

10442

10442

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|------------------------------------------------------------------------------------------------------------------------------|-----------------------|
| NOAA FORM 76-35A U.S. DEPARTMENT OF COMMERCE NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION NATIONAL OCEAN SERVICE | |
| DESCRIPTIVE REPORT | |
| Type of Survey | Hydrographic |
| Field No. | PHP-10-4-92 |
| Registry No. | H-10442 |
| LOCALITY | |
| State | California |
| General Locality | Sacramento River |
| Sublocality | Vicinity of Rio Vista |
| 19 92 | |
| CHIEF OF PARTY | |
| LT. G. F. Glang | |
| LIBRARY & ARCHIVES | |
| DATE | November 29, 1994 |

HYDROGRAPHIC TITLE SHEET

H-10442

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-10-4-92

State California

General locality Sacramento River

Locality Vicinity of Rio Vista

Scale 1:10,000 Date of survey Sept. 24 - Oct. 23, 1992

Instructions dated June 17, 1991 Project No. OPR-1208-PHP

Vessel Jensen Launch 0651

Chief of party LT. Gerd F. Glang, NOAA

Surveyed by LT G. Glang, ET E. Wernicke, ST R. Adams

Soundings taken by echo sounder, hand lead, pole Innerspace 448

Graphic record scaled by PHP Personnel

Graphic record checked by PHP Personnel

Verification by: L. Deodato Automated plot by PHS Xynetics Plotter

~~Processed by~~

Evaluation by: C.R. Davies

~~Reviewed by~~

Soundings in meters and decimeters at ~~MLLW~~ MLLW

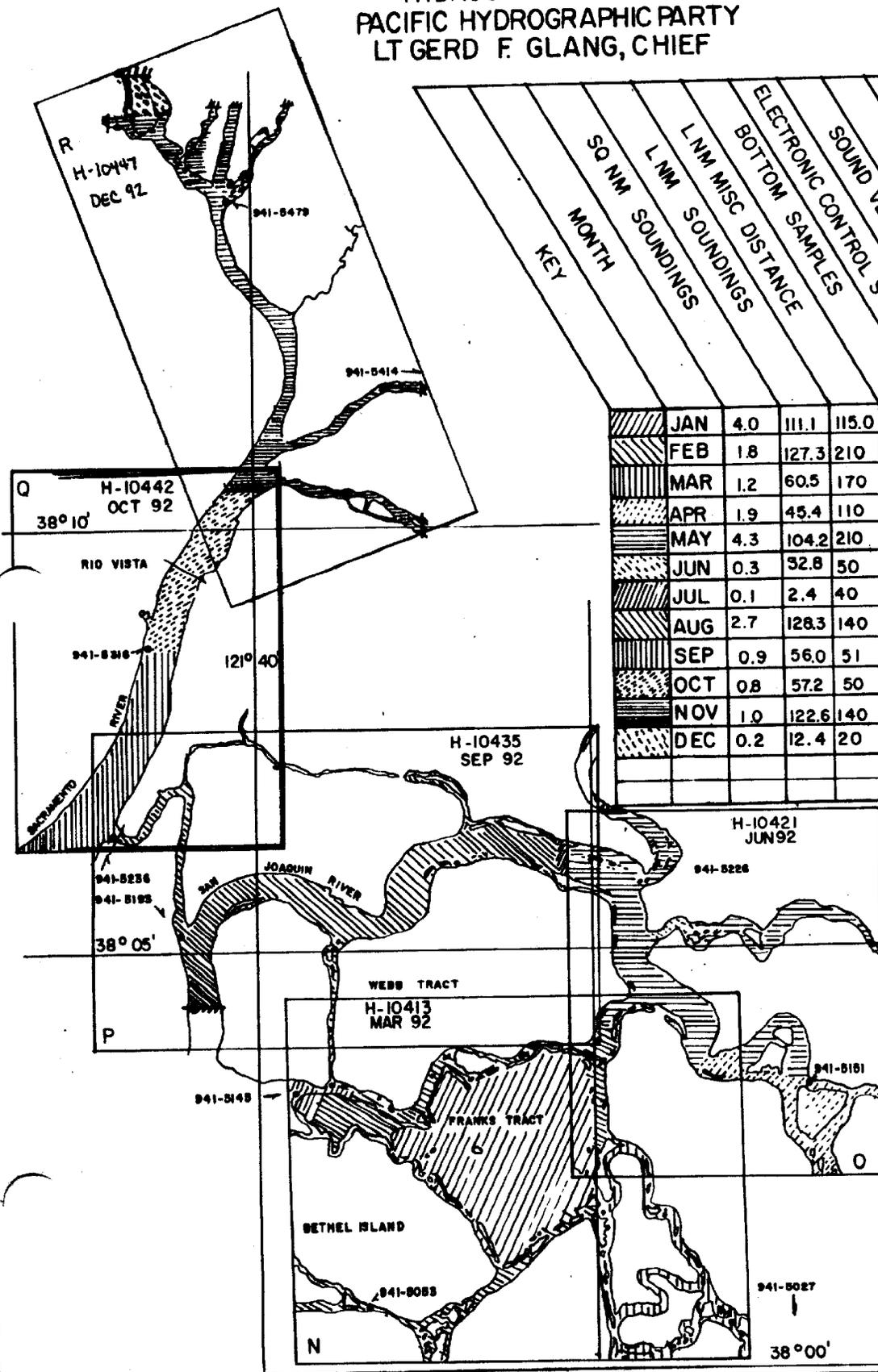
REMARKS: Time in UTC, revisions and marginal notes in black were generated during office processing. All separates are filed with the hydrographic data, as a result page numbering may be interrupted or non-sequential.

All depths listed in this report are referenced to mean lower low water unless otherwise noted.

SC 11/29/94 AW015 + SURF / RND 1/95

PROGRESS SKETCH
OPR-L208-PHP

SACRAMENTO RIVER, CA. SHEETS N,O,P,Q,R
JANUARY - DECEMBER 1992
HYDROGRAPHIC SURVEY
PACIFIC HYDROGRAPHIC PARTY
LT GERD F. GLANG, CHIEF



| KEY | MONTH | SO NM | LN M | LN M MISC | ELECTRONIC | SOUND | GEODETIC | AWOIS | ITEMS | RESOLVED |
|-----|-------|-----------|-----------|-----------|-----------------|-------------------|---------------|------------------|----------|----------|
| | | SOUNDINGS | SOUNDINGS | DISTANCE | CONTROL SAMPLES | VELOCITY STATIONS | TIDE STATIONS | CONTROL STATIONS | STATIONS | |
| | JAN | 4.0 | 111.1 | 115.0 | 0 | 8 | 2 | 0 | 37 | 3 |
| | FEB | 1.8 | 127.3 | 210 | 67 | 4 | 5 | 0 | 0 | 3 |
| | MAR | 1.2 | 60.5 | 170 | 42 | 0 | 3 | 1 | 0 | 13 |
| | APR | 1.9 | 45.4 | 110 | 61 | 4 | 2 | 0 | 0 | 0 |
| | MAY | 4.3 | 104.2 | 210 | 0 | 1 | 3 | 0 | 0 | 5 |
| | JUN | 0.3 | 32.8 | 50 | 0 | 0 | 1 | 0 | 1 | 17 |
| | JUL | 0.1 | 2.4 | 40 | 0 | 1 | 1 | 2 | 0 | 0 |
| | AUG | 2.7 | 128.3 | 140 | 44 | 1 | 7 | 0 | 1 | 0 |
| | SEP | 0.9 | 56.0 | 51 | 4 | 0 | 7 | 1 | 1 | 14 |
| | OCT | 0.8 | 57.2 | 50 | 28 | 0 | 3 | 2 | 0 | 7 |
| | NOV | 1.0 | 122.6 | 140 | 39 | 0 | 4 | 0 | 0 | 9 |
| | DEC | 0.2 | 12.4 | 20 | 8 | 0 | 1 | 0 | 0 | 1 |

Descriptive Report to Accompany Hydrographic Survey H-10442

Field Number PHP-10-4-92
Scale 1:10,000
1992

Pacific Hydrographic Party
Chief of Party: LT Gerd F. Glang

A. PROJECT ✓

This survey was conducted in accordance with Hydrographic Project Instructions OPR-L208-PHP, Sacramento River, California, dated June 17, 1991.

Hydrographic survey H-10442 was conducted to obtain data for maintenance of existing nautical charts, and for a new series of 1:12,500-scale charts. This project also responds to the San Francisco Pilots Association and the US Army Corps of Engineers (COE), Bay Model Engineering Office, by aiding the update of the Bay model.

This survey's sheet letter is "Q", as specified by the project instructions.

B. AREA SURVEYED ✓ See Evaluation Report, Section 1

The area surveyed for H-10442 is on the Sacramento River, from approximately 3 NM south of Rio Vista, at 38°06'15"N, to approximately 1.5 NM north of Rio Vista, at 38°10'29"N. The Sacramento River runs approximately from north to south here.

Data acquisition was conducted from September 24 (DN 268) through October 23 (DN 297), 1992.

C. SOUNDING VESSELS ✓

NOAA Launch 1101 (EDP No. 0651), a 29-foot Jensen, was used for all data acquisition. No changes to the standard vessel sounding configuration were necessary.

D. AUTOMATED DATA ACQUISITION AND PROCESSING ✓

This survey was completed with the following HDAPS Programs:

| <u>Program Name</u> | <u>Program Version</u> | <u>Installation Date</u> |
|---------------------|------------------------|--------------------------|
| PRESURVEY | 7.00 | 24 Sep 1992 |
| NEWPOST | 6.00 | 24 Sep 1992 |
| CARTO | 2.03 | 24 Sep 1992 |
| BIGABST | 2.03 | 24 Sep 1992 |
| PRINTOUT | 4.01 | 24 Sep 1992 |
| INVERSE | 2.00 | 24 Sep 1992 |
| CONVERT | 3.51 | 24 Sep 1992 |
| LSTAWOIS | 3.01 | 24 Sep 1992 |
| BACKUP | 2.00 | 24 Sep 1992 |
| FILESYS | 3.01 | 24 Sep 1992 |
| GRAFEDIT | 1.00 | 24 Sep 1992 |
| LISTDATA | 1.00 | 24 Sep 1992 |
| QUICK | 2.00 | 24 Sep 1992 |
| BLKEDIT | 2.00 | 24 Sep 1992 |
| REAPPLY | 2.01 | 24 Sep 1992 |
| PLOTALL | 2.06 | 24 Sep 1992 |
| DP | 2.11 | 24 Sep 1992 |
| MAN DATA | 2.00 | 24 Sep 1992 |
| EXCESS | 4.10 | 24 Sep 1992 |
| ZOOMEDIT | 2.10 | 24 Sep 1992 |
| SELPRINT | 2.02 | 24 Sep 1992 |

The PC-DAS SURVEY Program, version 4.02 (GPS implementation), was used for all data acquisition. The following non-HDAPS computer programs were used:

| <u>Program Name</u> | <u>Program Version</u> | <u>Version Date</u> |
|---------------------|------------------------|---------------------|
| VELOCITY | 1.11 | 1990 |
| NADCON | 1.01 | 1989 |
| DDPROC | 4.03 | 1990 |
| MTEN 4 | 20 | 1991 |
| GEOID90 | 1.00 | 1990 |
| ASHTECH GPS MP | 2.2 | 1990-1992 |
| WORDPERFECT | 5.1 | 1991 |

The master printout was annotated whenever software problems affected the data.

E. SONAR EQUIPMENT ✓

Not applicable.

F. SOUNDING EQUIPMENT ✓

During this survey, the following Innerspace Model 448 (IN-448) was used:

| <u>Echosounder</u> <u>Type</u> | <u>Vessel</u> <u>EDP No.</u> | <u>Serial No.</u> | <u>DN Used</u> |
|-----------------------------------|---------------------------------|-------------------|----------------|
| IN-448 | 0651 | 236 | 268-297 |

Soundings were recorded in meters, with an assumed speed-of-sound through water of 1500 m/sec. Depths encountered in the survey area ranged from awash to 29.2 meters.

The digitized soundings displayed on-line were compared in real time with the analog trace to ensure reasonable agreement. No on-line calibration adjustments were required for the IN-448. Occasional breaks in the on-line echogram occurred when depth range scales required adjusting, especially where the river bottom rose or fell steeply along the deep water ship channel. These breaks are not considered significant. *Occur No problems were encountered during office processing.*

Sounding poles were made by PHP using commercial surveyor's level-rod tape. These self-adhesive, pre-printed tapes are calibrated in centimeter intervals. They were laminated with clear epoxy to two-inch diameter wooden rods finished with white marine epoxy paint. The sounding poles are 3.3 meters long. No further calibrations are required. The sounding poles were used for measuring least depths on shallow AWOIS investigations. *Sounding pole was not used during this survey.*

Metric leadlines were made by PHP in accordance with HSG 69. Each leadline is 7/16-inch double-braided dacron line. Markings are at one-meter intervals from 0 to 19, and are shrink-tubing secured with epoxy glue. This deviation from HSG 69 makes for a more rugged leadline. Markings were calibrated during fabrication with a steel surveyor's tape while the line was under six pounds of constant tension. The throwing end is a standard six-pound lead shackled to a stainless steel thimble bent to the bitter end. Leadlines were used for depth comparisons with the echosounders and for measuring least depths on AWOIS investigations. Calibration forms are included in Separate IV* (Sounding Equipment Calibration and Corrections). *Leadline was not used during this survey.*

G. CORRECTIONS TO SOUNDINGS ✓

Velocity of Sound

Corrections for the speed of sound through the water column were computed from data obtained with an Applied Microsystems Laboratories (AML) Velocity of Sound Profiler (S/N 03004). The VELOCITY Program was used to determine the speed of sound

* Filed with the hydrographic data

correctors.

The following casts were taken:

| Cast | DN | Depth* | DN | HDAPS Tables | Cast Position | |
|------|-----|--------|-----------|--------------|---------------|-------------|
| | | | Range | 0651 | Latitude | Longitude |
| 1 | 269 | 24.4 | 268 - 270 | N/A | 38°05'10"N | 121°42'33"W |
| 1-R | " | 31.7 | " | 1 | " | " |
| 2 | 272 | 28.1 | 271 - 277 | 3 | 38°05'10"N | 121°42'33"W |
| 3 | 274 | 18.3 | " | N/A | 38°06'10"N | 121°37'00"W |
| 4 | 280 | 16.6 | 278 - 280 | 5 | 38°08'46"N | 121°41'26"W |
| 5 | 283 | 27.6 | 281 - 284 | 7 | 38°20'03"N | 121°52'25"W |
| 6 | 289 | 27.7 | 285 - 291 | 9 | 38°20'03"N | 121°52'25"W |

outside the survey area

*Extrapolated depths.

Cast No. 1 (DN 269) was manually re-entered into the VELOCITY Program and extrapolated a second time to accommodate deeper soundings obtained during this period of the survey. The second extrapolation of this cast is designated Cast No. 1-R. Cast No. 3 (DN 272) was not used and is provided as a reference.

The static draft for VN 0651 was rounded up to 0.5 meters for computing velocity correctors to accommodate processing by N/CG245. Copies of all velocity cast data and HDAPS Velocity Corrector Tables are included in Separate IV.* A floppy disk copy of the VELOCITY Program data files is provided with the data.

The AML instrument was calibrated by Northwest Regional Calibration Center on January 7, 1992. A copy of this calibration report is included in Separate IV.*

Leadline Comparisons ✓

Leadline comparisons were taken almost daily to determine instrument error and to verify static draft. The instrument correctors for the IN-448 varied from -0.14 to +0.21 meters (overall mean = +.023 meters). These instrument corrections were not applied to final field sheet soundings as they were not constant and may have been due to bottom type or individual operators. Leadline comparisons were annotated on the echograms and a Leadline Comparison Log is included in Separate IV.*

Static Draft ✓

A static draft for VN 0651 was determined on June 25, 1992 in two steps. The first step determined the depth of the transducer face from a reference mark on the hull. The second step involved measuring the depth from this reference mark to the launch's waterline with the launch in water (fuel tanks half full and two crew aboard). A static draft of 0.5 meters was determined. This draft agrees with historical data.

* Filed with the hydrographic data.

Dynamic Draft ✓

Settlement and squat measurements for VN 0651 were conducted on October 22, 1991, on the San Joaquin River, north of Antioch, CA.

Draft and settlement and squat correctors are applied online to all survey data via the HDAPS Offset Tables.* Offset Table 1 corresponds to VN 0651. Field records are included in Separate IV.*

Tide Correctors ✓

The Final Field Sheets were plotted using predicted tides based on San Francisco, California. One tidal corrector zone from the Tide Zone Chart (+4:00 HR HW, +5:00 HR LW, x 0.78 Height Ratio) was applied to all sounding data.

Approved water levels were requested from the ^{Product and Services} ~~Sea and Lake Levels~~ Branch (N/OES231) in a letter dated December 18, 1992. A copy of this letter is included in Appendix V*(Tides and Water Levels). ^{Approved tides were used to correct soundings on the smooth sheet. Tide Note dated February 18, 1993 is attached.}

H. CONTROL STATIONS ✓ See Evaluation Report, Section 2.

Horizontal Datum ✓

The horizontal control datum for this project is North American Datum of 1983 (NAD 83). A copy of the HDAPS Control Station Table is included in ~~Appendix III~~ (List of Horizontal Control Stations). ^{this report}

Survey Methods ✓

Geodetic positions used for establishing horizontal control on this survey were determined using PHP's Global Positioning System (GPS) receivers.

Station 800 (PHP1, 1992) is considered non-recoverable. Station PHP1 is the differential GPS (DGPS) reference station located at the PHP office trailer in Rio Vista, CA, positioned on August 13, 1992. After the DGPS reference station antenna was installed on a 20-foot tower bolted to the trailer, a position was computed by relative static observations (GPS baselines) between DROUIN RM2 1931 and PHP1, and again between HPGN CA 10 11 1991 and PHP1. Copies of the Trimble positioning solution summaries and the MTEN inverse computation between the two positions observed for PHP1 1992 are included in Appendix III.* Closures obtained for PHP1 1992 exceed Third Order, Class I, standards.

Station 807 (SR28, 1992) is Sacramento Deep Water Ship Channel Light 28. This light, positioned on September 22 (DN 266), was used to conduct the daily launch DGPS performance checks for this

* Filed with the hydrographic data.

survey. A position was computed by relative static observations (GPS baselines) between DROUIN RM2 1931 and SR28, and again between HPGN CA 10 11 1991 and SR28. Copies of the Trimble positioning solution summaries and the MTEN inverse computation between the two positions observed for SR28 1992 are included in Appendix III.* GPS Observation Log sheets are included in the data files. This station is considered non-recoverable and undescribed as no data will be submitted to NGS. Closures obtained for SR28 1992 exceed Third Order, Class I, standards.

Serial numbers for the GPS equipment are listed in Section I (Hydrographic Position Control) of this report. Refer to the GPS Observation Log sheets in the data files for equipment serial numbers used during geodetic surveying.

The 1992 OPR-L208-PHP Horizontal Control Report was submitted by N/CG2333 in July, 1992. The final adjusted position for DROUIN RM2 1931 and the preliminary adjusted position for HPGN CA 10 11 1991 were provided by N/CG2333 and can be found in Appendix III.*

I. HYDROGRAPHIC POSITION CONTROL ✓

Position Control ✓

Differential GPS (DGPS) was used for position control throughout this survey. The DGPS reference station, PHP1 1992, was installed as described in Section H (Control Stations) of this report, in accordance with FPM Section 3.4.6. Per FPM Section 3.4.6.3, the reference site was confirmed using the program MONITOR. A copy of the scatter plot and the outlier.sum file are included in Separate III*(Horizontal Position Control and Corrections to Position Data).

DGPS Performance Checks ✓

Per FPM Section 3.4.4.1, DGPS performance checks were obtained at the beginning and end of each survey day using Station SR28 1992, a fixed aid to navigation positioned to Third Order, Class I standards (described in Section H, Control Stations). All DGPS performance checks were successful. DGPS performance check forms are located in the data files.

Data collected with poor DGPS control, easily identified during processing by their physically impossible eastings and northings, were immediately rejected. DGPS control failed when a) the minimum number of satellites were no longer available, b) when the maximum allowable HDOP was exceeded, or c) when the reference station's differential correctors could not be received by the survey vessel.

Positioning Equipment ✓

The following GPS equipment was used:

| <u>Equipment Location</u> | <u>Type of Receiver/Antenna</u> | <u>Receiver Serial No.</u> | <u>Antenna Serial No.</u> |
|----------------------------|---------------------------------|----------------------------|---------------------------|
| PHP1 (DGPS Ref. Sta.) | Trimble 4000SST | 2952A00459 | 2951A00123 |
| Spare (used for Horcon) | Trimble 4000SST | 2952A00461 | 2951A00008 |
| VN 0651 | Ashtech | 700417A1080 | 700378A0272 |

The unique numbers for all equipment serial numbers are annotated on the daily master printout.*

J. SHORELINE *See EVMC Report, section 2*

Sources ✓

Shoreline detail shown on the final field sheets was transferred by hand from stable-based 1:10,000-scale enlargements of the following TP-sheets:

TP-01055 (1:20,000-scale, NAD 27, April 1983, CM 8400)
TP-01059 (1:20,000-scale, NAD 27, April 1981, CM 7823)

NAD 27 datum ticks were applied to the NAD 83 field sheets and are shown in green on the FFS (Final Field Sheet). Datum transformation from NAD 83 to NAD 27 was in accordance with FPM Section 7.4. A printout of the NADCON Program datum transformation is included in Separate IX (Hydrographic Sheets and Parameters).

Verification ✓

Unless specifically discussed in this section or Section N (Comparison with the Chart), all shoreline details were verified and are depicted on the Final Field Sheets.

Field notes from shoreline verification can be found on the echograms, on the boatsheets and the paper DP plots. Detached Position Listings created by the HDAPS DP Program, along with the cartographic tables generated in the CARTO Program, are included in the data files.*

TP-Sheet Shoreline Agreement ✓

TP-sheet shoreline was verified by its junction with the

hydrographic data, by detached positions, and by visual inspection. The TP-sheet shoreline generally agreed well with the hydrographic data, although several shoreline changes have occurred since the photography was flown. Some disagreement was apparent while aligning the TP-sheet latitude/longitude grid with the NAD 27 datum ticks on the FFS. This disagreement is likely due to the scale distortion which occurs during the TP-sheet enlargement process. Changes to shoreline are discussed below.

TP-Sheet Changes

The following significant changes to the TP-Sheets were observed:

TP-01055

Tanks, shown on TP-01055 at approximate position $38^{\circ}06'28''N$, $121^{\circ}42'01''W$, are no longer visible from seaward and are, therefore, not appropriate landmarks. These tanks were searched for during hydrography and shoreline verification in this area. The hydrographer recommends not charting these tanks. *Concur*

A 200-meter long section of shoreline at approximate position $38^{\circ}06'30''N$, $121^{\circ}42'05''W$, is missing and not shown on TP-01055 or TP-01059. This shoreline was outside the limits of both applicable TP-sheets and was verified by Pos. No.'s. 6160-6162 (DN 269) and by lines of hydrography terminating at this shore. This shoreline correction is shown in red on the FFS *and dashed red on the smooth sheet.*

Tanks, shown on TP-01055 at approximate position $38^{\circ}07'16''N$, $121^{\circ}41'27''W$, are no longer visible from seaward and are, therefore, not appropriate landmarks. These tanks were searched for during hydrography and shoreline verification in this area. The hydrographer recommends not charting these tanks. *Concur*

A ramp, shown on TP-01055 centered at approximate position $38^{\circ}08'37''N$, $121^{\circ}41'36''W$, is not useable and should no longer be considered a shoreline feature. A new pier and floating ~~deck~~, associated with the USCG Station Rio Vista, were verified immediately south of this ramp by Pos. No. 6175 (DN 269). The pier and floating ~~deck~~ are correctly depicted on the FFS. The hydrographer recommends not charting this ramp. *Concur, chart new piers as shown on the smooth sheet.*

A pier, shown on TP-01055 in approximate position $38^{\circ}08'48''N$, $121^{\circ}41'32''W$, is now in ruins. This change was verified by Pos. No. 6180 (DN 269). The pier ruins are correctly depicted on the ~~FFS~~ *smooth sheet.* *Chart pier ruins as shown on the smooth sheet*

Two dolphins and a pier, shown on TP-01055 in approximate position $38^{\circ}08'33''N$, $121^{\circ}41'08''W$, were disproved. On DN 281, a visual search verified by Pos. No. 6721 found no evidence of these dolphins or this pier. On DN 297, bottom drags were conducted centered around Pos. No. 7605. Launch personnel

interviewed the owner of the property immediately onshore of these TP-sheet dolphins and pier. According to Mr. Harold Skelton (916-777-6663), riprap and other used construction materials were dumped in the area of these dolphins. Two contacts were made and investigated by diver (Pos. No. 7606 and 7607)*. These contacts were identified as a submerged tree trunk and a submerged tree snag, ^{Submerged} covering 1.5 meters and 1.6 meters at MLLW, respectively. The diver found the bottom to be soft sand and mud, with numerous submerged rocks and hard objects, likely to have been riprap washed out from the shore, or jettisoned construction material. Visibility for the diver in the water was near zero. The hydrographer recommends charting a foul limit, as shown on the FFS⁺, and not charting the dolphins and the pier at this location. * Position 7607 is excessed for shoaler feature found nearby at position 7606. *CM cur*

A pier, shown on TP-01055 centered at approximate position 38°08'39"N, 121°41'05"W, was found to be an abandoned launch ramp associated with Duck Island RV Park. Although no detached positions were acquired to disprove this pier, the hydrographer and party personnel have frequently used this ramp during the course of this project as a reference station for baseline calibrations. The small cove where this pier is shown on the TP-sheet is an old concrete bulkhead which surrounds the ramp. A ramp is depicted on the FFS⁺.^{SS} The hydrographer recommends charting a ramp (abandoned) at this location. *CM cur*

Two dolphins, shown on TP-01055 centered at approximate position 38°09'05"N, 121°41'27"W, were not found. On DN 280, during shoreline verification, a floating ^{pier} dock was found at Pos. No. 6695. This ^{pier} dock was probably installed around the TP-sheet dolphins after the photography was flown. The hydrographer recommends charting a ^{pier} dock, as shown on the FFS⁺, and not charting these two dolphins. *CM cur*

Two small islets, shown on TP-01055 as marsh centered at approximate position 38°09'50"N, 121°40'20"W, have merged to form one large tule islet. This islet was verified by Pos. No's 6909-6910* (DN 282), and is approximately 160 meters long in a north-south direction, and 20 meters wide. The new configuration for this tule islet is shown in red on the FFS and dashed red on the smooth sheet. ** Positions 6909 and 6910 are Snags which uncover 0.4 meters at MLLW and delimit the south/north limits of Tule Islet.*

Two new tule islets, not shown on TP-01055 were observed in approximate position 38°10'11"N, 121°40'16"W. The islets, verified by Pos. No. 7550 (DN 290), are approximately 40 meters in diameter, 20 meters apart, and oriented in a north-south direction. These new islets are shown in red on the FFS and dashed red on the S.S.

A beach and parking area, with some tule marsh at the waterline, now extends from the HWL shown on TP-01055 centered at approximate position 38°10'18"N, 121°40'12"W. This beach with tule marsh was verified by lines of hydrography terminating at this shore. Because of the distance from the HWL and the height

of the tule grass, a precise reference to the HWL could not be made. Limits of this beach area are considered a shoreline change and are shown in red on the FFS and dashed red on the smooth sheet

A pile, shown on TP-01055 at approximate position 38°10'07"N, 121°40'16"W, was not found. This pile was searched for visually and disproved by Pos. No. 7545 (DN 290). The area around this pile was extremely shallow (approximately 0.3 meters) at the stage of tide during this search and no drag or diver investigation was determined necessary. The hydrographer recommends not charting this pile. This pile is likely one of the new tule islets positioned by fix 7550 and discussed on previous page. *COMMENT*

Two dolphins, shown on TP-01055 centered at approximate position 38°10'15"N, 121°40'38"W, were found to be the north and south ends of a new bulkhead, verified by Pos. No's. 7087 and 7086 (DN 283), respectively. This bulkhead is a HWL feature and is shown in black on the FFS since no difference with the TP-sheet shoreline was discernable at this location. The hydrographer recommends not charting these dolphins. *COMMENT*, This area is shown on the smooth sheet in dashed red and labeled as a bulkhead. Chart area as shown on the smooth sheet.

A pier or dock, shown on TP-01055 at approximate position 38°10'18"N, 121°40'35"W, was found to be a bulkhead. At Pos. No. 7088 (DN 283), the offshore end of the TP-sheet pier, a new bulkhead has been constructed which runs westward from this position to meet the HWL. The area inshore of these bulkheads is now filled. The new bulkhead, considered a shoreline change, is shown in red on the FFS. The hydrographer recommends charting these bulkheads as shown on the FFS and smooth sheet. *COMMENT*
Shown in dash red on the smooth sheet.

A dock, shown on TP-01055 as approximately parallel to the shoreline centered at position 38°10'23"N, 121°40'27"W, and shown to be approximately 100 meters long, was not found. On DN 283, during shoreline verification, launch personnel found dredge pipes moored in this area, extending from Pos. No. 7091, north, to Pos. No. 7092, in a configuration very similar to a long dock or pier. In addition, several dredges and barges, associated with the Dutra Construction Company, were moored along these dredge pipes. Limits of these dredge pipes are shown as dashed black lines on the FFS and should be charted as such. The hydrographer recommends not charting the dock shown on the TP-sheet in this area. *COMMENT*

A dolphin, shown on TP-01055 at approximate position 38°10'25"N, 121°40'26"W, was not found. A wreck was located at Pos. No. 7095 (DN 283), with the bow portion broken away and beached alongside the wreck. The bow was positioned such that a large deck bollard or mast, attached to the deck of the bow portion of this wreck, may have appeared as a dolphin during photographic compilation of this TP-sheet. The wreck, at its highest point, ~~was 1.5 meters~~ ^{was 1.5 to 0.8} meters at ~~MLLW~~ ^{MLLW}. This wreck is shown in black on the FFS and should be charted as such. The hydrographer recommends not charting this dolphin. *COMMENT*

Two islets, shown on TP-01055 as marsh, centered at approximate position $38^{\circ}10'25''N$, $121^{\circ}40'00''W$, have now merged to form one extensive tule marsh area. Furthermore, the configuration of these merged islets differs significantly from that shown for the larger islet on TP-01055. The tule marsh now extends from shore, at approximate position $38^{\circ}10'22''N$, $121^{\circ}40'12''W$, to the SSW, to approximate position $38^{\circ}10'15''N$, $121^{\circ}40'10''W$, at Pos. No. 6927 (DN 282). Limits of this extensive tule islet were determined by Pos. No's 6927-6932 (DN 282), and by lines of hydrography which run along, and terminate at, this shore. This shoreline change is shown in red on the FFS and dashed red on the smooth sheet. Positions 6927-6932 delineate areas which uncover 0.9 to 1.4 meters at M.L.W. and plot offshore of revised tule marsh area.

A shoreline change, approximately 40 meters long and extending approximately 30 meters inshore of the HWL shown on TP-01055, centered at approximate position $38^{\circ}10'30''N$, $121^{\circ}40'24''W$, was observed. This shoreline change was verified by lines of hydrography which terminate at this shore. This shoreline change is shown in red on the FFS and shown on the smooth sheet in dashed red.

TP-01059

A 130-meter long section of shoreline has eroded 10 to 15 meters inshore of the shoreline shown on TP-01059 at approximate position $38^{\circ}06'46''N$, $121^{\circ}42'47''W$, between Pos. No. 6248 and Pos. No. 6249 (DN 272). In this area, the west shore of the Sacramento River consists primarily of sand and fine agricultural till, with little or no vegetation, which erodes easily. This shoreline change is shown in red on the FFS, with a foul limit depicted between these two positions. Shown on the smooth sheet as a dashed red line.

K. CROSSLINES

A total of 15.1 nautical miles of crosslines and channel lines, representing 14% of the hydrography on H-10442, were used for crossline comparisons. Crossline and channel line soundings agree to within 0.3 to 0.7 meters of the mainscheme soundings. The most significant differences observed occurred where crosslines ran along steep sloping areas (i.e. outer channel lines).

L. JUNCTIONS *See Envr Report, section 5*

H-10442 junctions with the following surveys:

| <u>Registry Number</u> | <u>Scale</u> | <u>Date</u> | <u>Geographic Name</u> |
|------------------------|--------------|-------------------------------------------|---------------------------------------------------------|
| H-10373 | 1:10,000 | Aug 1991 | Sacramento River Sherman Island to Decker Island |
| H-10435 | 1:10,000 | Oct 1992 | San Joaquin River Webb Reach to Threemile Slough |
| H-10447 | 1:10,000 | ^{Nov-Dec} Jan 1993 | Sacramento River Sacramento River to Cache Slough |

Hydrography on this survey junctions at the south, on the Sacramento River, with H-10373, at approximate latitude 38°06'15"N. The hydrographer chose a 200 meter overlap with this adjoining survey (or four sounding lines) because of the 15-month period between data collection. Soundings were found to match within 0.1 meters. Depth curves matched generally very well, given the irregular bottom of the Sacramento River in this area. A shoal centered at approximately 38°06'16"N, 121°43'00"W, which appears on this survey as well as on H-10373, is now shoaler with a least depth of 4.2 meters at MLLW (Pos. No. 7573+2, DN 290). This shoal was reported as a danger to navigation (see Section N of this report). This shoaling trend is consistent with the overall shoaling found throughout this survey during comparison with the chart (see Section N of this report). Recommend data from this survey supersede data from H-10373 in their common areas. * Shoaling in the general area of the reported 4.4 meter (14 ft) sounding is approximately 3-8 meters (10-14 ft). *Comment*

Hydrography on this survey junctions to the east, at the Threemile Slough Bridge, with H-10435. Because the physical structure of the bridge was used as this sheet's limit on Threemile Slough, only two soundings from H-10435 were found to overlap with this survey. These two soundings matched the depth curves on this survey very well, given the irregular bottom found in this area where Threemile Slough and the Sacramento River meet. Recommend soundings from this survey supersede these two soundings from H-10435. *Comment*

Hydrography on this survey junctions to the north with H-10447 (PHP-10-5-92, ^{Nov-Dec} February, 1993). This junction will be discussed in the Descriptive Report for H-10447.

Overlapping junction soundings were obtained per section 4.3.2 of the Hydrographic Manual.

M. COMPARISON WITH PRIOR SURVEYS *See Eval Report, section 6*

Comparison with a stable-based copy of prior survey H-6013 (1:10,000, July 1934) was made in areas common to this survey. Specifically, the entrance to Threemile Slough, immediately west of the Threemile Slough Bridge, is the only area in common between these two surveys. Depths in this area are now generally 1-2 meters shallower. However, a shoal now extends from the north side of the Threemile Slough entrance, with a least depth of 3.5 meters (Pos. No. 7578+2, DN 290) at 38°06'24.3⁸⁸"N, 121°42'10.4⁸⁶"W, or approximately in the center of the entrance to Threemile Slough. This shoal was reported as a danger to navigation and is discussed in Section N (Comparison With The Chart) as AWOIS Item 51620. *Concur*

The hydrographer also notes that the Threemile Slough bridge has been removed from its location on H-6013 and rebuilt further west, confirmed by Pos. Nos. 6000 to 6004, and is as shown on TP-01055. *Concur*

No AWOIS Items originate with prior survey H-6013. *Concur*

N. COMPARISON WITH THE CHART *See Eval Report, section 7*

A stable-based 1:10,000-scale enlargement of Chart No. 18661 SC (21st edition, May 9, 1992) was used for comparison with survey (JFS) H-10442. *The comparison was done with 18661, 22nd Ed, 1/9/93.*

There were 13 AWOIS items within the limits of the H-10442 plotter sheet (HDAPS Plotter Sheet 21). Of these, three items (AWOIS Item Nos. 51645, 51646, and 51647) were reassigned to PHP-10-5-92, Sheet R, H-10447. Two items (AWOIS Item Nos. 51619 and 51622) were resolved as part of survey H-10435. The remaining eight AWOIS* items, originating from miscellaneous sources, were resolved as part of this survey and are discussed here. ** AWOIS investigation forms can be found with the separates filed with the hydrographic data.*

AWOIS Item No. 51620 originates from Blueprint 32524/38 (COE) and is described as a 14-foot shoal depth in position 38°06'23.700"N, 121°42'07.830"W. On DN 290, while conducting development hydrography, a least depth of 3.5⁷ meters at MLLW (Pos. No. 7578+2) was found approximately 75 meters WNW of the AWOIS target. This shoal was reported as a danger to navigation. The hydrographer recommends charting a depth of 3.5⁸ meters at MLLW in position 38°06'24.3⁸⁸"N, 121°42'10.4⁸⁶"W. *concur*

AWOIS Item No. 51621 originates from LNM 23/86 (12th CGD) and is described as a 21-foot shoal depth in position 38°06'54.700"N, 121°42'22.830"W. On DN 288, development hydrography over the target area (Pos. Nos. 7293-7324, VN 0651) failed to identify any shoal area, confirming the findings of the mainscheme hydrography. Per telecon with the US Army Corps of Engineers

(Bob Kelley, 916-557-5278), the Sacramento Deep Water Ship Channel has an active history of dredging since 1986, including the area of this AWOIS item. The hydrographer recommends the charted notation "Shl rep 21ft", in approximate position 38°07'00.0"N, 121°42'38.00"W, be removed. Recommend soundings from this survey supersede charted depths in this area. *comment*

AWOIS Item No. 51639 originates from Chart Letter 1846/72 (USPS) and is described as a row of submerged pilings, approximately 1500 meters long, ten feet offshore, used to hold riprap, in approximate position 38°08'24.700"N, 121°41'10.830"W. On DN 268, a row of submerged-to-awash pilings amid riprap material was positioned between Pos. No. 6008 (southern limit) and Pos. No. 6016 (northern limit). Some pilings uncovered up to 0.8 meters at MLLW; riprap rocks uncovered up to 0.5 meters at MLLW. Both the piles and the riprap parallel the shoreline, and extend 7 meters to 15 meters offshore of the HWL. There are numerous areas where tule grass (marsh) is intermixed with the pilings and/or riprap. Tule grass is limited to the shoreward side of all obstructions. The hydrographer suspects the row of pilings and the riprap material between Pos. No. 6008 and Pos. No. 6016 are the charted obstruction described in AWOIS 51639. The AWOIS target was verified at Pos. No. 6012. The length of this area of obstructions measures approximately 1800 meters and closely corresponds to the AWOIS description. Further investigation along the eastern shore of the Sacramento River, south of Pos. No. 6008, revealed more riprap, generally covering at mid to high-water. The riprap occurs only sporadically, extends 10-15 meters offshore of the HWL, and extends south to the Threemile Slough Bridge, parallel to shore. Pos. No. 6005 confirms the approximate southern limit of this alongshore foul area. The hydrographer recommends charting a foul area between 38°06'25.290"N, 121°42'02.290"W, and 38°08'28.270"N, 121°41'06.750"W, extending up to 15 meters offshore. See the FFS *comment* and smooth sheet for a complete depiction. Furthermore, recommend a general note be published on the chart, in the vicinity of the eastern shore of the Sacramento River, stating "Shoreline generally foul with submerged rocks and piles to 15 meters offshore, from Threemile Slough to 38°08'48"N.". Add "See note B" to cover extent of this foul area along the eastern shore of Sacramento River. *comment*

AWOIS Item No. 51640 originates from an unknown source, possibly a 1960 photo revision, and is described as a row of piles in position 38°08'32.700"N, 121°41'36.830"W. On DN 280, during shoreline verification, a visual search in the target area (Pos. No. 6677) located pilings and ruins at Pos. No. 6679 (approximately 130 meters south of the AWOIS GP), extending south for 80 meters to Pos. No. 6680 (approximately 210 meters south of the AWOIS GP), and uncovering up to 0.8 meters at MLLW. These pilings are within 3 meters of the HWL, obscured by thick vegetation, and partly covered by the eroding sand embankment; and are not considered a danger to navigation. A row of concrete fence foundations was also located at Pos. No. 6678 extending

offshore three meters and uncovering 2.8 meters at MLLW. Several piers and ramps depicted on TP-01055 in this area were verified. No further investigations were determined necessary by the hydrographer. The hydrographer recommends removing from the chart pilings* shown at 38°08'32.700"N, 121°41'36.830"W. *Concur and chart*

features as shown on the smooth sheet. *Extent of charted piling is Lat. 38°08'00"N to Lat. 38°08'30"N, Long. 121°41'36"W to Long. 121°41'39"W.
AWOIS Item No. 51641 originates from Chart Letter 241/78 (USPS) and is described as shoaling, possibly to 4 feet, in position 38°08'49.700"N, 121°41'28.830"W. On DN 288, 5-meter and 10-meter development hydrography 100 meters north and south of the AWOIS GP (Pos. Nos. 7188-7213) found no evidence of shoaling. On DN 297 a 50-meter radius bottom drag, centered at Pos. No. 7608 was also negative. Soundings obtained during this survey indicate the AWOIS GP reportedly lies within the Sacramento River Deep Water Ship Channel (SRDWSC), along its western limit. West of the SRDWSC, the river bottom rises to meet the shore with no unusual shoaling evident. Launch personnel interviewed Sam Nichols (707-374-2315), owner of Delta Marina for the past thirty years, who reported no knowledge of a shoal area and had heard no reports of any obstruction encountered in the target area. Mr. Nichols confirmed that dredging was performed shoreward of the target approximately six years earlier (circa 1986). The hydrographer believes no shoal exists now at the reported location and recommends removing from the chart the "Shl rep 1978" notation shown in approximate position 38°09'00"N, 121°41'57"W. ^{Concur} Recommend soundings from this survey supersede charted depths in this area. *Depths range from 8.8 to 11.6 meters.* *Concur*

AWOIS Item No. 51642 originates from an unknown source, possibly a 1960 photo revision, and is described as two piles in position 38°09'21.700"N, 121°41'19.830"W. On DN 280 a 16-minute echosounder drift search was conducted in the vicinity of the charted piles (Pos. No. 6700). No piles were visible on the echogram. A dolphin (Pos. No. 6701), ^{being} uncovering 3.9 meters at MLLW, was located shoreward of the charted piles, approximately 5 meters from the HWL, and approximately 40 meters north of the AWOIS GP. The area is industrial with several large, moored barges and deep-draft vessels. Because of the numerous moored vessels and barges, no bottom drag was feasible. ^{being} The 2.7 hydrographer recommends charting a dolphin* uncovering 3.9 meters at MLLW at 38°09'23.190"N, 121°41'19.910"W. *Do not concur* Do not chart the piles shown at 38°09'21.5"N, 121°41'20.5"W. *Concur* *Concur*
* The dolphin plots along the shoreline and should not be charted as it is covered under the "Note B, Caution".

AWOIS Item No. 51643 originates from Chart Letter 1055/74 (USPS) and is described as an area shoaling to bare in position 38°10'09.690"N, 121°40'18.830"W. Mainscheme, 50-meter splits, and 25-meter development hydrography from approximate latitude 38°09'30", north to the sheet limit, revealed extensive shoaling from the eastern limit of the SRDWSC to shore. Numerous shoal least depths were found. In particular, four shoal depths were reported as dangers to navigation to provide a general supplement to the charted notation "Shoaling to bare rep 1982". Pos. No.

7178+4 (4.1 meters at MLLW, DN 283), Pos. No. 7452+4 (0.7⁸ meters at MLLW, DN 289), Pos. No. 7440+6 (0.3⁵ meters at MLLW, DN 289), and Pos. No. 7018+2 (uncovers 0.1 meters at MLLW, DN 282) were reported to provide a general indication of the shoaling which has occurred in this area. The hydrographer recommends soundings from this survey be used to supersede the charted depths. *Concur*
Recommend the notation "Shoaling to bare rep 1982", in approximate position 38°10'06.0"N, 121°40'25.0"W, be removed from the chart. *Concur*

AWOIS Item No. 51644 originates from TP-01055/83 and is described as a wreck in position 38°10'25.690"N, 121°40'25.830"W. On DN 283, during shoreline verification, a wrecked barge approximately 125 meters long, 15-20 meters wide, and *uncovering* 1.5 meters at MLLW (south end, Pos. No. 7095) and *2.0 meters* at MLLW (north end, Pos. No. 7096), with vegetation growing in the hull (see photo), was located. The hydrographer recommends charting wreck limits between 38°10'24.951"N, 121°40'26.066"W, and 38°10'26.564"N, 121°40'25.153"W, as shown on TP-01055 and on the FFS. *Chart limits of wreckage rather than hull in ruins based on charting scale.* *Concur*

Dangers to Navigation ✓

Fifteen dangers to navigation were reported to the Eleventh Coast Guard District in correspondence dated January 21, 1993. A copy of this report is in ~~Appendix I (Danger to Navigation Reports)~~. *this report.*

In determining valid dangers to navigation, the hydrographer considered the types of vessel traffic observed throughout this survey area, and the adequacy of charted soundings. Typical vessels observed in this portion of the Sacramento River include some deep draft ships navigating within the SRDWSC, some sailboats, and most commonly, recreational power boats. Dangers submitted by the hydrographer are representative of the substantial shoaling which has occurred east of the SRDWSC and which is now inadequately charted. This shoaling represents real danger to any vessel, but is particularly dangerous to the mariner relying on charted soundings for safe navigation. Shoaling in this part of the Sacramento River is significantly more complex than could be described in a short Local Notice to Mariners (LNM). Accordingly, the hydrographer recommends N/CG245, Pacific Hydrographic Section, prepare a danger to navigation chartlet in accordance with HSG 66 for inclusion in the Notice to Mariners (NM). *The Pacific Hydrographic Field Party's Report was adequate warning for the mariner. No chartlet was generated by Pacific Hydrographic Section.*

Sounding Comparisons ✓

A sounding comparison was made between a stable-based 1:10,000-scale enlargement of Chart No. 18661 SC (21st edition) and the H-10442 final field sheet. Depth curves have changed significantly east of the SRDWSC; surveyed soundings are generally shoaler than charted depths and charted shoal areas are more extensive. As discussed in Dangers to Navigation, the shoal areas, both north

and south of the Rio Vista Bridge, are significantly different from the chart, and more complex than can be discussed here. The hydrographer recommends all charted soundings be superseded by data from this survey. *CONCUR*

This significant shoaling found east of the SRDWSC, within the limits of this survey, confirms informal reports received from local mariners. The prolonged drought in central California, together with increased irrigation of agricultural land south of the delta, has severely reduced the annual spring runoff which historically served to flush the Sacramento River. *See Evac Report, section 7a.*

Soundings west of the SRDWSC compared well, generally agreeing to within 1 meter of the charted depths. *CONCUR*

Per the OPR-L208 Chart Markup, all soundings within the Sacramento River originate from US Army Corps of Engineers surveys.

Sounding Comparisons - Controlling Depths *See Evac Report, section 7c.*

The controlling depth for the Sacramento River Deep Water Ship Channel (SRDWSC) throughout the survey area is noted on the chart as 26.9 feet (8.2 meters). Soundings from this survey were found to be deeper, typically 10 to 11 meters, from the southern limit of this survey to approximately Light 36. North of Light 36, the SRDWSC becomes deeper and broader. Depths over 20 meters were found near the northern limit of this survey. The controlling depth for the SRDWSC within the limits of this survey is considered adequate by the hydrographer. *CONCUR*

One shoal investigation, discussed under AWOIS Item 51641 and reported to exist in the SRDWSC, was disproved. Additionally, a "shoal rep 214", AWOIS Item 51624, located in the SRDWSC between Lt. 19 and Lt. 21 was disproved.

Non-Sounding Features Comparison ✓

Comparison was made between all non-sounding features and the hydrographic records. In accordance with Project Instruction paragraph 6.12.2, most features near the HWL were judged not to be dangers to navigation and, unless noted otherwise below, were searched for by visual methods only. Several non-sounding features were previously discussed as AWOIS items.

All significant charted non-sounding features were previously discussed under Section J (Shoreline), with the following exceptions:

A dredged cut, possibly an old marina, inshore of position 38°08'57.961"N, 121°40'58.963"W (Pos. No. 6719, DN 280) was not accessible to the launch as the cut entrance had a low telephone wire across it. Shoreline in this area agrees with that shown on TP-01055. The hydrographer recommends charting shoreline as

shown on TP-01055 and removing the small dredged area now shown on the chart to the south.

CONCUR

A pile charted in approximate position 38°09'00"N, 121°41'30"W, was disproved on DN 280 after a visual and echosounder search (Pos. No. 6690). A metal dolphin was located approximately 30 meters north of this charted pile, as per TP-01055, in position 38°09'00.242"N, 121°41'28.316"W (Pos. No. 6689), 10 meters from the HWL and uncovering 4.6 meters at MLLW. The hydrographer recommends not charting this pile. Chart a dolphin at 38°09'00.242"N, 121°41'28.316"W. Remove pile, and do not chart dolphin as found by this survey as it plots along the shoreline and is covered under the "Note B, Caution".

Do not
CONCUR

Two piles charted in approximate position 38°09'00"N, 121°41'00"W, were disproved on DN 280 after a visual and echosounder search (Pos. No. 6718). A T-shaped wooden pier was located, approximately 30 meters inshore of these charted piles, as per TP-01055, with its northern end at position (DOL) 38°08'59.054"N, 121°40'58.975"W (Pos. No. 6717). The hydrographer recommends not charting these piles. Chart the pier and dol as per TP-01055, in position 38°08'59.054"N, 121°40'58.975"W (north end).

CONCUR

A pile charted in approximate position 38°09'05"N, 121°41'27"W, was disproved on DN 280 after a visual and echosounder search (Pos. No. 6694). A floating dock was located, within 10 meters of the charted pile, shown as a two dolphins on TP-01055, in position 38°09'04.760"N, 121°41'26.830"W (Pos. No. 6695). The hydrographer recommends not charting this pile. Chart a small dock in position 38°09'04.760"N, 121°41'26.830"W.

CONCUR

A pile charted in approximate position 38°09'16"N, 121°41'24"W, was disproved on DN 280 after a visual, echosounder (Pos. No. 6703), and sounding pole searches (DN 297). This pile is charted at the south end of the Rio Vista municipal boat ramp. Per John DeSilva, Maintenance Foreman for the Department of Public Works in Rio Vista (707-374-6747), the existing boat ramp was constructed circa 1962; approximately 15 years ago, major dredge work was conducted to remove a reported obstruction (steel drums); in 1987, following major flooding, a new dock was constructed and new riprap added to reinforce the shoreline around the dock. Mr. DeSilva was not aware of any piles in this area, and was adamant that no obstructions or piles could exist in this area due to the recent history of dredge work at the public ramp. The hydrographer believes this charted pile no longer exists and recommends not charting it.

CONCUR

Marinas

Two active marinas charted within the limits of this survey were confirmed.

On DN 289, ^{piers} docks for the Delta Marina were verified as per TP-

01055 (Pos. Nos. 7503 to 7504). These ^{PIERS}docks are correctly depicted on the chart. A controlling depth of 1.3 meters in position 38°08'54.806"N, 121°41'31.808"W (Pos. No. 6900+2, DN 281) at MLLW was observed during hydrography in this marina.

On DN 282, docks for the Cliff House Marina were verified (Pos. Nos. 6922 to 6925). These docks are incorrectly shown on the chart and on TP-01055. A controlling depth of 1.2 meters in position 38°10'02.98"N, 121°40'14.43"W (Pos. No. 7465 +12, DN 282) at MLLW was observed during hydrography in this marina. The hydrographer recommends docks and shoreline features for this marina be shown as per the FFS and smooth sheet.

Recommendations

The hydrographer recommends the first paragraph of the "NOTE B CAUTION" shown on Chart 18661 SC in approximate position 38°12'00"N, 121°38'00"W be amended as follows: "...along the edges of the waterway; and snags and debris are subject to movement at any time".

CONCUR

Recommend N/CG245 immediately prepare a dangers to navigation chartlet in accordance with HSG 66. The hydrographer's danger report was adequate. No chartlet was made. See attached danger to navigation report dated 1-21-93.

O. ADEQUACY OF SURVEY ✓

This survey is a complete basic hydrographic survey and is adequate to supersede all prior surveys within their common areas.

CONCUR

P. AIDS TO NAVIGATION ✓

USCG Correspondence

The adjusted positions for aids to navigation provided by N/CG2333 (Pacific Photogrammetric Party) for aids positioned by GPS in January, 1992, were forwarded to the Eleventh Coast Guard District, Long Beach, CA in correspondence dated July 31 and August 4, 1992. Copies of this correspondence were provided in ~~Appendix II~~ of the Descriptive Report for H-10447 (October, 1992).

Position Comparisons ✓

Table P-1 lists all aids to navigation which fall within the H-10442 survey limits. This table was used to compare the charted positions, aerotriangulated positions, GPS (field, relative static method) positions, and field (hydrographic, GPS control) positions of all aids to navigation. An inverse distance and bearing were computed using the HDAPS Geodetic Utility Program

between the charted positions and the hydrographic positions. For SRDWSC LT 28 (Station SR28 1992), the unadjusted field position, vice the hydrographic position, was used for comparison with the chart. Printouts from coastal mapping project CM-7823 and CM-8400, which list the aerotriangulated positions (in NAD 27) for several navigational aids, were provided for this project (copies in Appendix II*Non-Floating Aids and Landmarks for Charts).

* Filed with the hydrographic data

TABLE P-1

Floating/Non-Floating Aids and Landmarks
Comparison of Charted Positions to Field Positions for IL-10442

| <u>DESCRIPTION</u> | <u>LL POS.</u> | <u>CHARTED POS.</u> | <u>AERO POS.</u> | <u>GPS POS.</u> | <u>HYDRO. POS.</u> | <u>DP</u> | <u>DN</u> | <u>DIST.</u> | <u>▲</u> |
|------------------------------------------------------------------|-------------------------------|-----------------------------------|-----------------------------------|-----------------|--------------------|-----------|-----------|--------------|----------|
| Chart 18661 Sacramento River Deep Water Ship Channel (SRDWSC) | | | | | | | | | |
| 1. SRDWSC LT 19 [✓] LLN 7255 | 38°06'47.0"W 121°42'37.0"W | 38°06'45.555"W 121°42'37.867"W | 38°06'46.927"W 121°42'36.804"W | 6163 | 269 | 5.3 | 114 | | |
| 2. SRDWSC LT 20 [✓] LLN 7260 | 38°06'43.0"W 121°42'33.0"W | 38°06'42.652"W 121°42'32.576"W | 38°06'42.470"W 121°42'32.565"W | 6164 | 269 | 19.4 | 147 | | |
| 3. SRDWSC LT 21 [✓] LLN 7265 | 38°07'02.0"W 121°42'21.0"W | 38°07'01.495"W 121°42'20.851"W | 38°07'01.450"W 121°42'20.789"W | 6166 | 269 | 17.7 | 163 | | |
| 4. SRDWSC LT 22 [✓] LLN 7270 | 38°07.0"N 121°42.2"W | 38°06'58.0"W 121°42'15.5"W | 38°06'57.554"W 121°42'15.057"W | 6165 | 269 | 17.5 | 142 | | |
| 5. SRDWSC LT 23 [✓] LLN 7275 | 38°07'29.0"W 121°41'58.0"W | 38°07'28.393"W 121°41'57.055"W | 38°07'28.349"W 121°41'57.213"W | 6167 | 269 | 27.8 | 136 | | |
| 6. SRDWSC LT 24 [✓] LLN 7280 | 38°07.4"N 121°41.8"W | 38°07'27.0"W 121°41'50.0"W | 38°07'26.478"W 121°41'49.748"W | 6168 | 269 | 17.2 | 159 | | |
| 7. SRDWSC LT 25 [✓] LLN 7285 | 38°08.0"N 121°41.7"W | 38°08'00.5"W 121°41'41.5"W | 38°08'00.197"W 121°41'42.706"W | 6170 | 269 | 30.9 | 253 | | |
| 8. SRDWSC LT 26 [✓] LLN 7290 | 38°07'59.0"W 121°41'36.5"W | 38°07'58.963"W 121°41'35.651"W | 38°07'58.888"W 121°41'35.592"W | 6171 | 269 | 22.4 | 099 | | |

TABLE P-1

Floating/Non-Floating Aids and Landmarks
Comparison of Charted Positions to Field Positions for H-10442

| <u>DESCRIPTION</u> | <u>LL POS.</u> | <u>CHARTED POS.</u> | <u>AERO POS.</u> | <u>GPS POS.</u> | <u>HYDRO. POS.</u> | <u>DP</u> | <u>DM</u> | <u>DIST.</u> | <u>#</u> |
|------------------------------------------------------|-------------------------|--------------------------------|-----------------------------------|-----------------------------------|-----------------------------------|-----------|-----------|--------------|----------|
| 9. SRWSC LT 27 ✓ LLN 7295 | | 38°08'58.5"N 121°41'26.5"W | | | 38°08'57.590"N 121°41'26.466"W | 6185 | 269 | 28.1 | 179 |
| 10. SRWSC LT 28 ✓ LLN 7305 (STATION SR28 1992) | 38°08.9'N 121°41.3'W | 38°08'57.0"N 121°41'20.0"W | 38°08'56.968"N 121°41'17.698"W | 38°08'56.700"N 121°41'20.267"W | 38°08'56.721"N 121°41'20.354"W | 6190 | 269 | 12.1 | 225 |
| 11. SRWSC LT 29 ✓ LLN 7310 | | 38°09'13.5"N 121°41'21.0"W | | | 38°09'13.622"N 121°41'20.328"W | 6186 | 269 | 16.7 | 077 |
| 12. SRWSC LT 30 ✓ LLN 7315 | | 38°09'12.0"N 121°41'13.0"W | | | 38°09'11.785"N 121°41'13.489"W | 6189 | 269 | 13.6 | 242 |
| 13. SRWSC LT 32 ✓ LLN 7320 | 38°09.3'N 121°41.1'W | 38°09'20.0"N 121°41'08.5"W | 38°09'19.350"N 121°41'08.143"W | | 38°09'19.186"N 121°41'08.873"W | 6188 | 269 | 26.6 | 200 |
| 14. SRWSC BUOY 34 ✓ LLN 7325 | 38°09.4'N 121°41.1'W | 38°09'26.0"N 121°41'05.0"W | | | 38°09'25.923"N 121°41'04.194"W | 6187 | 269 | 19.9 | 097 |
| 15. SRWSC BUOY 35 ✓ LLN 7340 | 38°09.6'N 121°41.0'W | 38°09'36.5"N 121°41'03.0"W | | | 38°09'35.670"N 121°41'01.975"W | 7471 | 289 | 35.7 | 136 |
| 16. SRWSC LIGHTED ✓ BUOY 36A LLN 7345 | 38°10.3'N 121°40.3'W | 38°10'19.50"N 121°40'17.0"W | | | 38°10'18.589"N 121°40'17.115"W | 7469 | 289 | 28.2 | 186 |
| 17. SRWSC LT 36 ✓ LLN 7355 | | 38°09'53.0"N 121°40'42.0"W | | | 38°09'52.799"N 121°40'40.942"W | 7470 | 289 | 26.5 | 103 |

The hydrographer found all aids to navigation, when compared to their charted position shown on the 21st edition of Chart 18661, differed by less than 36 meters. Because the 35.7 meter maximum difference is approximately one millimeter at the scale of the chart, the hydrographer believes no revisions to the location of these aids on Chart 18661 are required. All fixed aids to navigation within the limits of H-10442 adequately serve their established purpose. COMWAT

All floating aids to navigation within the limits of H-10442 were positioned by hydrographic methods. Descriptions and characteristics of these aids are provided in the field records. The hydrographer also notes that aids to navigation, particularly ✓ the fixed aids, are frequently damaged or destroyed by passing vessels, and are not always replaced in their exact charted location.

The NADCON computations which convert NAD 27 positions to NAD 83, and the inverse computations discussed above, are included in the data files.

Bridges ✓

The west side of the Threemile Slough Bridge was verified by Pos. Nos. 6000 to 6004 (DN 268). These positions confirm the location of this bridge is adequately charted. See survey H-10435 for verification of the east side of this bridge.

The Rio Vista Bridge was verified by Pos. Nos. 6712 to 6716 (south side, DN 274), and by Pos. Nos. 7472 to 7474 (north side, DN 289). These positions confirm the location of this bridge is adequately charted. A photograph of the west bridge fender confirmed the existence of the charted horns (see data for DN 297). Per the bridge operator (707-374-2134), these horns are operational.

Pipeline and Cable Crossings ✓

A charted pipeline crossing was verified by locating warning signs at $38^{\circ}08'49.858''\text{N}$, $121^{\circ}41'01.964''\text{W}$ (Pos. No. 6720, east shore, DN 280) and $38^{\circ}08'51.924''\text{N}$, $121^{\circ}41'31.014''\text{W}$ (Pos. No. 6681, west shore, DN 280). These positions confirm this pipeline crossing is adequately charted. COMWAT

A charted submerged cable crossing at the Rio Vista Bridge was verified by locating warning signs attached to the bridge fenders (Pos. Nos. 7472 to 7474, DN 289). These positions confirm this submerged cable crossing is adequately charted. COMWAT

* Filed with the hydrographic data.

Q. STATISTICS ✓

| <u>Description</u> | <u>Quantities</u> |
|--------------------------------------------------------|-------------------|
| Total Positions: | 1604 |
| Total Detached Positions: (includes Bottom Samples) | 219 |
| Linear Nautical Miles of Hydrography | 122.4 |
| Sq. Nautical Miles of Hydrography | 1.8 |
| Bottom Samples | 28 |
| Velocity Casts | 6 |
| Days of Production | 13 |

R. MISCELLANEOUS ✓

Bottom samples were taken in accordance with Hydrographic Manual Section 1.6.3. Samples were not submitted to the Smithsonian Institution. Bottom sample positions are plotted on the FFS Overlay. Bottom sample descriptions are noted on the FFS, and an overlay to accompany the Smooth Sheet.

No anomalous tidal conditions were observed.

Per Project Instructions, no current observations were conducted in the survey area.

No magnetic anomalies were observed.

S. RECOMMENDATIONS ✓

None.

T. REFERRAL TO REPORTS

| <u>TITLE</u> | <u>DATE</u> | <u>TO</u> |
|---------------------------------------------------------------|-------------|-----------|
| 1992 Horizontal Control Report, OPR-L208-PHP (by N/CG2333) | July, 1992 | N/CG245 |

No separate Electronic Control Report or Corrections to Echo Soundings Report is scheduled for submittal.

Approved and Forwarded,

Gerd F. Glang
Gerd F. Glang
Lieutenant, NOAA
Chief of Party

CONTROL STATIONS as of 6 Jan 1993

| No | Type | Latitude | Longitude | H | Cart | Freq | Vel | Code | MM/DD/YY | Station Name |
|----------------|------|--------------------------|--------------------------|---------------|----------------|----------------|----------------|------|---------------------|--------------------------------------------|
| 713 | F | 030-07-07.203 | 121-42-30.435 | 30 | 130 | 0.0 | 0.0 | | 09/23/92 | NO. 0 USE 1991 |
| 755 | F | 030-09-31.464 | 121-41-00.942 | 64 | 130 | 0.0 | 0.0 | | 09/23/92 | RIO5 1992 |
| 763 | F | 030-10-07.904 | 121-35-41.342 | 36 | 130 | 0.0 | 0.0 | | 09/23/92 | GRAN 1992 |
| 765 | F | 030-06-22.733 | 121-42-02.399 | 46 | 243 | 0.0 | 0.0 | | 09/23/92 | MILE 1992 |
| 771 | F | 030-06-14.619 | 121-41-46.100 | 4 | 130 | 0.0 | 0.0 | | 09/23/92 | TRES 1992 |
| 772 | F | 030-06-55.977 | 121-40-55.574 | 3 | 130 | 0.0 | 0.0 | | 09/23/92 | MACK 1992 |
| 800 | F | 030-08-53.124 | 121-41-38.827 | 14 | 254 | 0.0 | 0.0 | | 09/23/92 | PHP1 1992 (DIFF. GPS REF. STA.) |
| 801 | F | 030-10-42.619 | 121-40-11.592 | 3 | 130 | 0.0 | 0.0 | | 09/23/92 | SUBM 1992 |
| 802 | F | 030-10-21.524 | 121-38-07.535 | 7 | 130 | 0.0 | 0.0 | | 09/23/92 | GLUG 1992 |
| 803 | F | 030-09-52.752 | 121-37-20.114 | 6 | 130 | 0.0 | 0.0 | | 09/23/92 | DRAN 1992 |
| 804 | F | 030-10-21.860 | 121-39-08.551 | 8 | 130 | 0.0 | 0.0 | | 09/23/92 | LT04 1992 |
| 805 | F | 030-11-52.907 | 121-39-20.535 | 10 | 130 | 0.0 | 0.0 | | 09/23/92 | LT42 1992 |
| 806 | F | 030-11-09.601 | 121-30-52.796 | 7 | 130 | 0.0 | 0.0 | | 09/23/92 | STEM 1992 |
| 807 | F | 030-08-56.697 | 121-41-20.268 | 7 | 243 | 0.0 | 0.0 | | 09/23/92 | SR28 1992 (DIFF. GPS CHK. STA.) |
| 808 | F | 030-14-42.746 | 121-41-54.274 | 13 | 130 | 0.0 | 0.0 | | 09/23/92 | LINZ 1992 |
| 809 | F | 030-14-10.596 | 121-41-04.142 | 4 | 130 | 0.0 | 0.0 | | 09/23/92 | FURY 1992 |
| 810 | F | 030-14-05.992 | 121-39-55.393 | 7 | 130 | 0.0 | 0.0 | | 09/23/92 | HINT 1992 |
| 811 | F | 030-13-24.176 | 121-40-20.602 | 10 | 130 | 0.0 | 0.0 | | 09/23/92 | C540 1992 |
| 812 | F | 030-06-13.903 | 121-42-36.692 | 11 | 130 | 0.0 | 0.0 | | 09/23/92 | BECKER IS. N. END LT 1991 |
| 813 | F | 030-11-34.630 | 121-37-42.661 | 9 | 130 | 0.0 | 0.0 | | 09/23/92 | STEAMBOAT 1991 |
| 814 | F | 030-15-06.362 | 121-40-22.874 | 2 | 243 | 0.0 | 0.0 | | 09/23/92 | PROG 1992 |
| 815 | F | 030-14-37.242 | 121-40-43.374 | 4 | 243 | 0.0 | 0.0 | | 09/23/92 | ISLE 1992 |

1-6-93
GFG



UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL OCEAN SERVICE
Coast and Geodetic Survey
Seattle, Washington 98115-0070
Pacific Hydrographic Party
USATF 801 Beach Drive
Rio Vista, CA 94571-2003
(707) 374-5642

January 21, 1993

Commander
Eleventh Coast Guard District (oan)
Federal Building
501 W. Ocean Blvd.
Long Beach, CA 90822-5399

**ADVANCE
INFORMATION**

Dear Sir:

While conducting hydrographic survey operations on the Sacramento River, California, the NOAA Pacific Hydrographic Party discovered numerous dangers to navigation within the survey limits of H-10442, Vicinity of Rio Vista. Significant shoaling has occurred in the Sacramento River, east of the Sacramento River Deep Water Ship Channel, from Decker Island North End Light to approximate latitude 38°10'30", where Cache Slough meets the Sacramento River. This shoaling is extensive and charted soundings in this area are, in several cases, inaccurate. The attached dangers to navigation highlight significant least depths. Mariners should use every caution when transiting the Sacramento River between Decker Island North End Light and Cache Slough, while outside the marked deep water channel.

Detailed information will be provided to you by the NOAA Pacific Hydrographic Section, Seattle, WA, as soon as possible. I recommend the attached 15 dangers for immediate inclusion in the Local Notice to Mariners. These dangers have been reported to DMAHTC. A brief description, and a copy of the chart showing the area in which these dangers exist, are attached.

The reported depths are reduced to mean lower low water (MLLW) using predicted tides. Questions concerning this report should be directed to:

NOAA Pacific Hydrographic Section
7600 Sand Point Way, NE, BIN C15700
Seattle, WA 98102-0070
(206) 526-6853

Sincerely,

Gerd F. Glang
Lieutenant, NOAA
Chief, Pacific Hydrographic Party

Attachments
cc:DMAHTC
N/CG221
N/CG245





UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL OCEAN SERVICE
Coast and Geodetic Survey

Seattle, Washington 98115-0070
Pacific Hydrographic Party
USATF 801 Beach Drive
Rio Vista, CA 94571-2003
(707) 374-5642

January 21, 1993

Director
DMAHTC
Attn:MCNA
6500 Brooks Lane
Washington, D.C. 20315-0030

**ADVANCE
INFORMATION**

Dear Sir:

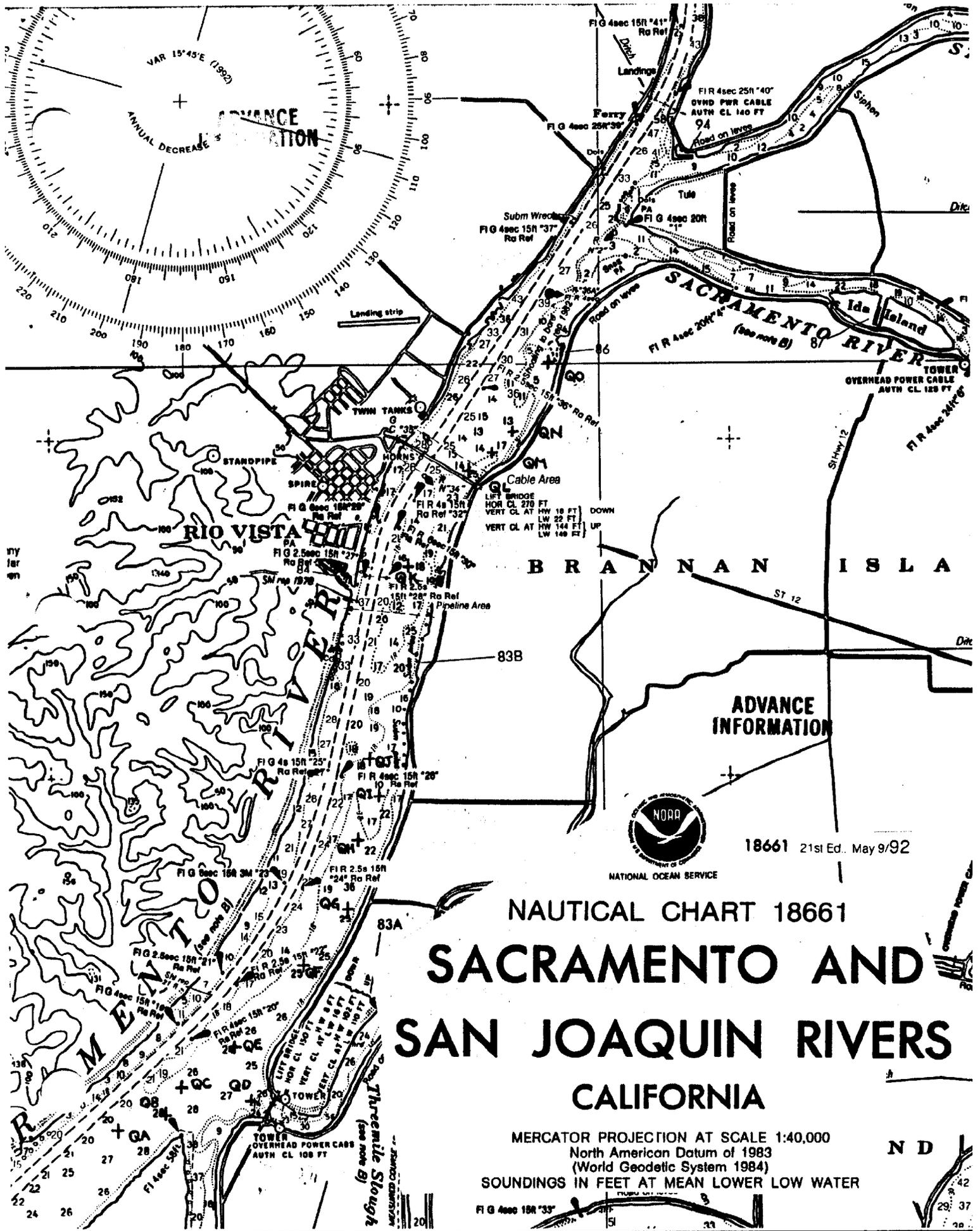
While conducting hydrographic survey operations on the Sacramento River, California, the NOAA Pacific Hydrographic Party discovered numerous dangers to navigation within the survey limits of H-10442, Vicinity of Rio Vista. They were reported to the Eleventh Coast Guard District. A copy of correspondence describing the dangers is enclosed.

Sincerely,

Gerd F. Glang
Gerd F. Glang
Lieutenant, NOAA
Chief, Pacific Hydrographic Party

Attachments





US Department of Commerce
 NOAA Pacific Hydrographic Party
 Dangers to Navigation
 Project OPR-L208, Survey H-10442
 California, Sacramento River, Vicinity of Rio Vista, PHP-10-4-92, Sheet Q

Significant shoaling has occurred in the Sacramento River, east of the Sacramento River Deep Water Ship Channel, from Decker Island North End Light to the Rio Vista Bridge. This shoal area is not shown on NOS Chart 18661 (21st Edition, May 9, 1992) and many charted soundings in this area are significantly inaccurate. Mariners should use particular caution when transiting this portion of the Sacramento River and navigating outside of the marked deep water channel. The following shoal least-depths are particularly dangerous:

| ITEM | POSITION NUMBER | CHART NUMBER EDITION/DATUM | SURVEY DEPTH | REPORTED DEPTH | LATITUDE | LONGITUDE |
|------|---------------------|----------------------------|-----------------|--------------------|---------------|----------------|
| QA. | 7573+2 | 18661 21st/NAD83 | 4.2M at MLLW | 13 feet at MLLW | 38°06'16.57"N | 121°43'00.07"W |
| QB. | 6033+3 | 18661 21st/NAD83 | 2.7M at MLLW | 9 feet at MLLW | 38°06'19.10"N | 121°42'43.88"W |
| QC. | 6485+3 | 18661 21st/NAD83 | 3.4M at MLLW | 11 feet at MLLW | 38°06'27.20"N | 121°42'36.14"W |
| QD. | 7578+ A2 | 18661 21st/NAD83 | 3.5M at MLLW | 11 feet at MLLW | 38°06'24.37"N | 121°42'10.50"W |
| QE. | 6459+5 | 18661 21st/NAD83 | 3.2M at MLLW | 10 feet at MLLW | 38°06'40.19"N | 121°42'17.63"W |
| QF. | 6413+6 | 18661 21st/NAD83 | 3.2M at MLLW | 10 feet at MLLW | 38°07'02.54"N | 121°41'51.45"W |
| QG. | 6382+3 | 18661 21st/NAD83 | 1.8M at MLLW | 6 feet at MLLW | 38°07'21'94"N | 121°41'35.72"W |
| QH. | 6573+7 | 18661 21st/NAD83 | 1.9M at MLLW | 6 feet at MLLW | 38°07'38.27"N | 121°41'31.14"W |
| QI. | 6229+1 | 18661 21st/NAD83 | 2.0M at MLLW | 6 feet at MLLW | 38°07'52.86"N | 121°41'22.87"W |
| QJ. | 6240+1 | 18661 21st/NAD83 | 3.4M at MLLW | 11 feet at MLLW | 38°08'02.57"N | 121°41'27.26"W |
| QK. | 6742+4 | 18661 21st/NAD83 | 4.2M at MLLW | 13 feet at MLLW | 38°08'59.37"N | 121°41'10.92"W |

ADVANCE
 INFORMATION

US Department of Commerce
 NOAA Pacific Hydrographic Party
 Dangers to Navigation
 Project OPR-L208, Survey H-10442
 California, Sacramento River, Vicinity of Rio Vista, PHP-10-4-92, Sheet Q

Significant shoaling has occurred in the Sacramento River, east of the Sacramento River Deep Water Ship Channel, from the Rio Vista Bridge north to approximate latitude 38°10'30"N (the northern limit of this survey). This shoal area is now indicated as "shoaling to bare" on NOS Chart 18661 (21st Edition, May 9, 1992). In addition to this shoaling, numerous snags and wrecks exist in this area close along the marsh shore. Charted soundings now indicated in this area are significantly inaccurate. Mariners should use particular caution when transiting this portion of the Sacramento River and navigating outside of the marked deep water channel. The following shoal least-depths are particularly dangerous:

| ITEM | POSITION NUMBER | CHART NUMBER EDITION/DATUM | SURVEY | | REPORTED DEPTH | GEOGRAPHIC POSITION | |
|------|-----------------|----------------------------|--------|---------|---------------------|---------------------|----------------|
| | | | DEPTH | at MLLW | | LATITUDE | LONGITUDE |
| QL. | 7178+4 | 18661 21st/NAD83 | 4.1M | at MLLW | 13 feet at MLLW | 38°09'26.97"N | 121°40'48.92"W |
| QM. | 7452+4 | 18661 21st/NAD83 | 0.7M | at MLLW | 2 feet at MLLW | 38°09'32.60"N | 121°40'39.13"W |
| QN. | 7440+6 | 18661 21st/NAD83 | 0.3M | at MLLW | 1 foot at MLLW | 38°09'39.10"N | 121°40'31.73"W |
| QO. | 7018+2 | 18661 21st/NAD83 | -.1M | at MLLW | uncovers at MLLW | 38°10'00.94"N | 121°40'17.66"W |

**ADVANCE
 INFORMATION**

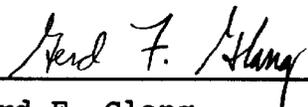
APPROVAL SHEET

for

SURVEY H-10442

I have reviewed the Descriptive Report, Final Field Sheets, and accompanying records for accuracy, completeness, compliance with project instructions, and adherence to required standards and procedures. I have supervised all field work on a daily basis to ensure a quality survey is forwarded for verification. I have personally examined the Final Field Sheets and all records of this survey during field processing. The data are forwarded for final review and processing to N/CG245, Pacific Hydrographic Section.

Approved and Forwarded,



Gerd F. Glang
Lieutenant, NOAA
Chief, Pacific Hydrographic Party

2-3-23

DATE

ORIGINAL



UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL OCEAN SERVICE
Office of Ocean and Earth Sciences
Rockville, Maryland 20852

TIDE NOTE FOR HYDROGRAPHIC SURVEY

DATE: February 18, 1993

MARINE CENTER: Pacific

OPR: L-208

HYDROGRAPHIC SHEET: H-10442

LOCALITY: California, Sacramento River, Vicinity of Rio Vista

TIME PERIOD: September 24 - October 23, 1992

TIDE STATION USED: 941-5236 Three Mile Slough, Sacramen. R., Ca.
Lat. $38^{\circ} 6.4'N$ Lon. $121^{\circ} 42.2'W$

PLANE OF REFERENCE (MEAN LOWER LOW WATER): 941-5236 = 2.43 ft.
HEIGHT OF HIGH WATER ABOVE PLANE OF REFERENCE: 941-5236 = 3.9 ft.

TIDE STATION USED: 941-5316 Rio Vista, Sacramento R., Ca.
Lat. $38^{\circ} 8.9'N$ Lon. $121^{\circ} 41.5'W$

PLANE OF REFERENCE (MEAN LOWER LOW WATER): 941-5316 = 13.88 ft.
HEIGHT OF HIGH WATER ABOVE PLANE OF REFERENCE: 941-5316 = 4.0 ft.

REMARKS: RECOMMENDED ZONING

1. In the Sacramento River south of $38^{\circ} 7.5'N$ to north of $38^{\circ} 6.0'N$, times and heights are direct on 941-5236.
2. North of $38^{\circ} 7.5'N$ to south of $38^{\circ} 11.0'N$, times and heights are direct on 941-5316.

NOTE: Hourly heights are tabulated on Pacific Standard Time.


CHIEF, DATUMS SECTION



GEOGRAPHIC NAMES

Name on Survey

A NOS Chart 18661
21st Ed/May 9, 1992
B
C TP-01055 1:20,000
March 1988
D TP-01059 1:20,000
April, 1981
E ON LOCAL MAPS
F P.O. GUIDE OR MAP
G RAND McNALLY
ATLAS
H U.S. LIGHT LIST
K

| Name on Survey | A | B | C | D | E | F | G | H | K | |
|--------------------|---|---|---|---|------------------------------|---|---|---|---|----|
| BRANNAN ISLAND | X | | X | | | | | | | 1 |
| CALIFORNIA (TITLE) | | | | | | | | | | 2 |
| DECKER ISLAND | X | | | X | | | | | | 3 |
| RIO VISTA | X | | X | | | | | | | 4 |
| SACRAMENTO RIVER | X | | X | X | | | | | | 5 |
| THREEMILE SLOUGH | X | | X | | | | | | | 6 |
| | | | | | | | | | | 7 |
| | | | | | | | | | | 8 |
| | | | | | | | | | | 9 |
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| | | | | | | | | | | 15 |
| | | | | | Approved: | | | | | 16 |
| | | | | | <i>Charles S. Hartington</i> | | | | | 17 |
| | | | | | Chief Geographer - N/CG 25 | | | | | 18 |
| | | | | | | | | | | 19 |
| | | | | | MAY - 5 1993 | | | | | 20 |
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HYDROGRAPHIC SURVEY STATISTICS

H-10442

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

| RECORD DESCRIPTION | | AMOUNT | RECORD DESCRIPTION | | AMOUNT |
|--------------------|-------------------|----------------------|------------------------------------|-----------|----------------------------|
| SMOOTH SHEET | | 1 | SMOOTH OVERLAYS: POS., ARC, EXCESS | | 1 |
| DESCRIPTIVE REPORT | | 1 | FIELD SHEETS AND OTHER OVERLAYS | | 0 |
| DESCRIPTION | DEPTH/POS RECORDS | HORIZ. CONT. RECORDS | SONAR-GRAMS | PRINTOUTS | ABSTRACTS/SOURCE DOCUMENTS |
| ACCORDION FILES | 1 | | | | |
| ENVELOPES | | | | | |
| VOLUMES | | | | | |
| CAHIERS | | | | | |
| BOXES | | | | 1 | |

| | | | | | |
|-----------------------------------|--|--|--|--|--|
| SHORELINE DATA | | | | | |
| SHORELINE MAPS (List): | | | | | |
| PHOTOBATHYMETRIC MAPS (List): | | | | | |
| NOTES TO THE HYDROGRAPHER (List): | | | | | |
| SPECIAL REPORTS (List): | | | | | |
| NAUTICAL CHARTS (List): | | | | | |

OFFICE PROCESSING ACTIVITIES

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

| PROCESSING ACTIVITY | AMOUNTS | | |
|------------------------------------------|--------------|------------|--------|
| | VERIFICATION | EVALUATION | TOTALS |
| POSITIONS ON SHEET | | | 1604 |
| POSITIONS REVISED | | | |
| SOUNDINGS REVISED | | | |
| CONTROL STATIONS REVISED | | | |
| | TIME-HOURS | | |
| | VERIFICATION | EVALUATION | TOTALS |
| PRE-PROCESSING EXAMINATION | | | |
| VERIFICATION OF CONTROL | | | |
| VERIFICATION OF POSITIONS | 41 | | 41 |
| VERIFICATION OF SOUNDINGS | 95 | | 95 |
| VERIFICATION OF JUNCTIONS | | | |
| APPLICATION OF PHOTOBATHYMETRY | | | |
| SHORELINE APPLICATION/VERIFICATION | | | |
| COMPILATION OF SMOOTH SHEET | 116 | | 116 |
| COMPARISON WITH PRIOR SURVEYS AND CHARTS | | 4 | 4 |
| EVALUATION OF SIDE SCAN SONAR RECORDS | | | |
| EVALUATION OF WIRE DRAGS AND SWEEPS | | | |
| EVALUATION REPORT | | 12 | 12 |
| GEOGRAPHIC NAMES | | | |
| OTHER | | | |
| USE OTHER SIDE OF FORM FOR REMARKS | | | |
| TOTALS | 252 | 16 | 268 |

| | | |
|-------------------------------------------------------|---------------------------------|--------------------------------|
| Pre-processing Examination by LT J. Griffin | Beginning Date 2/8/93 | Ending Date 2/19/93 |
| Verification of Field Data by L. Deodato | Time (Hours) 252 | Ending Date 6/7/94 |
| Verification Check by J. Stringham | Time (Hours) 37 | Ending Date 6/8/94 |
| Evaluation and Analysis by C.R. Davies | Time (Hours) 16 | Ending Date 6/17/94 |
| Inspection by B. Olmstead | Time (Hours) 26 | Ending Date 10/17/94 |

**EVALUATION REPORT
H-10442**

1. INTRODUCTION

Survey H-10442 is a basic hydrographic survey accomplished by the Pacific Hydrographic Party under the following Project Instructions.

OPR-L208-PHP, dated June 17, 1991

This survey was conducted in California and covers a portion of the Sacramento River, in the vicinity of Rio Vista. The surveyed area extends north from Decker Island and the entrance of Threemile Slough at latitude 38/06/15N, to latitude 38/10/30N. The shoreline in the area consists of levees built of rocks and piles, low-lying marsh islands and a number of private piers and marinas. The bottom consists of mud and sand. Depths range from zero meters along the shoreline to 20.7 meters in the center of the Sacramento River.

Predicted tides for San Francisco, California were used for the reduction of soundings during field processing. Approved hourly heights zoned from Three Mile Slough and Rio Vista, gages 941-5236 and 941-5316 were used during office processing.

The field sheet parameters have been revised to center the hydrography on the smooth sheet and to change the projection to polyconic. NAD 83 is used as the horizontal datum for plotting and position computation. The offset values and sound velocity correctors are adequate. An accompanying computer printout contains the parameters and the correctors.

A digital file has been generated for this survey that includes categories of information required to comply with Hydrographic Survey Guidelines No. 52, Standard Digital Data Exchange Format, April 15, 1986. Certain descriptive information, however, may not be in the digital record due to the restrictions of the presently available cartographic codes. The user should refer to the smooth sheet for complete information.

2. CONTROL AND SHORELINE

Sections H and I of the hydrographer's report and the 1992 Horizontal Control Report for OPR-L208-PHP, contain adequate discussions of horizontal control and hydrographic positioning.

Differential GPS (DGPS) was used to control this survey. A horizontal dilution of precision (HDOP) not to exceed 3.75 was computed for survey operations. The quality of 6 positions exceeded the limit in terms of HDOP. These positions are isolated and occur randomly

throughout the survey area. A review of the data, however, indicates that none of these fixes are used to position dangers to navigation. The features or soundings located by these fixes are consistent with the surrounding information. These fixes are considered acceptable.

The position of the horizontal control station used during hydrography is a 1992 field value based on NAD 83.

The smooth sheet and accompanying overlays are annotated with NAD 27 adjustment ticks based on values determined with NGS program NADCON. Geographic positions based on NAD 27 may be plotted on the smooth sheet utilizing the NAD 83 projection by applying the following corrections.

Latitude: 0.297 seconds (9.162 meters)
 Longitude: -3.837 seconds (-93.445 meters)

The year of establishment of control stations shown on the smooth sheet originates with the horizontal control records for this survey.

The following registered shoreline maps were compiled on NAD 27 and apply to this survey.

| | <u>Photo Date</u> | <u>Scale</u> |
|----------|-------------------|--------------|
| TP-01055 | April 1983 | 1:20,000 |
| TP-01059 | April 1979 | 1:20,000 |

The following shoreline changes are depicted on the smooth sheet with a dashed red line, and were transferred from the final field sheet without supporting position information. These revisions are approximate but are adequate to supersede the common photogrammetrically delineated shoreline.

| | <u>Latitude(N)</u> | <u>Longitude(W)</u> |
|---------------|--------------------|---------------------|
| Marsh islands | 38/10/11 | 121/40/16 |
| MHWL | 38/06/31 | 121/42/05 |
| Marsh island | 38/09/50 | 121/40/20 |
| MHWL | 38/10/23 | 121/40/00 |
| MHWL | 38/10/05 | 121/40/12 |
| MHWL | 38/10/28 | 121/40/24 |
| Bkhd | 38/10/18 | 121/40/35 |
| Bkhd | 38/10/15 | 121/40/33 |
| MHWL | 38/09/56 | 121/40/54 |
| MHWL | 38/09/50 | 121/40/57 |

| | | |
|------|----------|-----------|
| MHWL | 38/09/43 | 121/41/05 |
| MHWL | 38/09/01 | 121/41/15 |
| MHWL | 38/09/22 | 121/41/21 |
| MHWL | 38/08/27 | 121/41/41 |
| MHWL | 38/08/21 | 121/41/43 |
| MHWL | 38/08/03 | 121/41/41 |
| MHWL | 38/07/10 | 121/42/21 |
| MHWL | 38/07/05 | 121/42/27 |
| MHWL | 38/06/46 | 121/42/46 |

The following shoreline changes are depicted on the smooth sheet with a red line, and were transferred from the final field sheet with supporting position information. These revisions are adequate to supersede the common photogrammetrically delineated shoreline.

| | <u>Latitude(N)</u> | <u>Longitude(W)</u> |
|----------------|--------------------|---------------------|
| Marine railway | 38/10/08 | 121/40/45 |
| Pier | 38/09/02 | 121/41/14 |
| Pier | 38/09/05 | 121/41/27 |
| Pier | 38/08/55 | 121/41/29 |
| Marine railway | 38/08/51 | 121/41/32 |
| pier | 38/08/37 | 121/41/36 |
| pier | 38/08/23 | 121/41/40 |

3. HYDROGRAPHY

With the exception noted below and elsewhere in this report, hydrography is adequate to;

- a. delineate the bottom configuration, determine least depths, and draw the standard depth curves;
- b. reveal there are no significant discrepancies or anomalies requiring further investigation;
- c. show the survey was properly controlled and soundings are correctly plotted.

The hydrographer was apparently unable to define the zero curve throughout much of the survey area due to combination of either significant cultural development, numerous foul areas and or steeply sloping bottom just offshore of the mean high water line.

4. CONDITION OF SURVEY

The hydrographic records and reports received for processing are adequate and conform to the requirements of the Hydrographic Manual, 4th Edition, revised through Change No. 3, the Hydrographic Survey Guidelines, and the Field Procedures Manual, March 1992 edition.

5. JUNCTIONS

Survey H-10442 junctions with the following surveys.

| <u>Survey</u> | <u>Year</u> | <u>Scale</u> | <u>Area</u> |
|---------------|-------------|--------------|-------------|
| H-10373 | 1991 | 1:10,000 | South |
| H-10435 | 1992 | 1:10,000 | East |
| H-10447 | 1992 | 1:10,000 | North |

The junctions with surveys H-10435 and H-10447 are complete. The junction with survey H-10373 has not been formally completed because this survey has been previously processed and forwarded for charting. There is excellent agreement between soundings. Soundings have been transferred to survey H-10442 from surveys H-10373 and H-10447 to better portray the bottom in the common areas.

6. COMPARISON WITH PRIOR SURVEYS

H-6013(1934) 1:10,000

Survey H-6013 covers the entrance of Threemile Slough. There is an average difference in depths of two meters, survey H-10442 being shoaler. There has been several shoreline changes since the prior survey was accomplished, a marsh island located between 38/06/02N, longitude 121/42/07W and 38/07/24N, longitude 121/41/31W is no longer present, the northern end of Decker Island has eroded southward approximately 50 meters. These processes and the accretion due to the reduced runoff in the Sacramento River account for the depth differences between the two surveys.

There are no AWOIS items which originate with prior survey H-6013.

Survey H-10442 is adequate to supersede the prior survey within the common area.

7. COMPARISON WITH CHART

Chart 18661 22nd Edition, January 9, 1993; scale 1:40,000

a. Hydrography

Charted hydrography originates with the prior survey mentioned in section 6 and miscellaneous sources.

A comparison between charted depths and depths found on this survey east of the Sacramento River Deep Water Ship Channel and between Decker Island Light, latitude 38/06/ 15N, longitude 121/42/45W and Rio Vista Bridge, latitude 38/09/30N, longitude

121/40/50W differ on the average between 3 to 5 meters. There are extreme differences of up to 9 meters. This difference is due to the decrease spring runoff and increased irrigation of agricultural land in the vicinity of the Sacramento River.

Survey H-10442 is adequate to supersede charted hydrography within the common area.

b. AWOIS

All AWOIS items listed in the hydrographer's report originate with a miscellaneous source. Refer to the hydrographer's report for discussion and disposition of these features.

c. Controlling Depths

The Sacramento River Deep Water Ship Channel is located within the survey area and has a controlling depth of 8.2 meters. Survey depths in this area are deeper than the charted controlling depth. Survey depths range from 9.2 to 20.7 meters.

Depths of 4.7 to 6.4 meters (15-21 ft) were found by this survey to exist between 30 to 50 meters west of the Sacramento River Deep Water Channel between Lights 19 and 23, latitude 38/06/48N and latitude 38/07/30W. It is recommended that this area be monitored for shoaling.

d. Aids to Navigation

There are three floating and fifteen fixed aids to navigation within the survey area. All were located and serve their intended purpose and are listed in section P of the hydrographer report.

All charted landmarks should remain as charted.

e. Geographic Names

Names appearing on the smooth sheet and in the survey title have been approved by the Chief Geographer.

f. Dangers to Navigation

There were fifteen dangers to navigation reported by the hydrographer. A copy of the report is attached. No dangers to navigation were reported during office processing.

8. COMPLIANCE WITH INSTRUCTIONS

Survey H-10442 adequately complies with the project instructions except where noted in this report.

9. ADDITIONAL FIELD WORK

This is an excellent hydrographic survey. No additional field work is recommended.

Charles R. Davies
C.R. Davies
Cartographer

APPROVAL SHEET
H-10442

Initial Approvals:

The completed survey has been inspected with regard to survey coverage, delineation of the depth curves, development of critical depths, cartographic symbolization, comparison with prior surveys and verification or disproval of charted data. The digital data have been completed and all revisions and processing have been entered in the magnetic tape record for this survey. Final control, position, and sounding printouts have been made and are included with the survey records. The survey records and digital data comply with NOS requirements except where noted in the Evaluation Report.

Bruce Alan Obmsted
for Dennis J. Hill Date: 10/20/94
Chief, Hydrographic Processing Unit
Pacific Hydrographic Section

I have reviewed the smooth sheet, accompanying data, and reports. This survey and accompanying digital data meet or exceed NOS requirements and standards for products in support of nautical charting except where noted in the Evaluation Report.

Kathy Timmons
Kathy Timmons, NOAA Date: 10/29/94
Chief, Pacific Hydrographic Section

Final Approval

Approved:

Thomas Yeager
for J. Austin Yeager Date: 12-1-94
Rear Admiral, NOAA
Director, Coast and Geodetic Survey

