10435

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-10-3-92

Registry No. H-10435

LOCALITY

State California

General Locality San Joaquin River

Sublocality Webb Reach to Threemile Slough

19 92

CHIEF OF PARTY
LT G.F. Glang

LIBRARY & ARCHIVES

DATE November 15, 1994

*U.S. GOV. PRINTING OFFICE: 1967---756-980

10435

NOAA FORM 77-28 (11-72)

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

HYDROGRAPHIC TITLE SHEET

REGISTER NO.
H-10435

FIELD NO.
PHP-10-3-92

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

State: California

General locality: San Joaquin River

Locality: Webb Reach to Threemile Slough

Scale: 1:10,000 Date of survey: July 31 to Sept. 15, 1992

Instructions dated: June 17, 1991 Project No.: OPR-L208-PHP

Vessel: Jensen Launch 1101 (0651), MonArk Launch 1102 (0652)

Chief of party: LT G.F. Glang

Surveyed by: LT G.F. Glang, LT J.S. Verlaque, LT D.O. Neander *

Soundings taken by echo sounder, hand lead, pole: Raytheon DE-719CM & Innerspace 448

Graphic record scaled by: PHP Personnel

Graphic record checked by: PHP Personnel

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

Evaluation by: B.A. Olmstead

Soundings in ~~fathoms~~ ~~feet~~ Meters and Decimeters at ~~MLW~~ MLLW

REMARKS: * Additional Personnel: ET E.O. Wernick, ST R.W. Adams, ST M. E. Bigelow.

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.

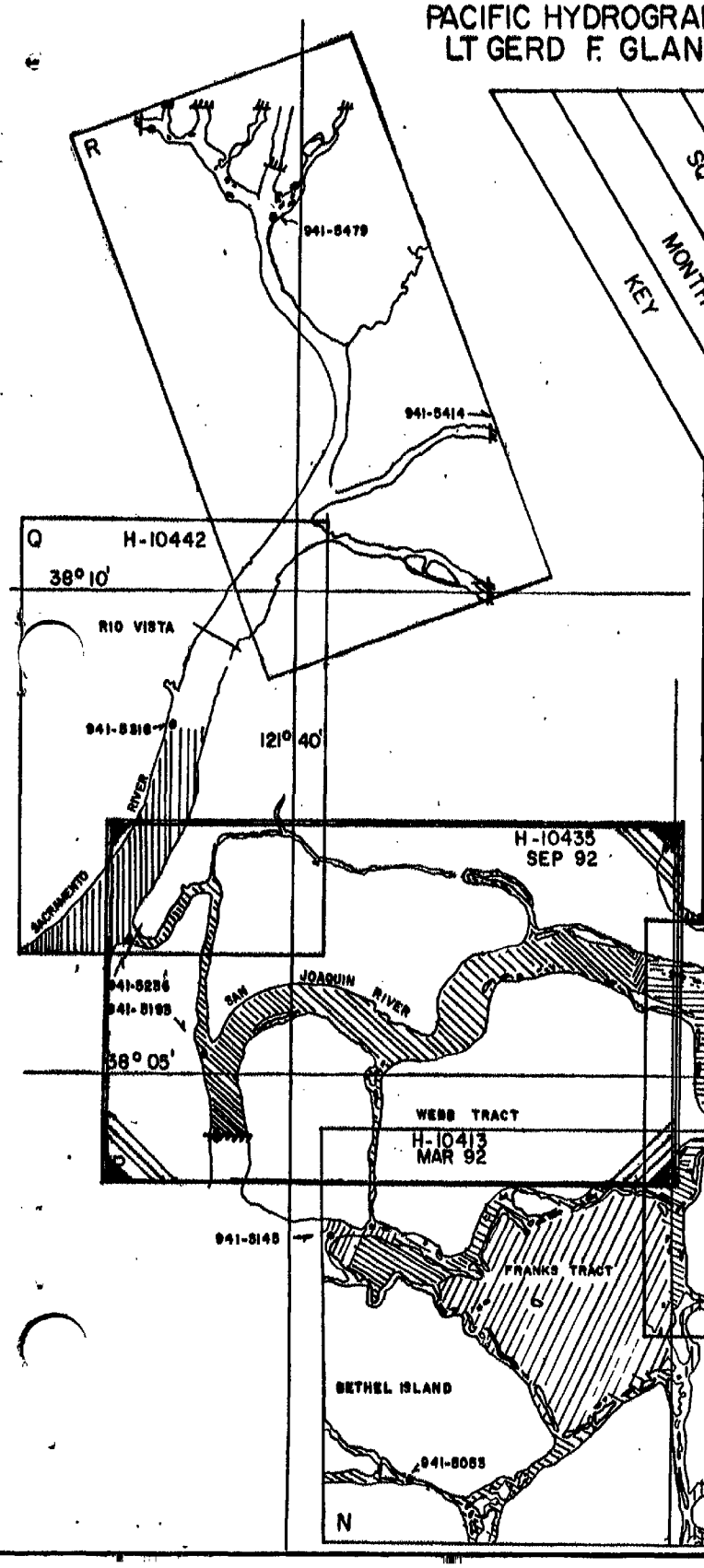
All depths listed in this report are referenced to mean lower low water unless otherwise noted.

AWOIS + SURF ✓ RWD 1/95

U.S. GOVERNMENT PRINTING OFFICE: 1986 - 652-007/41218

PROGRESS SKETCH
OPR-L208-PHP

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



KEY / MONTH	SQ NM SOUNDINGS	L NM SOUNDINGS	L NM MISC DISTANCE	BOTTOM SAMPLES	ELECTRONIC CONTROL STATIONS	SOUND VELOCITY CASTS	TIDE STATIONS	GEODETIC CONTROL STATIONS	AWOIS ITEMS RESOLVED
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	0	1	7	0	1	0
SEP	0.9	56.0	51	4	0	7	1	1	14
OCT									
NOV									
DEC									

Descriptive Report to Accompany Hydrographic Survey H-10435

Field Number PHP-10-3-92
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-10435 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 "P", as specified by the project instructions. To meet limits of the field processing system, sheet "P" was divided into P-East (HDAPS Sheet 19) and P-West (HDAPS Sheet 20) sheets.

B. AREA SURVEYED See Eval Rpt, Section I

The area surveyed for H-10435 includes: the San Joaquin River, from Webb Reach to Threemile Slough, and includes the navigable portions of Sevenmile Slough and the north portion of Fishermans Cut. The east limit of hydrography on the San Joaquin River is longitude 121°35'35"W. The west limit of hydrography in Threemile Slough is the Threemile Slough Bridge, at 38°06'23"N, and 121°42'02"W. The south limit of hydrography on the San Joaquin River is latitude 38°04'24"N.

This survey is centered in the delta of the Sacramento and San Joaquin Rivers, in central California. The Delta is a region of rivers and sloughs which meet and interconnect the Sacramento and San Joaquin Rivers. Tracts of agricultural land are separated by these sloughs and rivers, and are protected by dirt levees, sometimes reinforced with riprap. Unprotected shoreline of islets and old levees consist of mud and tule grass, which easily change in configuration with seasonal flooding and erosion.

Data acquisition was conducted from July 31 through September 15, 1992.

C. SOUNDING VESSELS

NOAA Launch 1101 (EDP No. 0651), a 29-foot Jensen, and NOAA Launch 1102 (EDP No. 0652), a 22-foot SeaArk, were used to collect sounding data, bottom samples, velocity casts, and to conduct shoreline verification. Bottom drags were conducted from VN 0651 exclusively. No changes to the standard vessel sounding configurations were necessary.

D. AUTOMATED DATA ACQUISITION AND PROCESSING

This survey was completed with the following HDAPS Programs:

Program Name	Program Version	Installation Date
DISC_UTIL	1.00	08/11/92
BIGAUTOST	2.00	08/11/91
DAS_SURVEY	6.30	08/11/92
POINT	2.10	08/11/92
PLOTALL	2.04	08/11/92
PRINTOUT	4.00	08/11/92
CARTO	2.02	08/11/92
BASELINE	1.13	08/11/92
QUICK	2.00	08/11/92
CONVERT	3.50	08/11/92
INVERSE	2.00	08/11/92
LOADNEW	2.00	08/11/92
BIGABST	2.02	08/11/92
REAPPLY	2.00	08/11/92
DIAGNOSTIC	3.01	08/11/92
FILESYS	3.00	08/11/92
BACKUP	2.00	08/11/92
LISTAWOIS	3.00	08/11/92
PREDICT	2.00	08/11/92
NEWPOST	6.00	08/11/92
DP	2.11	08/11/92
EXCESS	4.00	08/11/92
ZOOMEDIT	2.00	08/11/92
INSTALL	4.00	08/11/92
CARTOTRANS	1.00	08/11/92
RECOMP	2.02	08/11/92
COPRINTOUT	2.01	08/11/92
MAINMENU	1.00	08/11/92
HPRAZ	1.26	08/11/92
MANU_DAT	1.12	08/11/92
SHEETSPLIT	1.00	08/11/92
LIST_DATA	1.00	08/11/92
HIPSTICK	1.01	08/11/92
GRAPHEDIT	1.00	08/11/92
SUITESWITCH	1.00	08/11/92

Program Name	Program Version	Installation Date
BLOCKEDIT	2.00	08/11/92
RAMSAVER	1.01	08/11/92
PRESURVEY	7.00	08/11/92
LISTAWOIS	3.00	08/11/92
CONTACT	2.00	08/11/92

The PC-DAS SURVEY Program, versions 4.0 and 4.02 (GPS implementation), were used for all data acquisition. The following non-HDAPS computer programs were used:

Program Name	Program Version	Version Date
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 RMPO* was annotated whenever software problems affected the data.

* Raw Master Printout

E. SONAR EQUIPMENT ✓

Not applicable.

F. SOUNDING EQUIPMENT ✓

During this survey, two different echosounder types were used. The Raytheon DE-719CM echosounder, modified with an Odom Hydrographic Systems, Inc. Digitrace, and the Innerspace Model 448 (IN-448), modified with custom EPROMS for HDAPS, were used:

Echosounder Type	Vessel EDP No.	Serial No.	DN Used
DE-719	0651	10278	213-217
IN-448	"	236	233-259
DE-719	0652	10280	213-239

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 23.9 meters.

No change to the transducer configuration was required for the Innerspace echosounder. A comparison of soundings collected by the IN-448 showed no systematic differences when compared with soundings collected by the DE-719CM. ✓

For each echosounder, the digitized soundings displayed on-line were compared in real time with the analog trace to ensure reasonable agreement. Because of the poor reliability of the DE-719CM echosounders, adjustments were constantly required to the ✓ zero calibration, speed of sound, and tide and draft. Any adjustments were noted on the echogram, if not obvious. No on-line adjustments were required for the IN-448.

Survey records were scanned by PHP personnel in accordance with the Hydrographic Manual and FPM Section 2.3.3, with the digital sounding taking precedence over the analog trace. ✓

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 on 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 for least depths on AWOIS items during this survey.

* Filed with the survey records

G. CORRECTIONS TO SOUNDINGS ✓

Velocity of Sound

Corrections for the speed of sound through the water column for Cast No. 1 was computed from data obtained with an Odom DIGIBAR Sound Velocity Profiler (S/N 155) due to failure of the AML data cable. Corrections for the speed of sound through the water ✓ column for Casts No. 2 through No. 7 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 correctors.

The following casts were taken: ✓

Cast	DN	Depth*	DN Range	HDAPS Tables 0651	HDAPS Tables 0652	Cast Position Latitude	Cast Position Longitude
1	221	28.6	213 - 222	1	2	38°06'18"N	121°37'00"W
2	227	18.5	223 - 229	3	4	38°05'00"N	121°40'45"W
3	232	29.5	230 - 236	5	6	38°06'10"N	121°37'00"W
4	239	26.7	237 - 243	7	8	38°06'10"N	121°37'00"W
5	248	17.9	244 - 250	9	10	38°05'10"N	121°41'00"W
6	254	23.1	251 - 257	11	12	38°06'53"N	121°41'00"W
7	259	26.8	258 - 259	13	14	38°06'53"N	121°41'00"W

*Extrapolated depth.

Velocity corrector tables were created for both vessels from each cast due to their different drafts. 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 hydrographer notes that Casts No. 1, No. 3, and No. 4, taken in vicinity of San Joaquin River Light 41, were found to have warmer water temperatures than casts taken in the vicinity of San Joaquin River Light 29, which were found to have warmer water temperatures than casts taken in Threemile Slough. The warmer water temperatures in the San Joaquin River are likely due to this river's geographic origin in south central California, in the San Joaquin Valley. The cooler temperatures observed at the San Joaquin River entrance of Threemile Slough, and inside Threemile Slough, suggest waters from the Sacramento River flowing from northern California provide an overall cooling effect in Threemile Slough. Differences in water temperature observed between these two geographic locations were typically 3°C to 4°C. Differences in velocity correctors between these two geographic locations were noticeable at depths greater than approximately 13 meters. Since the magnitude of the velocity corrector differences did not exceed 0.1 meters at these depths, the hydrographer chose not to limit velocity casts by geographic area. Velocity correctors were determined by chronologically matching hydrography to each cast's applicable DN range. ✓

The Odom DIGIBAR instrument was calibrated by Odom Hydrographic Systems on February 21, 1992. The AML instrument was calibrated by Northwest Regional Calibration Center on January 7, 1992. Copies of these calibration reports are included in Separate IV.* ✓

* Filed with the Survey records.

Leadline Comparisons ✓

Leadline comparisons were taken almost daily to determine instrument error and to verify static draft. The instrument

error computed for the DE-719CM varied from -0.200 to +0.045 meters (overall mean = -0.052 meters). The instrument error computed for the IN-448 varied from -0.155 to +0.135 meters (overall mean = -0.021 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 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 0.46 meters was determined. This draft agrees with historical data.

A static draft for VN 0652 was determined on October 18, 1991 using a similar method as above. A static draft of 0.4 meters was determined. This static draft differs by 0.12 meters from the static draft measurement obtained in June, 1989. This change in static draft is likely due to an addition of 100 pounds of ballast and the gradual deterioration of the launch's flotation.

Dynamic Draft ✓

Settlement and squat measurements for VN 0651 were conducted on October 22, 1991, on the San Joaquin River, north of Antioch, CA. Settlement and squat measurements for VN 0652 were conducted on October 18, 1991, on the Sacramento River, in the vicinity of Rio Vista, 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 and Offset Table 2 corresponds to VN 0652. Field records are included in Separate IV.*

Tide Correctors ✓

The Final Field Sheets were plotted using predicted tides based on San Francisco, California. Three tidal corrector zones from the Tide Zone Chart are within this survey's limits. Correctors from the two largest zones were meaned (+5:15 HR HW, +6.15 HR LW, x 0.59 Height Ratio) and applied to all sounding data.

Approved water levels were requested from the Sea and Lake Levels Branch (N/OES231) in a letter dated September 24, 1992. A copy of this letter is included in Appendix V*(Tides and Water Levels). Approved Tide Note is attached to this report.

* Filed with the survey records.

No irregular depth curves were noted which could be attributed to the tide correctors. The hydrographer made a concerted effort to block portions of the survey and collect all data within a particular block in the shortest amount of time possible.

H. CONTROL STATIONS

See Eval Report, Section 2

Horizontal Datum

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

Station 774 (LT37, 1992), located on fixed aid to navigation San Joaquin River Light 37 (LLN 6820), was reported destroyed on DN 249. See Appendix VI (Supplemental Correspondence) for a copy of LNM 37/92.* This station was not used during this survey.

* Attached to this report.

Station 726 (FALSE, 1931), Station 755 (RIOS, 1992), Station 757 (MOLE, 1992), Station 763 (GRAN, 1992), and Station 768 (SJ48, 1992) do not plot within the limits of the FFS. Station 767 (TERM, 1992) is also beyond the sheet limit.

Station 773 (LT01, 1992), and Station 775 (LT41, 1992), are located on fixed aids to navigation Threemile Slough Light 1 (LLN 6775), and San Joaquin River Light 41 (LLN 6835), respectively. The station symbols obscure these lights on FFS 19 and FFS 20.

Station 765 (MILE, 1992) and Station 757 (MOLE, 1992) are considered non-recoverable. Station MILE 1992 is located on the north tower (fixed) of the Threemile Slough Bridge. Station MOLE 1992 was located on the center catwalk of the Mokelumne River Swing Bridge (permission obtained from N/CG24 per telecon in January, 1992). By continuously monitoring VHF channel 9 and the PC-DAS SURVEY Program ECRs and maximum residuals, launch OIC's could instantly determine if position quality was affected by a bridge opening. Tests conducted on survey H-10421 (DN 101, VN 0651, Pos. No's. 6015-6020), while the launch was in a static location (bow on riprap shoreline), showed the GP of the launch changed by not more than 3 meters and all quality indicators remained well within acceptable limits during a bridge opening. This test also verified the bridge returned to its previous position after opening, with no detectable difference in position. Nevertheless, no data was collected using Station MOLE 1992 while the bridge was opening.

* Filed with the survey data.

Survey Methods

Geodetic positions used for establishing horizontal control on this survey, with the exception of PHP1 1992, were obtained from either the NGS CONUS database or from the Pacific Photogrammetric Party's (N/CG2333) Global Positioning System (GPS) receivers.

All stations meet Third Order, Class I, standards.

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 No. 2 1931 and PHP1, and again between HPGN CA 10 11 1991 and PHP1. Copies of the Trimble positioning solution summaries and the MTEN3 inverse computation between the two positions observed for PHP1 are included in Appendix III* Serial numbers for the GPS equipment are listed in Section I (Hydrographic Position Control) of this report. Closures obtained for PHP1 exceed Third Order, Class I, standards.

Station TERM 1992 is an eccentric position of TERMINOUS WATER TANK (unknown year). TERMINOUS WATER TANK, the top center of a water tank on a tower structure, could not be reached to install a miniranger. As an alternative, the hydrographer installed the miniranger below the tank top, on a floodlight support arm which could be reached from a catwalk surrounding the tank perimeter. Horizontal, vertical, and distance observations to position TERM 1992 were conducted on May 29 and on June 29, 1992. The resulting Third Order, Class I position, computed with the MTEN programs, was found to close to better than 1:160,000. Field records for these observations are included in the data files for survey H-10421, June 1992. The MTEN LSTGPN listing is included in Appendix III.* The position computed for TERM 1992 is considered non-recoverable and no data was submitted to N/CG2333 (per telecon with N/CG2333).

The 1991 OPR-L208-PHP Horizontal Control Report was submitted by N/CG2333 in October, 1991. The 1992 OPR-L208-PHP Horizontal Control Report was submitted by N/CG2333 in July, 1992. Adjusted positions for all GPS-positioned stations (except PHP1) were forwarded by N/CG2333 and are provided in Appendix III.* The applicable NGS CONUS data for non-GPS-positioned stations is also included in Appendix III.*

* Filed with the survey records.

I. HYDROGRAPHIC POSITION CONTROL

Position Control

Two methods were used for hydrographic position control. VN 0651 used the Motorola Mini-Ranger (MR) Falcon 484 system for multiple-LOP position control on DN 213 and DN 217. Beginning with DN 233, VN 0651 used differential GPS (DGPS) for position control. The DGPS reference station 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). VN 0652 used the Motorola Mini-Ranger (MR) Falcon 484 system for multiple-LOP position control throughout this survey. Both systems provided accuracy to meet the 1:10,000-scale survey requirements.

DGPS Performance Checks ✓

Per FPM Section 3.4.4.1, DGPS performance checks were obtained at the beginning and end of each survey day. 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 completely bogus positions, was immediately rejected. DGPS control failed when a) the minimum number of satellites was 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. By using the Ashtech Mission Planning software with the weekly almanac, the hydrographer could effectively plan for satellite and HDOP outage periods. Where reference station signals were lost, the position control method was switched to MR Falcon 484.

Mini-Ranger System Checks ✓

Per FPM Section 3.1.3.3, when using three or four lines-of-position (LOPs), a critical system check is continuously obtained by observing the error circle radii (ECR) and the maximum residual values on the Navitronics PC-DAS screen in the survey launch. Positions which had erratic lines-of-position, indicated by high residuals or high ECRs on the RMPO (Raw Master Printout), were recomputed or smoothed during processing. If, after position recomputation, acceptable ECR and maximum residual values were indicated, the data were saved. The RMPO was annotated to reflect these edits.

In addition to the daily system checks described above, fixed-point system checks were conducted on DN 212 to ensure no blunders occurred in the HDAPS and PC-DAS Project Tables, and to confirm C-O values. Field records of the fixed-point calibrations are included in Separate III.*

Mini-Ranger Falcon Calibrations ✓

Baseline calibrations were performed on July 28-29, 1992 in accordance with FPM Section 3.1.2.1. The baseline correctors were incorporated into the PC-DAS C-O Tables and applied on-line. C-O Table 1 is for VN 0651 and C-O Table 2 is for VN 0652. All records of these calibrations are included in Separate III.*

* Filed with the Survey records

Positioning Equipment ✓

The following RPU-R/T combinations were used:

Vessel EDP No.	RPU-R/T Serial No.
0651	F0243/B1398
0652	F0259/C1680

The following Mini-Ranger (MR) transponders were used: ✓

MR Transponder Serial No.	Code
911711	1
E2692	2
B1214	3
E2705	4
C1789	5
E2709	6
F3047	7
911632	9
C1537	B

The following GPS equipment was used: ✓

Equipment Location	Type of Receiver/Antenna	Receiver Serial No.	Antenna Serial No.
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 RMPO.

J. SHORELINE See Eval 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)
TP-01059 (1:20,000-scale, NAD 27, April 1981)
TP-01060 (1:20,000-scale, NAD 27, April 1983)

Additional shoreline details shown on the final field sheets were transferred by hand from a stable-based, 1:10,000-scale enlargement of NOS Chart 18661 SC, 1:40,000, 20th Edition (NAD 83), June 9, 1990. There were no areas within the survey area lacking contemporary shoreline coverage. All shoreline detail originates with shoreline maps and or hydrographic revisions. NAD 27 datum ticks were applied to the NAD 83 field sheets and are shown in green on FFS 19 and 20. 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 I *(Hydrographic Sheets and Parameters).

* Filed with the survey records.

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 paper plots, the FFS, and the FFS Overlay. 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, or by visual inspection. The TP-sheet shoreline agreed well with the hydrographic data, although some distortion was apparent while aligning the TP-sheets with the NAD 27 datum ticks on the FFS.

Charted Shoreline Agreement

Charted shoreline was verified by its junction with the hydrographic data and by visual inspection. Shoreline from the chart enlargement was severely distorted and did not correspond to the hydrographic field notes. This distortion is likely due to the very old shoreline manuscripts used on Chart 18661 and the enlargement process. Shoreline along the sloughs is mostly levee, often reinforced with riprap, while the small islets are marsh (tule). Comparison of the charted shoreline with the TP-sheets showed numerous differences. Where these differences were found, the TP-sheet was considered to be more correct. Increased cultural development along the south shore of Andrus Island has resulted in many new private piers, docks, and boathouses. To streamline data acquisition, only limits of these structures were positioned.

TP-Sheet Changes

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

TP-01055

Docks for Happy Harbor Marina are not shown on TP-01055. These docks were verified by Pos. No. 577 (DN 223, VN 0652), at approximate position 38°06'18.060"N, 121°35'38.877"W, and continue southeast to the sheet limit. These docks are correctly shown on Chart 18661 and on ~~FFS 19~~ the Smooth Sheet. Docks not shown on TP-01055 were located by the hydrographer and shown in red on the Smooth Sheet.

Docks and covered berths for the Delta Bay Club are new, installed in 1988, and are not shown on TP-01055. These berths* were verified by Pos. No's. 589 to 601 (DN 223, VN 0652), and are centered at approximate position 38°06'30.371"N, 121°36'09.870"W. A copy of the marina plan is included with the data. These docks are not shown on Chart 18661. Refer to ~~FFS 19~~ the Smooth Sheet for proper depiction. * These berths have been shown in red on the Smooth Sheet.

Dolphins* shown on TP-01055 at approximate positions 38°06.30'N, 121°35.75'W, and 38°06.31'N, 121°35.70'W were not located by hydrography or visually. A sign on a single pile was located at Pos. No. 582 (DN 223, VN 0652), at 38°06'19.227"N, 121°35'45.233"W, ~~uncovering 7.1 meters~~ Baring 6.4 meters at ~~MLLW~~ MHW, and approximately 38 meters north of the first dolphin. Two piles were located at Pos. No. 581 (DN 223, VN 0652), 38°06'16.964"N, 121°35'39.803"W, approximately 74 meters southeast of the second dolphin. See AWOIS Item 51633 under Section N (Comparison with the Chart) for a complete discussion of the piles found at Pos. No. 581. * Dolphins have not been transferred to the Smooth Sheet.

Docks around Bruno's Island in the eastern portion of Sevenmile Slough, at approximate position 38°06'52"N, 121°37'~~050~~03"W, are as shown on TP-01055, with the exception of several additional docks located along the southwest shore. These new docks were located by Pos. No's. 707 through 714 (DN 224, VN 0652) and are shown on ~~FFS 19~~ the Smooth Sheet. Additionally, Bruno's Island, shown on TP-01055 as detached from a large tule islet at approximate position 38°07'00"N, 121°37'30"W, with two small marsh islets in between, was found to be one continuous island with no breaks. This shoreline change is shown in red dashed on ~~FFS 19~~ the Smooth Sheet. This shoreline is correctly portrayed on Chart 18661. Do not concur Chart portrays marsh islets. Chart this area as shown on the Smooth Sheet.

The dock, piles, and bulkhead located by Pos. No's. 715, 717, and 719 (DN 224, VN 0652), centered around position 38°06'57.451"N, 121°37'12.164"W, are associated with Walton's Marine Repair and are not shown on TP-01055. Refer to ~~FFS 19~~ the Smooth Sheet for proper depiction.

Docks and berths at Owl Harbor Marina, located along the south shore of Sevenmile Slough, at approximate position 38°06'57"N, 121°37'30"W, are correctly shown on TP-01055. Additional docks to the east and west, and still associated with Owl Harbor Marina, were located by Pos. No's. 727, 728, 730, 736, and 737 (DN 224, VN 0652). These additional docks are depicted on ~~FFS 19~~ the Smooth Sheet in red.

A pier shown on TP-01055 at 38°05'34"N, 121°37'24"W, was not observed during hydrographic operations (Pos. No. 174, DN 216, VN 0652). A snag, ~~uncovering 2.1~~ Baring 1.3 meters at ~~MLLW~~ MHW, was located by Pos. No. 654 (DN 223, VN 0652), within 1 meter of the riprap shoreline at that time. No evidence of a pier or associated piles was found. Recommend the pier not be charted. Concur Snag should not be charted as it is covered under the "Note B, Caution" on Chart 18661.

Dolphins shown on TP-01055 at 38°05'30"N, 121°38'03"W, and 38°05'04"N, 121°38'03"W, were not visually seen during hydrographic operations (Pos. No. 169+1, DN 216, VN 0652, Pos. No. 6181+1, DN 217, VN 0651, and Pos. No. 6764, DN 239, VN 0651) or shoreline verification on DN 223. Discussion with the US Army Corps of Engineers (COE, Bob Kelly, 916-557-5278) indicates the annual surveys conducted by the COE, as well as the major dredging conducted since the photogrammetry for this TP-sheet was flown, of the entire Stockton Deep Water Channel (to 35 feet), would have detected and removed these dolphins, particularly the first dolphin which is located offshore, in the deep water channel. COE stated no dolphins exist within the deep water channel. Recommend these dolphins not be charted. Concur

A shoreline change to the HWL at the southwest end of Twitchell Island, in approximate position 38°05'~~18~~15"N, 121°41'00"W, was observed while conducting hydrography in this area. This change was confirmed by detached Pos. No. 7193 (DN 259, VN 0651) and is shown in red on ~~FFS 20~~ the smooth sheet.

Docks and covered berths at the Outrigger Marina are as shown on TP-01055, with the exception of an additional covered berth in position 38°06'49.55"N, 121°41'01.009"W (Pos. No. 7206, DN 259, VN 0651), and the dock shown between Pos. No's. 7208 and 7209 (DN 259, VN 0651) is now only a row of piles. Refer to ~~FFS 20~~ the smooth sheet for a complete depiction.

TP-01060

Tule islets shown on TP-01059 in the vicinity of position 38°04'30"N, 121°41'00"W, were found to be more extensive. Limits shown on ~~FFS 20~~ smooth sheet depict the extent of tule grass determined during hydrography in this area. Heavy sea grass was also noted within 20 meters of these tule islets. ✓

A dock shown on Chart 18661, and not shown on TP-01060, was located (Ref. No. 15, DN 223, VN 0652) approximately 70 meters south of Pos. No. 683 (DN 223, VN 0652). The TP-sheet dock shown at Pos. No. 683, in position 38°04'03.213"N, 121°38'55.560"W, was found to be in ruins. Two house barges* are moored immediately north of these ruins (Pos. No's. 679 and 682, DN 223, VN 0652). Refer to ~~FFS 19~~ the smooth sheet for a complete depiction. ✓

* Barges are not shown on the smooth sheet due to their temporary nature.

K. CROSSLINES ✓

A total of 31.9 nautical miles of crosslines and channel lines, representing 19.5% of the hydrography on H-10435, were used for crossline comparisons. Crossline soundings agree to within 0.4 meters of the mainscheme soundings. The most significant differences observed occurred where crosslines ran along steep sloping areas (i.e. outer channel lines). The same vessels were not always used for both mainscheme hydrography and crosslines.

L. JUNCTIONS See Eval Report, Section 5

H-10435 junctions with the following surveys:

Registry Number	Scale	Date	Geographic Name
H-10409	1:10,000	Nov 1991	San Joaquin River Big Break to False River
H-10413	1:10,000	Mar 1992	San Joaquin River Franks Tract ✓
H-10421	1:10,000	Jun 1992	San Joaquin River Burns reach to Webb Reach
H-10442	1:10,000	Sept/Oct 1992	Vicinity of Rio Vista

Hydrography on this survey junctions at the south, on the San Joaquin River, with H-10409, at approximate latitude 38°04'24"N. Soundings and depth curves were found to not match well, despite a 150-meter (three mainscheme sounding-line) overlap. Soundings on this survey were found to be up to 1.0 meter deeper over the entire junction area. The hydrographer feels strongly that this disagreement is due to currents shifting the shoal which extends from Threemile Slough south, as well as the different predicted tide correctors used on H-10409. In accordance with HSG 22, the hydrographer recommends no junction between H-10409 and H-10435 be effected, if the application of smooth tides* does not correct junction differences. In this event, soundings from H-10435 should supersede those on H-10409, within their common areas. ✓ The hydrographer also noted the apparent shift in San Joaquin River Light 27 (approximately 10 meters) between these two surveys. Since this light was positioned by hydrographic means on both surveys, the hydrographer believes this shift is without consequence. Limits of the tule islets, observed during hydrography, compared well on this survey to those limits determined by hydrographic means on H-10409.* After application of approved tides, differences are generally within 0.5 meter. An adequate junction has been effected.

Hydrography on this survey junctions at the south, in Fishermans Cut, with H-10413, at approximate latitude 38°03'59"N. Depth curves in this cut are steep, forming a relatively narrow deepening which extends the entire length of the cut. Soundings

and depth curves appear to match well, generally agreeing within 0.5 meters. These differences are attributed to different predicted tide correctors used on H-10413. ✓

Hydrography on this survey junctions at the east, on the San Joaquin River, with H-10421, at approximate longitude 121°35'40"W. Soundings and depth curves appear to match well, generally agreeing within 0.3 meters. These differences are attributed to different predicted tide correctors used on H-10421. ✓ The hydrographer notes that non-sounding features, particularly along the north shore of the San Joaquin River, portrayed on H-10435, should supersede those shown on H-10421, in their common areas.

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

M. COMPARISON WITH PRIOR SURVEYS See Eval Rpt, Section 6

This survey was compared to the following prior surveys:

Survey No.	Scale	Date
H-6013	1:10,000	Jul 1934
H-6005a	1:10,000	May 1934

H-6013

No AWOIS items originated with prior survey H-6013. Concur

Comparison with a stable-based copy of this prior survey was made in areas common to survey H-10435, specifically Threemile Slough, west of approximate longitude 121°41'00"W, to the present location of Threemile Slough Bridge. Depths compared generally within 1-2 meters, although deeps and shoals are now more pronounced, which may be explained by the absence of dredge activity in recent history and the strong currents observed during tide changes. The hydrographer found steep sand waves evident on the echograms, another indication of strong currents. The following specific differences are noted: ✓

A 50-foot (15.2-meter) deep has deepened to 17.6 meters and shifted slightly south to approximate position 38°06'55.734"N, 121°41'01.483"W. ✓ Depths found by the present survey range from 14.4 meters to 19.6 meters (47-64 feet).

A 23-foot (7.0-meter) sounding has shoaled to 4.3 meters at approximate position 38°06'52.082"N, 121°41'15.949"W. This shoal extends east, to shore, and is approximately 40 meters wide. This feature was reported as a danger to navigation. (1374)

A 39-foot (11.9-meter) deep has deepened to 15.4 meters and

shifted slightly south to approximate position 38°06'15.792"N, 121°41'48.394"W. Depths found by the present survey range from 11 meters to 16.7 meters. (36 - 54 Feet).

A 59-foot (17.9-meter) deep has deepened to 21.2 meters and shifted slightly south to approximate position 38°06'17.900"N, 121°41'41.929"W. Depths found by the present survey range from 15 meters to 20.7 meters (49-68 feet)

The Threemile Slough Bridge was removed from its location shown on H-6013 and rebuilt at its present location, confirmed by detached Pos. No's. 7247 to 7251 (DN 259, VN 0651). Ruins at the former bridge location were found at Pos. No's. 7245 and 7242. Concur Ruins have been shown on the Smooth Sheet.

The boat basin and boat ramps for Brannan Island State Park, not shown on this prior survey, were observed at detached Pos. No's. 7231, 7213, and 7214. Concur

Outrigger Marina, not shown on this prior survey, was observed from detached Pos. No's. 7204 to 7209. This marina consists of six covered berths and a fuel/guest dock. Concur

Data from H-10435 should supersede this prior survey in their common areas. Concur

H-6005a

AWOIS Item No. 51596 originates with prior survey H-6005a. This item was reported as a visible wreck in position 38°05'21.400"N, 121°40'31.430"W. On DN 247, a visual search and 25-meter radius bottom drag centered at 38°05'21.400"N, 121°40'31.444"W (Pos. No. 7127, VN 0651) was conducted with no hangs observed. Tule grass was found to extend to within 5 meters of the AWOIS GP, with the HWL estimated to be 20 meters SE. Given the age of this wreck report, and the history of dredging and strong currents in this area, the hydrographer believes any remanents of this item have been assimilated into the mud embankment, washed away, or otherwise removed. The hydrographer recommends removing the wreck charted at 38°05'21.400"N, 121°40'31.430"W. Concur

Comparison with a stable-based copy of this prior survey was made in areas common to survey H-10435, specifically Fishermans Cut. Depths compared within 1 meter, and were found to be generally shoaler. The tule islets shown on this prior survey were found to be greatly eroded, particularly at the north entrance to Fisherman's Cut. Limits of these tule islets are depicted on the FFS from the hydrographic notes. The most significant tule islet change is centered between approximate positions 38°05'07.697"N, 121°38'30.827"W, and 38°05"06.669"N, 121°38'48.925"W. The tule berm shown on this prior survey is now submerged, with shoal least depths of typically 1.0 to 2.0 meters. The tule berm shown to extend south of the largest tule islet in Fishermans Cut is now submerged, from approximate position 38°04'37.665"N, 121°38'51.501"W, to the south. Any remanents of this tule berm

appear to have subsided into a shoal area with depths ranging from 1.2 to 3.7 meters.

The two landmarks, labeled as Fisherman Slough East and West Wood Power Poles, were replaced by steel towers located further inshore. No positions were taken on the new structures. ✓ Detached Pos. No's. 7146 and 7147 (DN 254, VN 0651) were taken from alongshore, and refer to the overhead cable extending between these towers.

Numerous docks and piers now exist alongshore in Fishermans Cut. Refer to the ~~FIS~~ smooth sheet for proper depiction.

Data from H-10435 should supersede this prior survey in their common areas. Concur

N. COMPARISON WITH THE CHART See Eval Rpt, Section 7

This survey was compared to the following charts in areas common with this survey:

Chart No.	Scale	Edition	Date
18661 SC	1:40,000	20th	June 9, 1990
18661 SC	1:40,000	21st	May 9, 1992

✓

A stable-based 1:10,000-scale enlargement of Chart No. 18661 SC, 20th edition, was used for comparison with survey H-10435. ✓

The 21st edition of Chart No. 18661 SC was issued in May, 1992. This new edition was compared to the 20th edition and any differences are discussed in this section. ✓

There were 14 AWOIS items within the limits of the H-10435 plotter sheets (HDAPS Plotter Sheets 19 and 20). Of these, one item (AWOIS Item No. 51597) was deleted per the pre-survey chart markup provided by N/CG24 (received June 5, 1991). A second item (AWOIS Item No. 51620) was reassigned to PHP-10-4-92, Sheet Q, H-10442. The remaining 12 AWOIS items were resolved as part of this survey. AWOIS Item No. 51596 was discussed above, in Section M, (Comparison with Prior Surveys) under H-6005a. The remaining eleven AWOIS items originate from miscellaneous sources and are discussed here. ✓

AWOIS Item No. 51626 originates from Chart Letter CL1053/73 (USPS) and is described as an obstruction, uncovering 2 feet as observed, possibly a large rock (rep. 1984) in position 38°06'04.700"N, 121°36'42.830"W. On DN 223, rocks uncovering 0.8 meters at MLLW were located at Pos. No. 656 (VN 0652). This position is approximately 250 meters WSW of the AWOIS GP and 90 meters SW of the alternate AWOIS GP. To confirm that no other rocks existed at the reported or alternate locations, 50M radius

bottom drags were conducted at the AWOIS GP (Pos. No. 7114, DN 246, VN 0651), and at the alternate AWOIS GP (Pos. No. 7115, DN 246, VN 0651). The AWOIS GP for this obstruction falls within a tule islet, approximately 5 meters south of Pos. No. 7114. Drags at each site were negative. Pos. No. 7116 (DN 246, VN 0651) was taken to confirm the rocks located visually by Pos. No. 656. The rocks at this location appear to be a single mound, approximately 10 meters in diameter (determined by echosounder search). The hydrographer recommends charting rock at 38°06'01.64"N, 121°36'52.793"W, uncovering 0.8 meters at MLLW. Remove the charted obstruction label at position 38°06'04.70"N 121°36'42.83"W. Concur

AWOIS Item No. 51627 originates from Chart Letter 1053/73 (USPS) and is described as piles (uncov. 1 foot as observed), approximately 3-5 feet from shoreline, also reported by OPR-511-DA-77-Item 61 as piles (row of 60, uncovers 2.5 feet as observed), in approximate position 38°06'04.700"N, 121°36'22.830"W. On DN 223, two steel piles ~~uncovering 3.1~~ baring 2.2 meters at ~~MLLW~~ MHW were located at Pos. No. 657 (VN 0652), approximately 150 meters WSW of the AWOIS GP (Pos. No. 7117, DN 246, VN 0651). These steel piles are ruins from a landing dock. On DN 246, bottom drags centered at Pos. No. 7118 (VN 0651) were conducted to 75 meters along shore and 20 meters offshore. This position was approximately 40 meters south (onshore) of the AWOIS GP. No hangs were observed. The bottom falls steeply away from shore to typical depths of 11 meters. An echosounder drift search was conducted between Pos. No. 7119 and Pos. No. 7120, the Davidson's reported position for a row of 60 piles. The Davidson GP's plotted onshore, approximately 3 meters into the riprap. These piles may have been buried by the addition of riprap along the levee since the Davidson's survey. No piles observed between these positions. The hydrographer recommends charting piles at 38°06'03.168"N, 121°36'28.775"W, ~~uncovering 3.1~~ baring 2.2 meters at ~~MLLW~~ MHW. Remove the charted piles (PA) at 38°06'04.700"N, 121°36'22.830"W. Concur

AWOIS Item No. 51632 originates from Chart Letter 1262/79 (USPS) and is described as a visible wreck on the levee, in approximate position 38°06'14.700"N, 121°37'13.830"W. On DN 247, a 100-meter radius bottom drag was conducted at Pos. No. 7136 (VN 0651). No hangs were observed. No wrecks were visually observed on the levee. The hydrographer recommends not charting a wreck at 38°06'14.700"N, 121°37'13.830"W. Concur

AWOIS Item No. 51633 originates from Chart Letter 980/84 (USPS) and is described as a sign in approximate position 38°06'17.200"N, 121°35'41.830"W. On DN 223, two piles, 1 meter apart, ~~uncovering~~ which bare 2.9 meters at ~~MLLW~~ MHW were located at Pos. No. 581 (VN 0652). This position is approximately 50 meters E of the AWOIS GP (Pos. No. 7121, VN 0651, DN 246). Pos. No. 7122 (VN 0651, DN 246) was taken to confirm Pos. No. 581. The hydrographer interviewed the harbormaster at Happy Harbor Marina

(916-777-6575) who stated these piles did have a sign several years ago, advertising his marina. A new sign does exist on the islet, approximately 50 meters SE of Pos. No. 7122 and well above the HWL. The hydrographer recommends charting piles at 38°06'16.964"N, 121°35'39.803"W, ~~uncovering~~ which bare 3.6 meters ~~at MLLW~~ at MLLW. Remove the charted pile at 38°06'17.1"N, 121°35'40.5"W, and the charted sign at 38°06'17.3"N, 121°35'43.0"W. Concur

AWOIS Item No. 51634 originates from Chart Letter 1262/79 (USPS) and is described as a sign (on 2 piles), in approximate position 38°06'21.700"N, 121°36'47.830"W. On DN 223, a single pile was observed at Pos. No. 604 (VN 0652), uncovering 1.2 3.7 meters. The pile was leaning at a noticeable angle, apparently from age or from a past collision with a vessel. A second pile was not found after searching visually and with a sounding pole within a 5 meter radius. This position was within 13 meters of the AWOIS GP. Two piles, with a sign advertising Rainbow Resort Marina (916-776-1096), and 1 meter apart, were located at Pos. No. 606 (DN 223, VN 0652), and approximately 48 meters E of the AWOIS GP. Owners of the Rainbow Resort Marina, contacted for information (DN 246) regarding the pile at Pos. No. 604, could not provide any additional history. The hydrographer recommends charting a pile at 38°06'22.056"N, 121°36'48.109"W, uncovering 1.2 3.7 meters at MLLW, and charting a (sign) marker at 38°06'21.857"N, 121°36'45.857"W. Remove the sign charted at 38°06'21.700"N, 121°36'47.830"W. Concur

AWOIS Item No. 51636 originates from Chart Letter 1685/75 (USPS) and is described as piles (row), in approximate position 38°06'24.700"N, 121°36'29.830"W. On DN 223, a row of large stakes was located between Pos. No. 607 (W. limit, VN 0652) and Pos. No. 608 (E. limit, VN 0652) ~~uncovering~~ which bare ~~from~~ 2.5 meters ~~to 3.0 meters~~ at ~~MLLW~~ MLLW. The row follows the irregular shoreline of the tule islet, ranging from 7 meters offshore to 15 meters offshore. Tule grass was observed to grow up to the row of stakes and the area inshore is considered foul because of the extent of the stakes, some piles, and ruins. Further investigation on DN 246 found another pile in the tule grass at Pos. No. 7123 (VN 0651), ~~uncovering~~ which bares 1.1 ~~2.1~~ meters at ~~MLLW~~ MLLW, approximately 25 meters from the perceived HWL of the tule islet, with tule grass extending offshore to this position. No visible piles were observed between Pos. No. 608 and Pos. No. 7123. Pos. No. 7124 (VN 0651) verifies the AWOIS GP provided. However, no piles were visible or noted during an echosounder drift search around the AWOIS GP. The hydrographer suspects the row of piles between Pos. No. 607 and Pos. No. 608 are the charted piles located at the AWOIS GP. The apparent shift of the piles depicted on the chart (from which the AWOIS GP was picked), approximately 350 meters E from the observed center of this row, is likely due to the chart compilation and enlargement process. Discussions with Mr. Robert Derkazarian (N/CG241) on DN 247 indicate his concurrence with this conclusion. The hydrographer recommends charting a row of stakes between 38°06'22.491"N,

121°36'46.125"W, and 38°06'22.111"N, 121°36'44.197"W, along the tule as shown on the ~~FES~~ smooth sheet. Remove the charted row of piles centered at 38°06'24.789"N, 121°36'29.981"W. Chart the single pile observed at 38°06'22.498"N, 121°36'42.586"W. Concur

AWOIS Item No. 51637 originates from Chart Letter 1765/74 (USPS) and is described as a submerged wreck, in approximate position 38°06'30.700"N, 121°36'14.830"W. On DN 223, a series of berths were found positioned directly over the reported location for this wreck. Pos. No. 594 located the offshore end of a floating dock (pier) which connects two marina boathouses. This position is 10 meters SSW of the AWOIS GP. Interview with the Delta Bay Club harbor master (DN 247, 916-777-5588, owner is Stephen Goetz) indicates the marina was built in 1988. The harbor master stated there have been no reports of an obstruction or wreck at this location. Because the AWOIS GP for this wreck lies directly beneath the marina boathouses, a bottom drag could not be conducted. It is unlikely this submerged wreck, if it still exists, is a hazard to navigation. The hydrographer recommends not charting this wreck. Chart the marina as shown on the ~~FES~~ smooth sheet. Concur See Section J (Shoreline, TP-01055) discussion of this marina.

AWOIS Item No. 51638 originates from Chart Letter 618/60 (C&GS District Office) and is described as a submerged snag in position 38°06'49.700"N, 121°37'00.830"W. On DN 247 the harbor master at Bruno's Island Yacht Harbor (David Snodderly, 916-777-6084) was interviewed by the hydrographer. The harbor master stated he regularly brings boats at higher tides, drawing typically 9 feet (2.7 meters), directly over the AWOIS GP for this snag, to marina berths further north. Depths in this part of the slough were found to be 3.8 to 4.4 meters. The reported position is centered in the deepest portion of this narrow slough, within 10 meters of the docks belonging to Bruno's Yacht Harbor. Mr. Snodderly also added that some dredging was done in this area to backfill the levee which exists immediately east of this AWOIS GP. These two facts, together with the age of the report, indicate to the hydrographer that the snag is unlikely to still exist at this location. Pos. No. 7137 was taken at the AWOIS GP to confirm it's location in the center of the channel and it's proximity to the docks at the marina. No evidence of a submerged snag were found on the echosounder. The hydrographer recommends not charting a submerged snag at 38°06'49.700"N, 121°37'00.830"W. Concur However, a snag uncovering 0.3 meters at MLLW was found ninety meters northwest of charted feature at Lat. 38°06'52.62"N, Long. 121°37'01.34"W and should be charted.

AWOIS Item No. 51790 originates from Chart Letter 388/90 (USCGAUX) and is described as a sunken barge (approx. 100 feet x 25 ft) with a green wheelhouse, 10-feet square, in approximate position 38°04'19.000"N, 121°38'54.000"W. On DN 247, the hydrographer interviewed the owner of the property immediately adjacent to the AWOIS GP. According to this source (Charles Davis, Captain, Webb Tract Ferry, 510-684-3003), the sunken barge was raised and refloated shortly after it's reported sinking. The barge belongs to Michael Skerry, owner of a small salvage

company located at the AWOIS GP. Pos. No. 7135 was taken to confirm the location of the AWOIS GP in relation to the Skerry docks. This barge is now moored* at the southern end of Fisherman's Cut. The hydrographer recommends not charting a wreck at 38°04'19.000"N, 121°38'54.000"W. Concur

* Barges were found moored at Lat. 38/04/06N, Long. 121/38/56W. As these features are temporary in nature, they have not been shown on the smooth sheet.

AWOIS Item No. 51622 originates from Chart Letter 552/78 (CAS18661, 1977) and is described as a swimming area, in approximate position 38°06'55.700"N, 121°40'59.830"W. On DN 241, four buoys were positioned (Pos. Nos. 7012, 7013, 7014, 7015) which mark the southern limit of a permanent no-boat zone at the entrance to Sevenmile Slough from Threemile Slough. This no-boat zone is administered by the State of California Department of Parks and Recreation and is part of Brannan Island State Park (per Roy McNamee, Park Maintenance Chief, Delta District, 916-777-7701). No power boats are permitted north of these buoys in Sevenmile Slough. In addition, a seasonal swimming area is marked by several buoys connected by a buoyed line, inside Sevenmile Slough, along it's western shore. Pos. Nos. 7017, 7018, and 7019, mark the south onshore limit, center offshore limit, and north onshore limit of this swim area. Per the Park Maintenance Chief, these swim buoys are removed during the winter months and reinstalled each spring. The hydrographer recommends retaining the charted swim area limit line shown at 38°06'57"N, across the entrance to Sevenmile Slough. Concur The actual swim area as marked by the seasonal swim buoys plots just north of the no-boat zone and extends for 200 meters on the west side of Sevenmile Slough.

AWOIS Item No. 51592 originates from Chart Letter 1178/71 (USPS) and is described as snags, in approximate position 38°04'36.710"N, 21°40'36.830"W. On DN 213, a snag 9 meters from the HWL was located at Pos. No. 24 (DN 213, VN 0652), uncovering 0.9 meters at MLLW, approximately 310 meters south of the AWOIS GP (Pos. No. 7129, DN 247, VN 0651). Depths in the vicinity of the AWOIS GP are typically 11 to 13 meters, with the bottom rising steeply within 10 meters of the riprap shoreline of Bradford Island. An extensive drift search with the echosounder conducted on DN 247 in this area found no anomalous contacts, confirming the hydrography. Per telecon with the U.S. Army COE on DN 247 (Bob Kelly, 916-557-5278), this area was dredged to a depth of 35 feet in the 1980's as part of the San Joaquin River Deep Water Channel. The channel's eastern limit is maintained up to the shore of Bradford Island. No other snags were observed along this shore. A row of piles was located between Pos. No. 26 and Pos. No. 28 (DN 213, VN 0651), approximately 3 meters offshore, 240 meters north of the AWOIS GP, uncovering 0.5 meters, 0.5 meters, and 0.6 meters, respectively, at MLLW. Given the history of dredging in this area, confirmed by this survey's hydrography, the reported snags and piles are not a hazard, and their existence, reported at 30 feet offshore, is doubtful. The hydrographer recommends charting a snag, uncovering 0.9 meters at MLLW, at 38°04'26.953"N, 121°40'33.284"W, and a row of piles between 38°04'44.621"N, 121°40'33.284"W, and 38°04'55.292"N, 121°40'38.695"W, along shore. Refer to the ~~FFS~~ smooth sheet for depiction.

Remove "Snags" label charted at 38°04'36.710"N, 121°40'36.830"W. Concur

Dangers to Navigation

Eleven dangers to navigation were reported to the Eleventh Coast Guard District in correspondence dated October 16, 1992. A copy of this report is in Appendix I*(Danger to Navigation Reports). *Attached to 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. It was not uncommon to observe sailboats with drafts over 6 feet pilot through the sloughs. Barges, typically carrying rock or sand, were also observed transiting or working in all sloughs common to this survey.

A least depth of 2.3 meters (7 feet on Chart 18661) was observed on a hydrographic centerline at the extreme northern end of the eastern navigable portion of Sevenmile Slough, in position 38°07'02.147"N, 121°37'43.505"W (Pos. No. 513+2, DN 220, VN 0652). The surveyed sounding plots over a charted 18-feet depth.

A shoal depth of 1.2 (4) meters (4 feet on Chart 18661) was observed on a hydrographic centerline in the eastern navigable portion of Sevenmile Slough, in position 38°06'32.471"N, 121°36'50.148"W (Pos. No. 6818, DN 239, VN 0651). ✓

A shoal depth of 3.3 meters (11 feet on Chart 18661) was observed on a hydrographic centerline in a narrow slough east of the entrance to the eastern navigable portion of Sevenmile Slough, in position 38°06'28.792"N, 121°36'36.334"W (Pos. No. 6803+1, DN 239, VN 0651). This sounding has been excessed by a 2.2 meter sounding which plots slightly shoreward from the reported depth.
AWOIS Item No. 51626, rocks uncovering 0.8 meters at MLLW (uncovering 2 feet on Chart 18661) were located at position 38°06'01.635"N, 121°36'52.793"W (Pos. No. 656, DN 223, VN 0652). The rocks appear to be a single mound, approximately 10 meters in diameter, with typically only one rock uncovering, with surrounding depths of 0.8 to 6.8 meters on this survey.

A shoal with depths of 1.1 meters (3 feet on Chart 1866) to 1.9 meters (6 feet on Chart 18661) was located at the San Joaquin River entrance in Threemile Slough. The 1.1 meter depth is located at 38°05'15.679"N, 121°41'06.116"W (Pos. No. 1425+5, DN 234, VN 0651), and the shoal extends SSW to the 1.9 meter depth at 38°05'13.339"N, 121°41'07.792"W (Pos. No. 1331+3, DN 233, VN 0651). This shoal was previously charted in position 38°05'12.8"N, 121°41'07.0"W with a least depth of 3 feet (0.9 meters). The shifting of this shoal was confirmed for the hydrographer by local sources familiar with the southern portion of Threemile Slough and is attributed to turbidity currents carrying sediment along the slough bed. The hydrographer

observed during tide changes how the currents from the San Joaquin River meet the currents in Threemile Slough directly over this shoal area, visible as strong ripples and standing waves on the water surface. The two currents meet and cause the sediment to become deposited at this location, forming the shoal. The currents in Threemile Slough are influenced by both the Sacramento and San Joaquin River. Both flood tides and ebb tides arrive at the Sacramento River entrance of Threemile Slough 30 minutes ahead of the flood and ebb tides at the San Joaquin River entrance of Threemile Slough. This, in turn, apparently determines that the Sacramento's flood tide meets the San Joaquin's flood tide within Threemile Slough at this shoal's location. A note on the Smooth Sheet has been added to reflect this situation.

A shoal depth of 3.3 meters (11 feet on Chart 18661) was located in Threemile Slough in position 38°05'29.376"N, 121°41'08.606"W (Pos. No. 1353+6, DN 233, VN 0652). This shoal appears as a larger sand wave on the echogram. ✓

A shoal depth of ~~4.1~~ 3.7 meters (13 feet on Chart 18661) was located in Threemile Slough in position 38°05'39.649"N, 121°41'08.976"W (Pos. No. 834+3, DN 224, VN 0652). This shoal appears as a larger sand wave on the echogram. ✓

A shoal depth of 4.~~2~~ 3 meters (13 feet on Chart 18661) was located in Threemile Slough in position 38°06'09.999"N, 121°41'07.213"W (Pos. No. 7196+3, DN 259, VN 0651). This shoal appears as a larger sand wave on the echogram. ✓

A shoal depth of 4.3 meters (14 feet on Chart 18661) was located in Threemile Slough in position 38°06'52.082"N, 121°41'15.949"W (Pos. No. 7221+7, DN 259, VN 0651). This least depth is on a shoal which extends west from the shore of Sherman Island approximately 200 meters, into Threemile Slough, and was found to be approximately 40 meters wide. A charted 17-foot (5.2-meter) depth is shown immediately due east of this shoal. This sounding has been excessed by a 4 meter sounding which plots slightly eastward from the reported depth.
A shoal depth of ~~3.8~~ meters (13 feet on Chart 18661) was located in Threemile Slough in position 38°06'27.097"N, 121°41'36.382"W (Pos. No. 7028+3, DN 241, VN 0651). This shoal appears as a larger sand wave on the echogram and plots directly over the 18-foot depth curve shown on Chart 18661 in this area. A 3.7 meter sounding (pos 7168+4), lat 38° 06' 26.71"N, long 121° 41' 37.10"W excessed the above sounding.
A shoal with least depths of 3.~~8~~ meters (13 feet on Chart 18661) and 4.2 meters (14 feet on Chart 18661) extends into Threemile Slough from the south shore of Brannan Island. This shoal's offshore limits, depths as described above, are between 38°06'19.199"N, 121°41'45.133"W (3.~~8~~ 3.7-meter depth, Pos. No. 7165+1, DN 259, VN 0651) and 38°06'19.122", 121°41'50.346"W (~~4.2~~-meter depth, Pos. No. 6988+4, DN 240, VN 0651). These soundings plot directly over the 18-foot depth curve shown on Chart 18661 in this area. A 3.1 meter sounding plots approximately half way between the two soundings mentioned above, at Lat 38° 06' 19.12"N, Long. 121° 41' 48.32"W.

Sounding Comparisons

A sounding comparison was made between a stable-based 1:10,000-scale enlargement of Chart No. 18661 SC (20th edition) and the H-10435 final field sheets. Agreement is generally good; charted soundings compared within 0.7 meters when shifted roughly 100 meters about their charted position. No systematic shift of the charted soundings was observed. The hydrographer suspects the chart enlargement process, together with the movement of bottom sediment, account for positional differences. The existence of sandwaves, confirmed by echograms on this survey (and particularly noticeable on crosslines), are a common characteristic of riverbeds and areas with strong current flows. ✓ The shifting characteristic of the riverbed was further in evidence by comparing depth curves determined on this survey with those shown on the chart. The hydrographer found the surveyed soundings over shoals were generally deeper than charted, with a few exceptions (discussed above, under dangers to navigation). A comparison of soundings was also made between survey H-10435 and the 21st edition of Chart 18661. Soundings within the San Joaquin River, recently updated by US Army Corps of Engineer surveys (to September 1990, per Chart 18661), compared to within 0.5 meters. Charted soundings on the San Joaquin River originate from US Army Corps of Engineer surveys. All other charted soundings originate from C&GS prior surveys, as discussed in Section M.

Sounding Comparisons - Tabulated Depths See Eval Rpt, Section 7

Tabulated soundings from the 21st edition of Chart 18661 were used for comparison with survey H-10435 for areas designated as federal waterways on the chart. Surveyed soundings, within the ✓ San Joaquin River-Stockton Deep Water Channel, east of San Joaquin River Light 43, were found to be generally 1 to 3 meters deeper than the tabulated depths. The tabulated controlling depths, within the above described common areas, are considered adequate by the hydrographer.

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.

Numerous islets and berms (old levees) were found to have eroded and submerged. Changes to islet or berm configurations are shown in red* on the FFS. Islets which are now submerged and appear shoal were developed with sounding lines. Because of the ✓ quantity of these islets and berms, only the more significant

* Shoreline changes were not shown on the FFS in red. However, changes noted by the hydrographer have been portrayed on the smooth sheet in red where warranted.

changes are discussed here.

Docks and covered berths for the Delta Bay Club, discussed under Section J of this report (TP-01055), need to be charted at approximate position 38°06'30.371"N, 121°36'09.870"W (Pos. No's. 589 to 601, DN 223, VN 0652). In addition, the hydrographer recommends a magenta leader and corresponding magenta number be charted in the vicinity of this marina which refer to an appropriate entry in the marina index provided in the cover jacket of Chart 18661, SC. Concur Chart the new docks and covered berths as shown on the smooth sheet.

The magenta line indicating the approximate location of the Outrigger Marina (magenta index number "83" on the chart) inaccurately points to the north limit of this marina, where only pile ruins are located. This magenta line should be revised to more accurately indicate this marina. Recommend drawing this line from the magenta "83" to approximate position 38°06.8'N, 121°41.7'W, which is the approximate offshore center of this marina. All structures charted in this area of the western shore of Threemile Slough along Sherman Island, seaward of the MHW line, are associated with the Outrigger Marina. Concur

The following non-sounding features were not found:

A charted landing, at approximate position 38°06.05'N, 121°36.55'W, no longer exists. This item was searched for as part of AWOIS Item No. 51627. Recommend the "Landing" label at this position be removed from the chart. Concur

The charted piles, position approximate (PA), at approximate position 38°06.10'N, 121°36.40'W, were searched for as part of AWOIS Item No. 51627. Recommend the "PA" label at this position be removed from the chart and the piles discussed under AWOIS Item No. 51627 be charted. Reference disposition of this item discussed previously as AWOIS 51627.

A charted islet, at approximate position 38°05.65'N, 121°38.9'W, was disproved by hydrography on DN 239 (VN 0651). A 4.7 meter shoal was found at Pos. No. 6725+4, in position 38°05'38.949"N, 121°38'52.890"W. This shoal is not a hazard to navigation. The hydrographer recommends removing the charted islet and charting the soundings from this survey. Concur

The two charted towers in Fishermans Cut, shown in approximate positions 38°04.62'N, 121°38.70'W (east tower), and 38°04.30'N, 121°39.08'W (west tower), were not found. The hydrographer recommends removing these charted towers. Concur

The charted depth curve labeled as "6" feet at approximate position 38°05.45'N, 121°37.70'W, on the 21st edition of Chart 18661, is incorrect. This curve should be labeled as "12" feet. The hydrographer recommends data from this survey be used to supersede this depth curve, and the correct curve depth label be

shown on the chart. Concur

The charted overhead power cables which cross Fishermans Cut at approximate latitude 38°04.67'N were found during shoreline verification on DN 254 (VN 0651) and located by Pos. No's. 7146 and 7147. The hydrographer recommends these overhead power cables* be charted at latitude 38°04.50'N, across Fishermans Cut, approximately 300 meters south of their present charted location.
*Chart the overhead cables as found by this survey. The presently charted overhead cables are likely compiled incorrectly but should be researched before removing from the chart.
A charted islet in approximate position 38°05.73'N, 121°40.5'W was disproved by Pos. No. 7154 (DN 254, VN 0651, NSP), at 38°05'43.464"N, 121°40'28.773"W. A 15.7 meter depth corresponds to this detached position. Hydrography in this area (Pos. No's. 6392+6, and 6393, DN 234, VN 0651) confirms this. The hydrographer recommends not charting this islet. Do not concur. Recommend charted spoil area be retained and noted as discontinued.
A charted spoil area, centered at approximate position 38°04.75'N, 121°40.00'W, 650 meters long and extending 150 meters offshore of Sherman Island into the San Joaquin River, is no longer active per telecon with Eleventh Coast Guard District San Francisco (LT O'Connor, 510-437-3081), and US Army Corps of Engineers Sacramento District (Bob Kelly, 916-557-5254). Furthermore, dredge dumping in open waters is no longer permitted per California legislation. The hydrographer recommends removing the charted spoil area label and limits. Recommend soundings from this survey supersede the charted depths in this area. Concur

The charted depth curve segment shown at approximate position 38°05.22'N, 121°40.9'W is incomplete. The hydrographer assumes this depth curve segment portrays the 30-foot depth curve of the San Joaquin River-Stockton Deep Water Channel. The hydrographer recommends data from this survey be used to supersede this depth curve, and the correct curve depth label be shown on the chart. Concur

A charted measured mile marker course in Threemile Slough no longer exists. On DN 254, Pos. No. 7162 (VN 0651) confirmed the existence of the southern mile marker charted at approximate position 38°05.62'N, 121°41.25'W. This marker is actually two fence posts spaced approximately one meter apart, with the seaward post marked by a triangular dayboard, and the inshore post marked by an inverted triangular dayboard. A vessel using these two markers would observe the apexes of each triangle meeting as it passed abeam. On DN 259, a visual search on shore for the northern mile marker located only the concrete footings where this marker once stood. Pos. No. 7203 (VN 0651, NSP) was taken to confirm this. The hydrographer recommends the notation on the chart for a "measured course 6057 feet" be removed, as well as the symbols and notations for both of these mile markers. Concur

A charted islet in Threemile Slough at approximate position 38°06.90'N, 121°40.92'W was disproved by Pos. No. 7215 (DN 259, VN 0651, NSP), at 38°06'55.757"N, 121°40'56.872"W. Depths in

this area were found to range from 8.4 meters immediately along shore to 15.9 meters and 21.5 meters. Hydrography conducted in this area confirms the generally deep depths found during the disproval search for this islet (Pos. No's. 6887+6, and 6887+7, DN 240, VN 0651, and Pos. No's. 7219+4, and 7219+5, DN 259, VN 0651). The hydrographer recommends not charting this islet. Concur

Recommendations

The hydrographer recommends the two geographic names MACKENSON and NOVERD, described on the Forms 9-1343 in Appendix IV* (Geographic Names), be deleted from the chart.* Forms 9-1343 are attached to this report.

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 Photogrammetry Party) for aids positioned by GPS in January, 1992, were forwarded to the Eleventh Coast Guard ✓ District, Long Beach, CA in correspondence date July 31 and August 4, 1992. Copies of this correspondence are included in Appendix VI *(Supplemental Correspondence). * Copies attached

Position Comparisons

Table P-1 lists all aids to navigation and landmarks which fall within the H-10435 survey limits. This table was used to compare the charted positions, aerotriangulated positions, GPS (adjusted) positions, and field (hydrographic) positions of all aids to navigation. An inverse distance and bearing was computed using the HDAPS Geodetic Utility Program between the charted positions ✓ and the hydrographic positions. Where available, the GPS position, vice the field position, was used for comparison with the chart. Printouts from coastal mapping project CM-8400, which lists the aerotriangulated positions (in NAD 27) for two landmarks, were provided for this project (copies in Appendix II,* Non-Floating Aids and Landmarks for Charts).* Attached to this report.

San Joaquin River Light 37 (LLN 6820) was observed missing on DN 254. Telecon with Eleventh Coast Guard District ATON Team San ✓ Francisco indicated this light was reported destroyed on DN 249. A copy* of LNM 37/92 confirming this is included in Appendix VI. Temporary Lighted Buoy 37 was positioned on DN 254. An

* Copy attached to this report.

echosounder drift search was conducted over the former location of Light 37. The ruins of this light were observed on the echogram and determined to not be a hazard to navigation. Per USCG ATON Team, the light ruins will be removed in the near future by a contractor and a new light installed. The remains of this light plot in 8-9 meters of water and within twenty meters of the shoreline. The destroyed remains do not rise significantly from the surrounding depths. This light has been rebuilt since survey completion. Reference the 1995 Light List for specific characteristics associated with LT "37".

TABLE P-1

Floating/Non-Floating Aids and Landmarks
Comparison of Charted Positions to Field Positions for H-10435

DESCRIPTION	LL POS.	CHARTED POS.	AERO POS.	GPS POS.	FIELD POS.	DP	DN	DIST.	ϕ
Chart 18661									
San Joaquin River (SJR)									
1. SJR LT 27 LLN 6767		38°04'27.0"N 121°40'42.5"W			38°04'26.472"N 121°40'42.555"W	18	213	16.4	184
2. SJR LT 28 LLN 6770		38°05'00.5"N 121°40'41.0"W			38°04'59.988"N 121°40'41.132"W	17	213	16.1	191
3. SJR LT 29 LLN 6780	38°05.3'N 121°41.0"W	38°05'19.0"N 121°40'58.0"W			38°05'18.982"N 121°40'57.246"W	16	213	33.7	147
4. SJR LIGHTED BUOY 30 LLN 6785	38°05.5'N 121°40.6'W	38°05'29.0"N 121°40'39.0"W			38°05'28.079"N 121°40'38.674"W	15	213	29.5	164
5. SJR LIGHTED BUOY 32 LLN 6790	38°05.6'N 121°40.4'W	38°05'39.0"N 121°40'23.0"W			38°05'38.201"N 121°40.23.218"W	14	213	25.2	192
6. SJR ~~LIGHTED BUOY~~ 33 LLN 6795	38°05.8'N 121°40.1'W	38°05'51.0"N 121°40'08.0"W			38°05'50.692"N 121°40'08.683"W	13	213	19.1	240
7. SJR LIGHTED BUOY 33A LLN 6797	38°05.6'N 121°39.3'W	38°05'37.0"N 121°39'19.0"W			38°05'36.235"N 121°39'18.594"W	12	213	25.5	157
8. SJR LT 34 LLN 6800	38°05.4'N 121°39.3'W	38°05'24.0"N 121°39'17.0"W			38°05'23.468"N 121°39'15.871"W	11	213	32.0	120

TABLE P-1

Floating/Non-Floating Aids and Landmarks
Comparison of Charted Positions to Field Positions for H-10435

DESCRIPTION	LL POS.	CHARTED POS.	AERO POS.	GPS POS.	FIELD POS.	DP	DN	DIST.	ϕ
9. SJR LT 35 LLN 6805		38°05′25.0"N 121°38′57.5"W			38°05′23.064"N 121°38′56.536"W	10	213	64.2	158
10. SJR LT 35A LLN 6810		38°05′18.0"N 121°38′37.5"W			38°05′17.102"N 121°38′36.908"W	9	213	31.3	152
11. SJR LT 36 LLN 6815	38°05.1′N 121°38.5′W	38°05′09.0"N 121°38′29.0"W			38°05′07.908"N 121°38′28.536"W	8	213	35.1	163
12. SJR LIGHTED BUOY 37*					38°05′23.095"N 121°38′11.522"W	7142	254		
*NOT CHARTED. REPLACES SJR LT 37, LLN 6820, REPORTED DESTROYED ON DN 249.									
13. SJR LT 38 LLN 6825		38°05′48.0"N 121°37′46.0"W			38°05′47.402"N 121°37′45.274"W	6	213	25.4	135
14. SJR LT 39 LLN 6830		38°06′08.0"N 121°37′40.0"W			38°06′07.548"N 121°37′38.240"W	5	213	45.1	108
15. SJR LIGHTED BUOY 40		38°06′10.5"N 121°36′55.0"W			38°06′09.888"N 121°36′57.991"W	4	213	73.2	254
16. SJR LT 41 LLN 6835		38°06′20.5"N 121°36′58.0"W		38°06′19.496"N 121°36′57.669"W	38°06′19.352"N 121°36′57.622"W	3	213	32.0	165
17. SJR LT 42 LLN 6840	38°06.1′N 121°36.2′W	38°06′04.0"N 121°36′10.0"W			38°06′03.136"N 121°36′09.611"W	2	213	28.3	160

TABLE P-1

Floating/Non-Floating Aids and Landmarks
Comparison of Charted Positions to Field Positions for H-10435

DESCRIPTION	LL POS.	CHARTED POS.	AERO POS.	GPS POS.	FIELD POS.	DP	DN	DIST.	ϕ
18. SJR LT 43 LLN 6845		38°06'04.5"N 121°35'42.0"W			38°06'04.152"N 121°35'42.338"W	1	213	13.5	217
19. THREEMILE SLOUGH LT 1 LLN 6775	38°05.1"N 121°41.2"W	38°05'09.0"N 121°41'11.0"W		38°05'8.256"N 121°41'10.575"W	38°05'08.144"N 121°41'10.535"W	19	213	25.2	155
20. TOWER (THREEMILE SLOUGH, NORTH)			38°06'24.936"N 121°41'58.247"W	38°06'24.93207"N* 121°41'58.24242"W*	Remarks: Good Landmark. Visually Located & Verified. See Pos. No. 7243, DN 259.				
21. TOWER (THREEMILE SLOUGH, SOUTH)			38°06'16.192"N 121°42'00.425"W	38°06'16.18893"N* 121°42'00.42132"W*	Remarks: Good Landmark. Visually Located & Verified. See Pos. No. 7244, DN 259.				

*POSITIONS FROM NGS NAD 83 GEODETIC CONTROL DATA.

Several fixed aids to navigation were positioned which do not appear on Chart 18661 SC, 20th edition. However, they are correctly shown on the 21st edition. 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 45 meters. Because the 45 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-10435 adequately serve their established purpose. Concur

All floating aids to navigation within the limits of H-10435 were positioned by hydrographic methods. Descriptions and characteristics of these aids are provided in the field records. ✓

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

Pipeline and Cable Crossings

A charted cable area at the northern end of the eastern navigable portion of Sevenmile Slough, approximate position 38°07.05'N, 121°37.65'W, could not be confirmed. No signs or other evidence of a submerged or overhead cable crossing were found during shoreline verification and hydrography in this area. The hydrographer recommends retaining this cable crossing as charted, lacking information to the contrary. Concur

A charted submerged cable* area at the southern end of Threemile Slough was verified on DN 254. Pos. No's. 7163 and 7164* (VN 0651) mark the approximate area where this submerged cable enters the water from Sherman Island and Twitchell Island, respectively. No signs or other markings exist. The hydrographer recommends retaining this cable crossing as charted. Concur
* Found by this Survey at Lat. 38/05/33N, Long. 121/41/05W.
A charted overhead cable area at the ~~eastern~~ Western end of Threemile Slough was verified on DN 259. Pos. No's. 7243* and 7244 (VN 0651) mark the approximate area where these overhead cables cross the water from Brannan Island to Sherman Island, respectively. The towers which suspend these overhead cables are good landmarks and are shown in Table P-1 (items 20 and 21). The hydrographer recommends retaining this cable crossing as charted. Concur
* Found by this survey at Lat. 38/06/23.30N, Long. 121/41/58.34W.
A charted pipeline crossing area (shown on the 21st edition of Chart 18661, only) in Threemile Slough was verified on DN 259. Pos. No's. 7211* and 7212 (VN 0651) mark the pipeline crossing signs on Brannan Island and Sherman Island, respectively. The hydrographer recommends retaining this pipeline crossing as charted. Concur * Found by this survey at Lat. 38/06/56.48N, Long. 121/41/10.63W.

A charted pipeline crossing area in the San Joaquin River was

verified on DN 213 and DN 254. Pos. No. 21* (VN 0652) and Pos. No. 7192 (VN 0651) mark the pipeline crossing signs on Sherman Island and Bradford Island, respectively. The hydrographer recommends retaining this cable crossing as charted. Concur

*Found by this survey at Lat. 38/04/46.67N, Long. 121/41/02.90W.

Q. STATISTICS ✓

Description	Quantities
Total Positions:	2830
VN 0651	1252
VN 0652	1578
Total Detached Positions:	422
VN 0651	92
VN 0652	330
Total Nautical Miles of Hydrography	163.9
Sq. Nautical Miles of Hydrography	2.9
Bottom Samples	48
Velocity Casts	7
Days of Production	22

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 overlays for FFS 19 and 20. Bottom sample descriptions are noted on FFS 19 and 20.

No further 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 ✓

TITLE	DATE	TO
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

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

October 16, 1992

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

Dear Sir:

While conducting hydrographic survey operations along the San Joaquin River, California, the NOAA Pacific Hydrographic Party discovered eleven dangers to navigation within the survey limits of H-10435. 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

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

October 16, 1992

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

Dear Sir:

While conducting hydrographic survey operations along the San Joaquin River, California, the NOAA Pacific Hydrographic Party discovered eleven dangers to navigation within the survey limits of H-10435. I recommend these dangers for 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.

Sincerely,

Gerd F. Glang

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

Attachments

cc: DMAHTC
N/CG221
N/CG245

US Department of Commerce
NOAA Pacific Hydrographic Party

Dangers to Navigation
Project OPR-L208
Survey H-10435
San Joaquin River, Webb Reach to Threemile Slough
PHP-10-3-92
Sheet P

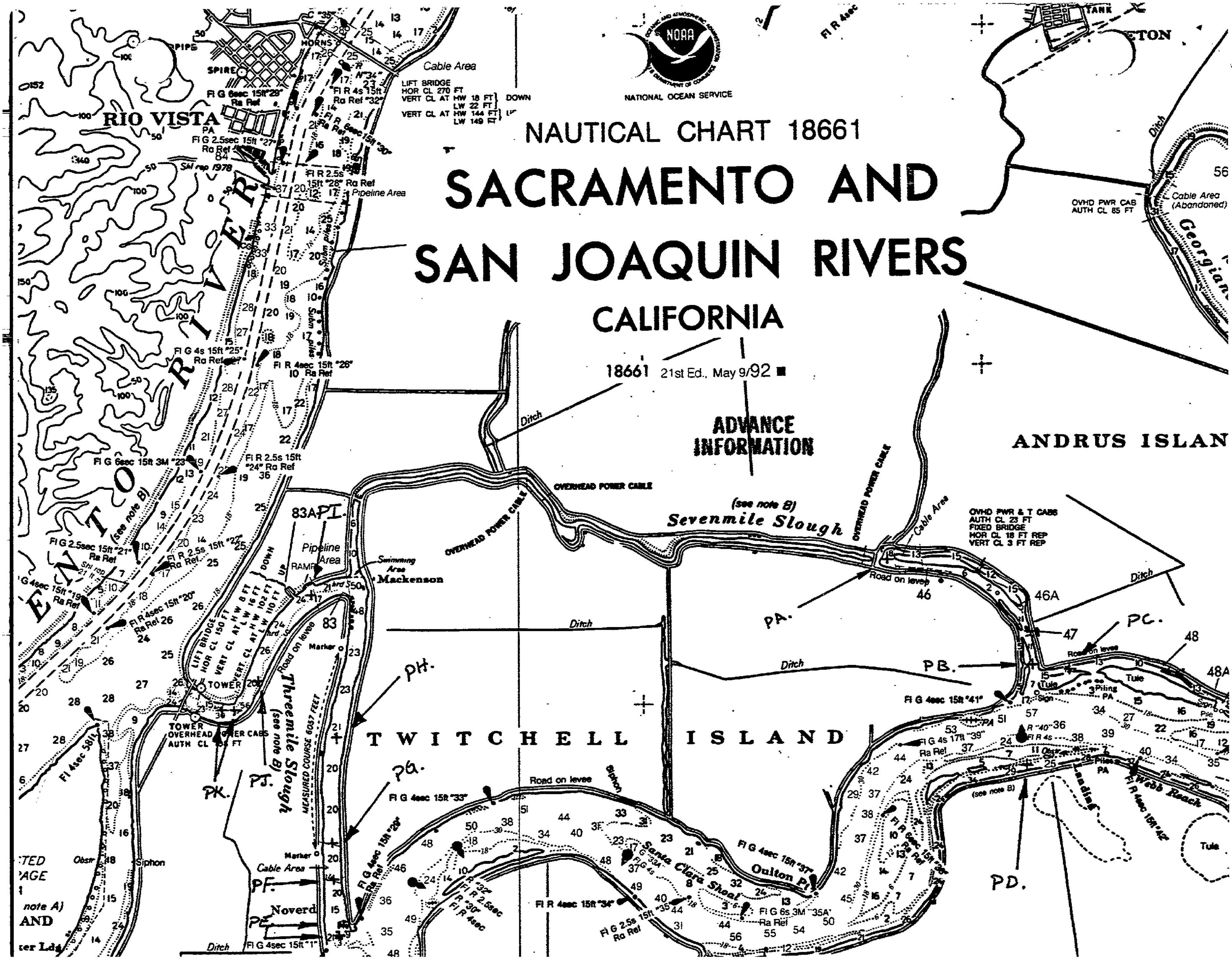
ADVANCE INFORMATION

ITEM	DANGER	CHART NUMBER	EDITION DATUM	REPORTED DEPTH	GEOGRAPHIC POSITION LATITUDE	LONGITUDE
PA. (Sevenmile Slough)	SHOAL	18661	21/May 92 NAD 83	7 feet at MLLW	38°07'02.147"N	121°37'43.505"W
PB. (Sevenmile Slough)	SHOAL	18661	21/May 92 NAD 83	4 feet at MLLW	38°06'32.471"N	121°36'50.148"W
PC. (San Joaquin River)	SHOAL	18661	21/May 92 NAD 83	11 feet at MLLW	38°06'28.792"N	121°36'36.334"W
PD. (San Joaquin River)	ROCKS	18661	21/May 92 NAD 83	uncov 2 feet at MLLW	38°06'01.635"N	121°36'52.793"W
PE. (Threemile Slough)	SHOAL	18661	21/May 92 NAD 83	3 feet at MLLW	38°05'15.679"N	121°41'06.116"W
This shoal extends SSW to:				6 feet at MLLW	38°05'13.339"N	121°41'07.792"W
PF. (Threemile Slough)	SHOAL	18661	21/May 92 NAD 83	11 feet at MLLW	38°05'29.376"N	121°41'08.606"W

Dangers to Navigation (cont'd)
Project OPR-L208
Survey H-10435
San Joaquin River, Webb Reach to Threemile Slough
PHP-10-3-92
Sheet P

ADVANCE INFORMATION

ITEM	DANGER	CHART NUMBER	EDITION DATUM	REPORTED DEPTH	GEOGRAPHIC POSITION LATITUDE	LONGITUDE
PG. (Threemile Slough)	SHOAL	18661	21/May 92 NAD 83	~13 feet at MLLW	~38°05'39.649"N	~121°41'08.976"W
PH. (Threemile Slough)		18661	21/May 92 NAD 83	~13 feet at MLLW	~38°06'09.999"N	~121°41'07.213"W
PI. (Threemile Slough)	SHOAL	18661	21/May 92 NAD 83	~14 feet at MLLW	~38°06'52.082"N	~121°41'15.949"W
PJ. (Threemile Slough)	SHOAL	18661	21/May 92 NAD 83	~13 feet at MLLW	~38°06'27.097"N	~121°41'36.382"W
PK. (Threemile Slough)	SHOAL	18661	21/May 92 NAD 83	~13 feet at MLLW	~38°06'19.199"N	~121°41'45.133"W
This shoal extends west, alongshore, to:				~14 feet at MLLW	~38°06'19.122"N	~121°41'50.346"W


NATIONAL OCEAN SERVICE
NAUTICAL CHART 18661
SACRAMENTO AND
SAN JOAQUIN RIVERS
CALIFORNIA
18661 21st Ed., May 9/92
ADVANCE INFORMATION
RIO VISTA
ANDRUS ISLAN
TWITCHELL ISLAND
Sevenmile Slough
Threemile Slough
Mackenson
Santa Clara Shoal
Oulton Pt
Webb Reach
Cable Area
LIFT BRIDGE
OVERHEAD POWER CABLE
Pipeline Area
Road on levee
Ditch
PA.
PB.
PC.
PD.
PF.
PG.
PH.
PI
PJ.
PK.

CARTOGRAPHIC FEATURES OF CHARTING INTEREST

COASTAL MAPPING PROJECT: CM-8400; Sacramento and San Joaquin Rivers, Sacramento to Stockton, California

NOS Nautical Charts Affected: 18661, 18662, 18664

GEODETIC DATUM: North American Datum of 1927

	FEATURE DESCRIPTION	NCD CC	GEOGRAPHIC POSITION(°-'-") LATITUDE	LONGITUDE	NCD QC	DATE OF LOCATION
	Map TP-01055 (continued):					
	TANK (Isleton Mun Water Tk)	086	38-09-43.399	121-36-25.639	3	001/1931
H-10426	TOWER (Three Mile Slu)	086	38-06-25.230	121-41-54.410	3	001/1931
	TOWER (Three Mile Slu)	086	38-06-16.485	121-41-56.588	3	001/1931
	TWIN TANKS (at RIO VISTA)	086	38-09-47.469	121-41-01.261	3	001/1931
	TOWER (SW Trans at Isleton)	086	38-09-58.530	121-37-41.251	3	001/1931
	TOWER (NE Trans at Isleton)	086	38-10-10.100	121-37-36.118	3	001/1931
	STEEL POLE (W at Howard Ldg)	086	38-13-49.331	121-36-11.316	3	001/1932
	STEEL POLE (E at Howard Ldg)	086	38-13-49.255	121-35-59.791	3	001/1932
	WATER TANK (at Ryde)	086	38-14-15.270	121-33-31.736	3	001/1931
	Map TP-01056:					
	TANK (Terminous Water Tk)	086	38-06-48.086	121-29-47.061	3	001/1931
	TOWER (N Staten I)	086	38-13-33.70	121-29-30.88	6	103/1983
	TV TOWER (Walnut Grove)	086	38-14-49.80	121-30-02.17	6	103/1983
	Map TP-01060:					
	TOWER (N Jersey I)	086	38-03-05.81	121-41-15.26	6	104/1983
	TOWER (SE Sherman I)	086	38-03-22.57	121-41-34.95	6	104/1983
	TOWER (NW Mandeville I)	086	38-04-09.67	121-34-24.74	6	104/1983
	TOWER (SE Webb Tract)	086	38-04-23.61	121-34-29.42	6	104/1983
	Map TP-01061:					
	TOWER (Bishop Cut)	086	38-03-32.14	121-25-05.66	6	103/1983
	TOWER (Bishop Cut)	086	38-03-31.91	121-24-59.19	6	103/1983
	TOWER (N Bacon I)	086	38-00-14.85	121-31-51.65	6	103/1983
	TOWER (SW Wright Tract)	086	37-59-15.66	121-23-29.58	6	103/1983
	TOWER (NE Roberts I)	086	37-59-07.46	121-23-32.28	6	103/1983
	TOWER (Empire Cut)	086	37-58-21.96	121-30-19.78	6	104/1983
	TOWER (Empire Cut)	086	37-58-14.19	121-30-19.15	6	104/1983
	TOWER (N Whiskey Slu)	086	37-58-13.25	121-28-32.03	6	104/1983
	TOWER (N Whiskey Slu)	086	37-58-10.10	121-28-24.75	6	104/1983
	Map TP-01062:					
	TANK (N of Port - E Tank)	086	37-57-24.699	121-19-02.768	3	001/1954
	TANK (N of Port - W Tank)	086	37-57-19.294	121-17-59.423	3	001/1954
	TANK (Stockton Port E Tank)	086	37-57-01.452	121-19-00.383	3	001/1932
	TANK (Stockton Port W Tank)	086	37-56-59.479	121-19-20.511	3	001/1932
	TANK (ESE of Port-Fiber Prod)	086	37-56-41.383	121-18-09.038	3	001/1932
	TANK (E of Moss Tract)	086	37-55-23.234	121-16-34.199	3	001/1959
	- end -					

Listing approved by: Robert W Rodkey Jr — Final Reviewer — 3/28/88 Date

121,41,54.410

North American Datum Conversion
NAD 27 to NAD 83
NADCON Program Version 1.01

OPR-L208
H-10435

Transformation #: 1 Region: Conus

Station name: TOWER (THREEMILE SLOUGH, NORTH)

	Latitude		Longitude	
NAD 27 datum values:	38 06	25.230	121 41	54.410
NAD 83 datum values:	38 06	24.936	121 41	58.247
NAD 83 - NAD 27 shift values:		-.294		3.837(secs.)
		-9.058		93.469(meters)
Magnitude of total shift:			93.907(meters)	

Do you want to do another datum transformation (Y/N)?
(Default is Y)

What is the NAME for this station or point?
TOWER (THREEMILE SLOUGH, SOUTH)
What is its NAD 27 latitude?

38,06,16.485

What is its NAD 27 longitude? (Longitude is positive west.)

121,41,56.588

Transformation #: 2 Region: Conus

name: TOWER (THREEMILE SLOUGH, SOUTH)

	Latitude		Longitude	
NAD 27 datum values:	38 06	16.485	121 41	56.588
NAD 83 datum values:	38 06	16.192	121 42	.425
NAD 83 - NAD 27 shift values:		-.293		3.837(secs.)
		-9.049		93.471(meters)
Magnitude of total shift:			93.908(meters)	

Do you want to do another datum transformation (Y/N)?
(Default is Y)

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

July 31, 1992

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

Dear Sir:

The NOAA Pacific Hydrographic Party is continuing Project OPR-L208, basic hydrographic surveys of the Sacramento and San Joaquin Rivers, and adjoining sloughs and rivers. The remaining surveys in this project will affect NOS Charts 18661 and 18662.

To complete the geodetic control for our hydrographic project, a GPS survey was conducted by the NOAA/NOS Pacific Photogrammetric Party between January 8 and January 13, 1992. These geodetic control stations are used for our electronic positioning system and include several non-floating aids to navigation. Positions provided below are from the January, 1992 GPS survey, NAD 83, and meet third order class I accuracy.

NON-FLOATING AID	ADJUSTED POSITION	LIGHT LIST POSITION
SACRAMENTO AND SAN JOAQUIN RIVERS (CHART 18661)		
San Joaquin River		
THREEMILE SLOUGH		
LIGHT 1	38°05'08.25665"N	38°05.1'N
LLN 6775	122°41'10.57430"W	121°41.2'W
LIGHT 37	38°05'24.13381"N	38°05.4'N
LLN 6820	121°38'09.55857"W	121°38.2'W
LIGHT 41	38°06'19.49654"N	No Published Position.
LLN 6835	121°36'57.66853"W	
LIGHT 48	38°05'34.46764"N	No Published Position.
LLN 6857	121°34'37.15036"W	
LIGHT 57	38°03'38.72588"N	38°03.6'N
LLN 6895	121°33'19.85161"W	121°33.3'W

NON-FLOATING AID	ADJUSTED POSITION	LIGHT LIST POSITION
SACRAMENTO AND SAN JOAQUIN RIVERS (Chart 18661)		
Sacramento River Deep Water Ship Channel		
LIGHT 42 LLN 7370	38°11'52.90804"N 121°39'20.53260"W	No Published Position.
LIGHT 48 LLN 7400	38°13'24.17663"N 121°40'20.59930"W	No Published Position.
SACRAMENTO RIVER (Chart 18662)		
Sacramento River Deep Water Ship Channel		
LIGHT 53 LLN 7430	38°15'23.15270"N 121°40'05.25140"W	No Published Position.
SACRAMENTO AND SAN JOAQUIN RIVERS (Chart 18661)		
Sacramento River		
LIGHT 4 LLN 7630	38°10'21.86987"N 121°39'08.55034"W	No Published Position.

Contact Pacific Hydrographic Party at (707) 374-5642 or Pacific Photogrammetric Party at (206) 526-6842 for additional information on these positions.

Sincerely,

Gerd F. Glang

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

cc: N/CG2333-Pacific Photo Party
N/CG245-CDR Hennick

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

August 4, 1992

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

Dear Sir:

Reference our letter to you, dated July 31, 1992, providing positions for aids to navigation on the Sacramento and San Joaquin Rivers.

The adjusted position for Threemile Slough Light 1 (LLN 6775) listed an incorrect longitude. The following position is provided:

NON-FLOATING AID	ADJUSTED POSITION	LIGHT LIST POSITION
SACRAMENTO AND SAN JOAQUIN RIVERS (CHART 18661)		
San Joaquin River		
THREEMILE SLOUGH LIGHT 1 LLN 6775	38°05'08.25665"N 121°41'10.57430"W	38°05.1'N 121°41.2'W

I regret the oversight. Contact Pacific Hydrographic Party at (707) 374-5642 or Pacific Photogrammetric Party at (206) 526-6842 for additional information.

Sincerely,

Gerd F. Glang

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

cc: N/CG2333-Pacific Photo Party
N/CG245-CDR Hennick

II. DISCREPANCIES / DISCREPANCIES CORRECTED

DISCREPANCIES: ***BOLD ITALIC CAPS*** indicates discrepancies since last LNM.

	NAME OF AID	STATUS	CHARTS AFFECTED	BNM REF.	LNM REF.
	Long Beach Radiobeacon	Inoperative.	18740		25/92
	Point Arguello Radiobeacon	Inoperative.	18720		21/92
350	San Francisco West Traffic Lane Lighted Gong Buoy W	Missing.	18680	0715/92	31/92
421	Point Arena Radiobeacon	Reduced intensity.	18640	0262/92	11/92
1580	Zuniga Point Degaussing Range West Buoy (Navy aid)	Missing.	18773	1348/91	01/92
3335	***REDONDO BEACH EAST JETTY LIGHT 2***	***FOG SIGNAL INOPERATIVE.***	***18744***	***0858/92***	***37/92***
3630	Channel Islands Harbor Breakwater South Light 1	Burning dim.	18725	0695/92	30/92
4690	Brooklyn Basin North Channel Daybeacon 2	Leaning.	18649	0515/92	22/92
5515	***SAN FRANCISCO BAY NORTH CHANNEL LIGHTED BUOY 14***	***OFF STATTION.***	***18649***	***0849/92***	***37/92***
5730	***RICHMOND HARBOR CHANNEL LIGHT 10***	***IMPROPER CHARACTERISTICS.***	***18649***	***0849/92***	***37/92***
5885	San Pablo Bay Channel Light 5	Leaning.	18654		26/92
6170	Napa River Light 9	Leaning.	18654		34/92

DISCREPANCIES CORRECTED: ***BOLD ITALIC CAPS*** indicates discrepancies found and corrected since last LNM.

40	***CARLSBAD LIGHTED BELL BUOY C***	***RELIGHTED.***	***18740***	***0853/92***	***37/92***
170	***POINT VICENTE LIGHT***	***LEFT WATCHING PROPERLY.***	***18740***		***37/92***
280	***POINT SUR LIGHT***	***LEFT WATCHING PROPERLY.***	***18680***	***0854/92***	***37/92***
485	***BLUNTS REEF LIGHTED HORN BUOY 2B (ELB)***	***RELIGHTED.***	***18620***		***37/92***
2890	Downtown Marina Breakwater Light East	Left watching properly.	18751	0831/92	36/92
3445	***MARINA DEL REY BREAKWATER SOUTH LIGHT 1***	***LEFT WATCHING PROPERLY.***	***18744***		***37/92***
4145	***PILLAR POINT HARBOR ENTRANCE LIGHT***	***LEFT WATCHING PROPERLY.***	***18682***	***0848/92***	***37/92***
4525	Pier 39 Breakwater Center Light C	Relighted.	18649	0818/92	35/92
5515	San Francisco Bay North Channel Lighted Buoy 14	Left watching properly.	18649	0840/92	36/92
5640	***SOUTHAMPTON SHOAL CHANNEL LIGHTED BUOY 1***	***LEFT WATCHING PROPERLY.***	***18649***	***0857/92***	***37/92***
8120	***NOYO RIVER RANGE REAR LIGHT 10***	***RELIGHTED.***	***18626***	***0842/92***	***37/92***

III. TEMPORARY CHANGES / TEMPORARY CHANGES CORRECTED

TRUB = Temporarily Replaced by Unlighted Buoy
TRLB = Temporarily Replaced by Lighted Buoy
TUB = Temporary Unlighted Buoy
TLB = Temporary Lighted Buoy
TDBN = Temporary Daybeacon
TLT = Temporary Light

TEMPORARY CHANGES: ***BOLD ITALIC CAPS*** indicates new temporary changes since last LNM.

	NAME OF AID	STATUS	CHARTS AFFECTED	BNM REF.	LNM REF.
	San Francisco Approach Lighted Horn Buoy SF (LNB)	Horn: 3 second blast vice 2	18680		31/92
240/3835	Morro Bay West Breakwater Light	Nominal range reduced to 9NM.	18700	0211/92	09/92
3190	Fish Harbor Channel Approach Lighted Buoy 2	TRLT.	18751		26/92
3225	Fish Harbor Channel Light 3	Fog signal inoperative.	18751	0589/92	26/92
3420	El Segundo Lighted Gong Buoy 10	TRLB.	18744		08/92
3850	Morro Bay Channel Lighted Buoy 3	Missing / TRUB.	18703	1355/91	01/92
5730	Richmond Harbor Channel Light 10	Destroyed / TRLB.	18649	0503/92	22/92
5935	San Pablo Bay Channel Light 14	Destroyed / TRLB.	18654	0720/92	31/92
6820	***SAN JOAQUIN RIVER LIGHT 37***	***MISSING / TRLB.***	***18661***		***37/92***
7830	Bodega Bay Channel Daybeacon 10	Destroyed / TRUB.	18643		25/88
7855	Bodega Harbor Channel Daybeacon 15	Destroyed / TRUB.	18643	1046/91	46/91
7900	Bodega Bay Channel Daybeacon 25	Destroyed / TRUB.	18643	0668/89	24/89
7946	Spud Point Marina Daybeacon 1	Destroyed / TRUB.	18643		48/87
7947	Spud Point Marina Daybeacon 2	Destroyed / TRUB.	18643		48/87
7948	Spud Point Marina Daybeacon 3	Destroyed / TRUB.	18643		48/87
7950	Spud Point Marina Daybeacon 5	Destroyed / TRUB.	18643		27/87
8310	Hookton Channel Light 6	DESTROYED / TRLB.	18622	1099/91	44/91

TEMPORARY CHANGES CORRECTED:

3845	Morro Bay Channel Lighted Buoy 2	Reset on station.	18703	0012/92	02/92

IV. INDEX OF WATERWAYS

The following waterways are affected by Section V. Chart Corrections (C), Section VI Advance Notice of Changes to Aids to Navigation (A), or Section VII Proposed Notice of Changes to Aids to Navigation (P) in this LNM.

Waterway	Charts Affected
San Francisco Bay (P)	18649, 18650, 18652
Morro Bay (A)	18703
Long Beach Harbor (P)	18740, 18746, 18749, 18751
San Diego Bay (C)	18773

CONTROL STATIONS as of 14 Oct 1992

No	Type	Latitude	Longitude	H	Cart	Freq	Vel	Code	MM/DD/YY	Station Name	
~~701~~	~~F~~	~~037:58:27.108~~	~~121:55:40.011~~	~~394~~	~~250~~	~~0.0~~	~~0.0~~	~~6~~	~~07/20/92~~	~~KIRKER 1946~~	
~~713~~	~~F~~	~~038:07:07.203~~	~~121:42:30.435~~	~~38~~	~~250~~	~~0.0~~	~~0.0~~		~~07/20/92~~	~~NO. 8 USE 1931~~	
726	F	038:03:14.161	121:41:07.670	2	250	0.0	0.0		07/20/92	FALSE 1931	
~~739~~	~~F~~	~~037:58:24.734~~	~~121:44:46.762~~	~~74~~	~~250~~	~~0.0~~	~~0.0~~		~~07/20/92~~	~~SAND CREEK 1946~~	
~~740~~	~~F~~	~~038:05:02.570~~	~~121:41:09.592~~	~~4~~	~~250~~	~~0.0~~	~~0.0~~		~~07/20/92~~	~~SHERMAN 1931~~	
755	F	038:09:31.464	121:41:00.943	64	250	0.0	0.0	1	07/20/92	RIOS 1992	
~~756~~	~~F~~	~~038:03:30.725~~	~~121:33:19.852~~	~~10~~	~~250~~	~~0.0~~	~~0.0~~		~~07/20/92~~	~~LT57 1992~~	
757	F	038:07:32.205	121:34:45.566	19	254	0.0	0.0	7	07/20/92	MOLE 1992	
763	F	038:10:07.985	121:35:41.341	36	250	0.0	0.0	8	07/20/92	GRAN 1992	
765	F	038:06:22.732	121:42:02.399	46	254	0.0	0.0	5	07/20/92	MILE 1992	
767	F	038:06:47.764	121:29:51.002	27	250	0.0	0.0	9	07/20/92	TERM 1992	
768	F	038:05:34.467	121:34:37.151	6	250	0.0	0.0	3	07/20/92	SJ48 1992	
~~771~~	~~F~~	~~038:06:14.618~~	~~121:41:46.100~~	~~4~~	~~250~~	~~0.0~~	~~0.0~~		~~07/20/92~~	~~TRES 1992~~	
~~772~~	~~F~~	~~038:06:55.977~~	~~121:40:55.576~~	~~3~~	~~250~~	~~0.0~~	~~0.0~~		~~07/20/92~~	~~MACK 1992~~	
773	F	038:05:08.256	121:41:10.575	7	250	0.0	0.0	2	07/20/92	LT01 1992	
~~774~~	~~F~~	~~038:05:24.133~~	~~121:38:09.559~~	~~9~~	~~250~~	~~0.0~~	~~0.0~~		~~07/20/92~~	~~LT37 1992~~	DESTROYED.
775	F	038:06:19.496	121:36:57.669	8	250	0.0	0.0	4	07/20/92	LT41 1992	
800	D	038:08:53.123	121:41:38.826	14	254	0.0	0.0		08/13/92	PHP1 1992	

GFG
10-14-92

NOAA FORM 76-155
(11-72)

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

SURVEY NUMBER

H-10435

GEOGRAPHIC NAMES

Name on Survey	A ON CHART NO. 18661	B TP-01060, I:20,000 April, 1983	C TP-01055, I:20,000 March, 1988	D FROM LOCAL INFORMATION	E ON LOCAL MAPS	F P.O. GUIDE OR MAP	G RAND MCNALLY ATLAS	H U.S. LIGHT LIST	K	
ANDRUS ISLAND	X		X							1
BRADFORD ISLAND	X		X							2
BRANNAN ISLAND	X		X							3
CALIFORNIA (title)	X		X							4
FISHERMANS CUT	X	X	X							5
OULTON POINT	X		X							6
SAN ANDREAS POINT	X									7
SAN JOAQUIN RIVER	X		X							8
SANTA CLARA SHOAL	X									9
SEVENMILE SLOUGH	X		X							10
SHERMAN ISLAND	X	X								11
THREEMILE SLOUGH	X		X							12
TWITCHELL ISLAND	X		X							13
WEBB REACH	X		X							14
WEBB TRACT	X	X	X							15
										16
										17
				Approved:						18
										19
				Charles E. Harrington						20
				Chief Geographer - N/CG 2x5						21
				FEB 25 1993						22
										23
										24
										25

NOAA FORM 76-155 SUPERSEDES C&GS 197

Attachment 1

Form 9-1343

UNITED STATES BOARD ON GEOGRAPHIC NAMES DOMESTIC GEOGRAPHIC NAMES REPORT

	Controversial name
X	Name change
	Changed application
	Other

Recommended name: MACKENSON

State: California

County: Sacramento

Lat. 38 ° 06 ' 54.0 " N. Long. 121 ° 40 ' 54.0 " W. Mouth End Center (Circle one)

Lat. ° ' " N. Long. ° ' " W. Heading End (Circle one)

Description of feature: where appropriate, give shape, length, width, direction of flow or trend, direction and distance of extremities from points with established names, and section, township, range, meridian where useful, also elevation if known.

Recommend the name MACKENSON be removed from NOS Chart 18661 SC. MACKENSON is a place name charted on the west shore of Twitchell Island, along Threemile Slough, approximately 2.5NM SSE of Rio Vista, CA.

Published Maps Using Recommended Name (Map name, date, agency, & scale)	Variant Name or Application	Map or Source Using Variant (Map name, date, agency, & scale)
NOS Chart 18661 SC 21st Ed., May 9, 1992		

Available information as to origin, spelling, and meaning of the recommended name and/or statement concerning nature of difference in usage or application

The name MACKENSON, which appears only on NOS Chart 18661, could not be found in two reference texts, Historic Spots in California (Brooks, 3rd Ed., 1932/1966), and California Place Names (Gudde, Erwin G., 3rd Ed., 1969). The hydrographer contacted several local sources, none of whom recognized this place name or it's origins. Mariners, primarily recreational boaters, when making reference while in Threemile Slough, commmonly refer to the Outrigger Marina or to Brannan Island State Park (either the boat ramps, swim area, or boat docks associated with this State Park). On a visit to the area charted as MACKENSON, on Twitchell Island, the hydrographer found only a few abandoned farm buildings. No evidence of any place named MACKENSON was found.

AUTHORITY FOR RECOMMENDED NAME	MAILING ADDRESS	OCCUPATION
NOAA Pacific Hydrographic Party	~~USATF 801 Beach Drive Rio Vista, CA 94571-2003~~	

Submitted by: Gerd F. Glang

Name ~~Gerd F. Glang, LT, NOAA~~ Title Chief Date 10/21/92

Agency NOAA/NOS/C&GS/PHP Address Same as above.

Attachment 1

Form 9-1343

UNITED STATES
BOARD ON GEOGRAPHIC NAMES
DOMESTIC GEOGRAPHIC NAMES
REPORT

	Controversial name
X	Name change
	Changed application
	Other

Recommended name: NOVERD

State: California

County: Sacramento

Lat. 38 ° 05 ' 18.0" N. Long. 121 ° 41 ' 18.0" W. Mouth End Center (Circle one)

Lat. ° ' " N. Long. ° ' " W. Heading End (Circle one)

Description of feature: where appropriate, give shape, length, width, direction of flow or trend, direction and distance of extremities from points with established names, and section, township, range, meridian where useful, also elevation if known.

Recommend the name NOVERD be removed from NOS Chart 18661 SC. NOVERD is a place name charted on the east shore of Sherman Island, along Threemile Slough, approximately 4.1NM SSE of Rio Vista, CA.

Published Maps Using Recommended Name (Map name, date, agency, & scale)	Variant Name or Application	Map or Source Using Variant (Map name, date, agency, & scale)
NOS Chart 18661 SC 21st Ed., May 9, 1992		

Available information as to origin, spelling, and meaning of the recommended name and/or statement concerning nature of difference in usage or application

The name NOVERD, which appears only on NOS Chart 18661, could not be found in two reference texts, Historic Spots in California (Brooks, 3rd Ed., 1932/1966), and California Place Names (Gudde, Erwin G., 3rd Ed., 1969). The hydrographer contacted several local sources, none of whom recognized this place name or it's origins. Mariners, primarily recreational boaters, when making reference while in Threemile Slough, commmonly refer to the Outrigger Marina or to Brannan Island State Park (either the boat ramps, swim area, or boat docks associated with this State Park). On a visit to the area charted as NOVERD, on Sherman Island, the hydrographer found only a few private homes. No evidence of any place named NOVERD was found.

AUTHORITY FOR RECOMMENDED NAME	MAILING ADDRESS	OCCUPATION
NOAA Pacific Hydrographic Party	~~USATF 801 Beach Drive Rio Vista, CA 94571-2003~~	

Submitted by:
Name Gerd F. Glang ~~Gerd F. Glang, LT, NOAA~~ Title Chief Date 10/21/92

Agency NOAA/NOS/C&GS/PHP Address Same as above.

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: December 9, 1992

MARINE CENTER: Pacific

OPR: L-208

HYDROGRAPHIC SHEET: H-10435

LOCALITY: San Joaquin River, Webb Reach to Three Mile Slough, Ca.

TIME PERIOD: July 31 - September 15, 1992

TIDE STATION USED: 941-5193 Three Mile Slough, San Joaquin R., Ca.
Lat. 38° 5.1'N Lon. 121° 41.2'W

PLANE OF REFERENCE (MEAN LOWER LOW WATER): 941-5193 = 11.16 ft.
HEIGHT OF HIGH WATER ABOVE PLANE OF REFERENCE: 941-5193 = 2.9 ft.

TIDE STATION USED: 941-5229 Korth's Harbor, San Joaquim R., Ca.
Lat. 38° 5.8'N Lon. 121° 34.1'W

PLANE OF REFERENCE (MEAN LOWER LOW WATER): 941-5229 = 15.00 ft.
HEIGHT OF HIGH WATER ABOVE PLANE OF REFERENCE: 941-5229 = 2.9 ft.

TIDE STATION USED: 941-5236 Three Mile Slough, Sacramen. R., Ca.
Lat. 38° 6.4'N Lon. 121° 42.2'W

PLANE OF REFERENCE (MEAN LOWER LOW WATER): 941-5236 = 2.49 ft.
HEIGHT OF HIGH WATER ABOVE PLANE OF REFERENCE: 941-5236 = 3.9 ft.

H-10435 continued

REMARKS: RECOMMENDED ZONING

1. In the Sacramento River and Three Mile Slough from the Sacramento River to the northern tip of Sherman Island, times and heights are direct on 941-5236.

2. In Three Mile Slough, on the east side of Sherman Island, north of 38° 05.5'N, and the tidal portion of Seven Mile Slough to the north of Three Mile Slough, apply a +18 minute time correction and a x0.87 range ratio to 941-5236.

3. In the San Joaquin River, west of 121° 38.3'W and in Fishermans Cut, times and heights are direct on 941-5193.

4. In the San Joaquin River, east of 121° 38.3'W and west of 121° 37.0'W, heights are direct and apply a +18 minute time correction to 941-5193.

5. In the San Joaquin River, east of 121° 37.0'W, and the adjacent tidal portion of Seven Mile Slough, times and heights are direct on 941-5229.

NOTE: Hourly heights are tabulated on Pacific Standard Time.

CHIEF, DATUMS SECTION

APPROVAL SHEET

for

SURVEY H-10435

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

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

DATE 10-26-92

NOAA FORM 77-27(H) (9-83) | U.S. DEPARTMENT OF COMMERCE | REGISTRY NUMBER

HYDROGRAPHIC SURVEY STATISTICS

H-10435

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

RECORD DESCRIPTION	AMOUNT	RECORD DESCRIPTION	AMOUNT
SMOOTH SHEET	1	SMOOTH OVERLAYS: ~~POS~~, ARC, ~~EXCESS~~ (BS)	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						
ENVELOPES						
VOLUMES						
CAHIERS	4					
BOXES						

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			2858
POSITIONS REVISED	0	0	0
SOUNDINGS REVISED	13	0	13
CONTROL STATIONS REVISED	0	0	0
	TIME-HOURS		
	VERIFICATION	*EVALUATION*	*TOTALS*
PRE-PROCESSING EXAMINATION			
VERIFICATION OF CONTROL			
VERIFICATION OF POSITIONS	42		42
VERIFICATION OF SOUNDINGS	148		148
VERIFICATION OF JUNCTIONS			
APPLICATION OF PHOTOBATHYMETRY			
SHORELINE APPLICATION/VERIFICATION			
COMPILATION OF SMOOTH SHEET	140		140
COMPARISON WITH PRIOR SURVEYS AND CHARTS		22	22
EVALUATION OF SIDE SCAN SONAR RECORDS			
EVALUATION OF WIRE DRAGS AND SWEEPS			
EVALUATION REPORT		25	25
GEOGRAPHIC NAMES			
OTHER* Eval Other		13	13
*USE OTHER SIDE OF FORM FOR REMARKS — TOTALS	330	60	390

Pre-processing Examination by J. Griffin	*Beginning Date* 10/30/92	*Ending Date* 11/20/92
Verification of Field Data by L. Deodato	*Time (Hours)* 330	*Ending Date* 3/7/94
Verification Check by J. Stringham	*Time (Hours)* 65	*Ending Date* 3/30/94
Evaluation and Analysis by B. Olmstead	*Time (Hours)* 60	*Ending Date* 8/26/94
Inspection by D. Hill / ACMACCN	*Time (Hours)* 4	*Ending Date* 10/5/94

EVALUATION REPORT

H-10435

1. INTRODUCTION

Survey H-10435 is a basic hydrographic survey accomplished by the NOAA Ship Rainier under the following Project Instructions.

OPR-L208-PHP, dated June 17, 1991

This survey occurred in California and covers an area in the delta of the Sacramento and San Joaquin Rivers, a region of rivers and navigable sloughs which are extensively used by small boats, tugs and barges. The purpose of this survey was to provide contemporary survey data in light of urbanization and increased commercial activity. Constant dredging has effected flow changes causing deepening and shoaling in specific areas. The surveyed area expands Webb Reach to Threemile Slough and in addition includes portions of the San Joaquin River-Stockton Deep Water Channel, Fishermans Cut, and Sevenmile Slough. The surveyed area extends from latitude 38/04/00N to latitude 38/07/18N, longitude 121/35/36W to longitude 121/42/03W.

The survey area is characterized by many marshy islands intersected by sloughs and channels. The islands are reclaimed tule and cattail marshes which have been converted to agriculture. Bordering the river are levees that are twelve feet or more higher than the land behind them. Tule is often found on the channel side of the levees. Several public and private small-boat harbors, marinas, and boating resorts are spread throughout the survey area. The bottom consists primarily of mud and sand. Depths generally range from 0 meters along the shoreline to over 20 meters within the San Joaquin River-Stockton Deep Water Channel.

Predicted tides for San Francisco, California were used for the reduction of soundings during field processing. Approved hourly heights zoned from Threemile Slough, California (San Joaquin and Sacramento Rivers), and Korths Harbor, California were used during office processing. The gages are numbered 941-5193, 941-5236, and 941-5229 respectively.

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 computations. The velocity and other offset correctors are adequate. An accompanying computer printout contains the parameters and the correctors.

A digital file has been generated for this survey as required by Hydrographic Survey Guideline 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 contain adequate discussions of horizontal control and hydrographic positioning. Additional detailed information on horizontal control is found in the Horizontal Control Reports for OPR-L208-PHP, dated October 1991 and July 1992.

Positions of horizontal control stations used during hydrography are published and 1992 field values based on NAD 83. The smooth sheet and accompanying overlays are annotated with an NAD 27 adjustment tick based on values determined with the 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: -0.292 seconds (-8.995 meters)
Longitude: 3.834 seconds (93.415 meters)

The year of establishment of control stations shown on the smooth sheet originates with the previously mentioned horizontal control reports and the NGS published data.

Mini Ranger Falcon 484 and Differential GPS (DGPS) were used to control this survey. The quality of several positions using the mini ranger system exceeds limits in terms of error circle radius and residual or have angles of intersection less than 30 degrees or more than 150 degrees. Survey specifications and accuracy requirements using DGPS were in accordance with the Field Procedures Manual. A horizontal dilution of precision (HDOP) not to exceed 3.75 was computed for survey operations using DGPS. However, the quality of several positions exceed limits in terms of horizontal dilution of precision (HDOP). A review of the data using both positioning systems, 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 data. These fixes are considered acceptable.

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

Photo	Date	Scale
TP-01055	April 1983	1:20,000
TP-01059	April 1979	1:20,000
TP-01060	April 1983	1:20,000

A dolphin shown on TP-01055 at latitude 38/05/50N, longitude 121/41/06W, was not specifically investigated and or discussed by the hydrographer. Two lines of hydrography were run very near this feature with no visible indication on the fathogram. This feature plots within ten meters of the shoreline and should be treated using the charted "Note B, Caution". The dolphin has not been transferred to the smooth sheet.

There are many changes to the shoreline maps throughout the survey area. They are primarily changes to the high water line positioned from lines of delimiting hydrography, additional pier construction in Sevenmile Slough and marsh islet configurations. With the exception of new pier construction in Sevenmile slough, these changes are depicted on the smooth sheet without supporting positional information and have been shown in dashed red and is adequate to supersede the photogrammetrically delineated mean high water line.

3. HYDROGRAPHY

With the exceptions noted 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; and

c. show the survey was properly controlled and soundings are correctly plotted.

The mean lower low water line and several standard depth curves could not always be drawn continuously. This was due to a combination of significant cultural development, numerous foul areas (grass, piling) and or the 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-10435 junctions with the following surveys.

Survey	Year	Scale	Area
H-10409	1991	10,000	South
H-10413	1992	10,000	South
H-10421	1992	10,000	East
H-10442	1992	10,000	West

These junctions are complete. Soundings and standard depth curves are in good agreement. Some soundings have been transferred to this survey to better portray the bottom in the common area.

6. COMPARISON WITH PRIOR SURVEYS

H-6005a (1934) 1:10,000
H-6013 (1934) 1:10,000

These prior surveys cover portions of Threemile Slough and Fishermans Cut. Generally, the depths shown on the present survey are within one meter of the prior surveys and reflect no significant trends of either shoaling or deepening. The shoreline has remained generally stable although several tule islands detached from the mean high water line have changed configuration affecting size and shape. Portions of several tule islands once visible are now submerged. Additionally, many small piers and marine facilities have been established since 1934. Refer to Section M of the hydrographer's report for additional infromation.

AWOIS item 51596 originates from prior survey H-6005a. The disposition of this item has been satisfactorily addressed in section M of the hydrographer's report.

H-10435 is adequate to supersede the above prior surveys for the areas of common coverage.

7. COMPARISON WITH CHART

Survey H-10435 was compared to the following chart.

Chart 18661, 21st edition, dated May 9, 1992; scale 1:40,000

a. Hydrography

Charted hydrography originates from surveys H-6005a, H-6013, and miscellaneous sources. A few features including AWOIS items, are not charted by authority of Note B "Caution". Refer to section N of the hydrographer's report for additional discussion on the comparison with this chart.

Survey H-10435 is adequate to supersede charted hydrography within the common area.

b. AWOIS

There are twelve AWOIS items within the limits of this survey. These items are adequately discussed and disposed of by the hydrographer in his report, sections M and N.

c. Controlling Depths

The San Joaquin River-Stockton Deep Water Channel traverses this survey area. The controlling depths from San Joaquin River Light 27 to San Joaquin River Light 43 are the charted soundings. A comparison with the charted soundings reveals present survey depths are generally deeper by 0.5 to 0.7 meters. Survey depths are all deeper than tabulated for the channel east of San Joaquin River Light 43.

d. Aids to Navigation

There are fourteen fixed and five floating aids to navigation which were positioned by either GPS or hydrographic methods. A list containing these positions is included in section P of the hydrographer's report. These aids are adequate to serve their intended purpose.

The hydrographer recommended two landmarks for charting. See table attached to the hydrographer's report, CARTOGRAPHIC FEATURES OF CHARTING INTEREST, COASTAL MAPPING PROJECT: CM-8400; Sacramento and San Joaquin Rivers, Sacramento to Stockton, California. Note that the coordinates provided for these features are on the North American Datum of 1927. The positions of these features, updated to NAD 83, may also be found in section P of the hydrographer's report.

e. Geographic Names

Names appearing on the smooth sheet and in the survey title have been approved by the Chief Geographer. Two additional geographic names, MACKENSON and NOVERD, shown on the 21st ED of Chart 18661, have been recommended for deletion and were not shown on the smooth sheet. These names were not included on NOAA Form 76-155 as approved by the Chief Geographer.

f. Dangers to Navigation

A total of eleven dangers to navigation were generated during survey operations and reported to USCG, DMAHTC and N/CG221. A copy of this report is attached. No additional dangers were generated during office processing.

8. COMPLIANCE WITH INSTRUCTIONS

Survey H-10435 adequately complies with the Project Instructions.

9. ADDITIONAL FIELD WORK

This is a good hydrographic survey. No additional field work is recommended.

Bruce A. Olmstead
Bruce A. Olmstead
Senior Cartographer

APPROVAL SHEET
H-10435

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.

Date: 10-5-94

for Dennis J. Hill
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 Date: 10/14/94

Commander Kathy Timmons, NOAA
Chief, Pacific Hydrographic Section

****

Final Approval

Approved:

Date: 12-1-94

J. Austin Yeager
Rear Admiral, NOAA
Director, Coast and Geodetic Survey

NOAA FORM 75-96
(10-83)

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

MARINE CHART BRANCH

RECORD OF APPLICATION TO CHARTS

FILE WITH DESCRIPTIVE REPORT OF SURVEY NO. H-10435

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
18661	9-15-94	Russ Davis	Full Part Before After Marine Center Approval Signed Via Full application of
			Drawing No. soudgs from smooth sheet
18020	10-14-94	Bruce A. Olmstead	Full ~~Part Before~~ After Marine Center Approval ~~Signed~~ Via
			Drawing No. Examined, no corrections and soundings applied
18022	10-14-94	Bruce A. Olmstead	Full ~~Part Before~~ After Marine Center Approval ~~Signed~~ Via
			Drawing No. Examined, no corrections and soundings applied.
18010	10-14-94	Bruce A. Olmstead	Full ~~Part Before~~ After Marine Center Approval ~~Signed~~ Via
			Drawing No. Examined, no corrections and soundings applied.
501	10-14-94	Bruce A. Olmstead	Full ~~Part Before~~ After Marine Center Approval ~~Signed~~ Via
			Drawing No. Examined, no corrections and soundings applied
530	10-14-94	Bruce A. Olmstead	Full ~~Part Before~~ After Marine Center Approval ~~Signed~~ Via
			Drawing No. Examined, no corrections and soundings applied.
50	10-14-94	Bruce A. Olmstead	Full ~~Part Before~~ After Marine Center Approval ~~Signed~~ Via
			Drawing No. Examined, no corrections and soundings applied
			Full Part Before After Marine Center Approval Signed Via
			Drawing No.
			Full Part Before After Marine Center Approval Signed Via
			Drawing No.
			Full Part Before After Marine Center Approval Signed Via
			Drawing No.

SUPERSEDES C&GS FORM 8352 WHICH MAY BE USED.