION 16A

PRELIMINARY DATA

PLATE SL39

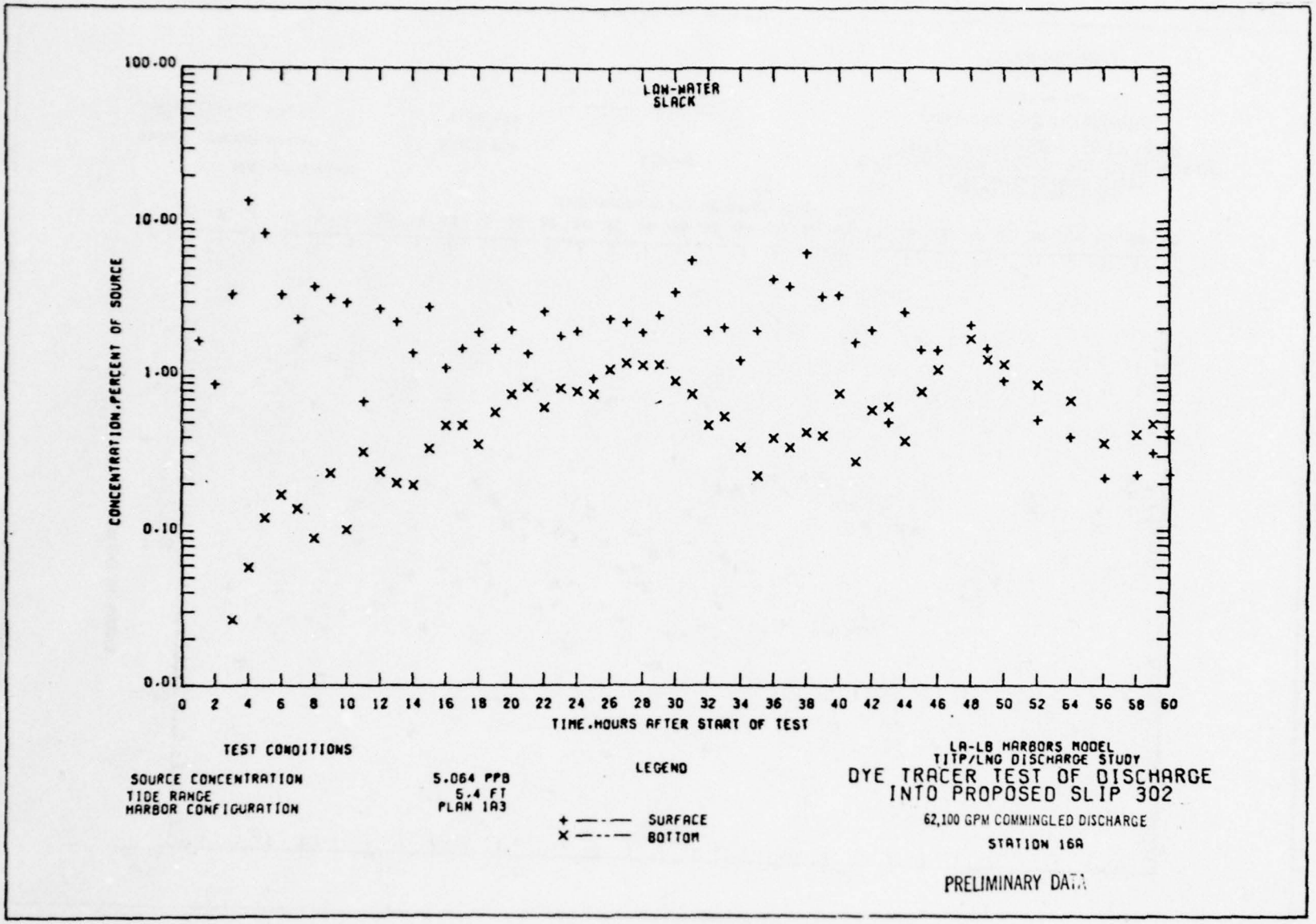
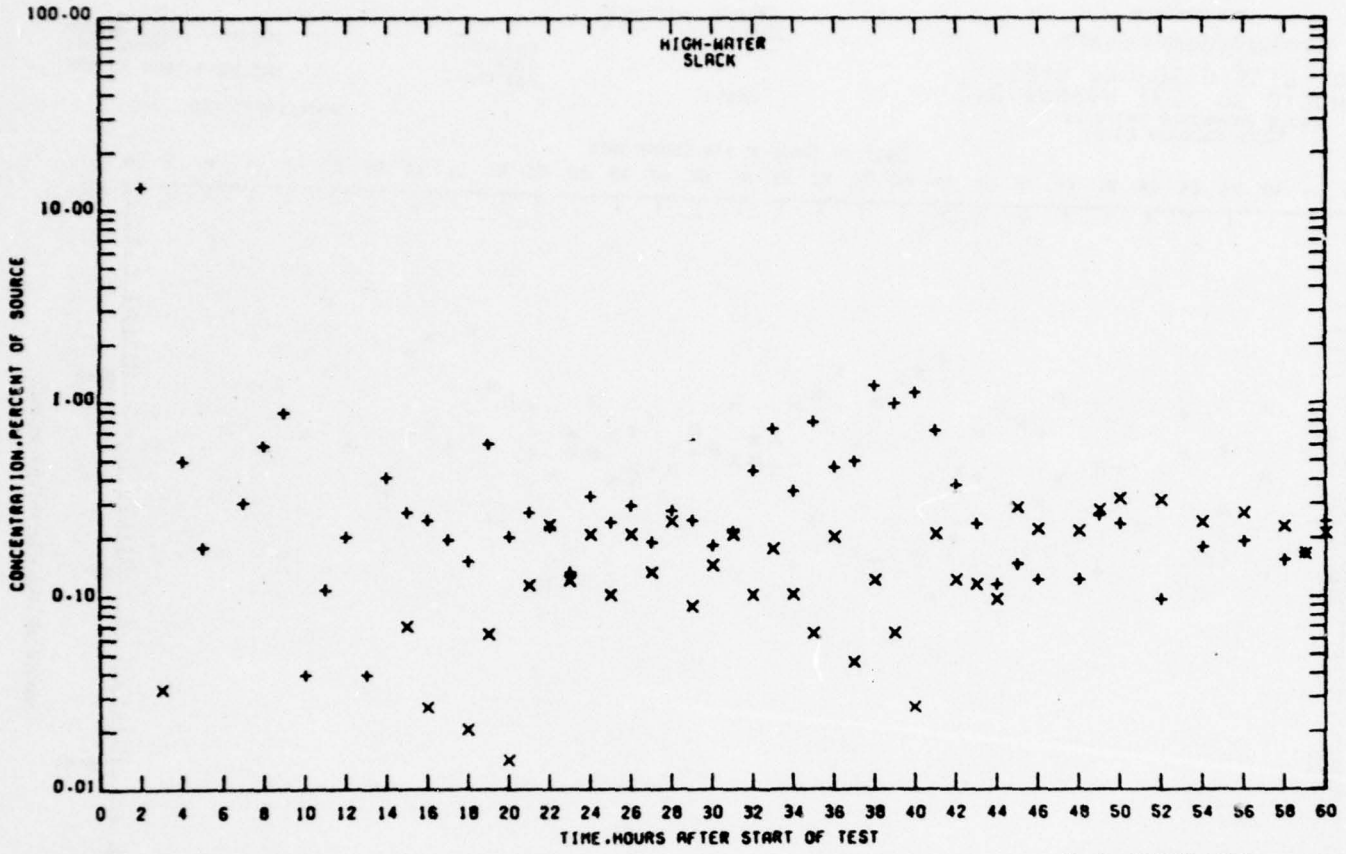

LOW-WATER SLACK
100.00
10.00
1.00
0.10
0.01
CONCENTRATION, PERCENT OF SOURCE
0 2 4 6 8 10 12 14 16 18 20 22 24 26 28 30 32 34 36 38 40 42 44 46 48 50 52 54 56 58 60
TIME, HOURS AFTER START OF TEST
TEST CONDITIONS
SOURCE CONCENTRATION 5.064 PPB
TIDE RANGE 5.4 FT
HARBOR CONFIGURATION PLAN 1A3
LEGEND
SURFACE
BOTTOM
LA-LB HARBORS MODEL
TITP/LNG DISCHARGE STUDY
DYE TRACER TEST OF DISCHARGE
INTO PROPOSED SLIP 302
62,100 GPM COMMINGLED DISCHARGE
STATION 16A
PRELIMINARY DATA

PLATE SL40



TEST CONDITIONS

SOURCE CONCENTRATION	5.064 PPB
TIDE RANGE	5.4 FT
HARBOR CONFIGURATION	PLAN 1A3

LEGEND

+ —·— SURFACE

× —··— BOTTOM

LA-LB HARBORS MODEL
TITP/LNG DISCHARGE STUDY

DYE TRACER TEST OF DISCHARGE INTO PROPOSED SLIP 302

62,100 GPM COMMINGLED DISCHARGE

STATION 168

PRELIMINARY DATA

PLATE SL-11

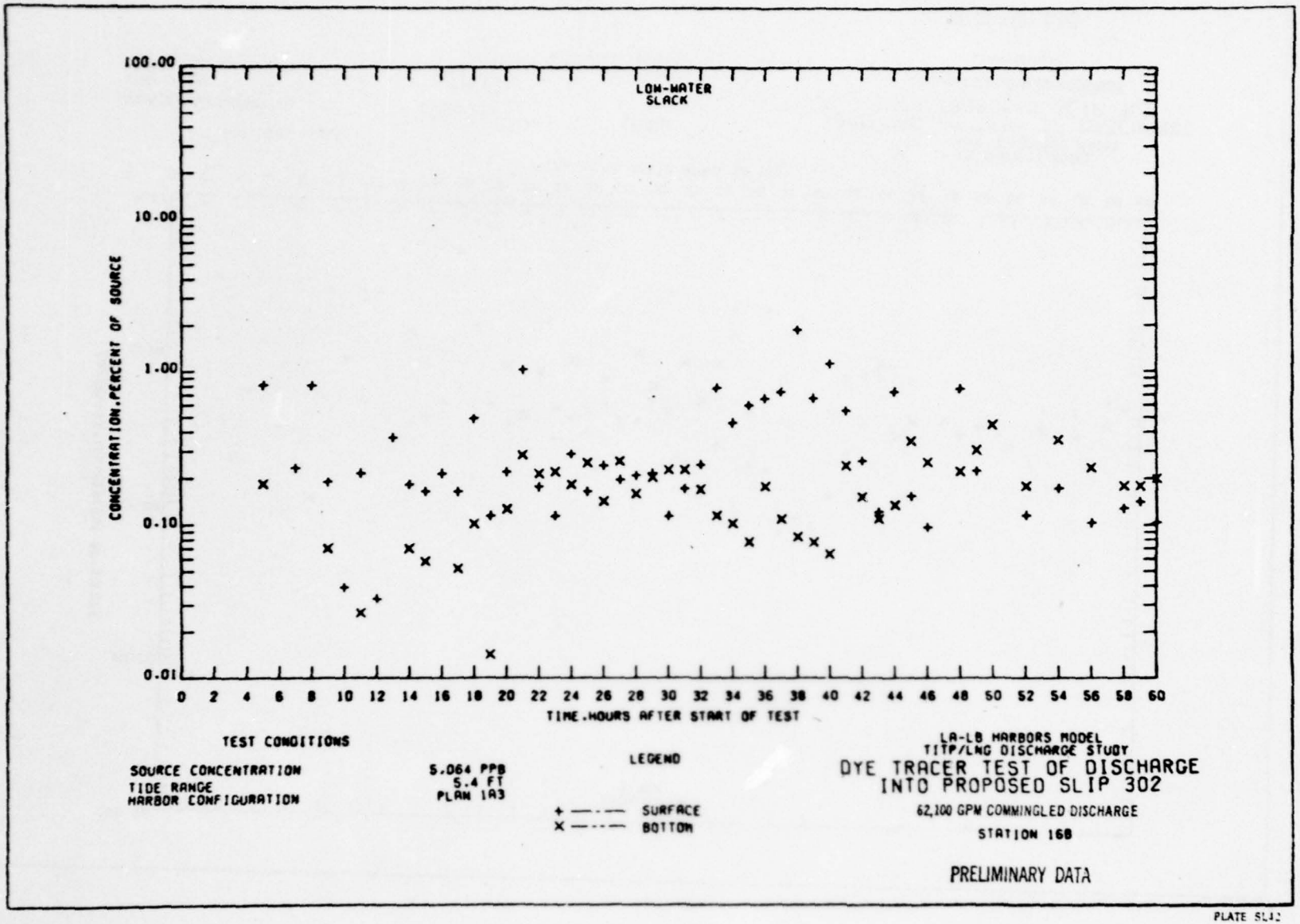
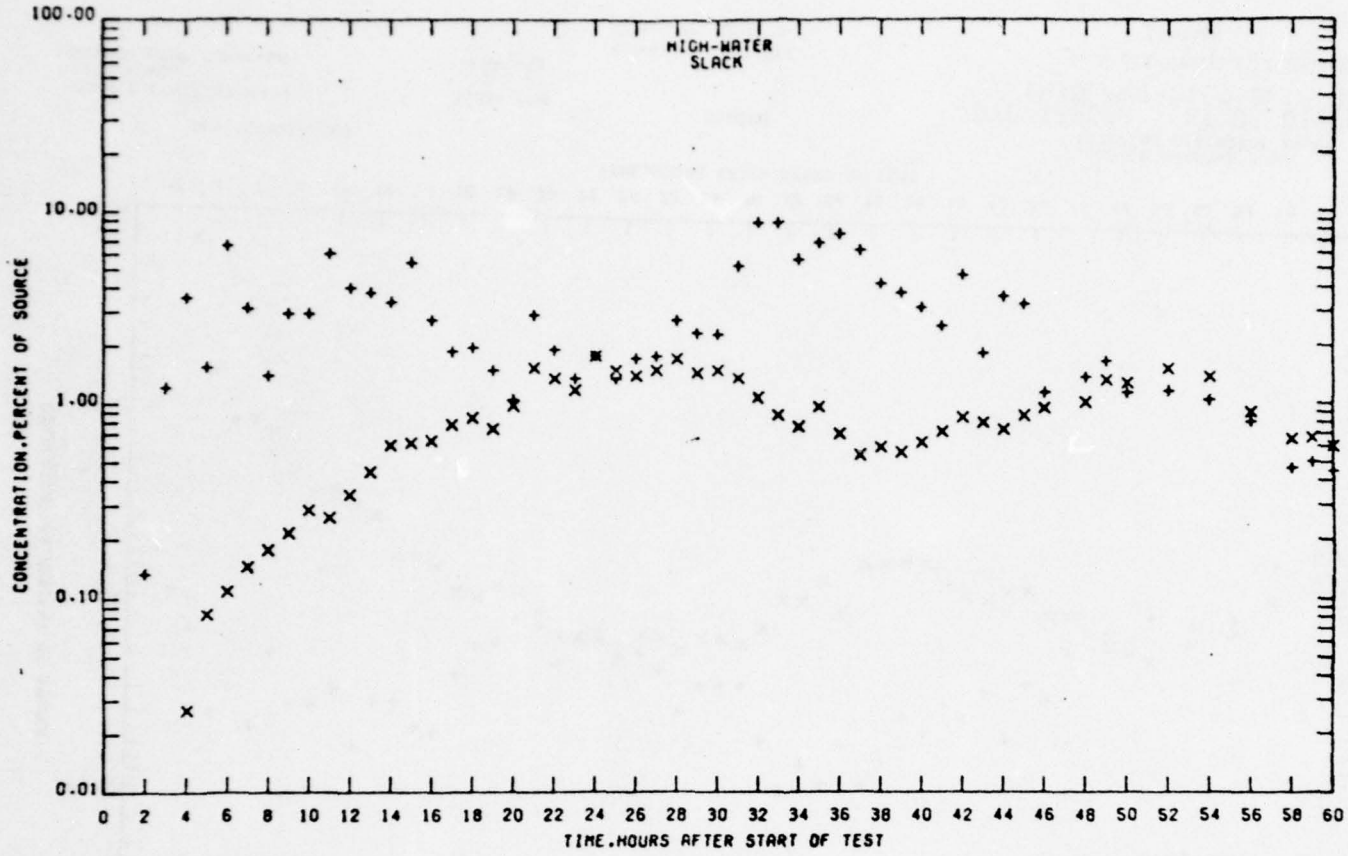

LOW-WATER
SLACK
100.00
10.00
1.00
0.10
0.01
CONCENTRATION, PERCENT OF SOURCE
0 2 4 6 8 10 12 14 16 18 20 22 24 26 28 30 32 34 36 38 40 42 44 46 48 50 52 54 56 58 60
TIME, HOURS AFTER START OF TEST
TEST CONDITIONS
SOURCE CONCENTRATION
TIDE RANGE
HARBOR CONFIGURATION
5.064 PPB
5.4 FT
PLAN 1A3
LEGEND
+ —·— SURFACE
× —·— BOTTOM
LA-LB HARBORS MODEL
TITP/LNG DISCHARGE STUDY
DYE TRACER TEST OF DISCHARGE
INTO PROPOSED SLIP 302
62,100 GPM COMMINGLED DISCHARGE
STATION 168
PRELIMINARY DATA

PLATE SL12



TEST CONDITIONS

SOURCE CONCENTRATION	5.064 PPB
TIDE RANGE	5.4 FT
HARBOR CONFIGURATION	PLAN 1A3

LEGEND

+ —·— SURFACE
× —·— BOTTOM

LA-LB HARBORS MODEL
TITP/LNG DISCHARGE STUDY

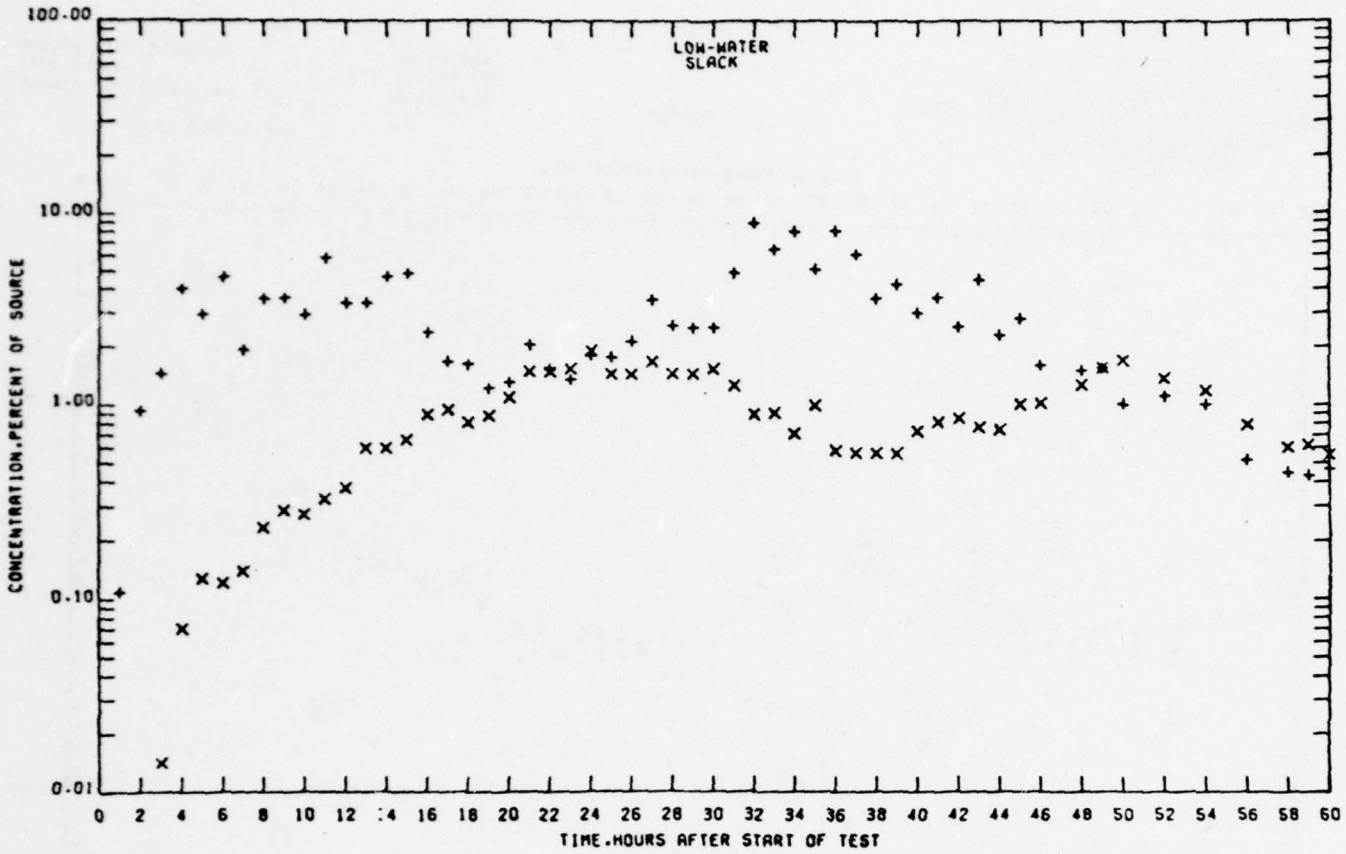
DYE TRACER TEST OF DISCHARGE INTO PROPOSED SLIP 302

62,100 GPM COMMINGLED DISCHARGE

STATION 17

PRELIMINARY DATA

PLATE SL43



TEST CONDITIONS

SOURCE CONCENTRATION	5,064 PPB
TIDE RANGE	5.4 FT
HARBOR CONFIGURATION	PLAN 1A3

LEGEND

+ —·— SURFACE

× —··— BOTTOM

LA-LB HARBORS MODEL
TITP/LNG DISCHARGE STUDY

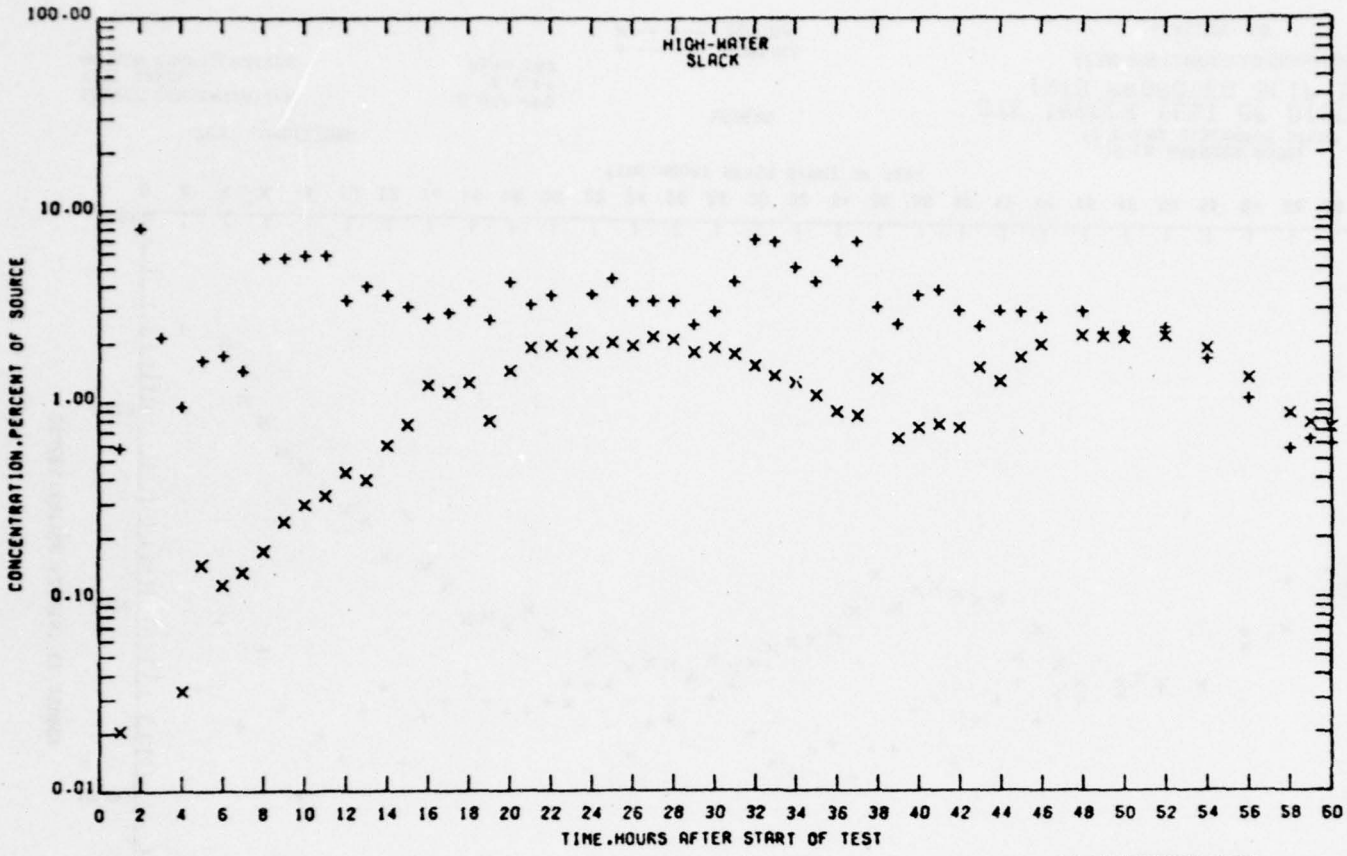
DYE TRACER TEST OF DISCHARGE INTO PROPOSED SLIP 302

62,100 GPM COMMINGLED DISCHARGE

STATION 17

PRELIMINARY DATA

PLATE SL44



TEST CONDITIONS

SOURCE CONCENTRATION	5.084 PPB
TIDE RANGE	5.4 FT
HARBOR CONFIGURATION	PLAN 1A3

LEGEND

+ —·— SURFACE
× —··— BOTTOM

LA-LB HARBORS MODEL
TITP/LNG DISCHARGE STUDY

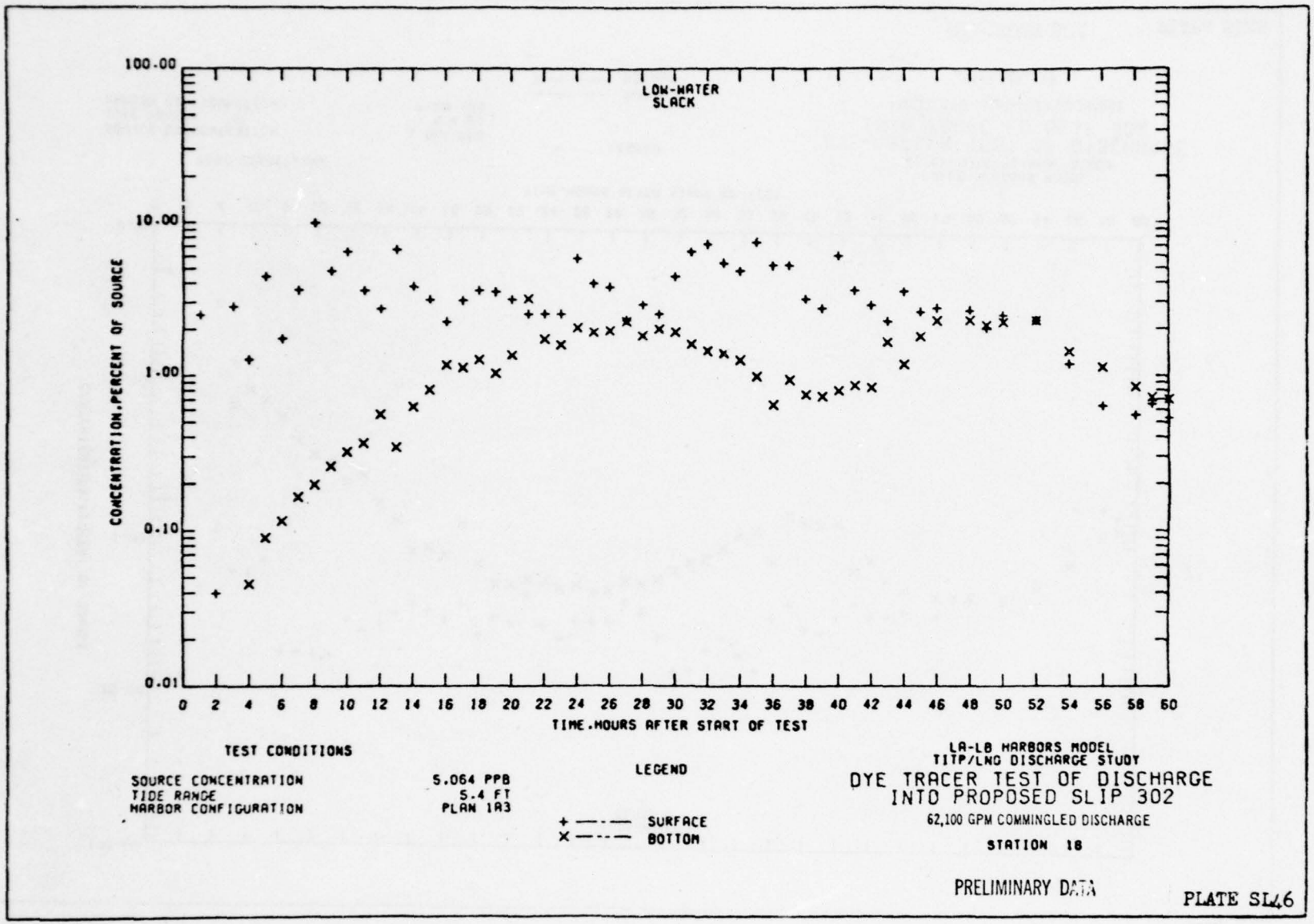
DYE TRACER TEST OF DISCHARGE INTO PROPOSED SLIP 302

62,100 GPM COMMINGLED DISCHARGE

STATION 18

PRELIMINARY DATA

PLATE SL45


100.00
10.00
1.00
0.10
0.01
LOW-WATER SLACK
CONCENTRATION, PERCENT OF SOURCE
0 2 4 6 8 10 12 14 16 18 20 22 24 26 28 30 32 34 36 38 40 42 44 46 48 50 52 54 56 58 60
TIME, HOURS AFTER START OF TEST
TEST CONDITIONS
SOURCE CONCENTRATION 5.064 PPB
TIDE RANGE 5.4 FT
HARBOR CONFIGURATION PLAN 1A3
LEGEND
+ —·— SURFACE
× — - — BOTTOM
LA-LB HARBORS MODEL
TITP/LNG DISCHARGE STUDY
DYE TRACER TEST OF DISCHARGE INTO PROPOSED SLIP 302
62,100 GPM COMMINGLED DISCHARGE
STATION 18
PRELIMINARY DATA
PLATE SL46

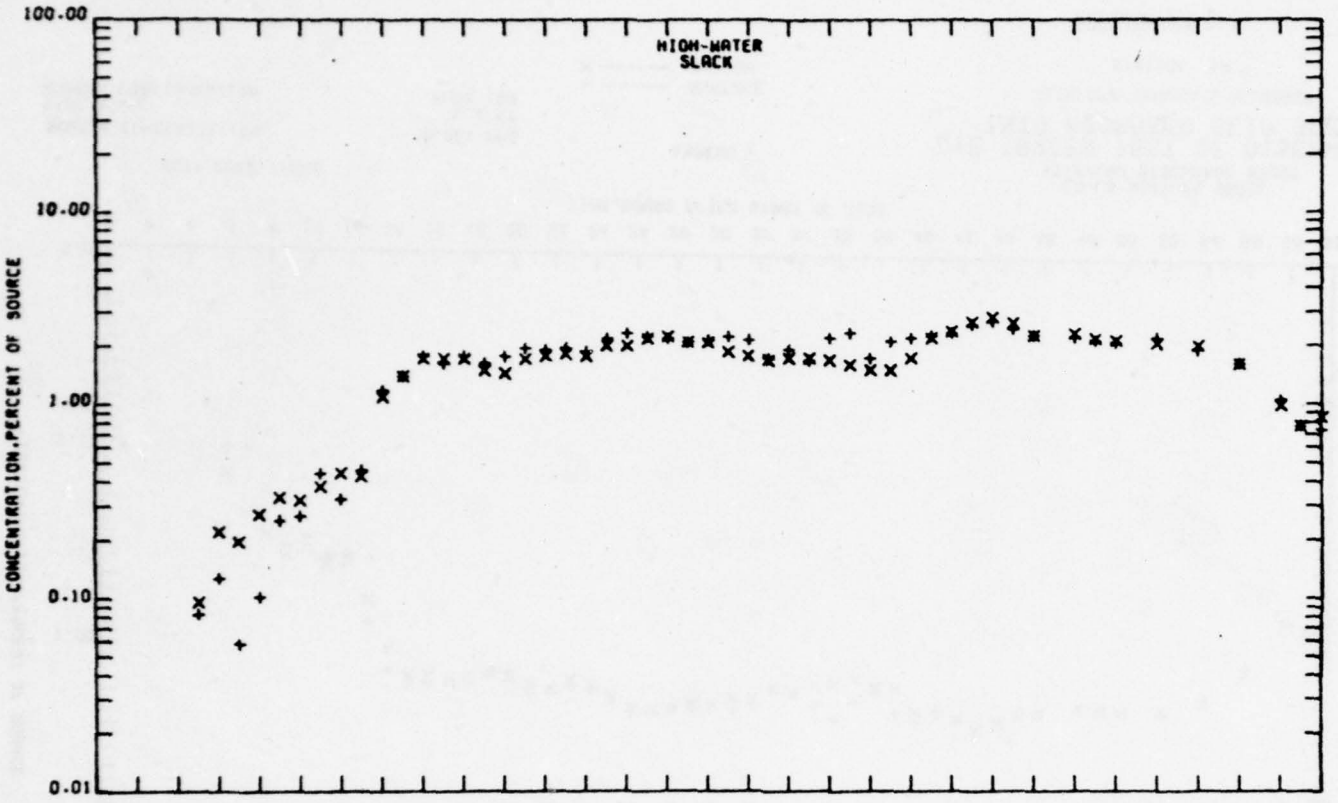

HIGH-WATER SLACK
100.00
10.00
1.00
0.10
0.01
CONCENTRATION, PERCENT OF SOURCE
0 2 4 6 8 10 12 14 16 18 20 22 24 26 28 30 32 34 36 38 40 42 44 46 48 50 52 54 56 58 60
TIME, HOURS AFTER START OF TEST
TEST CONDITIONS
SOURCE CONCENTRATION 5.064 PPB
TIDE RANGE 5.4 FT
HARBOR CONFIGURATION PLAN 1A3
LEGEND
+ —·— SURFACE
× —··— BOTTOM
LA-LB HARBORS MODEL
TITP/LNG DISCHARGE STUDY
DYE TRACER TEST OF DISCHARGE
INTO PROPOSED SLIP 302
62,100 GPM COMMINGLED DISCHARGE
STATION 19
PRELIMINARY DATA

PLATE SL1

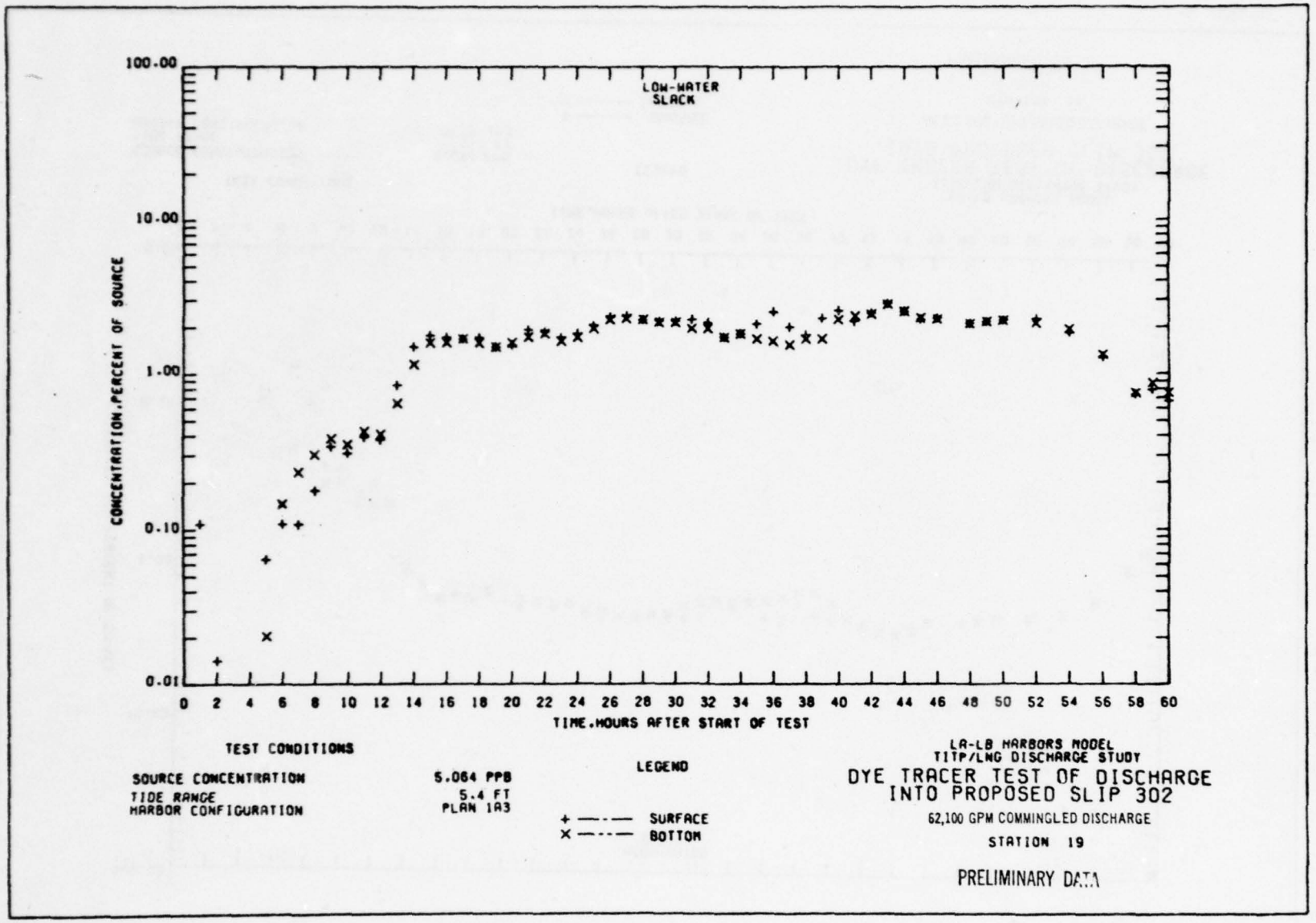
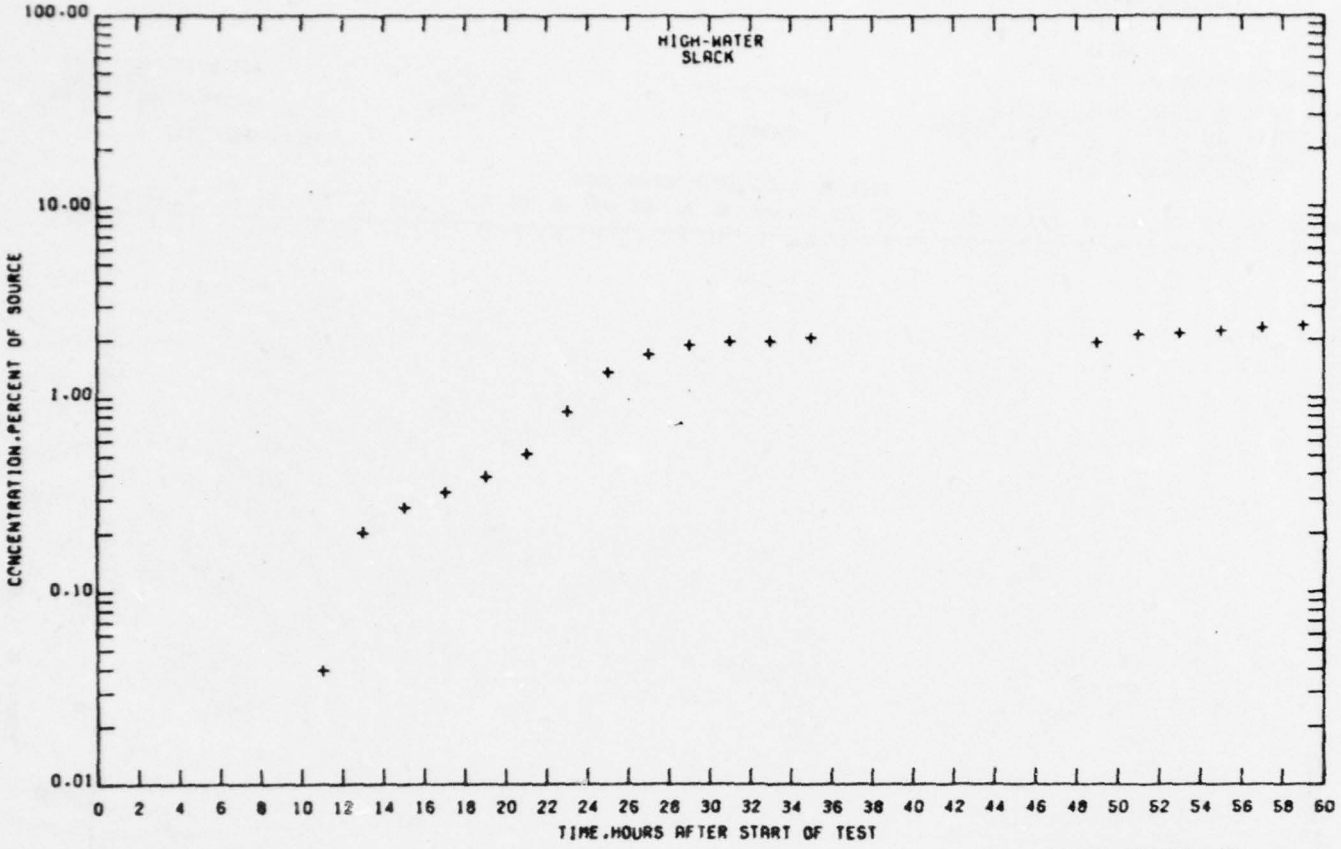

LOW-WATER
SLACK
100.00
10.00
1.00
0.10
0.01
CONCENTRATION, PERCENT OF SOURCE
0 2 4 6 8 10 12 14 16 18 20 22 24 26 28 30 32 34 36 38 40 42 44 46 48 50 52 54 56 58 60
TIME, HOURS AFTER START OF TEST
TEST CONDITIONS
SOURCE CONCENTRATION 5.064 PPB
TIDE RANGE 5.4 FT
HARBOR CONFIGURATION PLAN 1A3
LEGEND
+ —·— SURFACE
× —··— BOTTOM
LA-LB HARBORS MODEL
TITP/LNG DISCHARGE STUDY
DYE TRACER TEST OF DISCHARGE
INTO PROPOSED SLIP 302
62,100 GPM COMMINGLED DISCHARGE
STATION 19
PRELIMINARY DATA

PLATE SL45



TEST CONDITIONS

SOURCE CONCENTRATION	5.064 PPB
TIDE RANGE	5.4 FT
HARBOR CONFIGURATION	PLAN 1A3

LEGEND

+ —·—·— SURFACE

LA-LB HARBORS MODEL
TITP/LNG DISCHARGE STUDY

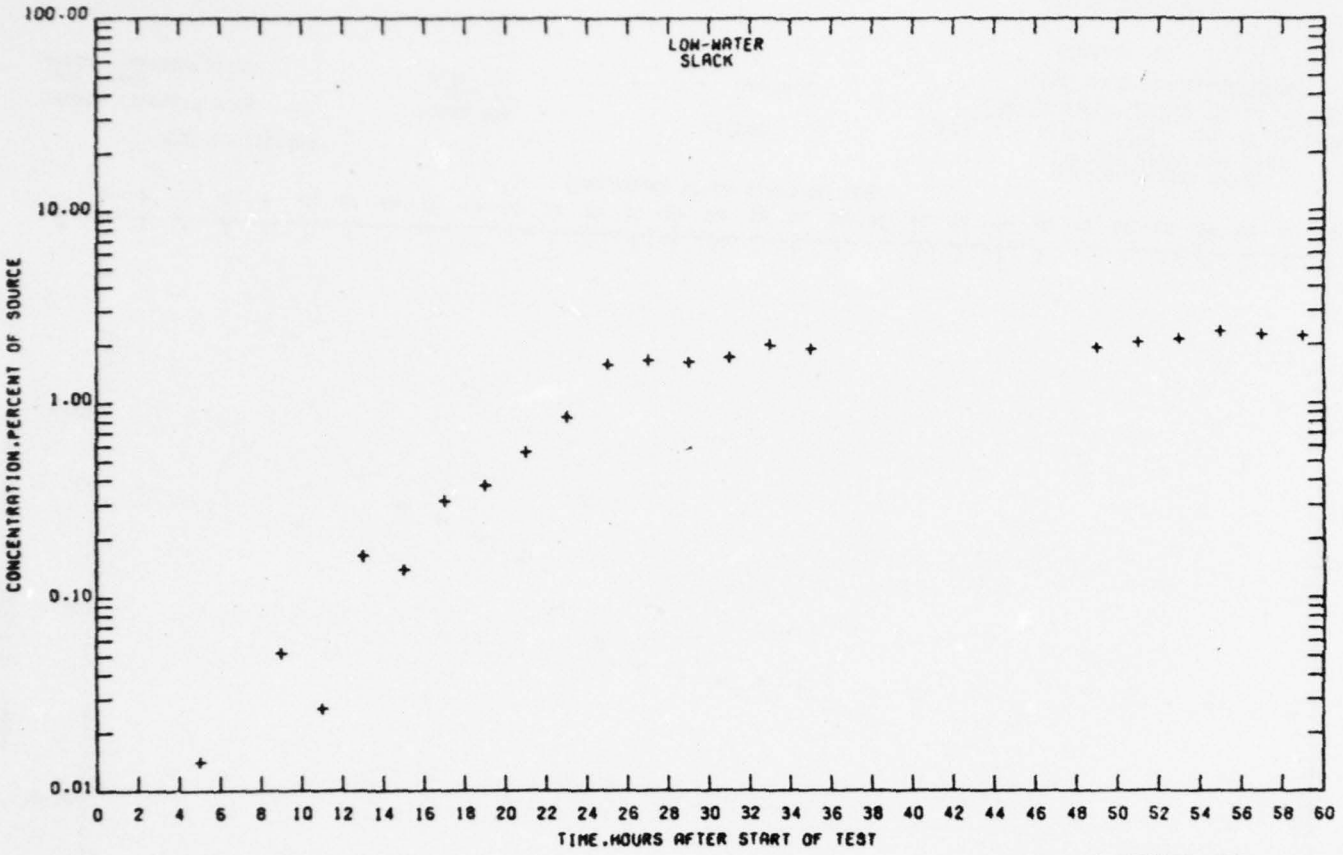
DYE TRACER TEST OF DISCHARGE INTO PROPOSED SLIP 302

62,100 GPM COMMINGLED DISCHARGE

STATION 20

PRELIMINARY DATA

PLATE SL19



TEST CONDITIONS

SOURCE CONCENTRATION	5.064 PPB
TIDE RANGE	5.4 FT
HARBOR CONFIGURATION	PLAN 1A3

LEGEND

+ —·— SURFACE

LA-LB HARBORS MODEL
TITP/LNG DISCHARGE STUDY

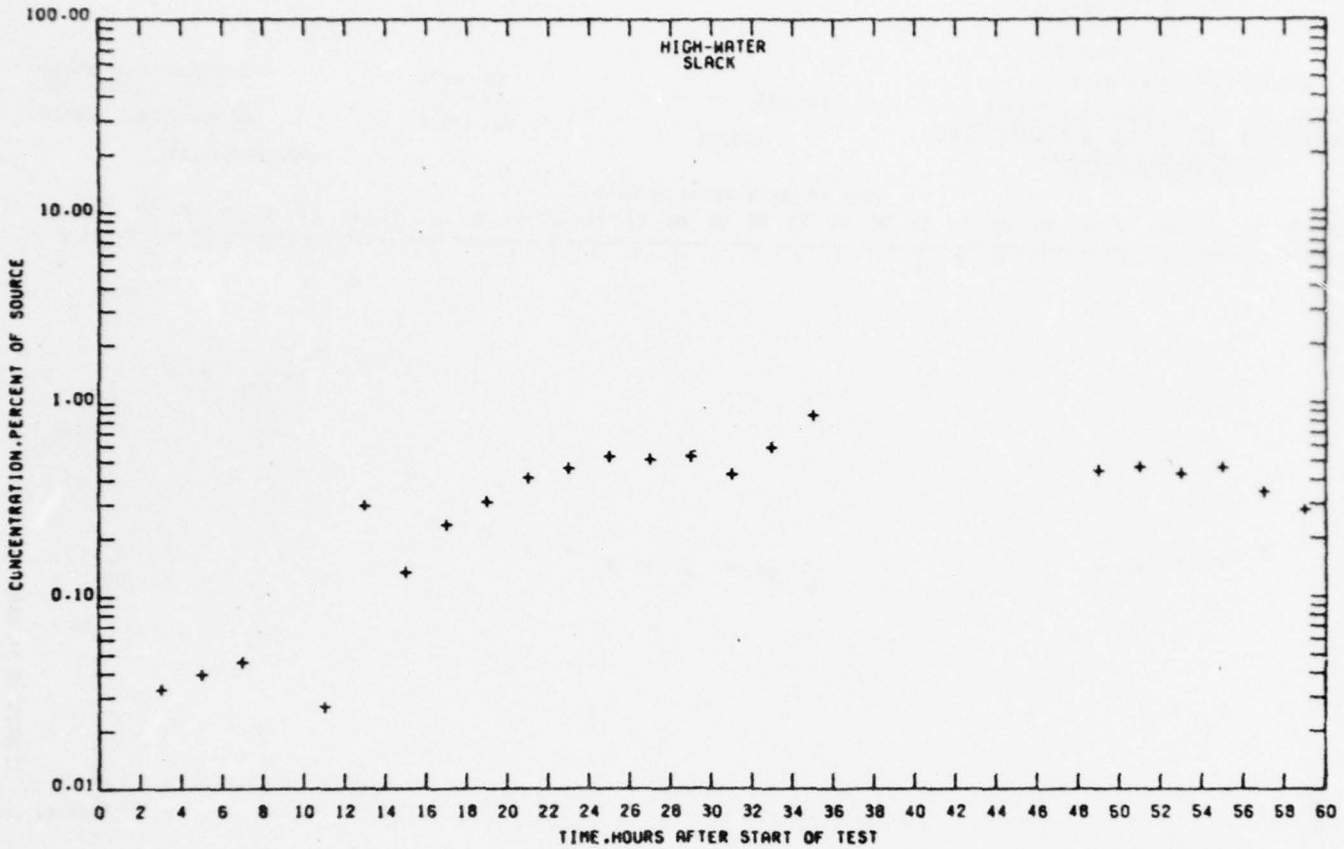
DYE TRACER TEST OF DISCHARGE INTO PROPOSED SLIP 302

62,100 GPM COMMINGLED DISCHARGE

STATION 20

PRELIMINARY DATA

PLATE SL30



TEST CONDITIONS

SOURCE CONCENTRATION	5.064 PPB
TIDE RANGE	5.4 FT
HARBOR CONFIGURATION	PLAN 1A3

LEGEND

+ —·— SURFACE

LA-LB HARBORS MODEL
TITP/LNG DISCHARGE STUDY

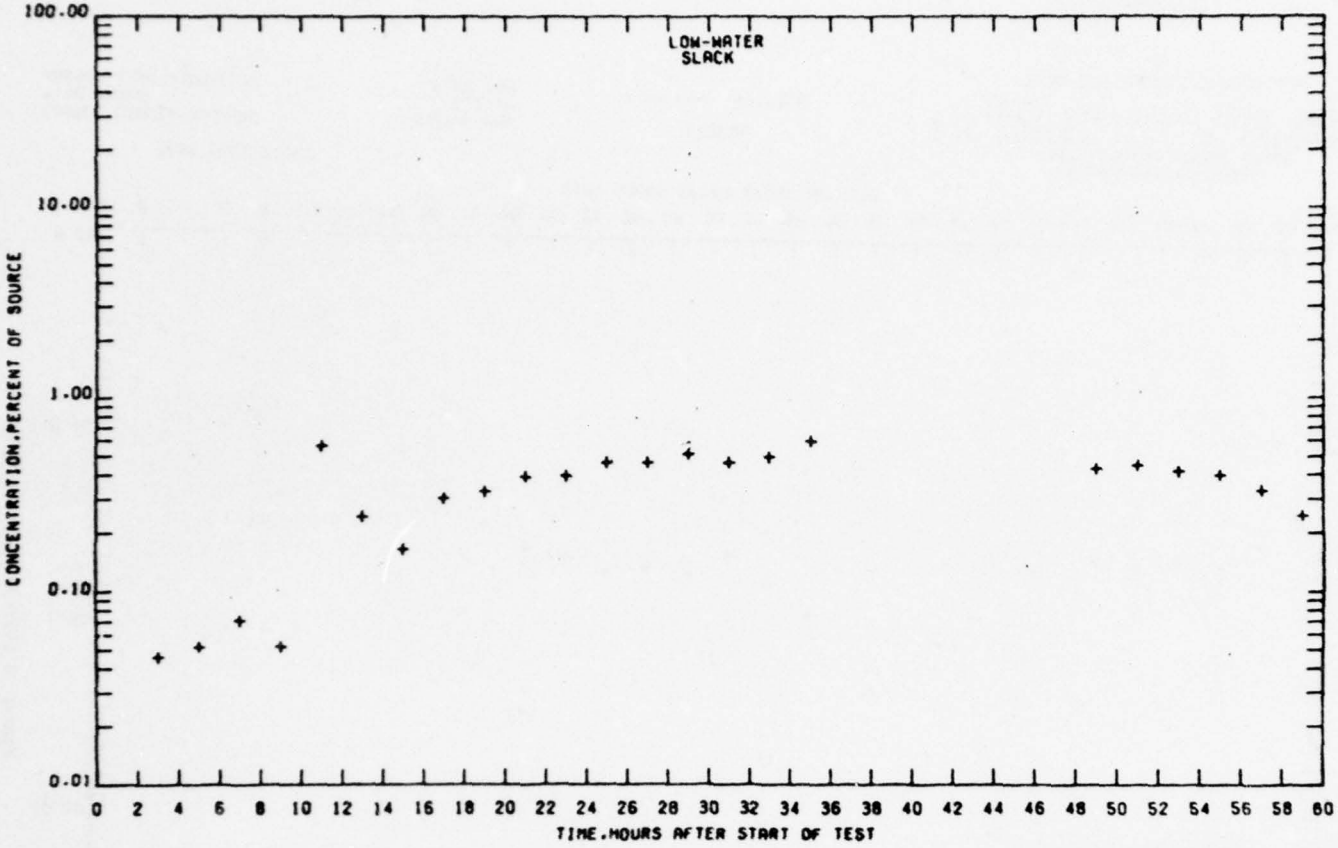
DYE TRACER TEST OF DISCHARGE INTO PROPOSED SLIP 302

62,100 GPM COMMINGLED DISCHARGE

STATION 21

PRELIMINARY DATA

PLATE SL51



TEST CONDITIONS

SOURCE CONCENTRATION	5,064 PPB
TIDE RANGE	5.4 FT
HARBOR CONFIGURATION	PLAN 1A3

LEGEND

+ —·—· SURFACE

LA-LB HARBORS MODEL
TITP/LNG DISCHARGE STUDY

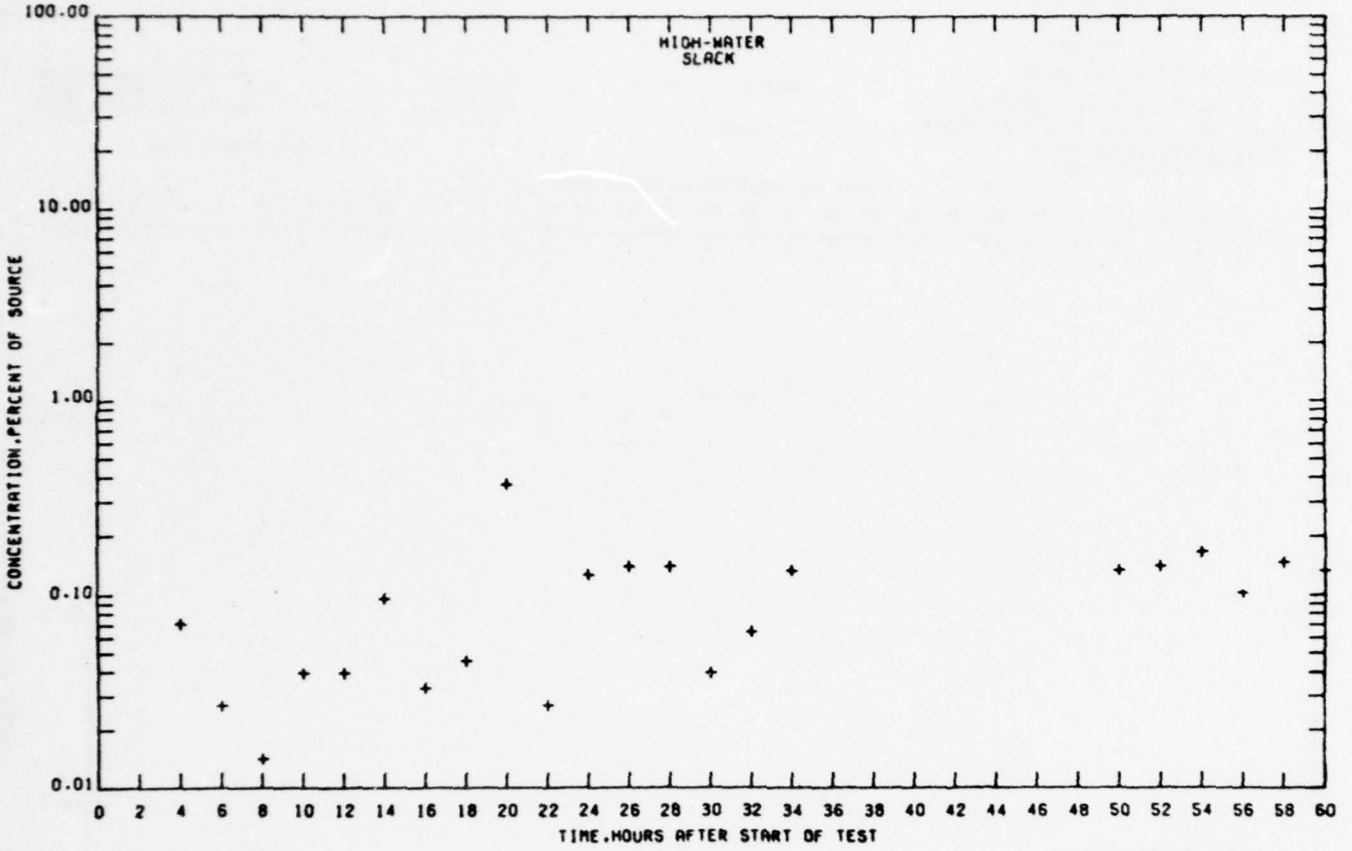
DYE TRACER TEST OF DISCHARGE INTO PROPOSED SLIP 302

62,100 GPM COMMINGLED DISCHARGE

STATION 21

PRELIMINARY DATA

PLATE SL52



TEST CONDITIONS

SOURCE CONCENTRATION	5,064 PPB
TIDE RANGE	5.4 FT
HARBOR CONFIGURATION	PLAN 1A3

LEGEND

+ —·— SURFACE

LA-LB HARBORS MODEL
TITP/LNG DISCHARGE STUDY

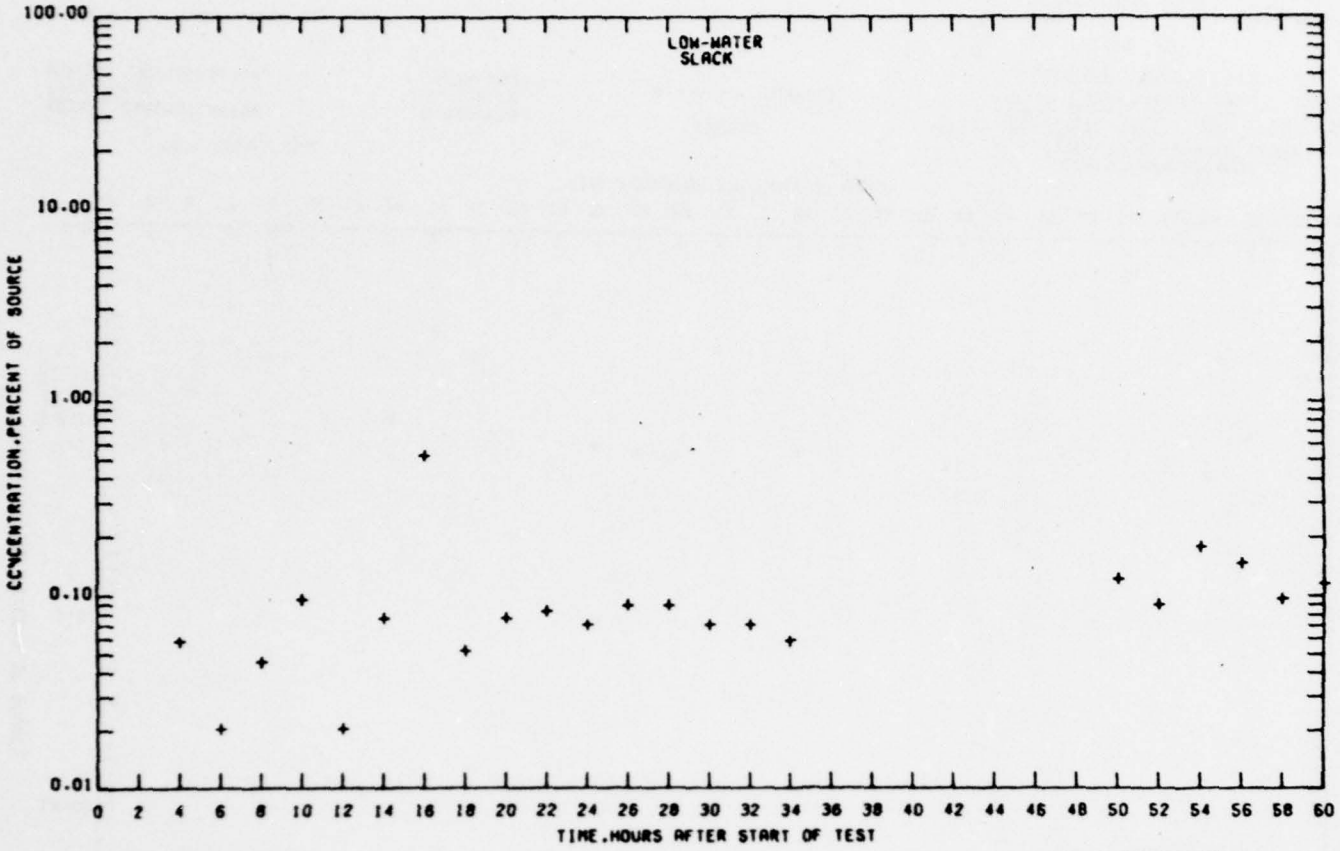
DYE TRACER TEST OF DISCHARGE INTO PROPOSED SLIP 302

62,100 GPM COMMINGLED DISCHARGE

STATION 22

PRELIMINARY DATA

PLATE SL53



TEST CONDITIONS

SOURCE CONCENTRATION 5.064 PPB
TIDE RANGE 5.4 FT
HARBOR CONFIGURATION PLAN 1A3

LEGEND

+ —·— SURFACE

LA-LB HARBORS MODEL
TITP/LNG DISCHARGE STUDY

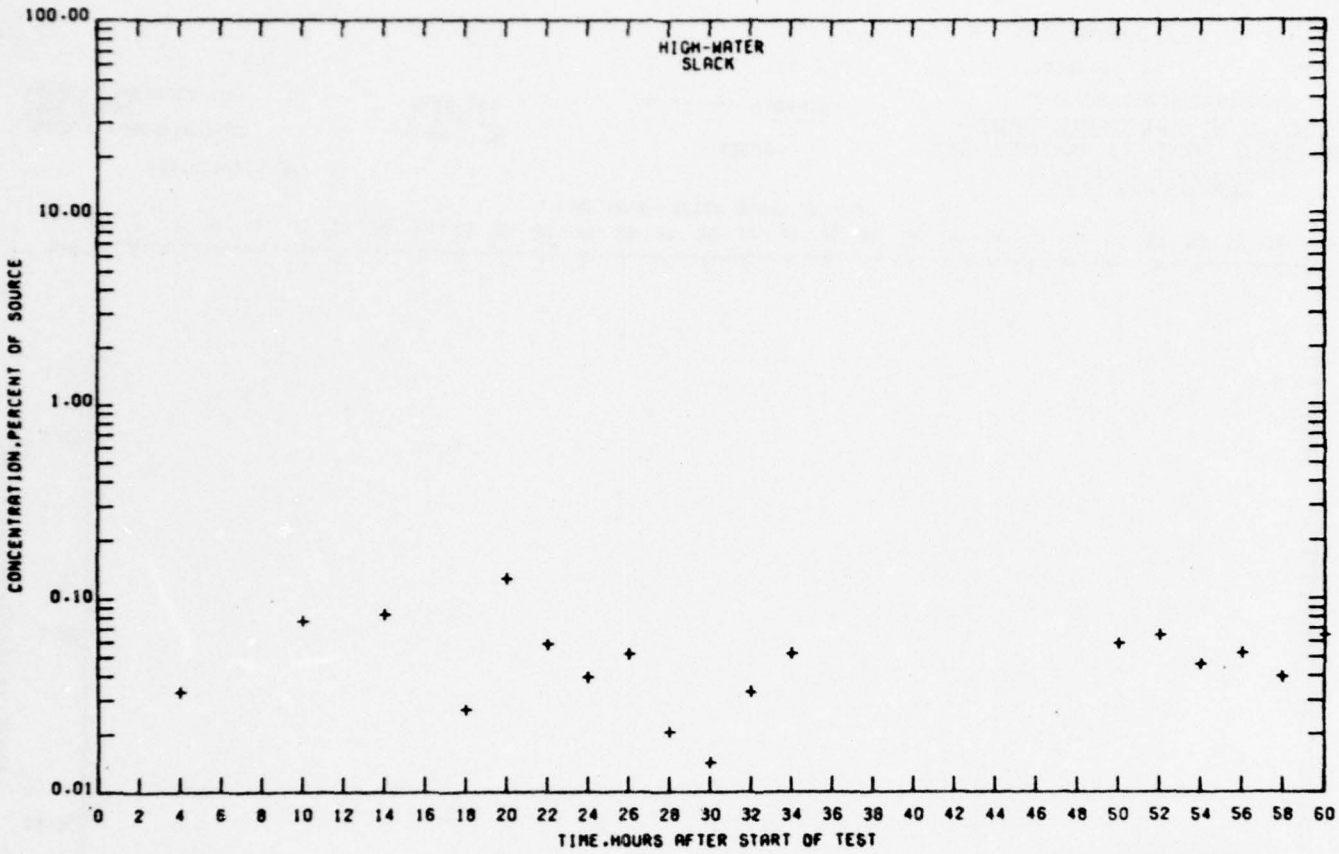
DYE TRACER TEST OF DISCHARGE INTO PROPOSED SLIP 302

62,100 GPM COMMINGLED DISCHARGE

STATION 22

PRELIMINARY DATA

PLATE SL34



TEST CONDITIONS

SOURCE CONCENTRATION	5.064 PPB
TIDE RANGE	5.4 FT
HARBOR CONFIGURATION	PLAN 1A3

LEGEND

+ —·— SURFACE

LA-LB HARBORS MODEL
TITP/LNG DISCHARGE STUDY

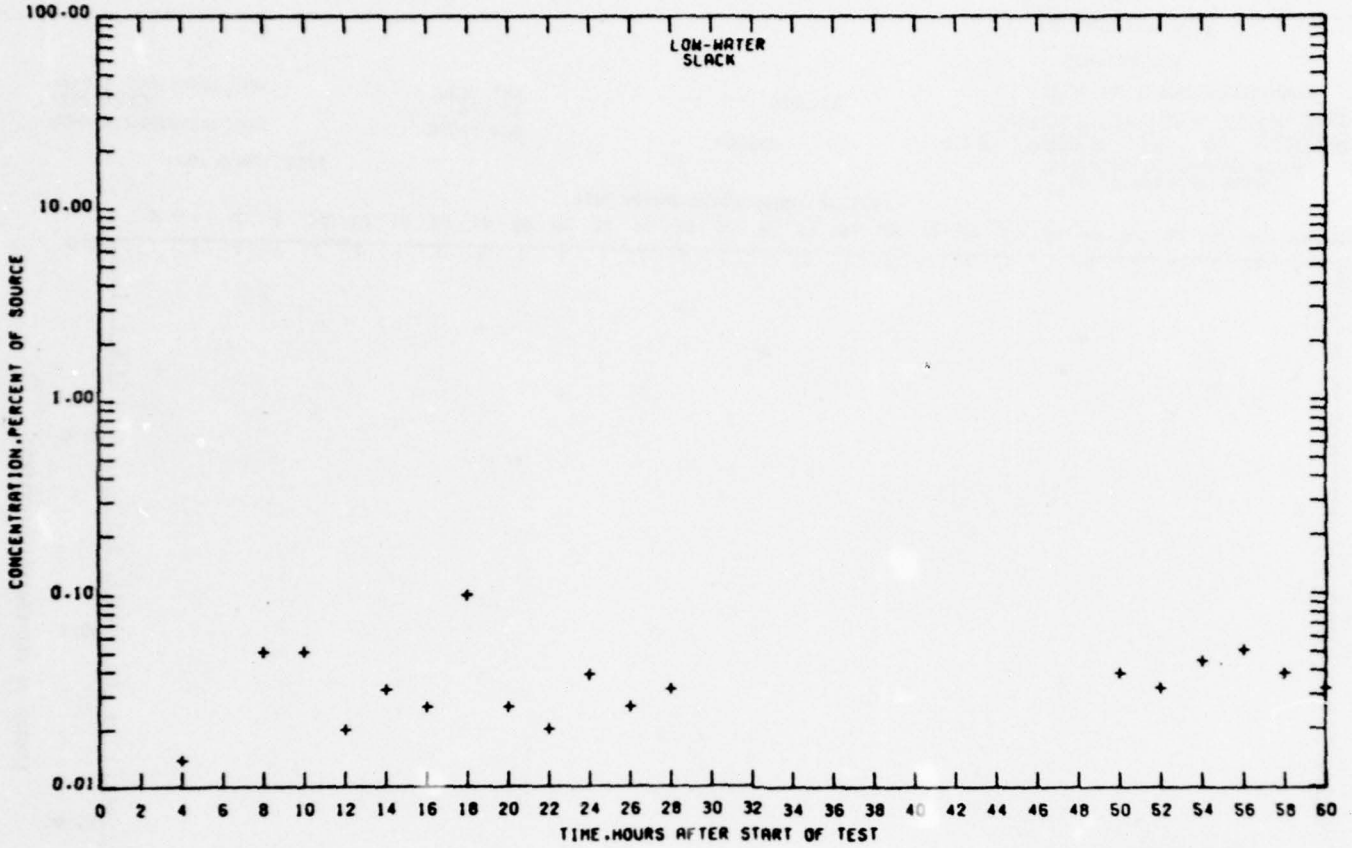
DYE TRACER TEST OF DISCHARGE INTO PROPOSED SLIP 302

62,100 GPM COMMINGLED DISCHARGE

STATION 23

PRELIMINARY DATA

PLATE SL35



TEST CONDITIONS

SOURCE CONCENTRATION 5.084 PPB
TIDE RANGE 5.4 FT
HARBOR CONFIGURATION PLAN 1A3

LEGEND

+ —·— SURFACE

LA-LB HARBORS MODEL
TITP/LNG DISCHARGE STUDY

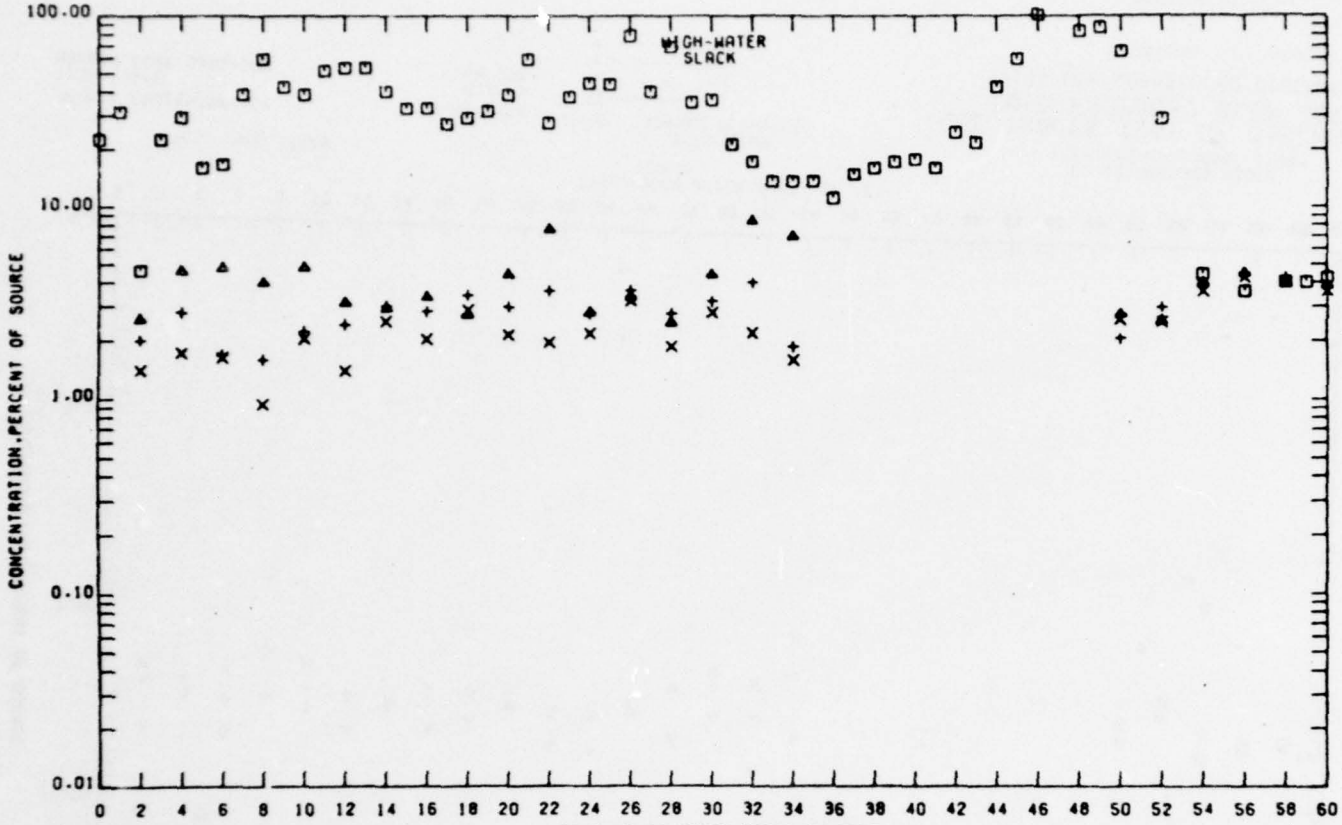
DYE TRACER TEST OF DISCHARGE INTO PROPOSED SLIP 302

62,100 GPM COMMINGLED DISCHARGE

STATION 23

PRELIMINARY DATA

PLATE SL5e



TEST CONDITIONS

SOURCE CONCENTRATION	5.064 PPB
TIDE RANGE	5.4 FT
HARBOR CONFIGURATION	PLAN 1A3

LEGEND

SYMBOL	DEPTH BELOW SURFACE, FT (PROTO)
□	1
▲	11
+	22
×	34

LA-LB HARBORS MODEL
TITP/LNG DISCHARGE STUDY

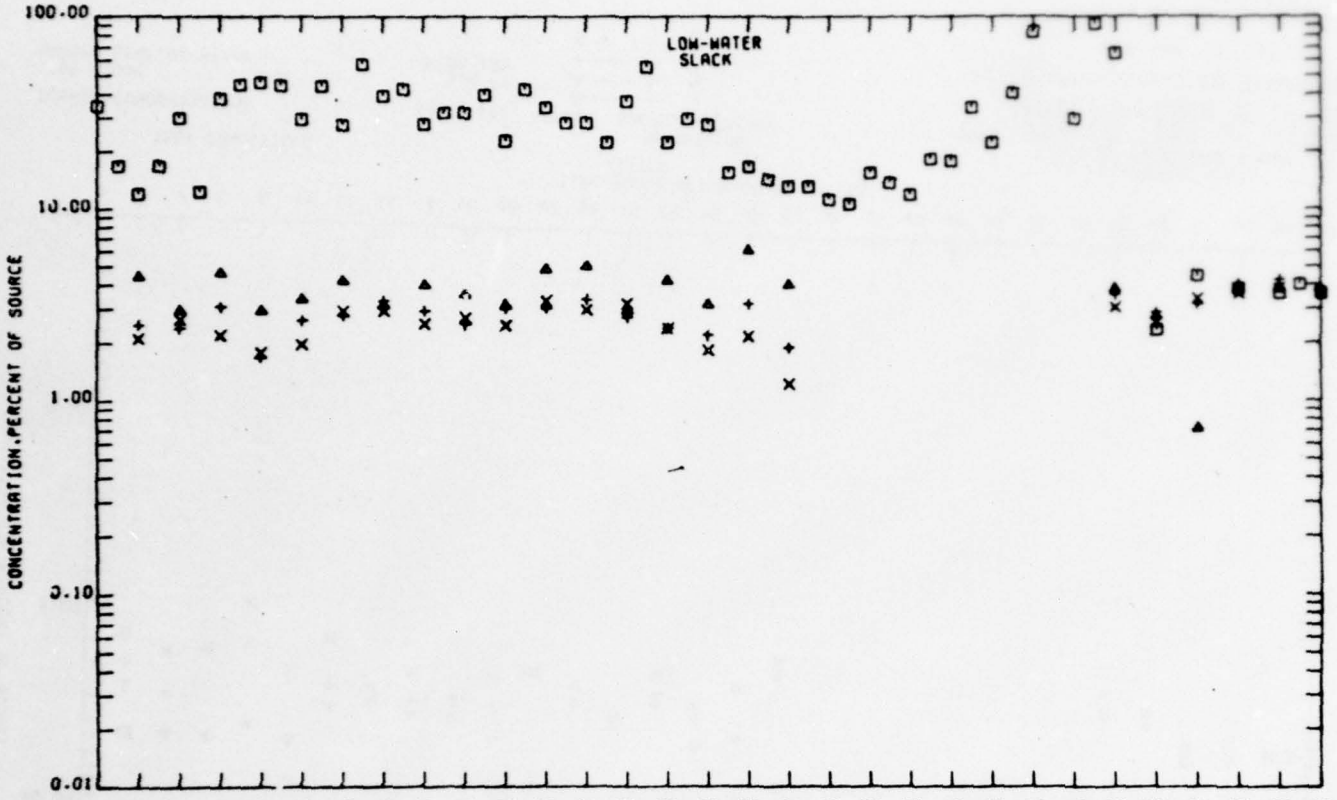
DYE TRACER TEST OF DISCHARGE INTO PROPOSED SLIP 302

62100 GPM COMMINGLED DISCHARGE

STATION 1 PROFILES

PRELIMINARY DATA

PLATE 5.57



TEST CONDITIONS

SOURCE CONCENTRATION	5.064 PPB
TIDE RANGE	5.4 FT
HARBOR CONFIGURATION	PLAN 1A3

LEGEND

SYMBOL	DEPTH BELOW SURFACE, FT (PROTO)
□ ——	1
△ – – –	11
+ —·—·—	22
× —··—	34

LA-LB HARBORS MODEL
TITP/LNG DISCHARGE STUDY

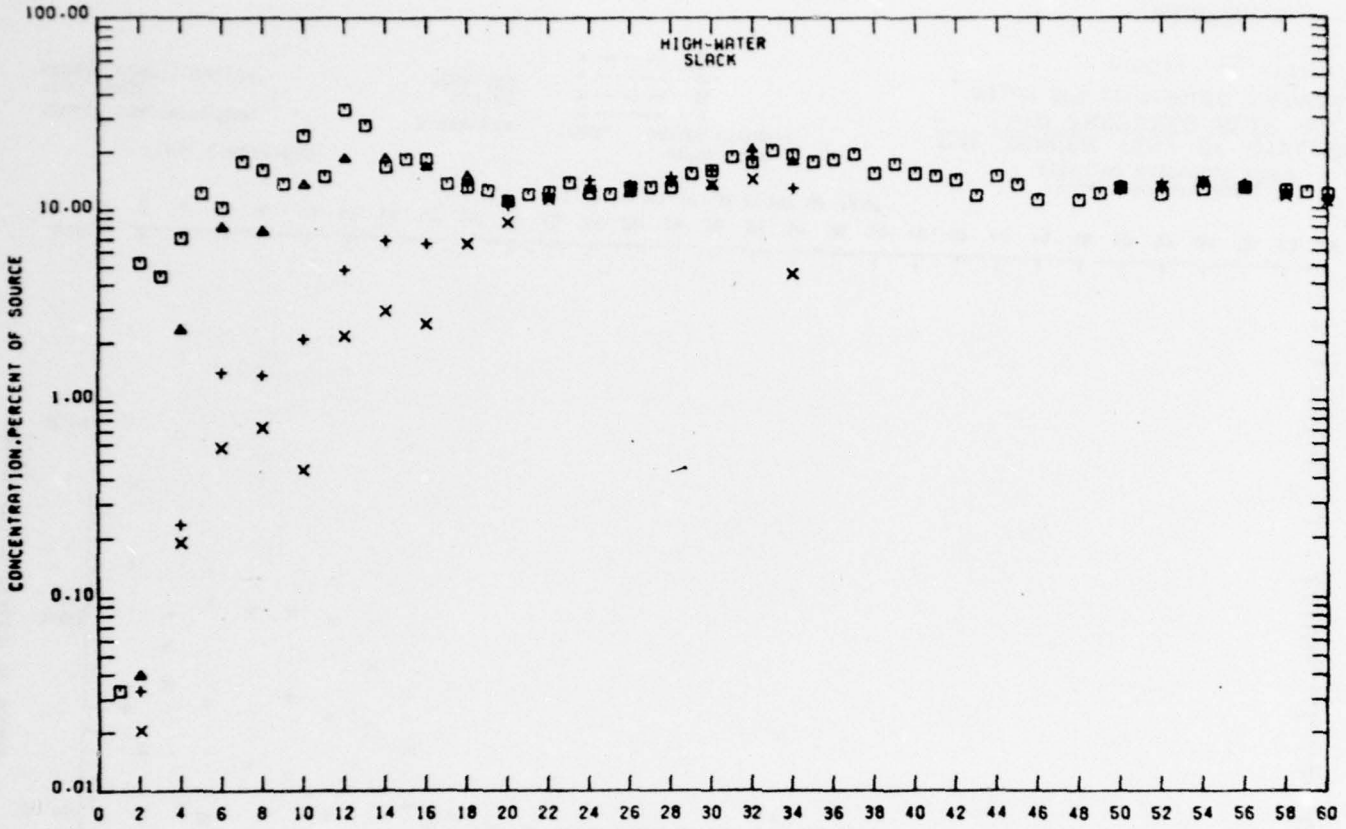
DYE TRACER TEST OF DISCHARGE INTO PROPOSED SLIP 302

62100 GPM COMMINGLED DISCHARGE

STATION 1 PROFILES

PRELIMINARY DATA

PLATE SL3



TEST CONDITIONS

SOURCE CONCENTRATION 5.064 PPB
TIDE RANGE 5.4 FT
HARBOR CONFIGURATION PLAN 1A3

LEGEND

SYMBOL	DEPTH BELOW SURFACE, FT (PROTO)
□ ———	1
▲ — — —	11
+ —·—	22
× ----—	34

LA-LB HARBORS MODEL
TITP/LNG DISCHARGE STUDY

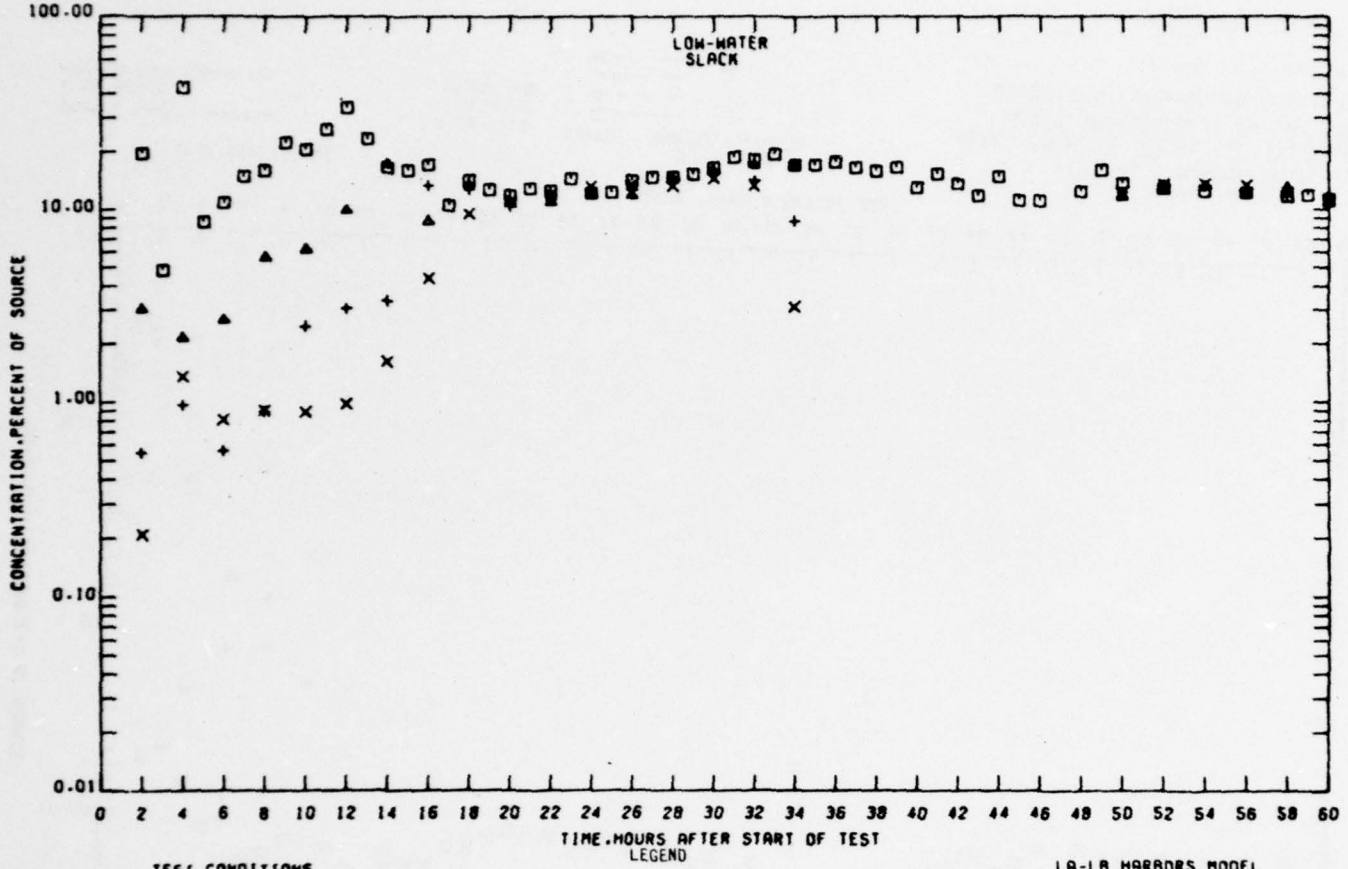
DYE TRACER TEST OF DISCHARGE INTO PROPOSED SLIP 302

62100 GPM COMMINGLED DISCHARGE

STATION 2 PROFILES

PRELIMINARY DATA

PLATE SL54



TEST CONDITIONS

SOURCE CONCENTRATION	5.064 PPB
TIDE RANGE	5.4 FT
HARBOR CONFIGURATION	PLAN 1A3

LEGEND

SYMBOL	DEPTH BELOW SURFACE, FT (PROTO)
□	1
△	11
+	22
×	34

LA-LB HARBORS MODEL
TITP/LNG DISCHARGE STUDY

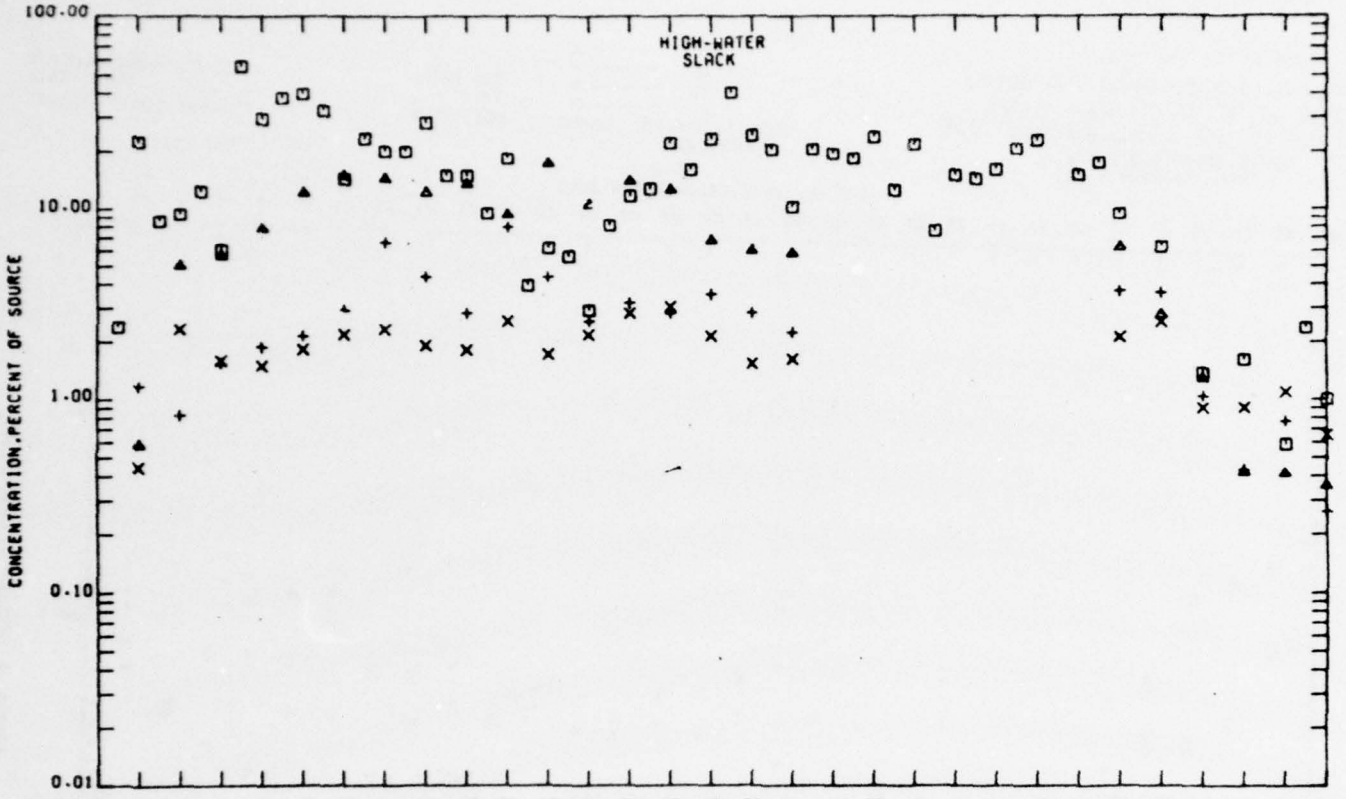
DYE TRACER TEST OF DISCHARGE INTO PROPOSED SLIP 302

62100 GPM COMMINGLED DISCHARGE

STATION 2 PROFILES

PRELIMINARY DATA

PLATE SL5C



TEST CONDITIONS

SOURCE CONCENTRATION	5.064 PPB
TIDE RANGE	5.4 FT
HARBOR CONFIGURATION	PLAN 1A3

LEGEND

SYMBOL	DEPTH BELOW SURFACE, FT (PROTO)
□	1
△	11
+	22
×	34

LA-LB HARBORS MODEL
TITP/LNG DISCHARGE STUDY

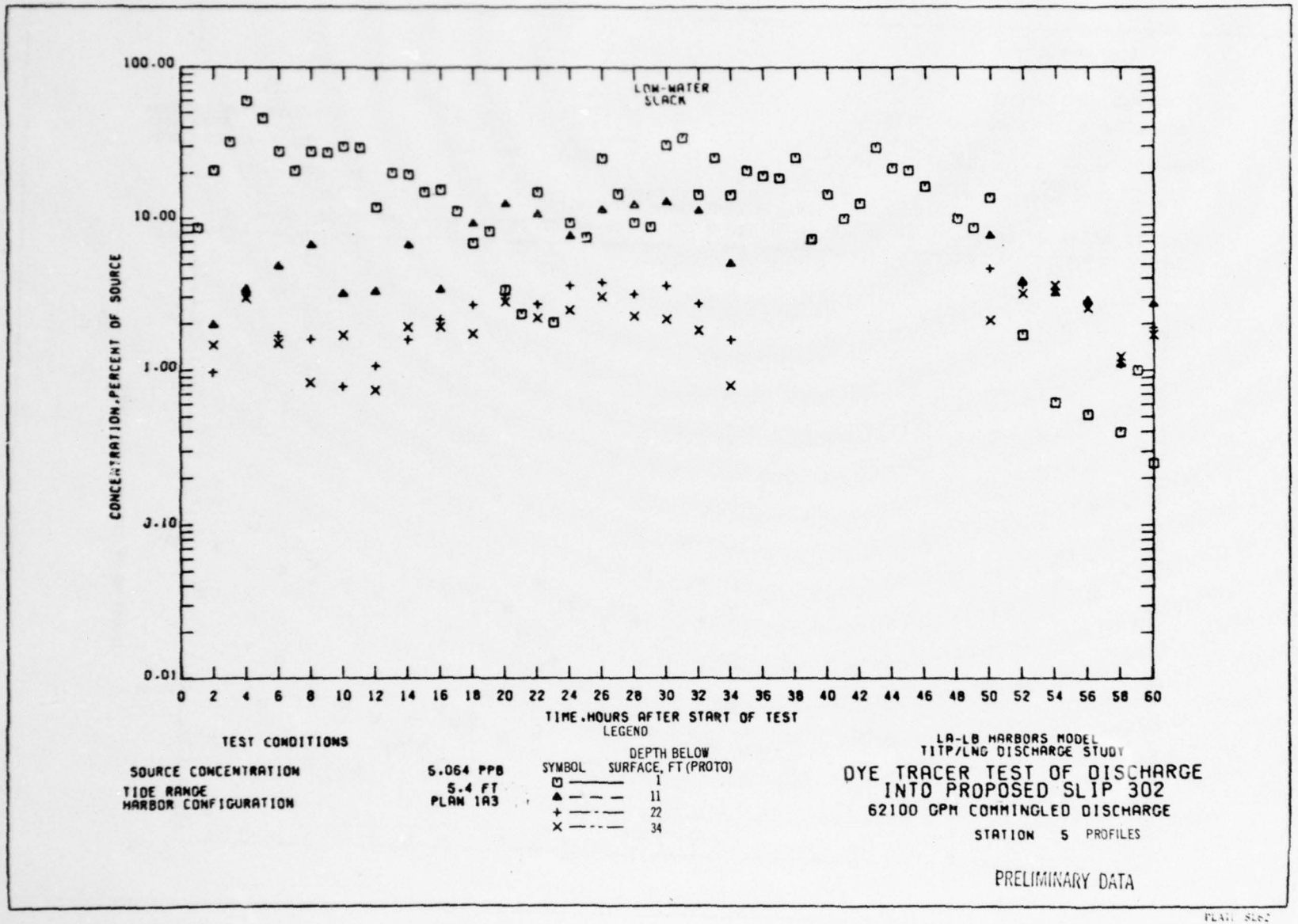
DYE TRACER TEST OF DISCHARGE INTO PROPOSED SLIP 302

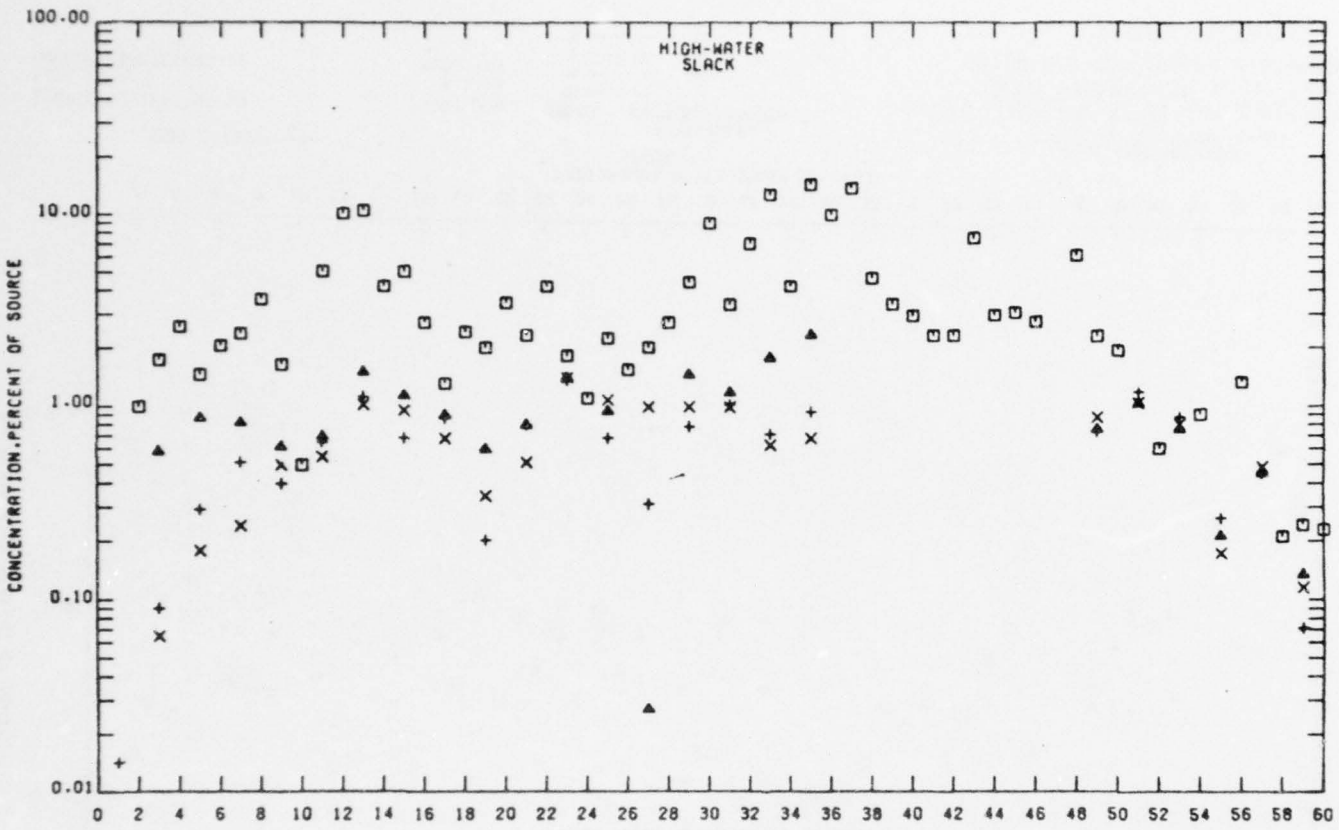
62100 GPM COMMINGLED DISCHARGE

STATION 5 PROFILES

PRELIMINARY DATA

PLATE 5[illegible]


100.00
10.00
1.00
0.10
0.01
CONCENTRATION, PERCENT OF SOURCE
LOW-WATER SLACK
0 2 4 6 8 10 12 14 16 18 20 22 24 26 28 30 32 34 36 38 40 42 44 46 48 50 52 54 56 58 60
TIME, HOURS AFTER START OF TEST
TEST CONDITIONS
SOURCE CONCENTRATION 5.064 PPB
TIDE RANGE 5.4 FT
HARBOR CONFIGURATION PLAN 1A3
LEGEND
SYMBOL DEPTH BELOW SURFACE, FT (PROTO)
1
11
22
34
LA-LB HARBORS MODEL
TITP/LNG DISCHARGE STUDY
DYE TRACER TEST OF DISCHARGE INTO PROPOSED SLIP 302
62100 GPM COMMINGLED DISCHARGE
STATION 5 PROFILES
PRELIMINARY DATA



TEST CONDITIONS

SOURCE CONCENTRATION	5.064 PPB
TIDE RANGE	5.4 FT
HARBOR CONFIGURATION	PLAN 1A3

LEGEND

SYMBOL	DEPTH BELOW SURFACE, FT (PROTO)
□ ———	1
△ — — —	11
+ —·—	22
× —··—	34

LA-LB HARBORS MODEL
TITP/LNG DISCHARGE STUDY

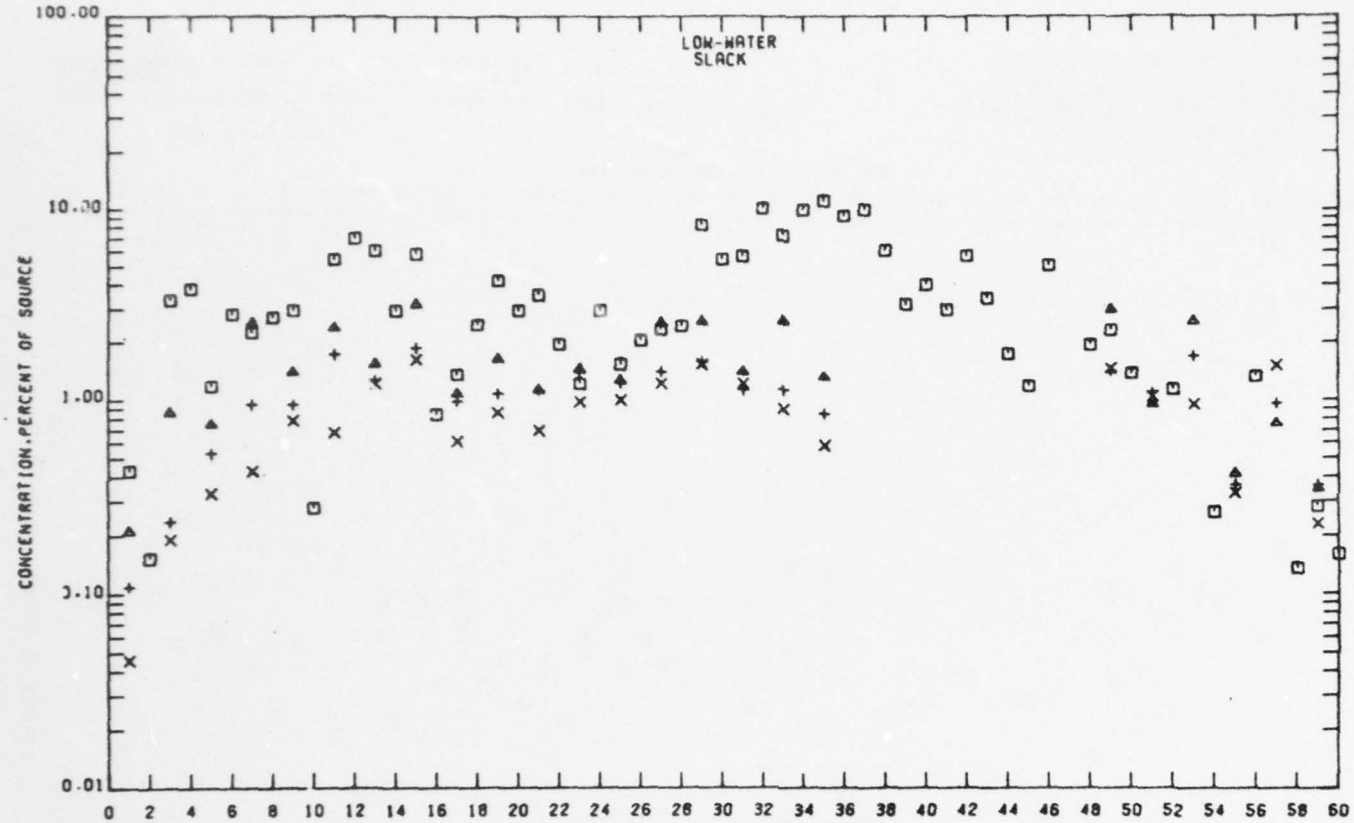
DYE TRACER TEST OF DISCHARGE INTO PROPOSED SLIP 302

62100 GPM COMMINGLED DISCHARGE

STATION 8 PROFILES

PRELIMINARY DATA

PLATE SL63



TEST CONDITIONS

SOURCE CONCENTRATION	5.064 PPB
TIDE RANGE	5.4 FT
HARBOR CONFIGURATION	PLAN 1A3

LEGEND

SYMBOL	DEPTH BELOW SURFACE, FT (PROTO)
□	1
△	11
+	22
×	34

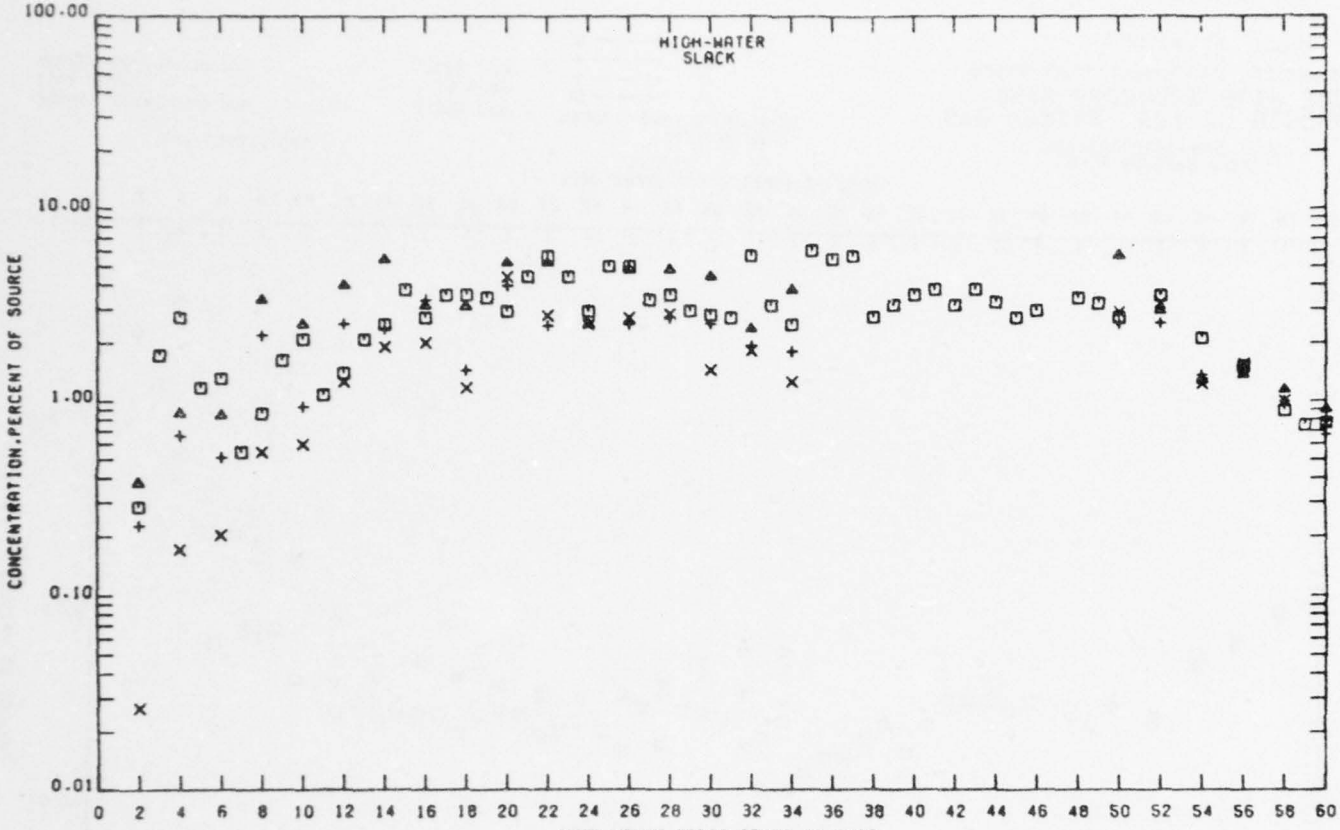
LA-LB HARBORS MODEL
TITP/LNG DISCHARGE STUDY

DYE TRACER TEST OF DISCHARGE
INTO PROPOSED SLIP 302
62100 GPM COMMINGLED DISCHARGE

STATION 8 PROFILES

PRELIMINARY DATA

PLATE 5.64



TEST CONDITIONS

SOURCE CONCENTRATION	5.064 PPB
TIDE RANGE	5.4 FT
HARBOR CONFIGURATION	PLAN 1A3

LEGEND

SYMBOL	DEPTH BELOW SURFACE, FT (PROTO)
□ ———	1
△ — — —	11
+ —·—	22
× —··—	34

LA-LB HARBORS MODEL
TITP/LNG DISCHARGE STUDY

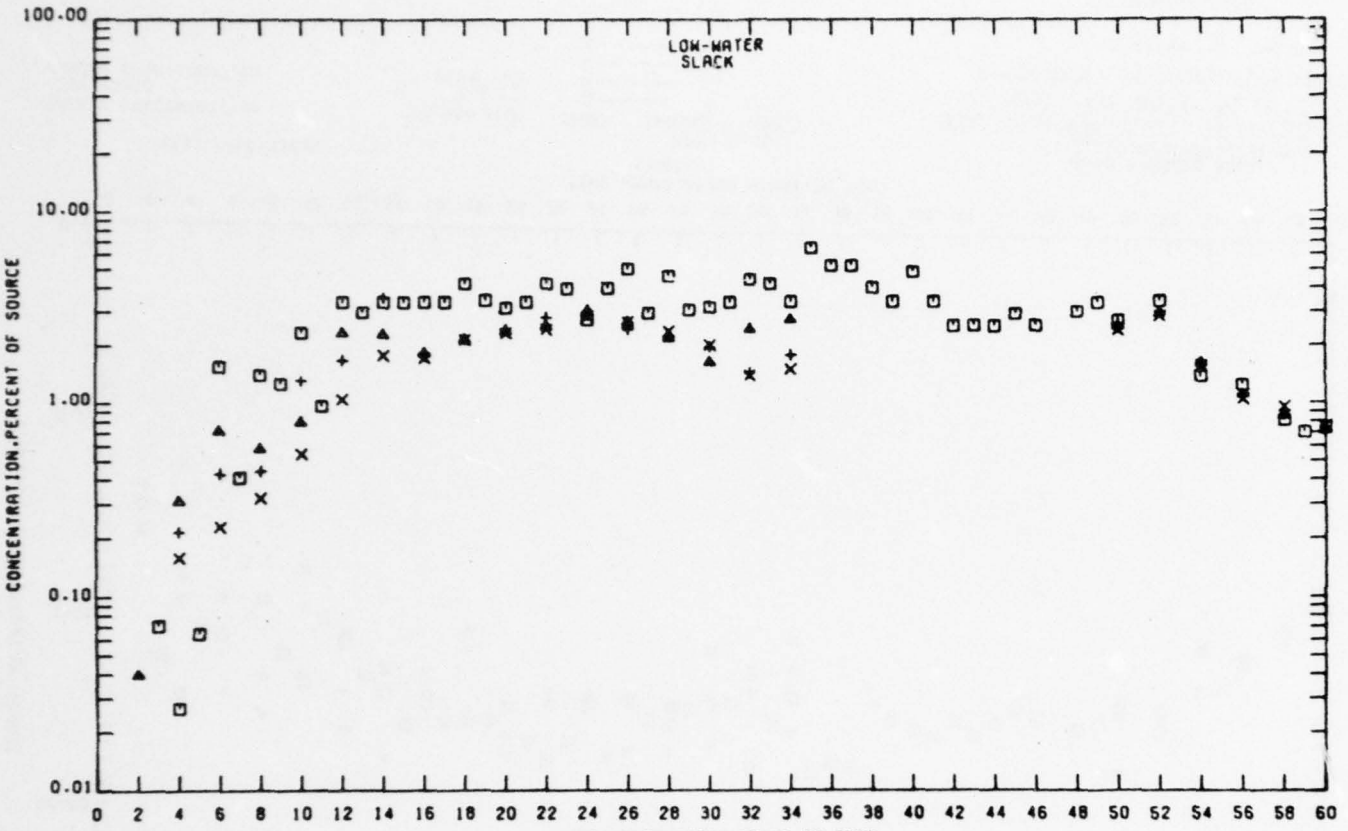
DYE TRACER TEST OF DISCHARGE INTO PROPOSED SLIP 302

62100 GPM COMMINGLED DISCHARGE

STATION 10 PROFILES

PRELIMINARY DATA

PLATE 5.63



LEGEND

SYMBOL	DEPTH BELOW SURFACE, FT (PROTO)
□ ———	1
△ — — —	11
+ — · —	22
× — · · —	34

TEST CONDITIONS

SOURCE CONCENTRATION	5.064 PPB
TIDE RANGE	5.4 FT
HARBOR CONFIGURATION	PLAN 1A3

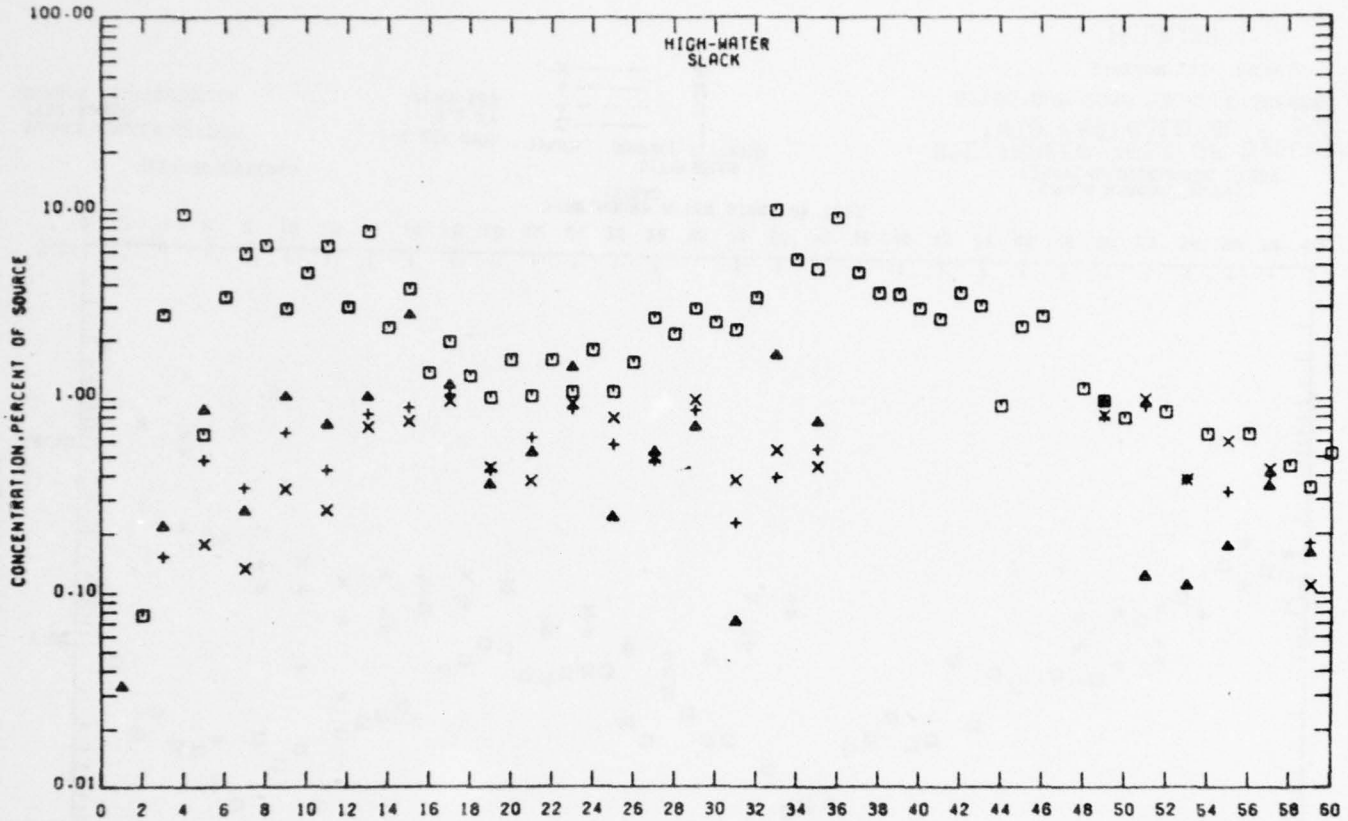
LA-LB HARBORS MODEL
TITP/LNG DISCHARGE STUDY

DYE TRACER TEST OF DISCHARGE
INTO PROPOSED SLIP 302
62100 GPM COMMINGLED DISCHARGE

STATION 10 PROFILES

PRELIMINARY DATA

PLATE 5-[illegible]



TEST CONDITIONS

SOURCE CONCENTRATION	5,064 PPB
TIDE RANGE	5.4 FT
HARBOR CONFIGURATION	PLAN 1A3

LEGEND

SYMBOL	DEPTH BELOW SURFACE, FT (PROTO)
☐	1
△	16
+	32
×	49

LA-LB HARBORS MODEL
TITP/LNG DISCHARGE STUDY

DYE TRACER TEST OF DISCHARGE
INTO PROPOSED SLIP 302
62100 GPM COMMINGLED DISCHARGE

STATION 13 PROFILES

PRELIMINARY DATA

PLATE 5267

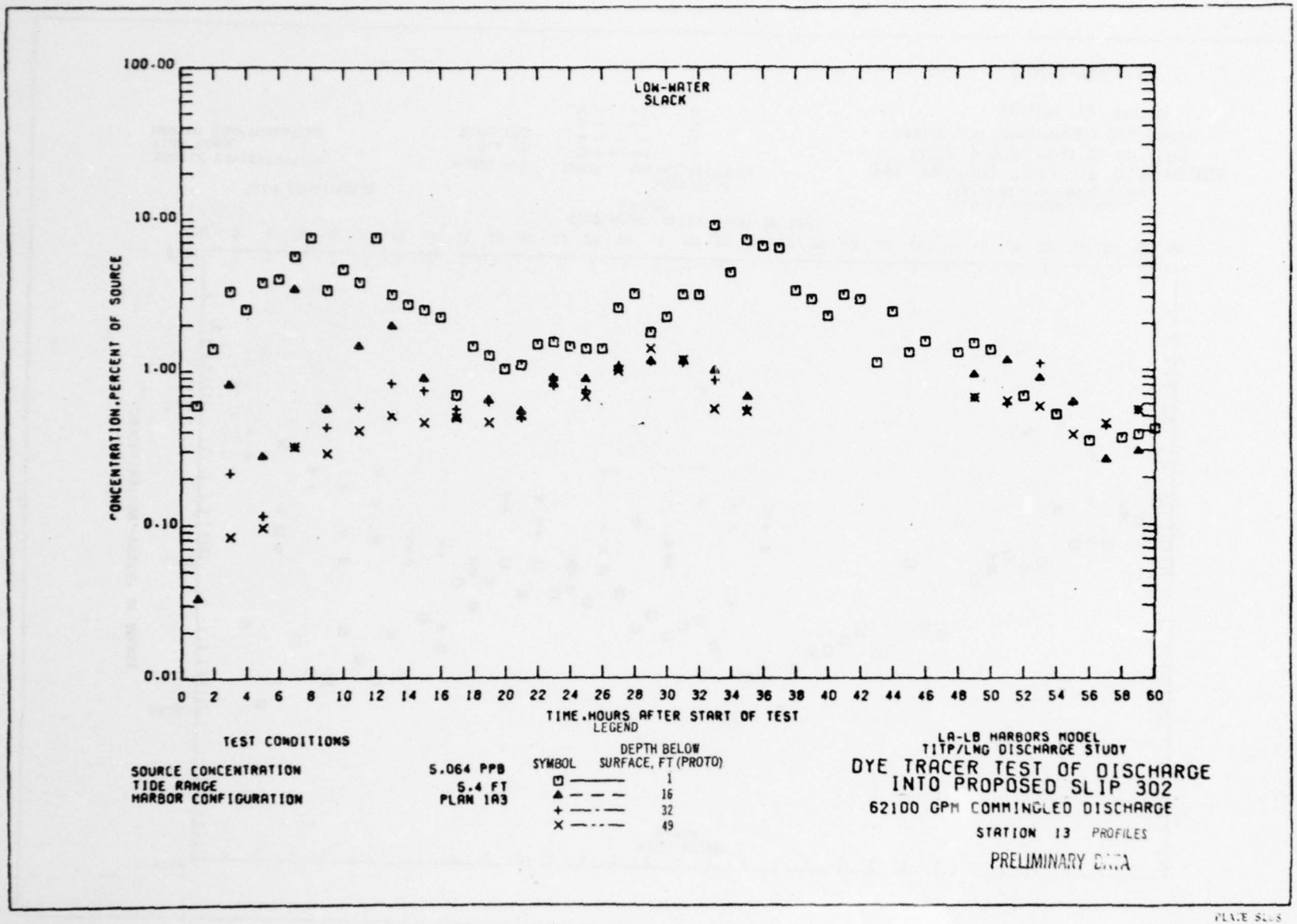
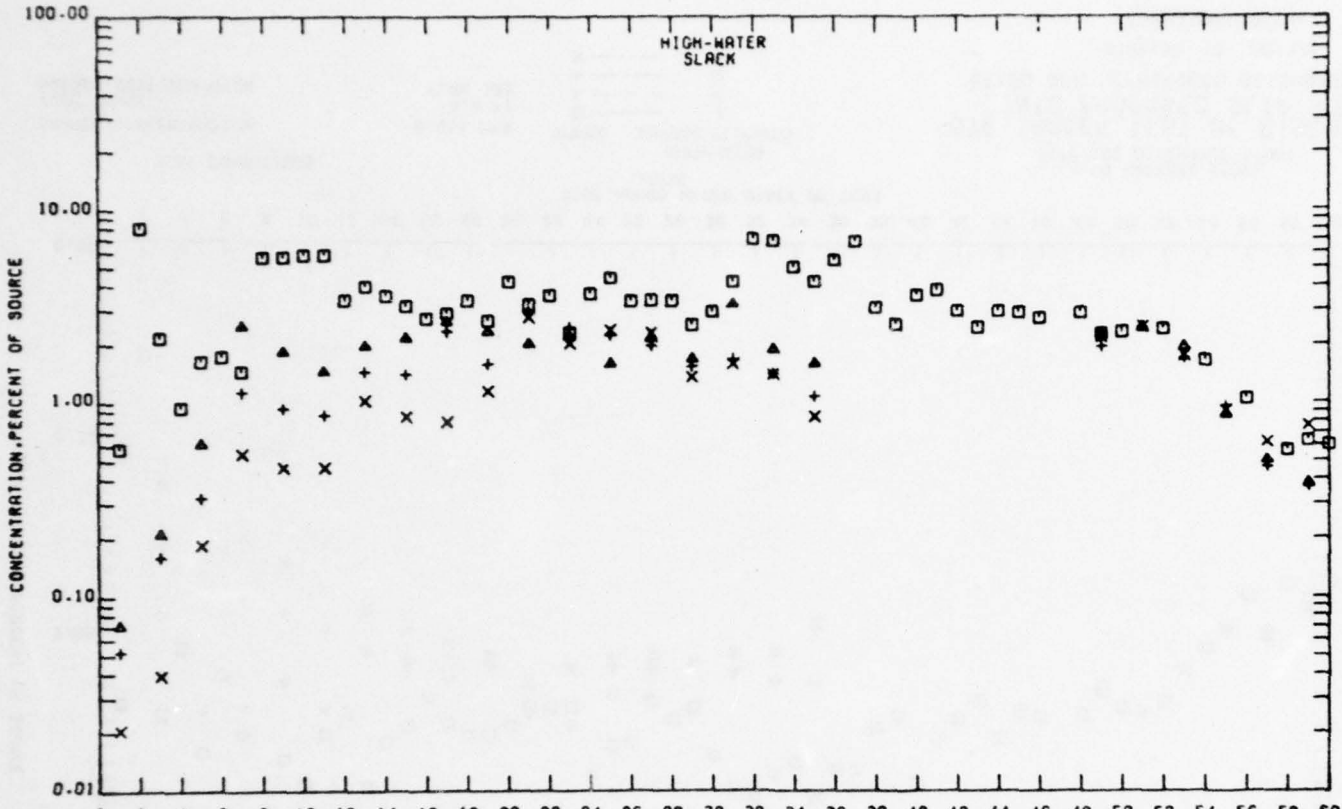

100.00
10.00
1.00
0.10
0.01
LOW-WATER SLACK
CONCENTRATION, PERCENT OF SOURCE
0 2 4 6 8 10 12 14 16 18 20 22 24 26 28 30 32 34 36 38 40 42 44 46 48 50 52 54 56 58 60
TIME, HOURS AFTER START OF TEST
LEGEND
SYMBOL
DEPTH BELOW SURFACE, FT (PROTO)
1
16
32
49
TEST CONDITIONS
SOURCE CONCENTRATION 5.064 PPB
TIDE RANGE 5.4 FT
HARBOR CONFIGURATION PLAN 1A3
LA-LB HARBORS MODEL
TITP/LNG DISCHARGE STUDY
DYE TRACER TEST OF DISCHARGE INTO PROPOSED SLIP 302
62100 GPM COMMINGLED DISCHARGE
STATION 13 PROFILES
PRELIMINARY DATA

PLATE SL-8



LEGEND

SYMBOL	DEPTH BELOW SURFACE, FT (PROTO)
□ ———	1
▲ — — —	11
+ — · —	22
× — · · —	34

TEST CONDITIONS

SOURCE CONCENTRATION	5.064 PPB
TIDE RANGE	5.4 FT
HARBOR CONFIGURATION	PLAN 1A3

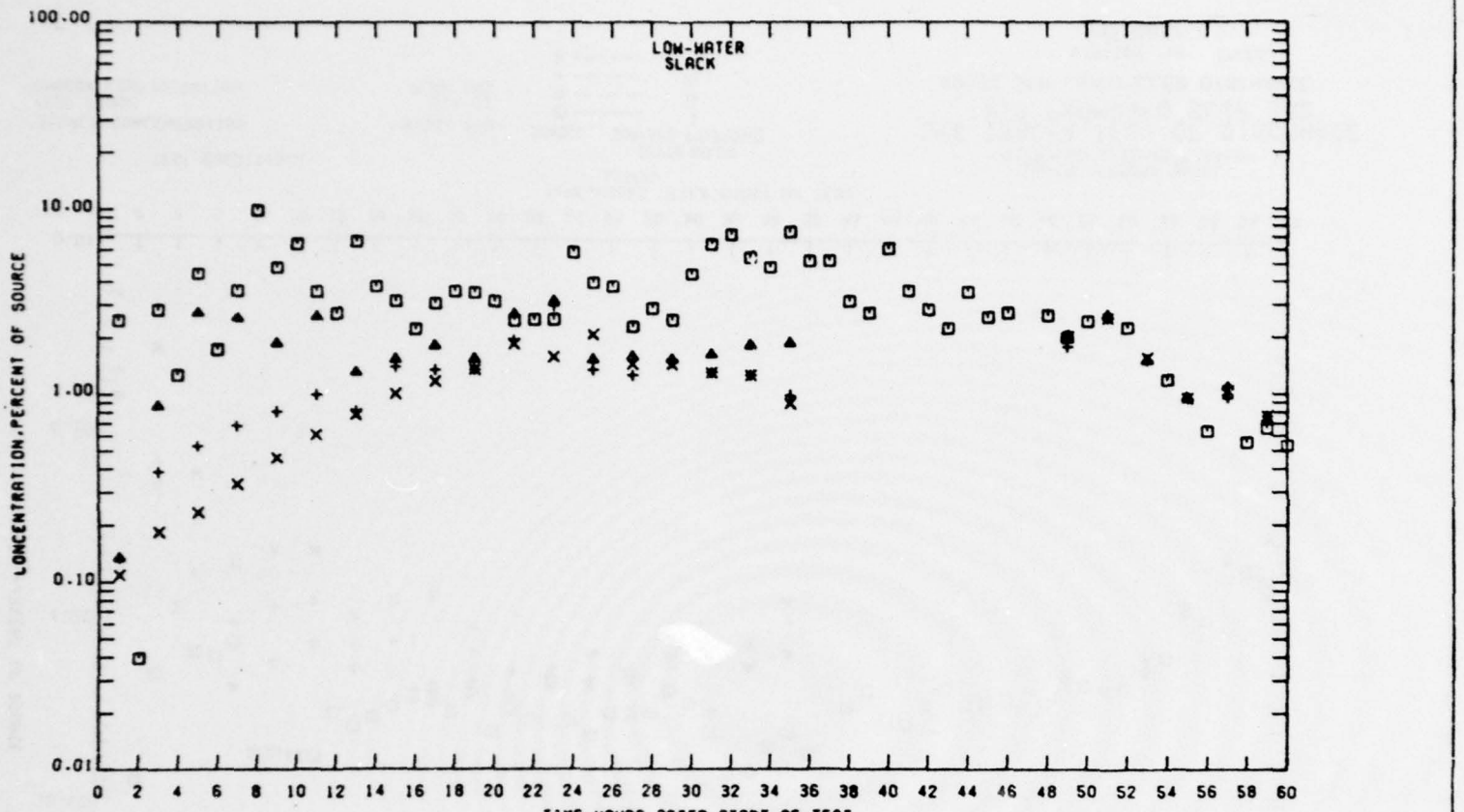
LA-LB HARBORS MODEL
TITP/LNG DISCHARGE STUDY

DYE TRACER TEST OF DISCHARGE
INTO PROPOSED SLIP 302
62100 GPM COMMINGLED DISCHARGE

STATION 18 PROFILES

PRELIMINARY D...

PLATE 3169



TEST CONDITIONS

SOURCE CONCENTRATION	5.064 PPB
TIDE RANGE	5.4 FT
HARBOR CONFIGURATION	PLAN 1A3

LEGEND

SYMBOL	DEPTH BELOW SURFACE, FT (PROTO)
□ ———	1
△ — — —	11
+ —·—	22
× —··—	34

LA-LB HARBORS MODEL
TITP/LNG DISCHARGE STUDY

DYE TRACER TEST OF DISCHARGE
INTO PROPOSED SLIP 302
62100 GPM COMMINGLED DISCHARGE

STATION 18 PROFILES

PRELIMINARY DATA

PLATE SL70

In accordance with letter from DAEN-RDC, DAEN-ASI dated 22 July 1977, Subject: Facsimile Catalog Cards for Laboratory Technical Publications, a facsimile catalog card in Library of Congress MARC format is reproduced below.

McAnally, William H
Model study of cool water discharge from proposed LNG facility, Los Angeles Harbor, California / by William H. McAnally, Jr. Vicksburg, Miss. : U. S. Waterways Experiment Station ; Springfield, Va. : available from National Technical Information Service, 1977.
3, [33] p., [145] leaves of plates : ill. ; 27 cm. (Miscellaneous paper - U. S. Army Engineer Waterways Experiment Station ; H-77-13)
Prepared for Port of Los Angeles, San Pedro, California.
Includes bibliographies.

1. Discharge (Water). 2. Los Angeles Harbor. 3. Model tests. 4. Stratification (Water). I. Port of Los Angeles. II. Series: United States. Waterways Experiment Station, Vicksburg, Miss. Miscellaneous paper ; H-77-13.
TA7.W34m no.H-77-13