

9869

Diagram No. 5402-3

NOAA FORM 76-35A

U.S. DEPARTMENT OF COMMERCE  
NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION  
NATIONAL OCEAN SURVEY

DESCRIPTIVE REPORT

Type of Survey ... Hydrographic  
Field No. .... PHP-10-1-80  
Office No..... H-9869

LOCALITY

State ..... California  
General Locality San Francisco Bay  
Locality ..... San Leandro

19 80

CHIEF OF PARTY  
LCDR D.R. Taylor

LIBRARY & ARCHIVES

DATE ..... March 22, 1984

☆U.S. GOV. PRINTING OFFICE: 1980-766-230

*Area 5*

*See Record of  
Application for  
Signoff.*

9869

1

HYDROGRAPHIC TITLE SHEET

H-9869

INSTRUCTIONS - The Hydrographic Sheet should be accompanied by this form, filled in as completely as possible, when the sheet is forwarded to the Office.

FIELD NO.

PHP 10-1-80

State California

General locality San Francisco Bay

Locality San Leandro

Scale 1:10,000 Date of survey March 26 - May 1, 1980

Instructions dated February 22, 1979 Project No. OPR-L123-PHP-80

Vessel NOAA Launch 1016

Chief of party LCDR D. R. Taylor

Surveyed by LCDR D. R. Taylor, LTJG D. D. Smith, Mr. F. L. Rosario

Soundings taken by echo sounder, hand lead, etc

Graphic record scaled by Pacific Hydrographic Party Personnel

Graphic record checked by Pacific Hydrographic Party Personnel

Verification  
~~Plotted~~ by K. M. Scott, R. A. Shipley Automated plot by PMC Xynetics Plotter

Evaluation  
~~Checked~~ by B. A. Olmstead

Soundings in ~~XXXX~~ feet at ~~MLLW~~ MLLW

REMARKS: All times are Greenwich Mean Time

Revisions and marginal notes in black were made during Evaluation.

STANDARDS CK'D

3-27-84

C.L.O.

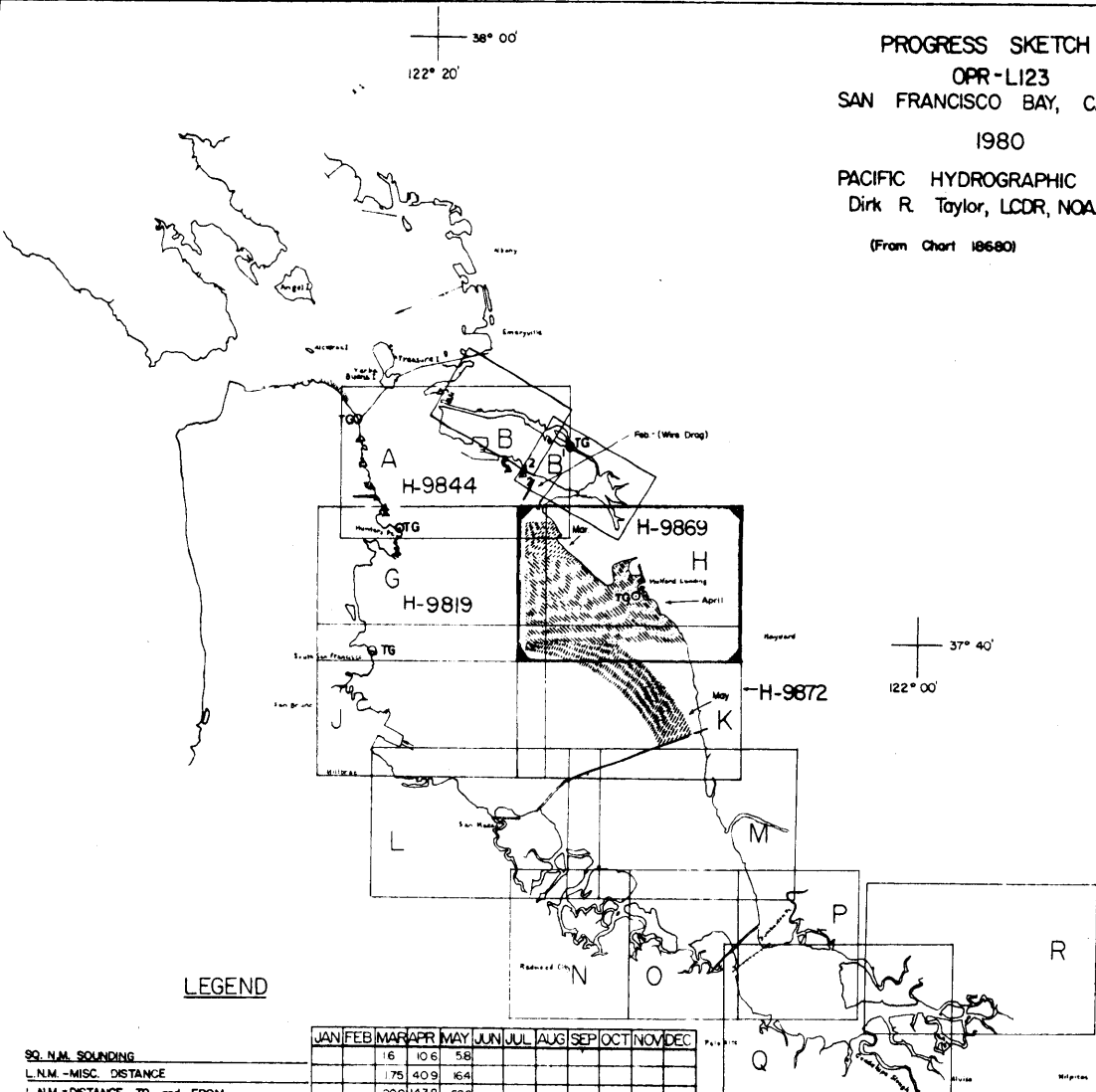
AWOIS ✓ RW 10/84

SURF ✓

RWW 9/23/92

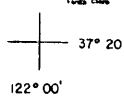
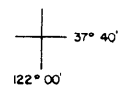
PROGRESS SKETCH  
 OPR-L123  
 SAN FRANCISCO BAY, CALIF  
 1980

PACIFIC HYDROGRAPHIC PARTY  
 Dirk R. Taylor, LCDR, NOAA, Chief of Party  
 (From Chart 18680)



LEGEND

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
90. N.M. SOUNDING			16	106	58							
L.N.M. -MISC. DISTANCE			175	409	164							
L.N.M. -DISTANCE TO and FROM			200	1438	526							
L.N.M. -SOUNDING LINE (Launch 1016)			406	281	1277							
BOTTOM SAMPLES (GRAB)				28								
WATER SAMPLES ANALYZED (Salinity)												
CONTROL STATIONS	12		2		9							
TEMPERATURE, DEPTH, CONDUCTIVITY												
MANSEN CAST												
TIDE GAGE			1									
L.N.M. -FIELD EDIT				74	206							
L.N.M. -SOUNDING LINE												



BAY  
 AREA  
 SURVEY  
 EXPEDITION

DESCRIPTIVE REPORT  
TO ACCOMPANY HYDROGRAPHIC SURVEY

H-9869

PHP-10-1-80

SCALE 1:10,000

1980

PACIFIC HYDROGRAPHIC PARTY

LCDR. DIRK R. TAYLOR  
Chief of Party

A. PROJECT

Survey H-9869, PHP-10-1-80 was accomplished as per project instructions OPR-L123-PHP-79, San Francisco Bay, Bay Area Survey Expedition (BASE) dated February 22, 1979 and amended by Change #1 dated November 27, 1979, and Change #2 dated May 15, 1980. Change 2 was issued to field after completion of this survey. ✓

B. AREA SURVEYED

H-9869 covered the eastern portion of San Francisco Bay from the Oakland International Airport south to the city of Hayward. The locality is San Leandro. The geographic boundaries were as follows:

North	37° 44' 05" N
West	122° 16' 21" W
South	37° 40' 00" N
East	Shoreline

Hydrographic operations were conducted between March 26, 1980 and May 1, 1980. ✓

C. SOUNDING VESSEL

NOAA Launch 1016 (Vesno 0656) was used for all data collection. This launch is an aluminum, Type I, and was fitted with an ASI Hydrographic Logger. ✓

D. SOUNDING EQUIPMENT AND CORRECTIONS TO ECHO SOUNDINGS

Soundings for survey H-9869 were recorded with a Ross Fineline Fathometer system. The transducer was a single, narrow beam ( $7\frac{1}{2}^\circ$ ). The Ross system consisted of the following components:

Transceiver	Model 4000	S/N 1097
Recorder	Model 5000	S/N 1082
Digitizer	Model 6000	S/N 3787
Power Supply		S/N 1041-7

The transducer draft of NOAA Launch 1016 was measured as 1.5 feet. This TRA is entered on all corrector tapes. The actual TRA as determined by bar checks from several surveys is 1.35 feet. This value is applied on the TRA Abstracts and the TC/TI tape. ✓

Settlement and Squat trials were conducted on August 16, 1979 near the Hunters Point Naval Shipyard. The launch was run toward and away from the observer on the shore who was using a Lietz level, serial number 214303. A level rod was held on the cabin top above the transducer location. Several readings were taken on each run at each speed and then averaged. A dead in the water reading was taken on the inshore and offshore ends of the runs to allow for the change due to tides. Trial information and the settlement and squat curve are appended to this report. The raw data is available in the Pacific Hydrographic Party's files. No additional equipment was added or existing equipment removed since the settlement and squat trials in August 1979. ✓

Phase calibrations on the Ross recording system were made daily on the 0 to 100 foot scale at 10 foot intervals. The analog trace was adjusted as necessary to coincide with the mid scale value of 50 feet. Occasionally the initial at the 0 foot mark would wander. It was always adjusted as necessary to where the mid scale value was correct. ✓

Velocity corrections were derived from daily digital bar check comparison data. Data that varied considerably from the mean, mainly due to sea state at the time of observation, was not used. The bar check consisted of an aluminum ladder with a non skid plate attached to one side. The bar check lines were  $\frac{1}{4}$  inch galvanized chain with painted markings at 5 foot intervals. The chains are checked at 6 month intervals for accuracy. ✓

The velocity curve derived from the bar check data does not conform to the standard form. At a depth of 25 feet the slope of the curve reverses. All bar check comparison data that was gathered below 20 feet was done in the north-east corner of the sheet. This area has been borrowed out and the maximum depth found was 42 feet. Depths surrounding the borrow area are 10 feet or less. Depths on the remainder of the field sheet do not exceed 20 feet. The borrow area tends to trap the colder water and this accounts for the reversal in the velocity curve. The bar check comparison logs, bar check abstract, velocity curve and the velocity tape printout are appended to this report. ✓

Velocity corrections are applied to the field sheet soundings. ✓

#### E. HYDROGRAPHIC SHEETS

The field sheet was prepared by the Pacific Hydrographic Party using a PDP 8/e computer system. It was necessary to divide the sheet into two sections, north and south, due to plotter sheet size limitations. Soundings on the field sheet are corrected for transducer depth (TRA), sound velocity and predicted tides. Tidal correctors applied to San Francisco were +50 minutes high water, +1 hour 13 minutes low water, and a height ratio of 1.33. These correctors were applied to all soundings on the field sheet. ✓

Two expanded scale plots were made to clearly show results of developments. San Leandro Marina is plotted at a scale of 1:5000 and is inset in the upper right corner of the south plotter sheet. ✓

The field sheet soundings for days 115, 116, 120, and part of day 119 do not have the final electronic correctors applied. The correctors shown on the Electronic Corrector Abstract and the corrector tape printouts are correct. ✓ *See Comments in Evaluation Report Section*

The San Leandro Marina Entrance Channel lights and markers are shown for reference only on the south plotter sheet overlay. See Field Edit Report for TP-00535. *(These aids were originally located using Raydist positioning.)* Reference the attached letter from Coastal mapping for additional information. ✓

The field sheet and field records will be forwarded for verification to OA/CPM3, Pacific Marine Center, Seattle, Washington. ✓

#### F. CONTROL STATIONS

Horizontal control for this survey was provided by two supplemental con-

trol stations positioned by party personnel. All electronically controlled hydrography was run from these stations. The two stations are:

Block, 1980	Signal #202	✓
Koret, 1980	Signal #200	

See the Horizontal Control Report, 1980, OPR-L123-PHP-80 (January 1981) for the positional data.

In addition several stations were used as Raydist calibration points and objects for check angles. They are:

San Bruno Shoal Light #4, 1977	Signal #204
Ballena Bay Light #1, 1979	Signal #206
San Bruno Shoal Light #3, 1977	Signal #208
Oakland P.G.&E. 50th Avenue Gas Holder, 1947	Signal #210
Oakland International Airport Control Tower	Signal #212
Oakland Mormon Temple Spire, 1977	Signal #214

See  
Evaluation  
Report  
Section 2

#### G. HYDROGRAPHIC POSITION CONTROL

Position control for this survey was provided by a Hastings Raydist System in a range-range configuration operating at a frequency of 3290.400 KHZ.

Mobile Station-Installed in NOAA Launch 1016.

Transmitter	Model TA-96	S/N 25
Navigator	Model ZA-75C-1	S/N 118
Position Indicator	Model GA-50B	S/N 122

Base Station-Red installed at station #200, Koret, 1980.

	Model AA-60A	S/N 241
Power Supply	Model SA-192	S/N 94

Base Station-Green installed at station #202, Block, 1980.

	Model AA-60A	S/N 242
Power Supply	Model SA-192	S/N 34

The base stations consisted of a 35 foot whip antenna (telescoping) atop two 10 foot tower sections. Both stations were powered by 120 volt AC through a Raydist power supply and batteries. ✓

No equipment failures occurred with the base station equipment. Considerable problems were encountered with the ground plane at station Block due to vandalism. ✓

Daily calibrations were performed prior to and after all survey work. Fixed points were used in all calibrations. The Raydist position indicator and the navigational interface were set at the computed lane values for the fixed point. After the launch's Raydist antenna was positioned as close as possible to the object, a set of 10 readings were observed and logged on the master printout. These were averaged in the morning to provide initial correctors for proper spacing of the day's first line. The end of the day correctors were determined in the same manner. Morning and end of day partial correctors were meaned for the final partial correctors. ✓

Lane checks were usually performed at San Leandro Channel Marker #7 before and after lunch. The Raydist system was very steady. Lane jumps occurred only on day 121 during the lunch break. ✓

#### H. SHORELINE

No shoreline appears on the field sheets except for the 1:5000 inset of San Leandro Marina. A blowup of chart #18651, 29th edition, August 12, 1978 was available but contained major distortion. The inset's shoreline was carefully made from TP-00535, 1:20,000 with a pantograph. Some distortion is present. The San Leandro Marina shoreline is shown improperly on chart #18651. See Evaluation Report Section 4

#### I. CROSSLINES

The percentage of crosslines to main scheme hydrography is 8.4 percent. Agreement is good over the entire field sheet. Differences did not exceed one foot except in a few instances. These can be attributed to the discrepancy between predicted and actual tides. Errors in times of predicted high and low water were observed by survey personnel. ✓

#### J. JUNCTIONS

This survey junctioned on the west with H-9819, 1979. A smooth sheet was not available, therefore the unverified field sheet was used. Agreement in the overlap area was good. There was some displacement of the 6 foot curve in the northwest corner. See Evaluation Report Section 5

At Lat.  $37^{\circ} 42' 00''$  N to  $37^{\circ} 42' 45''$  N the depths found on the current survey were 1 to 2 feet deeper, causing a displacement of the 12 foot curve. The bottom topography is relatively flat and gently sloping. Small errors in tide correctors are most likely and can cause large apparent displacements in contours. ✓

The junction improves noticeably south of latitude  $37^{\circ} 42' 00''$  N.

Several shoal soundings were found during survey H-9819 on the eastern edge of the sheet. Similar shoal soundings were found in the same vicinity on this survey. These were investigated and plotted at an expanded scale. They are described below: ✓

A 12 foot sounding at Lat.  $37^{\circ} 40' 16.5''$  N, Long.  $122^{\circ} 16' 25.5''$  W. was searched for and not found during development #1



The 10 foot sounding at Lat.  $37^{\circ} 40' 32.5''$  N, Long.  $122^{\circ} 16' 14.0''$  W on survey H-9819 was searched for during development #2. A least depth of 12 feet was found and is shown in red on the field sheet.

The 13 foot sounding at Lat.  $37^{\circ} 40' 49''$  N, Long.  $122^{\circ} 16' 13''$  W on H-9819 was searched for and not found by splitting the mainscheme during development #3. ✓

The 10 foot sounding at Lat.  $37^{\circ} 41' 00''$  N, Long.  $122^{\circ} 16' 12''$  W on H-9819 was searched for during development #4. A least depth of 11 feet was found in two locations. These are plotted in red on the field sheet. This development was expanded westward to  $122^{\circ} 16' 25''$  W where a 14 foot sounding was found while searching for a 12 foot sounding. This is also plotted in red on the field sheet. The two 11 foot soundings reduced to 10 feet on the Smooth Sheet. ✓

The 14 foot sounding at Lat.  $37^{\circ} 41' 12''$  N, Long.  $122^{\circ} 16' 30''$  W on survey H-9819 was searched for and not found during development #5. ✓

The above discussed shoal soundings and others found in the vicinity during this survey appear to be about 30 meters across at their bases and 5 meters across at their tops. This could be an indication of dumping. The surrounding depths do not vary significantly from prior surveys and the chart, also reinforcing the dumping theory. It is recommended that these shoal soundings be charted. ✓

This survey will also junction on the north with survey H-9844 and on the south with survey H-9872. Refer to comments in the Evaluation Report under Section 5, Junctions.

#### K. COMPARISON WITH PRIOR SURVEYS

This survey was compared to two prior surveys; H-8024, scale 1:10,000, April-Sept. 1954 and H-8027, scale 1:20,000, January 1955-January 1956. No presurvey review items occurred on this survey.

See  
Evaluation  
Report  
Section 6

H-8024, 1:10,000, April-Sept. 1954

The area compared is north of Lat.  $37^{\circ} 43' 37.5''$  N. The shoreline of Bay Farm Island has been extended to the southwest with fill approximately .2 nautical miles. The charted borrow area was not present on the prior surveys. Fifty percent of the area common to the two surveys is borrow area and no comparison can be made. The remaining area, in general, shows little change other than what can be attributed to the effects of the borrowing. Some additional 0 foot soundings were found on the new survey. The large shoal (0') at Lat.  $37^{\circ} 43' 45''$  N, Long.  $122^{\circ} 15' 00''$  W is still evident in part on the new survey at the shoal's south and southeast edges. The 6 foot curve offshore of the borrow area compares favorably with that on the prior survey. The changes are a result of the leveling or evening out of the bottom and possible inaccuracies in predicted tides. ✓

H-8027, 1:20,000, January 1955-January 1956

The major difference between the new survey and the prior is the shoreline. Major landfill for the Oakland International Airport has extended the shoreline approximately .5 nautical miles at Lat.  $37^{\circ} 43' 30''$  N, Long.  $122^{\circ} 15' 00''$  W to 1.5 nautical miles at Lat.  $37^{\circ} 42' 00''$  N, Long.  $122^{\circ} 13' 00''$  W. The marina at ✓

San Leandro is also new along with it's maintained entrance channel.

The depths have changed little. In general the new survey is 1 to 3 feet deeper and the 0 foot curve is further inshore. The bottom topography is gently sloping. The discrepancies between actual and predicted tides mentioned earlier in this report explain the general depth changes. The 6 foot curve at Lat.  $37^{\circ} 43' 00''$  N and the Oakland International Airport extends offshore approximately .6 nautical miles on the new survey. This is a pipeline area which did not exist in 1955. The deeps extending further offshore are also a result of this pipeline. A new pipeline, under construction at the time of the survey, runs along the San Leandro Marina Entrance Channel just outside the channel markers on the south side. At the offshore end of the channel, the pipeline turns and runs  $293^{\circ}$  off the western edge of the sheet. The path of the pipeline is evident by the deeps on the field sheet. A 17 foot hole was found at Lat.  $37^{\circ} 42' 10''$  N, Long.  $122^{\circ} 15' 15''$  W on the new survey. The area southeast of San Leandro Marina Entrance Channel is shallower than the prior survey. There are several areas that bare at low water. The channel construction and maintenance is most likely the cause. ✓

#### L. COMPARISON TO THE CHART

This survey was compared to a blowup of chart #18651, 29th edition, August 12, 1978. Many of the comments made in the previous section also apply to the comparison to the chart. ✓

In general the new survey appears to be one to three feet deeper. Differences between predicted and actual tides may account for most of the change. ✓

There is a relatively deep trough along the shoreline of the Oakland International Airport. This is apparently man made and is not shown on the chart. Evaluator  
Concurs

The pipeline area extending from the Oakland International Airport at Lat.  $37^{\circ} 43' 10''$  N stands out on the survey. The 6 foot curve extends out to Long.  $122^{\circ} 15' 00''$  W. Further offshore in the area are several deeps. These do not appear on the chart. Evaluator  
Concurs

The borrow area in the northeast corner of the field sheet is larger than charted. Due to this, the two areas that bare at mean lower low water at Lat.  $37^{\circ} 43' 45''$  N, Long.  $122^{\circ} 15' 00''$  W are significantly smaller or non existant on the new survey. Evaluator  
Concurs

On the new survey several 0 foot and negative soundings were found north of Lat.  $37^{\circ} 43' 30''$  N which do not appear on the chart. These shoal soundings will be more evident when actual tides are applied. ✓

The charted shoreline is accurate except at San Leandro Marina. The floating docks are not depicted properly. ✓

The charted mooring buoys at Lat.  $37^{\circ} 40' 05''$  N, Long.  $122^{\circ} 15' 42''$  W and Lat.  $37^{\circ} 40' 10''$  N, Long.  $122^{\circ} 13' 15''$  W were not found and should be removed from the chart. Evaluator  
Concurs

The privately maintained white buoy with orange strips charted at Lat.  $37^{\circ} 40' 15''$  N, Long.  $122^{\circ} 16' 00''$  W was not found on station. It's new position is shown on the south sheet overlay. ✓

A new pipeline extends just outside the channel markers on the south side of the San Leandro Marina Entrance Channel. At the outer end of this channel the pipeline turns and runs 293<sup>0</sup>T. Three temporary piles and one temporary platform are plotted on the overlay. These marked the pipeline during construction. Several additional piles marked the pipeline further inshore. They appear on the field edit. These structures were removed by the contractor at the completion of the construction. ✓

#### M. ADEQUACY OF SURVEY

This survey is complete and adequate to supersede prior surveys for charting purposes. ✓

#### N. AIDS TO NAVIGATION

Several non-floating aids to navigation are located within the boundaries of survey H-9869. They all mark the entrance channel to the San Leandro Marina. The outer two are lights. The remainder are day markers. These adequately mark the channel. A lighted range also marks San Leandro Marina Entrance Channel. When visible, this range adequately marks the center of the channel at it's inshore end. ✓

#### O. STATISTICS

NOAA Launch 1016	324.2 linear nautical miles sounding line.
	12.5 square nautical miles
Tide Stations	<del>2</del>
Bottom Samples	34
Positions	<del>2776</del> 2652

#### P. Miscellaneous

None

#### Q. RECOMMENDATIONS

The piles and platforms marking the new pipeline which was under construction were removed by the contractor. This occurred after the completion of the survey. The structures should be disproved by wire drag and/or divers to ensure that no submerged objects remain. These features are retained on the smooth sheet. The evaluator recommends the compiler investigate the source of removal and chart accordingly. Evaluator Concurs ✓

#### R. AUTOMATED DATA PROCESSING

The following computer programs were used with the Hydroplot System to process this survey: ✓

<u>Program</u>	<u>Name</u>	<u>Version</u>
RK 201	Grid, Signal, and Lattice Plot	4/18/75
RK 211	Range-Range Non-Real Time Plot	1/15/76
RK 300	Utility Computations	2/05/76
RK 330	Reformat and Data Check	5/04/76
PM 360	Electronic Corrector Abstract	2/02/76
RK 407	Geodetic Inverse/Direct Computation	9/25/78
AM 500	Predicted Tide Generator	11/10/72
AM 602	Elinore-Line Oriented Editor	5/20/75

S. REFERRAL TO REPORTS

Field Edit Report, TP-00535	September 1980
Coast Pilot Report	December 1980
Horizontal Control Report, 1980 OPR-L123-PHP-80	January 1981

H-9869

Parameter Tape Listing

South Plotter Sheet

FEST=25000  
CLAT=4140000  
CMER=122/10/10  
GRID=30  
PLSCL=10000  
PLAT=37/39/35  
PLON=122/16/56  
VESNO=0656  
YR=80  
ANDIST=-3.7

North Plotter Sheet

FEST=25000  
CLAT=4140000  
CMER=122/10/0  
GRID=30  
PLSCL=10000  
PLAT=37/41/39  
PLON=122/16/56  
VESNO=0656  
YR=80  
ANDIST=-3.7

H-9869

Parameter Tape Listing

San Leandro Marina Inset

FEST=25000

CLAT=4140000

CMER=122/10/10

GRID=15

PLSCL=5000

PLAT=37/41/28

PLON=122/11/44

VESNO=0656

YR=80

ANDIST=-3.7

Parameter Tape Listing

Developments 1,2,3, & 5

FEST=25000

CLAT=4140000

CMER=122/10/10

GRID=15

PLSCL=5000

PLAT=37/40/07.5

PLON=122/16/41.9

VESNO=0656

YR=80

ANDIST=-3.7

H-9869

Parameter Tape Listing

Development #4

FEST=25000

CLAT=4140000

CMER=122/10/10

GRID=04

PLSCL=1250

PLAT=37/40/52

PLON=122/16/32

VESNO=0656

YR=80

ANDIST=-3.7

H-9869

Area Tape    South Plotter Sheet

037 39 40 122 16 56

037 42 00 122 16 56

037 42 00 122 09 30

037 39 40 122 09 30

H-9869

Area Tape    North Plotter Sheet

037 42 00 122 16 56

037 44 30 122 16 56

037 44 30 122 09 30

037 42 00 122 09 30



✓  
FIELD TIDE NOTE

March-May 1980

OPR-L123-PHP-80

H-9869          PHP-10-1-80

Field tide reductions of soundings are based on San Francisco Bay predicted tides. The correctors supplied with the project instructions divided the sheet into two zones. The entire field sheet is plotted with only one set of correctors. They are +50 minutes high water, +1 hour 13 minutes low water, and a height ratio of 1.33.

AM 500, the Predicted Tide Generator was used to interpolate tide correctors for all soundings through the PDP 8/e computer.

Three ADR gages were installed in the project area for tide control on this survey. Location and operational periods are listed below:

<u>Site</u>	<u>Position</u>	<u>Period</u>
San Leandro #941-4688	37 <sup>0</sup> 41.7'N 122 <sup>0</sup> 11.5'W	March - May 1980
Oyster Point #941-4392	37 <sup>0</sup> 39.9'N 122 <sup>0</sup> 22.8'W	March - May 1980
Hunters Point #941-4358	37 <sup>0</sup> 43.8'N 122 <sup>0</sup> 21.4'W	March - May 1980

San Leandro

A Fisher Porter ADR gage, serial number 6903A5568M13 is installed on channel marker #15 at San Leandro Marina. On March 26 the gage time was off by three hours. It was reset and worked satisfactorily thru the survey. Gage time was reset whenever it differed from standard time by 3 minutes or more.

Oyster Point

A Fisher Porter ADR gage, serial number 7403A3402M3 was installed on March 14 on an existing well. On March 28 the gage jammed. This was cleared. Gage time was reset whenever it differed from standard time by 3 minutes or more.

Hunters Point

A Fisher Porter ADR gage, serial number 7504A2689M24 is installed at the Hunters Point Naval Shipyard. No major problems were encountered with this gage. Gage time was reset whenever it differed from standard time by 3 minutes or more.

February 19, 1981

U.S. DEPARTMENT OF COMMERCE  
NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION  
NATIONAL OCEAN SURVEY

TIDE NOTE FOR HYDROGRAPHIC SHEET

Processing Division: Pacific Marine Center:

Hourly heights are approved for

Tide Station Used (NOAA Form 77-12): 941-4392 Oyster Point Marina, CA  
941-4688 San Leandro Channel, CA

Period: March 26, 1980 - July 11, 1980

HYDROGRAPHIC SHEET: H-9869

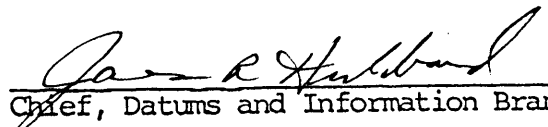
OPR: L123

Locality: South San Francisco Bay, California

Plane of reference (mean lower low water): 1.73 ft. (941-4392)  
5.70 ft. (941-4688)

Height of Mean High Water above Plane of Reference is 6.43 ft. (941-4392)  
6.69 ft. (941-4688)

REMARKS: Recommended Zoning: See Page 2

  
Chief, Datums and Information Branch

February 19, 1981

U. S. DEPARTMENT OF COMMERCE  
NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION  
NATIONAL OCEAN SURVEY

## TIDE NOTE FOR HYDROGRAPHIC SHEET

## Recommended Zoning:

1. San Leandro Channel, California (941-4688)
  - A. Using longitude  $122^{\circ}16.4'$  as the common western boundary for all zoning. From latitude  $37^{\circ}44.7'$  to  $37^{\circ}42.5'$  apply -10 minute time corrector and x0.91 range ratio.
  - B. From latitude  $37^{\circ}42.5'$  south to latitude  $37^{\circ}39.5'$ 
    1. West of longitude  $122^{\circ}14.0'$  apply x0.95 range ratio.
    2. East of longitude  $122^{\circ}14.0'$  zone direct.
2. For days 122-137 zone on Oyster Point Marina, California (941-4392)
  - A. Using longitude  $122^{\circ}16.4'$  as the common western boundary for all zoning. From latitude  $37^{\circ}44.7'$  to  $37^{\circ}42.5'$  zone direct.
  - B. From latitude  $37^{\circ}42.5'$  south to latitude  $37^{\circ}39.5'$ 
    1. West of longitude  $122^{\circ}14.0'$  apply +10 minute time corrector.
    2. East of longitude  $122^{\circ}14.0'$  apply +20 minute time corrector and x1.06 range ratio.

GEOGRAPHIC NAMES

Name on Survey

A ON CHART NO. 16649  
B ON PREVIOUS SURVEY NO. 16651  
C ON U.S. QUADRANGLE MAPS  
D FROM LOCAL INFORMATION  
E ON LOCAL MAPS  
F P.O. GUIDE OR MAP  
G RAND McNALLY ATLAS  
H U.S. LIGHT LIST  
MANUSCRIPTS

Name on Survey	A	B	C	D	E	F	G	H	
BAY FARM ISLAND	X							X	1
ESTUDILLO CREEK								X	2
METROPOLITAN OAKLAND INTERNATIONAL AIRPORT	X							X	3
MULFORD GARDENS	X							X	4
ROBERTS LANDING	X							X	5
SAN FRANCISCO BAY	X							X	6
SAN LEANDRO	X							X	7
SAN LEANDRO MARINA	X							X	8
SAN LORENZO	X								9
SAN LORENZO CREEK	X								10
CALIFORNIA (title block)									11
									12
									13
									14
									15
									16
									17
									18
									19
						Approved:			20
									21
						<i>Charles E. Harrington</i>			22
						Chief Geographer - N	CG2X5		23
						21 JUNE 1983			24
									25

H-9869

VELOCITY TAPE PRINTOUT

Table 1

000301 0 0000 0001 000 065600 009869

000382 1 0002

000530 1 0004

999999 1 0006

✓  
ELECTRONIC CORRECTOR ABSTRACT

VESSEL : 0656

SHEET : H-9869

TIME	DAY	PATTERN 1	PATTERN 2
171412	086	+00017	+00015
170440	088	+000 <sup>20</sup> <del>13</del>	+000 <sup>12</sup> <del>13</del>
215453	093	-00008	-00009
171554	094	-00008	-00012
172524	095	+00018	+00005
181648	098	+00017	+00016
174636	100	+00016	+00021
172850	101	+00014	+00024
173548	106	+00020	+00028
203606	107	+00017	+00027
205448	108	+00016	+00017
193547	114	+00030	+00026
171456	115	-00002	+00001
164530	116	+00048	+00021
162800	119	+00018	+00012
192518		+00000	+00000
180648	120	-00017	+00000
165234	121	+00028	+00020
205830		+00028	+00320
202712	122	+00030	-00005
173349	130	+00026	-00021

Signal Tape Listing

200	1	37	39	130 <sup>66</sup> <del>74</del>	122	22	541 <sup>71</sup>	250	0037	329040
202	1	37	34	2446 <sup>5</sup> <del>7</del>	122	16	41876	250	0007	329040
204	0	37	40	083 <sup>3</sup> <del>70</del>	122	19	3914 <sup>9</sup> <del>7</del>	139	0000	000000
206	0	37	45	4906 <sup>7</sup> <del>8</del>	122	16	535 <sup>66</sup> <del>82</del>	139	0000	000000
208	0	37	40	108 <sup>39</sup> <del>47</del>	122	19	3047 <sup>4</sup> <del>8</del>	139	0000	000000
<del>210</del>	<del>0</del>	<del>37</del>	<del>45</del>	<del>54676</del>	<del>122</del>	<del>12</del>	<del>50885</del>	<del>139</del>	<del>0000</del>	<del>000000</del>
212	0	37	42	450 <sup>2</sup> <del>00</del>	122	12	479 <sup>3</sup> <del>00</del>	243	0000	000000
<del>214</del>	<del>0</del>	<del>37</del>	<del>48</del>	<del>28399</del>	<del>122</del>	<del>11</del>	<del>52784</del>	<del>139</del>	<del>0000</del>	<del>000000</del>

Station List: H-9869

<u>Station</u>	<u>0</u>	<u>Latitude</u>	<u>Longitude</u>	<u>CRT</u>	<u>Elev</u>	<u>F. KHZ</u>	<u>Source</u>	<u>Name</u>
200	1	37 39 13074 <sup>6</sup>	122 22 5411 <sup>7</sup>	250	0037	329040	PHP, 1980	Koret, 1980
202	1	37 34 24464 <sup>5</sup>	122 16 41876 <sup>6</sup>	250	0007	329040	PHP, 1980	Block, 1980
204	0	37 40 08340 <sup>3</sup>	122 19 39147 <sup>9</sup>	139	0000	000000	PPP, 1977	San Bruno Shoal Channel Lt. 4, 1977
206	0	37 45 49066 <sup>7</sup>	122 16 53587 <sup>8</sup>	139	0000	000000	PHP, 1979	Ballena Bay Light 1, 1979
208	0	37 40 10827 <sup>9</sup>	122 19 30478 <sup>4</sup>	139	0000	000000	PPP, 1977	San Bruno Shoal Channel Lt. 3, 1977
210	0	37 45 54676	122 12 50885	139	0000	000000	Q-3712211 #1072	Oakland P.G.&E. 50th Avenue Gas holder, 1947
212	0	37 42 4508 <sup>20</sup>	122 12 47900 <sup>3</sup>	243	0000	000000	Photo TP-00535 76-40	Oakland International Airport Control Tower
214	0	37 48 28399 <sup>405</sup>	122 11 52784	139	0000	000000	PPP, 1977	Oakland, Merman Temple Spire, 1977

PPP - Pacific Photo Party

PHP - Pacific Hydrographic Party



OCEANOGRAPHIC LOG SHEET - M  
BOTTOM SEDIMENT DATA

U.S. DEPARTMENT OF COMMERCE  
NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION

VESSEL		PROJ. NO.		YEAR		Hydrographic Survey H-9869						CHECKED BY		DATE CHECKED	
NOAA Launch 1016		L123-PHP-80		1980											
SERIAL NO.	DATE	SAMPLE POSITION		DEPTH (Feet)	WEIGHT OF SAM- PLER	AP- PROX. TRA- TION	LENGTH OF CORE	COLOR SEDI- MENT	FIELD DESCRIPTION	REMARKS <small>(Unusual conditions, coherence, density, cutter, stat. no., type of bottom relief, etc.)</small>	OBS. INIT.				
		NORTH ITUDE	LONGI- TITUDE West												
9000	Julian 114	37/41	122/15	12.2	5#	6"	N/A	gy gn	M, S	Tube Worms					
9001	114	37/41	122/14	07.3				gy gn	M, S, Sh						
9002	114	37/41	122/13	11.4						No Sample-Hard Bottom					
9003	114	37/41	122/11	04.0				gy gn	M						
9004	115	37/43	122/15	02.5				wh							
9005	115	47.526	43.668					br bk	Wd, Sh, M, fine S						
9006	115	37/43	122/16	10.6				wh							
9007	115	18.810	13.293					bk vi	fine S, Wd						
9008	115	37/43	122/15	09.4				gy	fine M, S, Sh	Mussel Shells					
9009	115	14.965	12.897					gn							
9010	115	37/42	122/14	08.7				gn wh	fine M, S, Sh	Mussel Shells					
9011	115	43.915	44.214					gn wh							
9012	115	37/42	122/15	10.7				gy							
9013	115	44.658	44.430					gn wh	<del>fine</del> M, Cl, Sh	Mussel Shells					
9014	115	37/42	122/16	10.3				gy	M, Cl	Tube Worms					
9015	115	16.703	11.225					gn							
9016	115	37/42	122/15	12.0				gy							
9017	115	15.707	14.365					gn wh	fine M, Cl, Sh	Re tested					
9018	115	37/41	122/16	11.7				gy gn							
9019	115	12.656	10.436					br wh	Cl, M, Sh	Re tested					
9020	120	37/41	122/15	12.0				gy	M, Cl						
9021	120	11.176	13.196					gn							
9022	120	37/41	122/14	10.2				gy	M, Cl, Sh	Tube Worms					
9023	120	16.248	14.088					gn							
9024	120	37/41	122/13	07.4				gy	M, Cl, Sh						
9025	120	13.335	15.079					gn							
9026	120	37/41	122/12	05.2				gy	M, Sh	Animal Life					
9027	120	14.287	16.025					gn							
9028	120	37/40	122/11	05.9				gy	M, Sh						
9029	120	44.170	45.643					gn							

Use more than one line per sample if necessary.

OCEANOGRAPHIC LOG SHEET - M  
BOTTOM SEDIMENT DATA

U.S. DEPARTMENT OF COMMERCE  
NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION

VESSEL		PROJ. NO.		YEAR		CHECKED BY		DATE CHECKED			
NOAA Launch 1016		L123-PHP-80		1980		Hydrographic Survey H-9869					
SERIAL NO.	DATE	SAMPLE POSITION		DEPTH (Fathoms) Feet	WEIGHT OF SAM- PLER	AP- PROX- TRA- TION	LENGTH OF CORE	COLOR OF SEDI- MENT	FIELD DESCRIPTION	REMARKS  (Unusual conditions, coherence, dented cutter, stat. no., type of bottom relief i.e., slope, plain, deposition, etc.)	OBS. INIT.
		LATITUDE North	LONGITUDE West								
9017	120	37/40	122/10	06.0	5#	6"	N/A	gy	M, Sh	Mussels	
9018	120	37/40	122/12	08.3				gy	M, Sh		
9019	120	37/40	122/13	10.7				gn br	fne S, Cl, Sh	Tube Worms	
9020	120	37/40	122/14	12.6				gn	M, Sh		
9021	120	37/40	122/15	15.6				gn	M, Sh	Tube Worms	
9022	120	37/40	122/16	20.6				gn	M	Plant Roots, Pink Bug	
9023	120	37/40	122/15	18.8				gy	M, Cl, Sh	Tube Worms	
9024	120	37/40	122/14	13.8				gn br	M, Cl, Sh	Mussels	
9025	120	37/40	122/13	10.6				gn br	M, Cl, Sh	Mussels	
9026	120	37/40	122/12	08.6				gy	M, Cl, Sh	Mussels	
9027	120	37/40	122/10	05.0				gn br	M, Cl, Sh		
9030	122	37/41	122/12	08.6				gn	M, Sh	Tube Worms	
9031	122	37/41	122/11	05.8				gn	M, Grs		
9033	122	37/41	122/11	06.1				gn	M, Sh, Grs		
9034	122	37/41	122/11	01.7				gn	M, Sh, Grs		
9035	122	37/41	122/11	03.3				gn	M, Sh		
9036	122	37/42	122/14	03.0				gn	M, Sh		

Use more than one line per sample if necessary.



		RESPONSIBLE PERSONNEL	
TYPE OF ACTION	NAME	ORIGINATOR	
OBJECTS INSPECTED FROM SEAWARD		<input type="checkbox"/> PHOTO FIELD PARTY	<input type="checkbox"/> HYDROGRAPHIC PARTY
		<input type="checkbox"/> GEODETIC PARTY	<input type="checkbox"/> OTHER (Specify)
POSITIONS DETERMINED AND/OR VERIFIED		FIELD ACTIVITY REPRESENTATIVE	
		OFFICE ACTIVITY REPRESENTATIVE	
FORMS ORIGINATED BY QUALITY CONTROL AND REVIEW GROUP AND FINAL REVIEW ACTIVITIES		<input type="checkbox"/> REVIEWER	<input type="checkbox"/> QUALITY CONTROL AND REVIEW GROUP REPRESENTATIVE
INSTRUCTIONS FOR ENTRIES UNDER 'METHOD AND DATE OF LOCATION'			
(Consult Photogrammetric Instructions No. 64.)			
OFFICE	OFFICE IDENTIFIED AND LOCATED OBJECTS	FIELD (Cont'd)	
	Enter the number and date (including month, day, and year) of the photograph used to identify and locate the object. EXAMPLE: 75E(C)6042 8-12-75	B. Photogrammetric field positions* require entry of method of location or verification, date of field work and number of the photograph used to locate or identify the object. EXAMPLE: P-8-V 8-12-75 74L(C)2982	
FIELD	I. NEW POSITION DETERMINED OR VERIFIED	II. TRIANGULATION STATION RECOVERED	
	Enter the applicable data by symbols as follows: F - Field L - Located V - Verified 1 - Triangulation 2 - Traverse 3 - Intersection 4 - Resection A. Field positions* require entry of method of location and date of field work. EXAMPLE: F-2-6-L 8-12-75	When a landmark or aid which is also a triangulation station is recovered, enter 'Triang. Rec.' with date of recovery. EXAMPLE: Triang. Rec. 8-12-75	
		III. POSITION VERIFIED VISUALLY ON PHOTOGRAPH	
		Enter 'V-Vis.' and date. EXAMPLE: V-Vis. 8-12-75	
	*FIELD POSITIONS are determined by field observations based entirely upon ground survey methods.	**PHOTOGAMMETRIC FIELD POSITIONS are dependent entirely, or in part, upon control established by photogrammetric methods.	

NOAA FORM 76-40 (8-74)

SUPERSEDES NOAA FORM 76-40 (2-71) WHICH IS OBSOLETE, AND EXISTING STOCK SHOULD BE DESTROYED UPON RECEIPT OF REVISION.

\* U.S. GOVERNMENT PRINTING OFFICE: 1974-665-073/1030 Region 6

NONFLOATING AIDS

U.S. DEPARTMENT OF COMMERCE  
NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION  
FOR CHARTS

Replaces CGCS Form 567.

TO BE CHARTED  
 TO BE REVISED  
 TO BE DELETED

REPORTING UNIT: Pacific Party, Ship or Office: PNC, Seattle, WA

STATE: CA

LOCALITY: San Francisco Bay

DATE: 7/29/80

ORIGINATING ACTIVITY:  
 HYDROGRAPHIC PARTY  
 GEODETIC PARTY  
 PHOTO FIELD PARTY  
 COMPILATION ACTIVITY  
 FINAL REVIEWER  
 QUALITY CONTROL & REVIEW GRP.  
 COAST PILOT BRANCH

The following objects HAVE  HAVE NOT  been inspected from seaward to determine their value as landmarks.

OPR PROJECT NO. CM-7704

JOB NUMBER TP-00535

SURVEY NUMBER

DATUM: NA 1927

CHARTING NAME	DESCRIPTION <i>(Record reason for deletion of landmark or aid to navigation. Show triangulation station names, where applicable, in parentheses.)</i>	LATITUDE		LONGITUDE		METHOD AND DATE OF LOCATION <i>(See instructions on reverse side)</i>	OFFICE	FIELD	CHARTS AFFECTED
		D.M. Meters	//	D.P. Meters	//				
LIGHT (Horn)	* Light 1	37	40	122	13	Beyond photo limits.		F-Raydist-L	18651 18652
LIGHT	* Light 2	37	40	122	13	Beyond photo limits		F-Raydist-L	"
DAYBEACON	* Daybeacon 4	37	40	122	12	Not visible on photos		F-Raydist-L	"
DAYBEACON	* Daybeacon 5	37	40	122	12	"		F-Raydist-L	"
DAYBEACON	* Daybeacon 6	37	40	122	12	"		F-Raydist-L	"
DAYBEACON	* Daybeacon 7	37	40	122	12	"		F-Raydist-L	"
DAYBEACON	* Daybeacon 8	37	40	122	12	"		F-Raydist-L	"
DAYBEACON	* Daybeacon 9	37	41	122	12	"		F-Raydist-L	"

LANDMARKS FOR CHARTS

NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION  
U.S. DEPARTMENT OF COMMERCE

ORIGINATING ACTIVITY

- HYDROGRAPHIC PARTY
  - GEODETIC PARTY
  - PHOTO FIELD PARTY
  - COMPILATION ACTIVITY
  - FINAL REVIEWER
  - QUALITY CONTROL & REVIEW GRP.
  - COAST PILOT BRANCH
- (See reverse for responsible personnel)

Replaces C&GS Form 567.

TO BE CHARTED  
 TO BE REVISED  
 TO BE DELETED

REPORTING UNIT  
(Field Party, Ship or Office)  
Pacific Hydro Party  
PNC, Seattle, WA

STATE  
CA

LOCALITY  
San Francisco Bay

DATE  
7/29/80

The following objects HAVE  BEEN INSPECTED FROM SEAWARD TO DETERMINE THEIR VALUE AS LANDMARKS.  
OPR PROJECT NO. \_\_\_\_\_

JOB NUMBER  
CM-7704

SURVEY NUMBER  
TP-00535

DATUM  
NA 1927

METHOD AND DATE OF LOCATION  
(See instructions on reverse side)

CHARTS  
AFFECTED

CHARTING NAME	DESCRIPTION (Record reason for deletion of landmark or aid to navigation. Show triangulation station name, where applicable, in parentheses)	POSITION			OFFICE	FIELD	CHARTS AFFECTED
		LATITUDE	LONGITUDE	DATUM			
		° /	° /	NA 1927			
		D.M. Meters	D.P. Meters				
CONTROL TOWER	Metropolitan Oakland Int. Airport Control Tower	37 42	122 12	47.93 / 1388	77B(P) 3708	V-Vis 5/21/80	18651 18652
-FANK	(Hayward California Home Brand Fank, 1931)	37 40	122 06	03.187 / 98.2	77B(P) 2653	Triang. Rec. 5/21/80	"
RADIO POWER	S.W. of four (KFAK)	37 37	122 07	54.59 / 1603	77B(P) 3712	V-Vis 5/22/80	"
AERO ROT W&G	Hayward Airport Rotating Beacon	37 39	122 07	45.71 / 1409		F-4-6-L 6/4/80	"
SURGE TOWER	Red clearance light atop square surge tower (20ft. sides, height 65 ft.) on pump house at ORO LOMA Sewage Treatment Plant. New landmark recommended by field editor.	37 40	122 09	03.48 / 107		F-4-6-L 6/12/80	"

### NONFLOATING AIDS

NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION  
**FOR CHARTS**

U.S. DEPARTMENT OF COMMERCE

Replaces C&GS Form 567.

TO BE CHARTED  
 TO BE REVISED  
 TO BE DELETED

REPORTING UNIT  
*(Field Party, Ship, or Office)*  
 Pacific Hydro Party  
 PMC, Seattle, WA

STATE  
CA

LOCALITY  
San Francisco Bay

DATE  
7/29/80

The following objects HAVE  HAVE NOT  been inspected from seaward to determine their value as landmarks.

ORIGINATING ACTIVITY  
 HYDROGRAPHIC PARTY  
 GEODETIC PARTY  
 PHOTO FIELD PARTY  
 COMPILATION ACTIVITY  
 FINAL REVIEWER  
 QUALITY CONTROL & REVIEW GRP.  
 COAST PILOT BRANCH  
*(See reverse for responsible personnel)*

OPR PROJECT NO. JOB NUMBER SURVEY NUMBER  
 CM-7704 TP-00535

DATUM NA 1927  
 POSITION

METHOD AND DATE OF LOCATION  
*(See instructions on reverse side)*

CHARTS AFFECTED

CHARTING NAME	DESCRIPTION <i>(Record reason for deletion of landmark or aid to navigation. Show triangulation station names, where applicable, in parentheses)</i>	LATITUDE		LONGITUDE		OFFICE	FIELD	CHARTS AFFECTED
		° /	// D.M. Meters	° /	// D.P. Meters			
DAYBEACON	San Leandro Marina Daybeacon 12	37	41	122	11	Not visible on photos	F-4-8-L 5/16/80	18651 18652

NONFLOATING AIDS

NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION  
FOR CHARTS

U.S. DEPARTMENT OF COMMERCE

Replaces CGGS Form 567.

REPORTING UNIT (Field Party, Ship or Office)  
Pacific Hydro Party  
P.M.C., Seattle, WA  
STATE  
CA  
LOCALITY  
San Francisco Bay  
DATE  
7/29/80

ORIGINATING ACTIVITY  
 HYDROGRAPHIC PARTY  
 GEODETIC PARTY  
 PHOTO FIELD PARTY  
 COMPILATION ACTIVITY  
 FINAL REVIEWER  
 QUALITY CONTROL AND REVIEW GRP.  
 COAST PILOT BRANCH  
(See reverse for responsible personnel).

TO BE CHARTED  
 TO BE REVISED  
 TO BE DELETED  
The following objects HAVE  HAVE NOT  been inspected from seaward to determine their value as landmarks.

OPR PROJECT NO. CM-7704  
JOB NUMBER  
SURVEY NUMBER TP-00535

NA 1927  
DATUM

METHOD AND DATE OF LOCATION  
(See instructions on reverse side)

CHARTS AFFECTED

CHARTING NAME	DESCRIPTION (Record reason for deletion of landmark or aid to navigation. Show triangulation station names, where applicable, in parentheses)	POSITION		METHOD AND DATE OF LOCATION (See instructions on reverse side)	FIELD	CHARTS AFFECTED
		LATITUDE D.M. Meters	LONGITUDE D.P. Meters			
DAYBEACON *	San Leandro Marina					
DAYBEACON *	Daybeacon 10	37 41	122 12	Not visible on photos	F-Raydist-L	18651
DAYBEACON *	Daybeacon 13	37 41	122 11	"	F-Raydist-L	18652
DAYBEACON *	Daybeacon 14	37 41	122 11	"	F-Raydist-L	"
DAYBEACON	Daybeacon 15, located photogrammetrically from 1977 compilation photos and position confirmed by May 1981 photos.	37 41	122 11	77B(P)3710	Not verified	"
LIGHT	Range Front Light	37 41	122 11	77B(P)3709	V-Vis (Field sketch)	"
LIGHT	Range Rear Light	37 41	122 11	Not visible on photos	F-4-8-L	"
DAYBEACON	Daybeacon 3	37 40	122 13	"	F-4-8-L	"
DAYBEACON	Daybeacon 11	37 41	122 11	"	F-4-8-L	"



APPROVAL SHEET

HYDROGRAPHIC SURVEY H-9869

PHP-10-1-80

OPR-L123-PHP-80

The field records and data were inspected and approved on a daily basis by the Chief of Party. This survey is complete and adequate to supersede prior surveys for charting purposes.

*Dirk R Taylor*

Dirk R. Taylor  
LCDR. NOAA  
Chief of Party

## HYDROGRAPHIC SURVEY STATISTICS

H-9869

RECORDS ACCOMPANYING SURVEY: To be completed when survey is registered.

RECORD DESCRIPTION		AMOUNT	RECORD DESCRIPTION		AMOUNT	
SMOOTH SHEET		1	BOAT SHEETS & PRELIMINARY OVERLAYS		2	
DESCRIPTIVE REPORT		1	SMOOTH OVERLAYS: POS. ARC, EXCESS		6	
DESCRIP- TION	DEPTH RECORDS	HORIZ. CONT. RECORDS	PRINTOUTS	TAPE ROLLS	PUNCHED CARDS	ABSTRACTS/ SOURCE DOCUMENTS
ENVELOPES						
CAHIERS	1					
VOLUMES						
BOXES			1			

T-SHEET PRINTS (List) TP-00532, TP-00533, TP-00534(2 of 4), TP-00535

SPECIAL REPORTS (List)

## OFFICE PROCESSING ACTIVITIES

The following statistics will be submitted with the cartographer's report on the survey

PROCESSING ACTIVITY	AMOUNTS		
	PRE- VERIFICATION	VERIFICATION	TOTALS
POSITIONS ON SHEET			2776
POSITIONS CHECKED		2776	
POSITIONS REVISED		951	
SOUNDINGS REVISED		326	
SOUNDINGS ERRONEOUSLY SPACED		--	
SIGNALS (CONTROL) ERRONEOUSLY PLOTTED		--	
	TIME - HOURS		
CRITIQUE OF FIELD DATA PACKAGE (PRE-VERIFICATION)	6	*(VER)/(EVAL)	
VERIFICATION OF CONTROL		03/04	07
VERIFICATION OF POSITIONS		54/00	54
VERIFICATION OF SOUNDINGS		207/01	208
COMPILATION OF SMOOTH SHEET		88/04	92
APPLICATION OF TOPOGRAPHY		10/02	12
APPLICATION OF PHOTOBATHYMETRY		00/00	00
JUNCTIONS		12/05	17
COMPARISON WITH PRIOR SURVEYS & CHARTS		08/16	24
VERIFIER'S REPORT		03/50	61
OTHER Familiarization		00/08	
TOTALS	6	385/90	475
Pre-Verification by James S. Green	Beginning Date 12/18/80	Ending Date 12/18/80	
Verification by K.M. Scott, R.A. Shipley	Evaluation by B. A. Olmstead	Beginning Date 2/26/83	Ending Date 7/21/83
Verification Check by J. L. Stringham, J. S. Green	Time (Hours) 39	Date 12/27/83	
Marine Center Inspection by MOP 21 Review	Time (Hours) 6	Date 2/10/84	
Quality Control Inspection by	Time (Hours)	Date	
Requirements Evaluation by	Time (Hours)	Date	

\*Time in this column is for Verification (VER) and Evaluation (EVAL)

PACIFIC MARINE CENTER  
EVALUATION REPORT

REGISTRY NO: H-9869

FIELD NO: PHP-10-1-80

California, San Francisco Bay, San Leandro

SURVEYED: March 26 - May 1, 1980

SCALE: 1:10,000

PROJECT NO: OPR-L123-PHP-80

SOUNDINGS: Ross Fineline Fathometer  
Feet

CONTROL: Range-Range/  
Teledyne Hastings Raydist

Chief of Party.....LCDR D. R. Taylor

Surveyed By.....LCDR D. R. Taylor  
LTJG D. D. Smith  
Mr. F. L. Rosario

Automated Plot By.....PMC Xynetics Plotter

Verified By.....K. M. Scott  
R. A. Shipley

Evaluated By.....B. A. Olmstead

1. INTRODUCTION

H-9869 (PHP-10-1-80) is a basic survey conducted under the current National Ocean Service methods of planning, executing and processing a hydrographic survey as defined in the Hydrographic Manual, 4th Edition. The PMC OORDER and the Data Requirements Letter for 1979 further define field procedures. Project Instructions OPR-L123-PHP-79, San Francisco Bay, California, dated February 22, 1979 were generated to supplement the Hydrographic Manual. Two supplements to instructions were appended for the 1980 field work; Change 1 dated November 27, 1979 and Change 2 dated May 15, 1980. Change 2 was issued to the field subsequent to the completion of this survey.

H-9869 (PHP-10-1-80), a harbor survey, is centered approximately 7.5 miles east of San Francisco. Hydrographic and field edit operations encompass the shoreline from Roberts Landing north to Oakland International Airport, and extends offshore from one to six miles. Situated within the survey area is San Leandro Marina and connecting channel. A 1:5,000 inset of San Leandro Marina was plotted to adequately depict soundings and shoreline detail. This data was gathered using "see boatsheet methods" and subsequently converted to pseudo Raydist measurements.

Two temporary ADR tide gages, San Leandro and Oyster Point, were installed and operating during the field work. The tidal data collected by these gages was employed to zone the survey for office reduction of soundings. Field tide reduction of soundings was based on predictions from San Francisco, California, with corrections for time and range ratios.

Sounding differences of one-half to one foot between the final field sheet and the smooth sheet are attributed to the application of approved tidal zoning and the incorporation of settlement and squat. Greater differences are found on the northern extremities of the field work and along Bay Farm Island approximately 100 meters offshore. Here, dredging operations have created a very irregular bottom configuration. Sounding data in these anomalous areas were selected to best represent the shoals and deeps.

The projection parameters, signal list, velocity table and electronic correctors were amended during the verification process. All corrected data is listed in the smooth printouts to accompany the smooth sheet.

## II. CONTROL AND SHORELINE

Two new horizontal control stations were established in accordance with Third Order, Class I geodetic standards. Existing stations (recovered marks, intersection points) incorporated into the control net were confirmed and minor adjustments made to the geographic positions.

The present survey utilized two control stations for all hydrographic operations. Four additional stations were used for calibration points and objects for check angles. Three of these stations are located beyond the sheet limits (San Bruno Shoal Light 3, 1977; San Bruno Shoal Light 4, 1977; Ballena Bay Light 1, 1979). The Teledyne Hastings Raydist System was configured in a range-range mode to determine positional data during launch operations. Corrections to positional data were determined by daily calibrations using fixed points. All remaining information affecting the positioning and station control of this survey is listed in paragraphs F and G of the ship's Descriptive Report, the Horizontal Control Report and the Electronic Control Report for OPR-L123-PHP-80. Refer to letter N/MOP222 (attached), Computers Addendum to Horizontal Control Report, dated January 18, 1983 for additional information concerning field procedures.

The smooth sheet was plotted using preliminary adjusted field positions.

The mean high water line and other photogrammetrically determined features were applied from reviewed manuscripts. Several revisions and updated compilations of shoreline manuscripts occurred throughout the processing of the present survey. Refer to letters OA/CAM52x1, Coastal Mapping, Final Review AMC, dated April 30, 1982 and May 28, 1982 (copies attached).

<u>Dates of Photography</u>	<u>Dates of Field Edit</u>	<u>Reviewed</u>
TP-00532 March 1977	April 1980	February 1982
TP-00533 March 1977	September 1980	February 1982
TP-00534 March 1977	October 1980	April 1982
TP-00535 March 1977	August 1980	April 1982

### 3. HYDROGRAPHY

Depths at crossings are in good agreement.

The bottom configuration was adequately developed. Generally, all standard depth curves are complete and satisfactorily defined. Least depths were adequately determined except the following shoal soundings were not developed.

	<u>Latitude</u>	<u>Longitude</u>
a. 3 foot sounding	37°44'02"N	122°15'19.5"W
b. 5 foot sounding	37°44'05.5"N	122°16'05"W
c. 3 foot sounding	37°43'49"N	122°15'32.5"W
d. 0 foot sounding	37°43'56.5"N	122°15'22"W
e. 5 foot sounding	37°44'06"N	122°16'02"W
f. 1 foot sounding	37°43'59.9"N	122°15'25.5"W

These soundings on the northern limits of the smooth sheet are in an area of dredging and indicative of a very irregular bottom. As dredging activity (borrowing and filling) appears to be still occurring in this area, additional field work is not recommended at this time.

The Raydist positioning system (range-range) for this survey is approximately 10-15 meters in error. This error is confirmed by the conflicts between positions and the Class I reviewed shoreline manuscripts and further documented in a letter dated April 30, 1982 from OA/CAM52x1, Coastal Mapping, AMC (copy attached). Although this error approaches the maximum acceptable standards for a hydrographic survey (seldom to exceed 1.5mm at survey scale), it has been accepted since there is a sparsity of specific hydrographic positioned features charted in the area of this survey.

Numerous soundings along built-up cultural features were displaced to maintain legibility.

### 4. CONDITION OF SURVEY

The hydrographic records and reports are adequate and conform to the requirements of the Hydrographic Manual of July 4, 1976 with the following exceptions:

a. The final field sheets were returned to the Pacific Hydrographic Party for shoreline application and resolution of Mean High Water Line conflicts near San Leandro Marina. PHP returned the survey with shoreline compiled in blue (unverified).

b. Raydist positioning methods (range-range) to accurately locate fixed aids to navigation are not acceptable. Field work conducted (1980) in San Francisco Bay near San Leandro employed a Teledyne Raydist positioning system in the range-range mode. This system, though reasonably accurate for hydrographic surveying, does not meet basic accuracy requirements specified for fixed aids. As such, a recommendation to field relocate these aids was made in April 1982 and subsequently accomplished.

c. One information item from Presurvey Review OPR-L123-DA-79, San Francisco Bay, was not addressed by the hydrographer either in the Descriptive Report or graphically on the final field sheet. The item is eight concrete piles grouped in a 15-meter square charted at latitude  $37^{\circ}40'12''N$ , longitude  $122^{\circ}11'31''W$  and originates from T-4610 (1930-31). The continued existence of these features was confirmed by the shoreline manuscript and through Chart Evaluation Survey 18651 (item 32). The Class I reviewed shoreline manuscript TP-00532 was used to depict a dashed limit line foul with concrete piling on the smooth sheet.

d. The ship's Descriptive Report did not discuss the junction with H-9844 (PHP-10-2-79/81). Additionally, the junction with H-9819 (PHP-10-1-79) above latitude  $37^{\circ}43'00''N$  was not covered. The common junctional area between these three contemporary surveys is situated in an area of dredging activity. Here, standard depth curves on the final field sheets were not made in agreement and shoaler in-between soundings were not scanned to accurately reflect the irregularity of the bottom. This information was considered and the smooth sheet compiled to effect adequate junctions.

e. Channel areas should have been better defined. The Hydrographic Manual, section 4.3.5.4 specifically states that "after the limits of a channel have been established, the channel must be developed by a system of closely spaced lines approximately parallel to its axis". Deficiencies in the survey are as follows:

(1) Between San Leandro Marina Daybeacons 14 and 15 to San Leandro Marina Range Front Light.

(2) From San Leandro Marina Daybeacon 12 into Estudillo Canal.

f. The charted pipeline area extending west from latitude  $37^{\circ}42'00''N$  longitude  $122^{\circ}13'00''W$  was not confirmed by survey data nor was it addressed in the Descriptive Report. As a charted feature, it should be found or confirmed by survey data or its disposition for future charting addressed in section L, Comparison with the Chart. *CL 14/67 indicates pipeline is buried 4 ft (min.) below the bay bottom. RWD 10/84*

## 5. JUNCTIONS

H-9869 (PHP-10-1-80) is bordered by three contemporary surveys:

a. H-9872 (PHP-10-2-80) - This survey joins approximately at latitude  $37^{\circ}40'00''N$ , from longitude  $122^{\circ}10'00''W$  to longitude  $122^{\circ}16'30''W$ . Adequate agreement was made with all standard depth curves. The junctional note is inked accordingly.

b. H-9844 (PHP-10-2-79/81) - The common area of hydrography with this junctional sheet lies in the extreme northern limits of the present survey at latitude  $37^{\circ}44'00''N$ , from longitude  $122^{\circ}15'20''W$  to longitude  $122^{\circ}16'20''W$ . Adequate agreement was made with all standard depth curves. The junctional note is inked accordingly.

c. H-9819 (PHP-10-1-79) - This survey joins approximately at longitude 122°16'20"W, from latitude 37°40'00"N to latitude 37°44'07"N. Adequate agreement was made with all standard depth curves. The junctional note is inked accordingly.

#### 6. COMPARISON WITH PRIOR SURVEYS

H-8024 (1954) 1:10,000  
H-8027 (1955-56) 1:20,000

A comparison with these prior surveys reveals that soundings have generally deepened by 1-3 feet. However, the areas of dredging activity along Bay Farm Island and the northern limits of the present survey, reveal an increase in depths of thirty-eight feet since 1954. Shoreline along Bay Farm Island has been extended seaward approximately 400 to 2,000 meters. Additionally, a new small boat channel has been dredged to a marina constructed near San Leandro. Here, present survey depths are approximately five to eight feet deeper. Shoreline south of latitude 37°41'30"N has remained relatively stable.

There were no numbered presurvey review items.

H-9869 (PHP-10-1-80) is adequate to supersede the prior surveys within the common areas.

#### 7. COMPARISON WITH CHART

a. Hydrography - A comparison was made with Chart 18651, 29th Edition, August 12, 1978 and Chart 18650, 34th Edition, May 5, 1978. The charted information originates primarily with the previously discussed prior surveys and unknown sources. The following items were not found or disproven. The chart compiler should retain these features for charting unless additional information is available for supersession.

(1) A 10-inch steel petroleum products pipeline completed in 1966 (Reference: Chart Letter 14/1967), is not confirmed by survey data. It should continue to be charted from the existing source. See para. 4.F.

(2) The three piles charted at latitude 37°41'36"N, longitude 122°11'12"W originate from an unknown source. The hydrographer did not address these charted features. Two piles transferred from TP-00535 to the smooth sheet approximately 80 meters northwest of the charted position may be part of the charted feature; however, the evaluator has no information with which to determine the quality of the charted position. It is recommended that the source of the charted feature be determined and a charting disposition be based on the compiler's assessment of charted position quality. Source of piles; COE, CL 272/75

(3) The southeast portion of the Borrow Area charted on 18650, latitude 37°44'00"N, longitude 122°15'58"W should be extended south and east to include the additional dredged areas found on this survey. In addition, a warning note alerting chart users of the potential for uncharted shoal data in the fringe areas when dredging operations occur should be added.

The area covered by this survey was examined for additional dangers. Because of the age of this survey, the dangers to navigation identified in the survey area were cross-referenced with the Marine Chart Branch (N/CG22) and were found to be superseded by later information. Therefore, a Danger to Navigation Report for this survey has not been generated.

With consideration of the above items, the present survey is adequate to supersede the charted hydrography within the common area.

b. Controlling Depths - The present survey soundings confirm the tabulated controlling depths within the common area. Exceptions are as follows:

	<u>Survey Depth</u>	<u>Charted Controlling Depth</u>	<u>Latitude</u>	<u>Longitude</u>
(1)	0 foot sounding	2 ft.	37°41'42.5"N✓	122°11'30"W✓
(2)	0.5 foot sounding	3 ft.	37°41'42"N✓	122°11'19"W✓
(3)	1 foot sounding	4 ft.	37°41'41"N✓	122°11'18"W✓
(4)	3 foot sounding	4 ft.	37°41'38"N✓	122°11'15"W✓

The right edge of San Leandro Channel from Daybeacon 8 to Daybeacon 12 appears to have shoaled. Several present survey soundings that fall between these fixed aids are less than the controlling depth of 3-5 feet at MLLW.

c. Aids to Navigation - There is one floating aid and seventeen fixed aids to navigation (13 daybeacons, 4 fixed lights) within the sheet limits. These structures were compared to the charted positions and adequately serve the purpose intended.

#### 8. COMPLIANCE WITH INSTRUCTIONS

H-9869 (PHP-10-1-80) adequately complies with the project instructions except as noted in section 4, Condition of Survey.

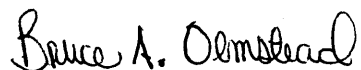
#### 9. ADDITIONAL FIELD WORK

H-9869 (PHP-10-1-80) is an adequate basic survey. Additional field work is recommended concerning the three piles discussed in Section 7, item 2. As



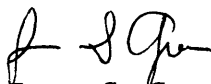
discussed in paragraph Q, Recommendations, of the ship's Descriptive Report, piles removed subsequent to the completion of this survey should be disproved by wire drag or divers investigation.

Respectfully submitted,



Bruce A. Olmstead  
Evaluator

This survey has been verified and evaluated. I have examined the survey and it meets Charting and Geodetic Services survey standards and requirements for use in nautical charting except as noted in the Evaluation Report. The survey is recommended for approval.



James S. Green  
Supervisory Cartographer



U.S. DEPARTMENT OF COMMERCE  
National Oceanic and Atmospheric Administration  
NATIONAL OCEAN SURVEY

April 30, 1982

TO: OA/C322, Norman E. Banks  
Chart Information Branch

THRU: OA/CAM52, Billy H. Barnes *Billy H. Barnes*  
Chief, Coastal Mapping Branch, AMC

FROM: OA/CAM52x1, Jerry L. Hancock *J.L.H.*  
Coastal Mapping, Final Review, AMC

SUBJECT: Cover page to accompany 76-40 forms, Nonfloating Aids and  
Landmarks for Charts, Proj. CM-7704, TP-00535, San Francisco  
Bay, Ca.

Field investigation for all fixed aids to navigation and landmarks was performed in July 1980 by the Pacific Hydrographic Party stationed in San Francisco Bay.

The majority (11) of nonfloating aids marking the entrance to San Leandro Marina were located by the hydrographic method known as Raydist/Hydrolog positioning system. These detached positions do not meet basic accuracy requirements specified for fixed aids; however, the positions generally agree with the currently charted positions. Due to registration priorities for this map, all Raydist located aids were reluctantly compiled as position approximate in order that we may accomodate Marine Charts at this time. A recommendation has been relayed to the Hydrographic Processing Division, PMC to field relocate these aids so precise positional data can be applied to the corresponding hydrographic survey (H-9869, 1981) which will succeed this shoreline map.

One new landmark was recommended by the field editor for addition to the charts. This feature is a Surge Tower which has a red clearance light atop a square structure with 20 Ft. sides. The tower is 65 Ft. tall and is built on the pumphouse of the Oro Loma Sewage Treatment Plant.

C C:  
OA/C3421  
OA/CPM32



# 9869



**RECEIVED**  
MAY 07 1982

U.S. DEPARTMENT OF ~~PROCESSING~~ DIVISION  
National Oceanic and Atmospheric Administration  
NATIONAL OCEAN SURVEY

April 30, 1982

TO: OA/CPM3, Cdr. John W. Carpenter  
Chief, Processing Division, PMC

THRU: OA/CAM52, Billy H. Barnes *Billy H. Barnes*  
Chief, Coastal Mapping Branch, AMC

FROM: OA/CAM52x1, Jerry L. Hancock *J.L.H.*  
Coastal Mapping, Final Review, AMC

SUBJECT: Nonfloating Aids to Navigation, Proj. CM-7704, TP-00535,  
H-9869 (1981), San Francisco Bay, Ca.

Attached is a copy of the final 76-40 forms, Nonfloating Aids or Landmarks for Charts, as submitted from Coastal Mapping, Final Review, to the Marine Charts Division. The explanation, as addressed to Marine Charts, indicates the method of location for the fixed aids at San Leandro Marina channel entrance. This was necessary because the hydrographic (Raydist) detached positions, submitted as field edit data for TP-00535, do not agree with unverified photo positions observed from May 1981 aerial photographs. Because the altitude of this photography is excessively high (20,000 Ft.) and offshore horizontal photo control is limited, definite photo locations could not be achieved. However, there is enough photo evidence to indicate a 5 to 15 meter error in the Raydist determinations.

It is recommended that the aids listed as Raydist located be re-determined by field survey methods and be applied to the corresponding Hydrographic Survey (H-9869) now awaiting final processing in the Verification Branch, PMC.

CC:  
OA/C3421  
OA/CPM32



17-9809



U.S. DEPARTMENT OF COMMERCE  
National Oceanic and Atmospheric Administration  
National Ocean Service  
Pacific Marine Center  
1801 Fairview Avenue East  
Seattle, Washington 98102

January 18, 1983

N/MOP222-RBM

TO: N/CG164

FROM: N/MOP222 - R. B. Melby *R. B. Melby*

SUBJECT: PMC Computers' Addendum to Horizontal Control Report, Project  
OPR L123 PHP, 1979, 1980, 1981, 1982, San Francisco, California  
TSN 410-630

This report covers several years of field work. The field work was the continuation of the same basic project, so the field data was processed through the telephone data terminal as yearly projects. This report will cover the combined projects as one.

The project was the result of the field work as performed by the Pacific Marine Center Hydrographic Party in the southern part of San Francisco Bay to support hydrographic surveys.

Third order, Class I horizontal control methods were generally employed.

Considerable reprocessing was required of the field info at the Pacific Marine Center to permit its entry and recomputation through the telephone data terminal. Some of the stations were located by the eccentric resection method. The final positions at the involved stations were listed as no-check position, due to field procedure.

Due to the size of the project and the number of observations involved, several ADJNET programs were required to process all of the field positions. FILL (TEMP) indicated an excessive adjustment.

Horizontal and vertical observations that would not compute or properly adjust were deleted before the final ADJNET program was run.

The horizontal directions to the references marks at station DEL MONTE were not observed in the field.

A thorough review is recommended at all the field positions and their methods of location prior to any final office adjustment and subsequent publication.

Summary: The field data was processed through a telephone data terminal to the NGS Headquarters in Rockville, Maryland.



ATTACHMENT TO DESCRIPTIVE REPORT FOR H-9869

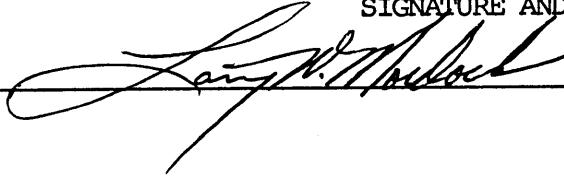
I have reviewed the smooth sheet, accompanying data, and reports of this hydrographic survey. Except as noted in the Evaluation Report, the hydrographic survey meets or exceeds Charting and Geodetic Services (C&GS) standards, complies with instructions, and is accurately and completely represented by the smooth sheet and digital data file for use in nautical charting.

 2/28/84  
Chief, Nautical Chart Branch (Date)

CLEARANCE:

N/MOP2:LWMordock

SIGNATURE AND DATE:

 2/29/84

After review of the smooth sheet and accompanying reports, I hereby certify this survey is accurate, complete, and meets appropriate standards with only the exceptions as noted above. The above recommendations are forwarded with my concurrence.

 3/2/84  
Director, Pacific Marine Center (Date)

H-9869

...sheets, the Hydrographic Chart... that were  
sent to you, TP-00532 - if possible "FINAL" except  
... (attached). I would like to  
... that you should use  
... the Final Map ("Hydro. Main Print") for  
... to the Hydro Surveys. I highly recommend destroying the previous Class III, Class I,  
... final field edit. or whatever copies you may still have.



**U.S. DEPARTMENT OF COMMERCE**  
National Oceanic and Atmospheric Administration  
NATIONAL OCEAN SURVEY  
ATLANTIC MARINE CENTER  
439 West York Street  
Norfolk, VA 23510

May 28, 1982

TO: OA/C322, Normen E. Banks *Jerry Hancock*  
Chief, Chart Information Branch

JUN 14 1982

THRU: OA/CAM52, Billy H. Barnes *Billy H. Barnes*  
Chief, Photogrammetric Branch, AMC

FROM: OA/CAM52x1, Jerry L. Hancock *JLH*  
Coastal Mapping, Final Review, AMC

SUBJECT: Current Charting Data for San Francisco Bay, California

During the period of May 10 through May 21, 1982, current charting information was obtained by this final reviewer while visiting the Pacific Hydrographic Party stationed in San Francisco Bay, California. Acquisition of this data resulted from field activity associated with the termination of photogrammetric shoreline project CM-7704, San Francisco and San Pablo Bays, California. This project contains 5 final Class III maps and 10 final field edited maps of which Chart Maintenance Prints were prepared during Final Review and forwarded to the Marine Charts Division.

One of the objectives of this post field activity was to evaluate the adequacy of the project in reference to supporting Nautical Charts. As a result of this evaluation, several new chartable features were observed while making a field comparison with the final shoreline maps and the current nautical charts. The following is a list of field investigated features that will affect portions of the charts portraying the San Francisco Bay area; references to the appropriate shoreline map and corresponding nautical charts are prepared for your convenience.

*New Changes*  
*Since field edit.*

1. TP-00535, Charts 18651, 18652: New public boat ramp has been added in the San Leandro Marina area, Lat. 37°41.7', Long. 122°11.2'. This ramp has replaced the "old ramp" currently mapped and indicated on the submitted plan, "San Leandro Marina Area," dated January 1980. A permanent cement bulkhead has been constructed making the "old ramp" inaccessible. (See pg. 4)

*New 2.*  
*Since field edit*  
*and Hydro Survey*

2. TP-00534, Charts 18649, 18650, 18651, 18652: New 300 ft. long fishing pier at Candlestick Point has been constructed within the last 6 months. Resected sextant shore and seaward end positions determined. See sketch on following page.

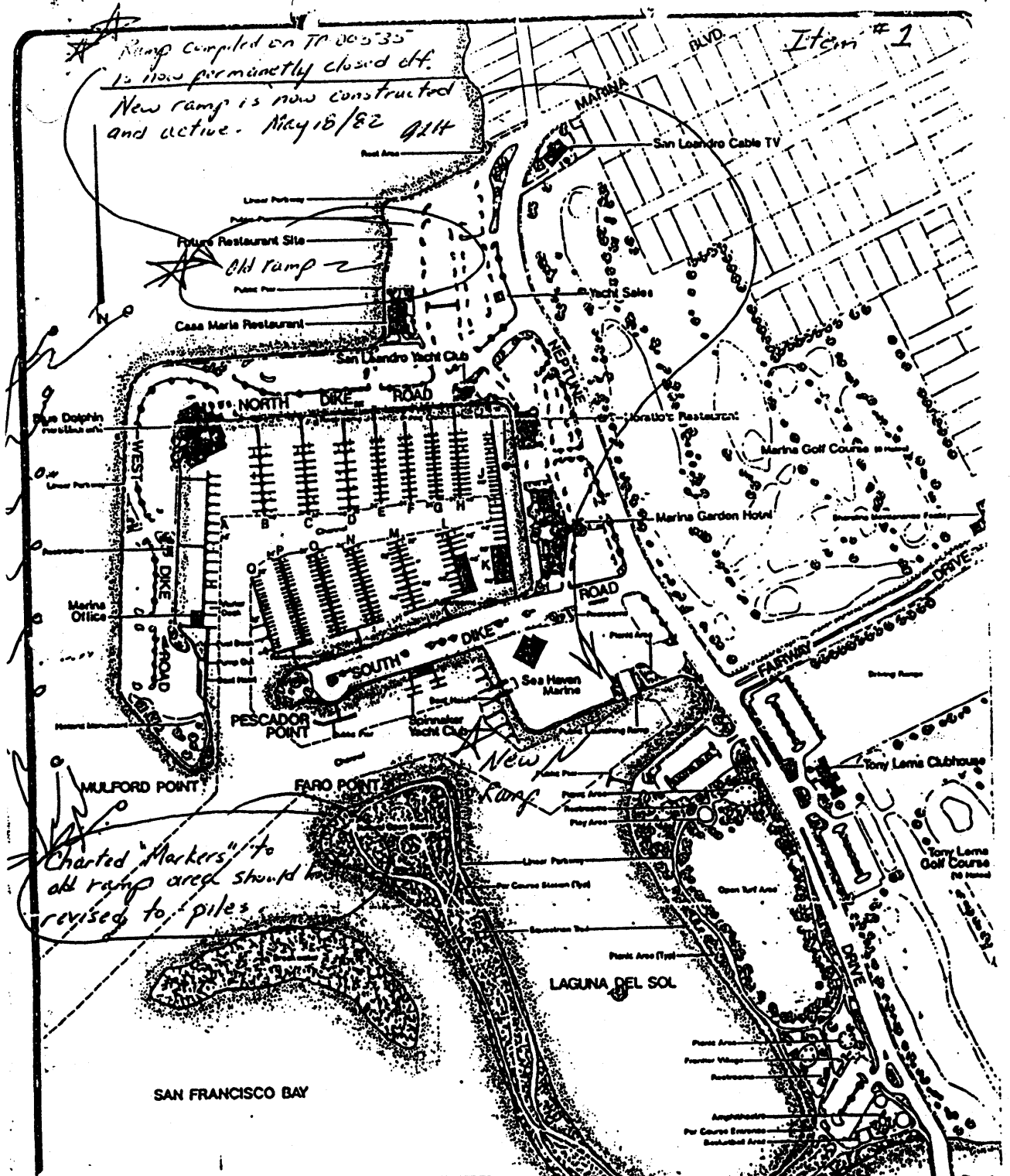
Center of shore end  
Lat. 37°42'31.15"  
Long. 122°22'24.50"

Center of seaward end  
Lat. 37°42'28.20"  
Long. 122°22'24.15"



*\* Ramp compiled on TP-00535  
 is now permanently closed off.  
 New ramp is now constructed  
 and active. May 16/82 JLL*

*Item # 2*

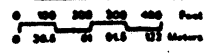


*Charted "Markers" to  
 old ramp area should be  
 revised to piles*

**SAN LEANDRO MARINA AREA**

CITY OF SAN LEANDRO

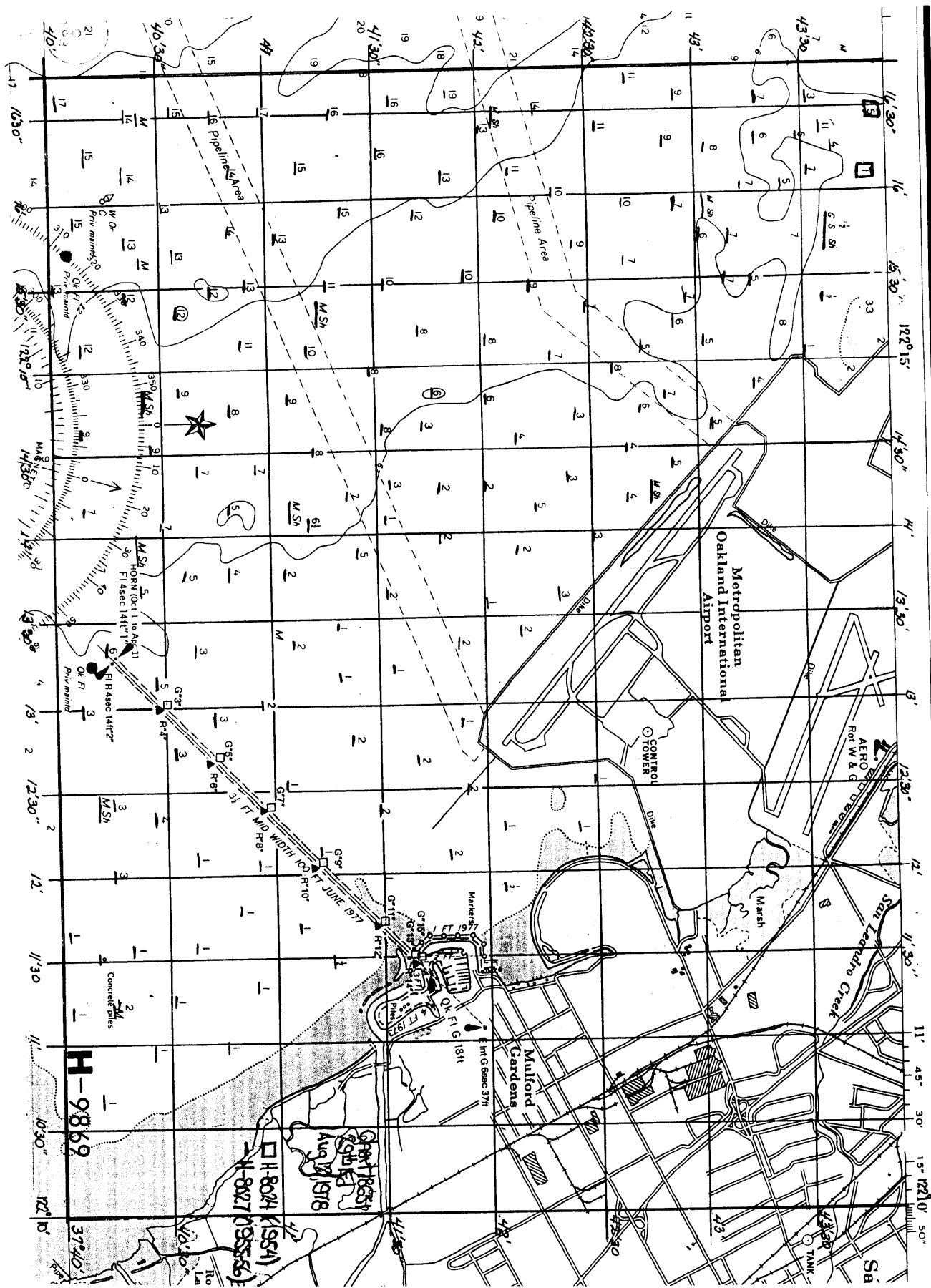
JANUARY 1980



*Item # 1  
 TP-00535*

*CHARTS 18651 18657*

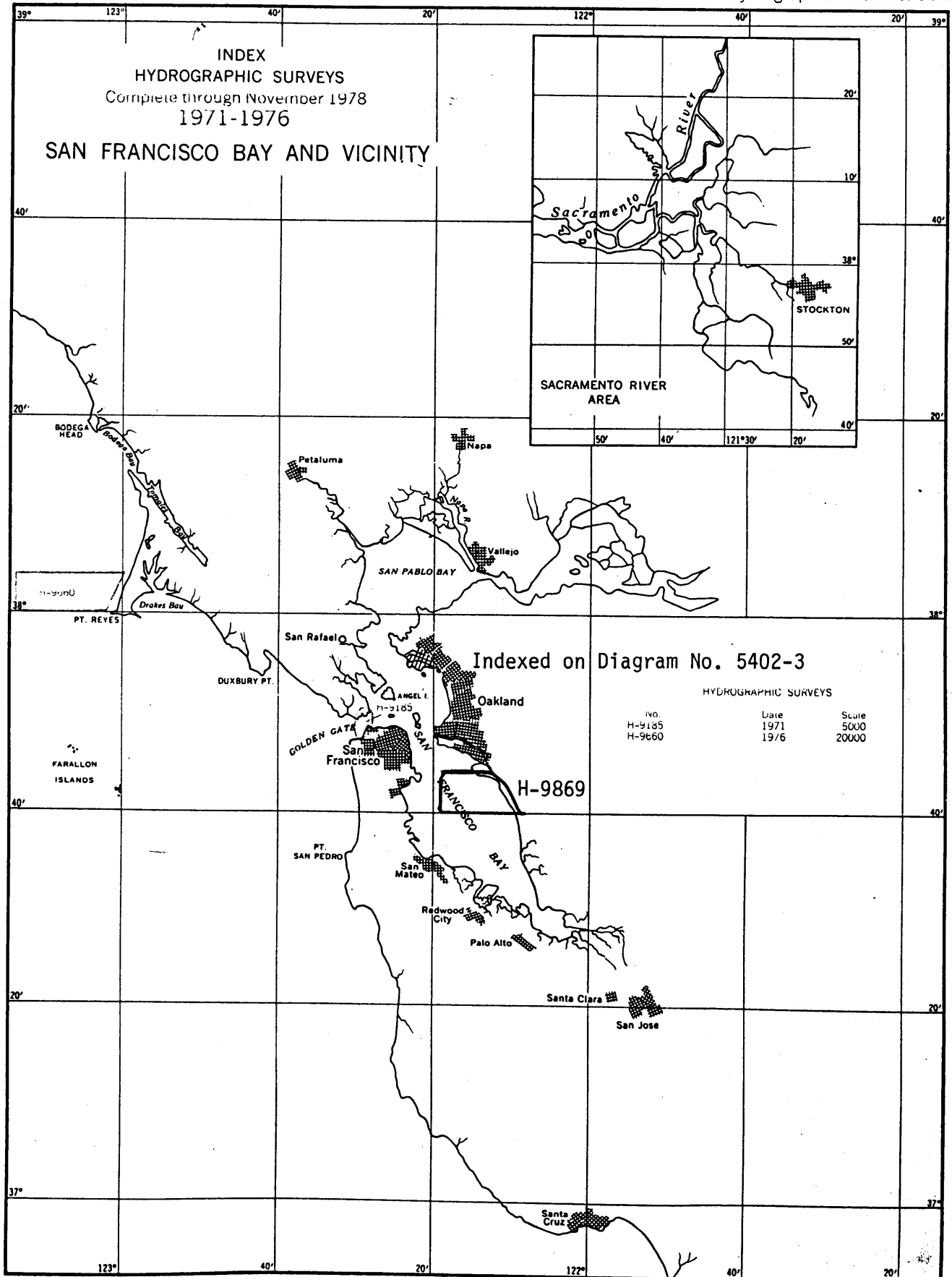
*NO. 1 OF 12*





DEPARTMENT OF COMMERCE  
 National Oceanic and Atmospheric Administration  
 National Ocean Survey  
 Rockville, Maryland

Hydrographic Index No. 96M



RECORD OF APPLICATION TO CHARTS

H-9869

FILE WITH DESCRIPTIVE REPORT OF SURVEY NO. \_\_\_\_\_

INSTRUCTIONS

- A basic hydrographic or topographic survey supersedes all information of like nature on the uncorrected chart.  
 1. Letter all information.  
 2. In "Remarks" column cross out words that do not apply.  
 3. Give reasons for deviations, if any, from recommendations made under "Comparison with Charts" in the Review.

CHART	DATE	CARTOGRAPHER	REMARKS
18651	6/27/84	Peter Schuman	Full <del>Part Before</del> After Verification Review Inspection Signed Via Drawing No. 40
18652	10/10/86	Cordts	Full <del>Part Before</del> After Verification Review Inspection Signed Via Drawing No. 28
18649	10/10/86	Cordts	Full <del>Part Before</del> After Verification Review Inspection Signed Via Drawing No. 66
18650	10-14-86	Marie Herrick	Full <del>Part Before</del> After Verification Review Inspection Signed Via Drawing No. 57
18650	3/16/98	Al Kill	Full <del>Part Before</del> After Verification Review Inspection Signed Via Drawing No. 65 in area of 18651 overlap.
18651	3/16/98	Al Kill	Full <del>Part Before</del> After Verification Review Inspection Signed Via Drawing No. 47 in area of 18649 overlap
18649	3/16/98	Al Kill	Full <del>Part Before</del> After Verification Review Inspection Signed Via Drawing No. 7 in area of 18651 overlap
			Full Part Before After Verification Review Inspection Signed Via Drawing No.
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