H11747

**NOAA** FORM 76-35A

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

# DESCRIPTIVE REPORT

*Type of Survey* MULTIBEAM

*Field No* OPR-L430-NRT6-09

*Registry No.* H11747

## LOCALITY

*State* CALIFORNIA

*General Locality* SAN FRANCISCO BAY

*Locality* SAN PABLO POINT TO 1.5 MILES
WEST OF PINOLE POINT

2009

CHIEF OF PARTY
ERIC M. MOORE

## LIBRARY & ARCHIVES

DATE SEPTEMBER, 2009

NOAA FORM 77-28
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U.S. DEPARTMENT OF COMMERCE
NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION

REGISTRY No H11747

# HYDROGRAPHIC TITLE SHEET

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

FIELD No.

**State** California

**General Locality** San Francisco Bay

**Sub-Locality** San Pablo Point to 1.5 miles west of Pinole Point

**Scale** 1:10,000 **Date of Survey** 06/01/2009 - 08/12/2009

**Instructions dated** 01/11/2007 **Project No.** OPR-L430-NRT6-09

**Vessel** NOAA Survey Launch S3003

**Chief of party** Eric M. Moore

**Surveyed by** Navigation Response Team Six Personnel

**Soundings by echo sounder, hand lead, pole** Simrad EM3000 Multibeam Echosounder

**Graphic record scaled by** N/A

**Graphic record checked by** N/A **Automated Plot** N/A

**Verification by** Atlantic Hydrographic Branch

**Soundings in fathoms feet at MLW MLLW** Meters at MLLW

**REMARKS:** 1) All times are UTC. 2) Projection is UTM Zone 10.

NOAA FORM 77-28 SUPERSEDES FORM C&GS-537

U.S GOVERNMENT PRINTING OFFICE: 1976-665-661/1222 REGION NO.6

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Descriptive Report
to accompany
HYDROGRAPHIC SURVEY H11747
PROJECT: OPR-L430-NRT6-09
Scale of Survey: 1:40000
Year of Survey: 2009
NOAA Navigation Response Team 6
Eric Moore, Laura Pagano and Ed Wernicke

## A. AREA SURVEYED

This survey was conducted in accordance with Hydrographic Survey Letter Instructions for Survey H11747, San Francisco Bay, CA. The original instructions are dated January 11, 2007. Data acquisition was conducted from June 1 through August 12, 2009. ***Concur.***

See table 1 and figures 1-3 below for acquisition totals, images of survey limits and data coverage. ***Concur***

Table 1: NOAA Survey Launch S3003 Acquisition Totals

| | |
|---|---|
| Multibeam (mainscheme) | 175 LNM |
| Side Scan Sonar 100% (mainscheme) | 69 LNM |
| Side Scan Sonar 200% (mainscheme) | 67 LNM |
| Crosslines | 9 LNM |
| Development/Holidays | 8 LNM |
| Square Nautical Miles | 3.5 SNM |

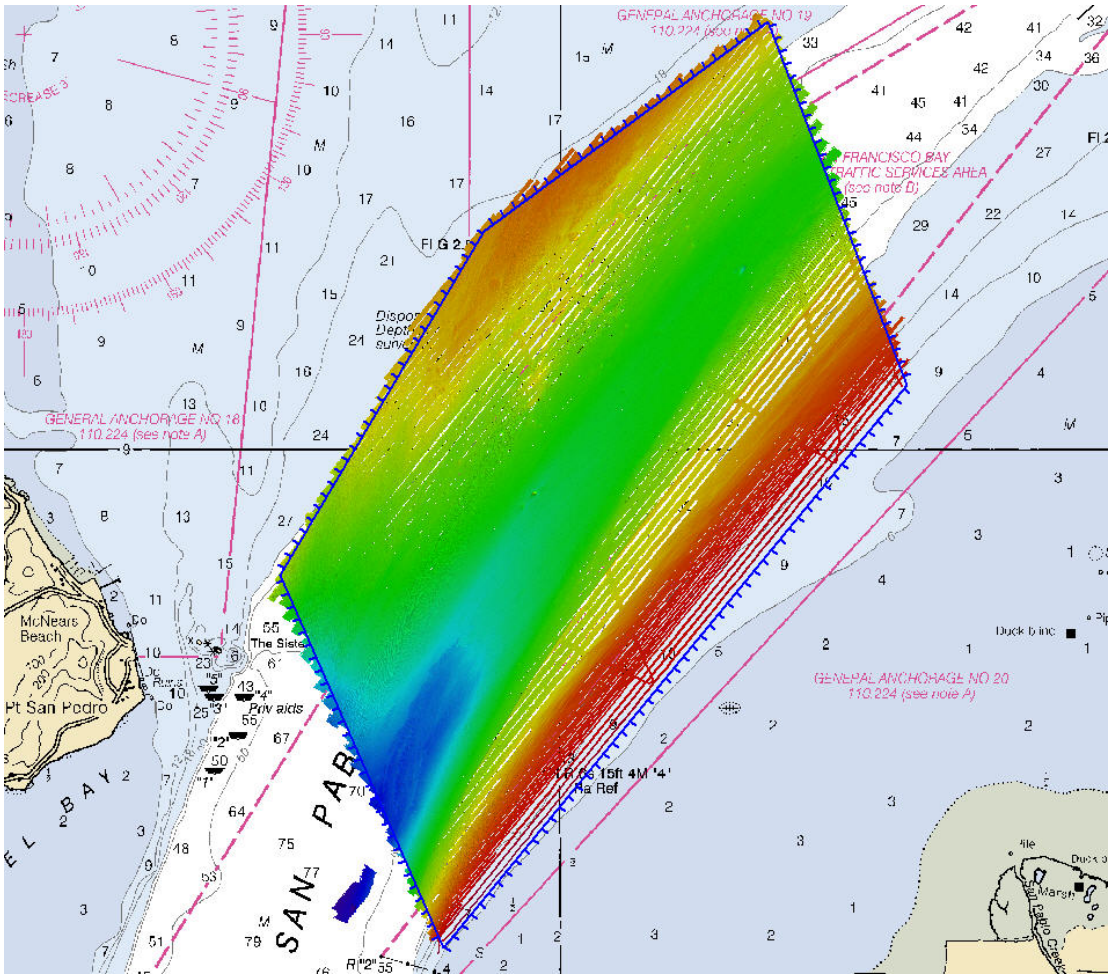



**Figure 1: San Pablo Bay, Sheet E, multibeam sonar data coverage.**

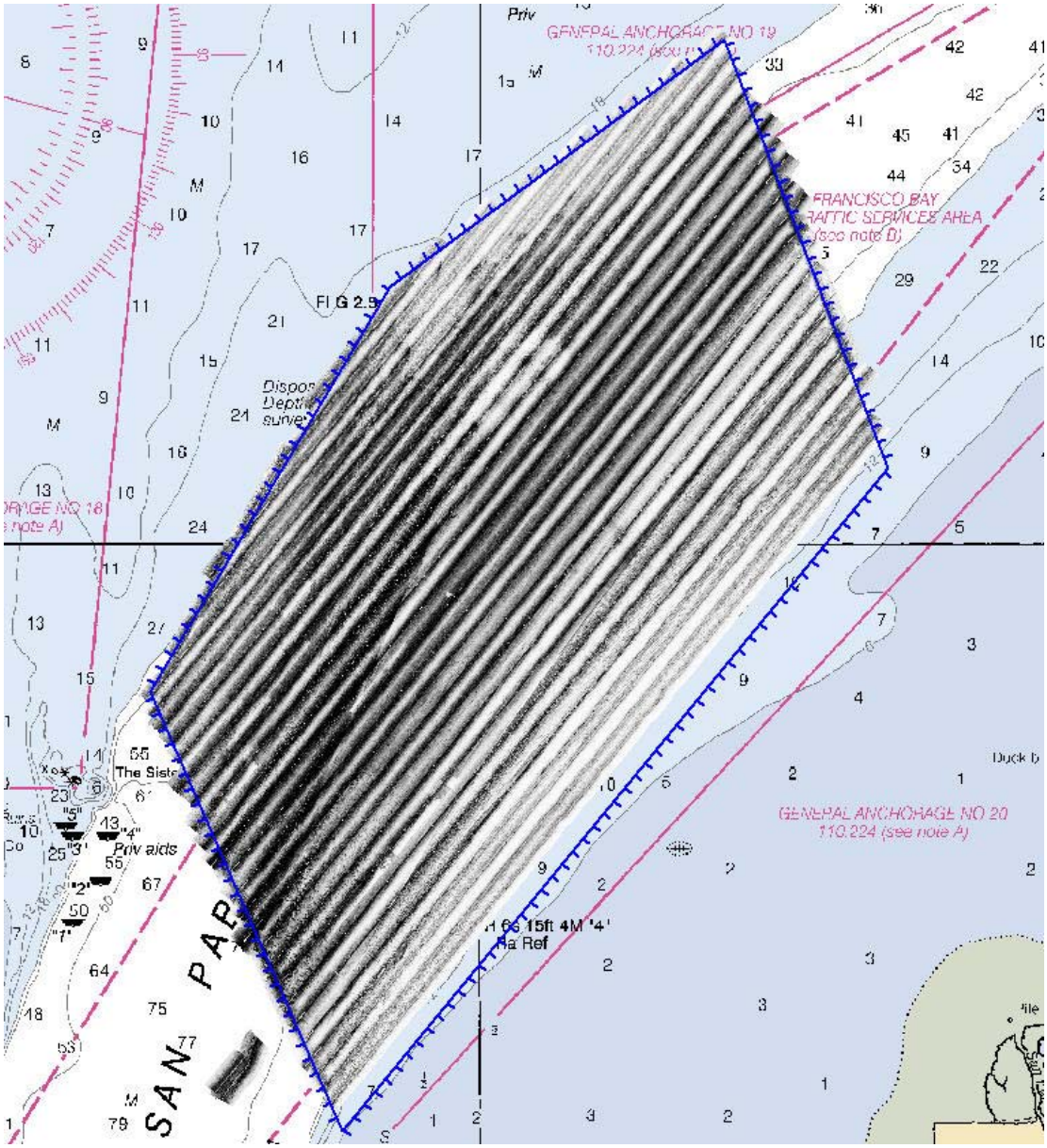



**Figure 2: San Pablo Bay, Sheet E, 100% side scan sonar data coverage.**

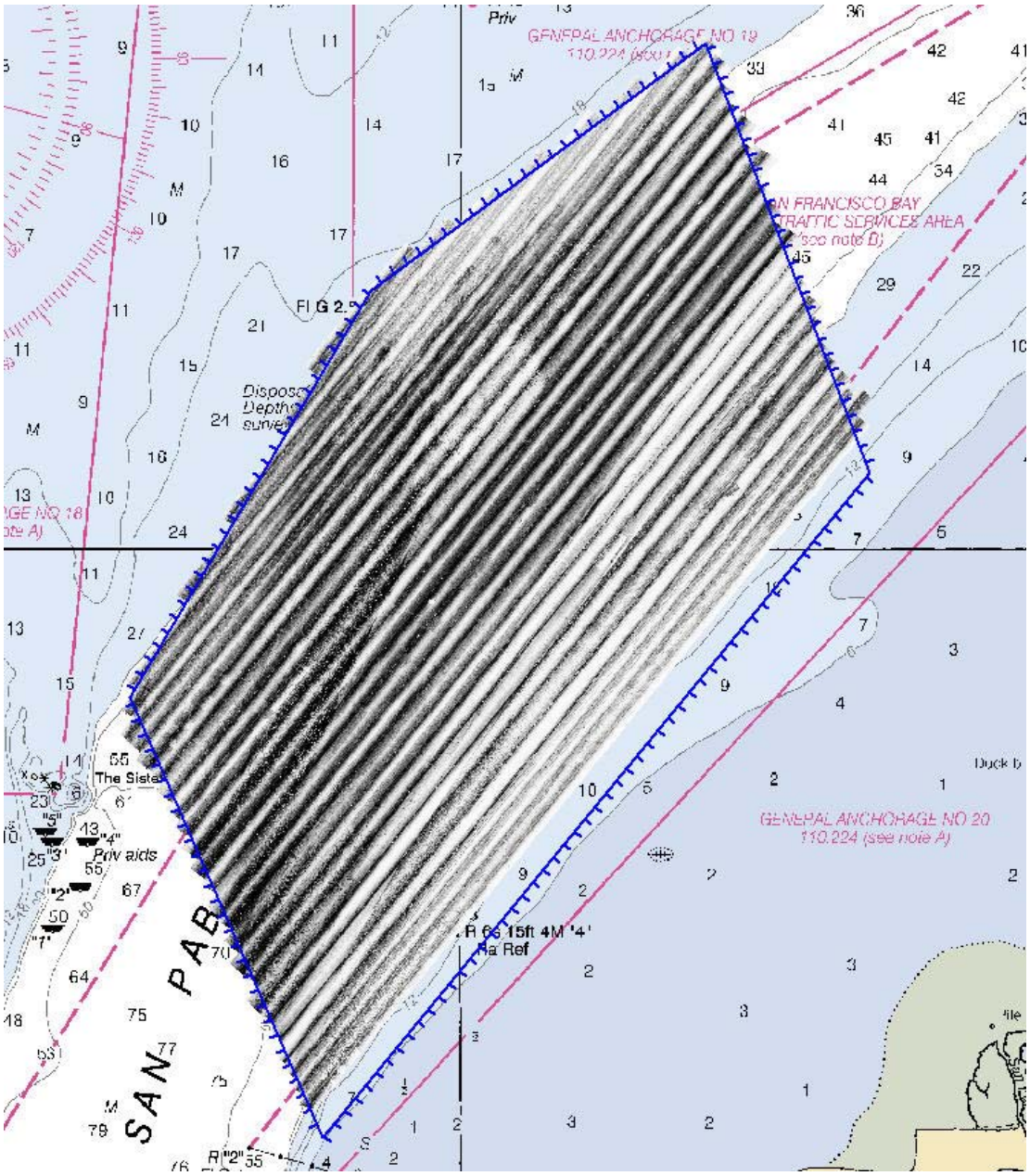



**Figure 3: San Pablo Bay, Sheet E, 200% side scan sonar data coverage.**

## B. DATA ACQUISITION AND PROCESSING *See also the H-Cell Report.*

### B.1 EQUIPMENT

Data were acquired by NOAA Survey boat S3003, which is a 10-meter hydrographic survey vessel with a transducer draft of 0.54 meters. *Concur.*

NOAA Survey boat S3003 acquired soundings, imagery, and sound velocity profiles. Soundings and imagery were acquired by SIMRAD EM3000 multibeam echosounder. Imagery was acquired by KLEIN 3000 side scan sonar. Water column sound velocity data was acquired with a Sea-Bird SBE 19+ CTD. ***Concur.***

NOAA Survey boat S3003 positioning and attitude data were determined with an Applanix POS/MV 320 Version 4 GPS-aided inertial navigation system. ***Concur.***

Refer to the Data Acquisition and Processing Report (DAPR)* for detailed equipment and vessel configuration information. ****Included with survey deliverables.***

## B.2 QUALITY CONTROL *See also the H-Cell Report.*

### B.2.1 Side Scan Sonar Quality Control

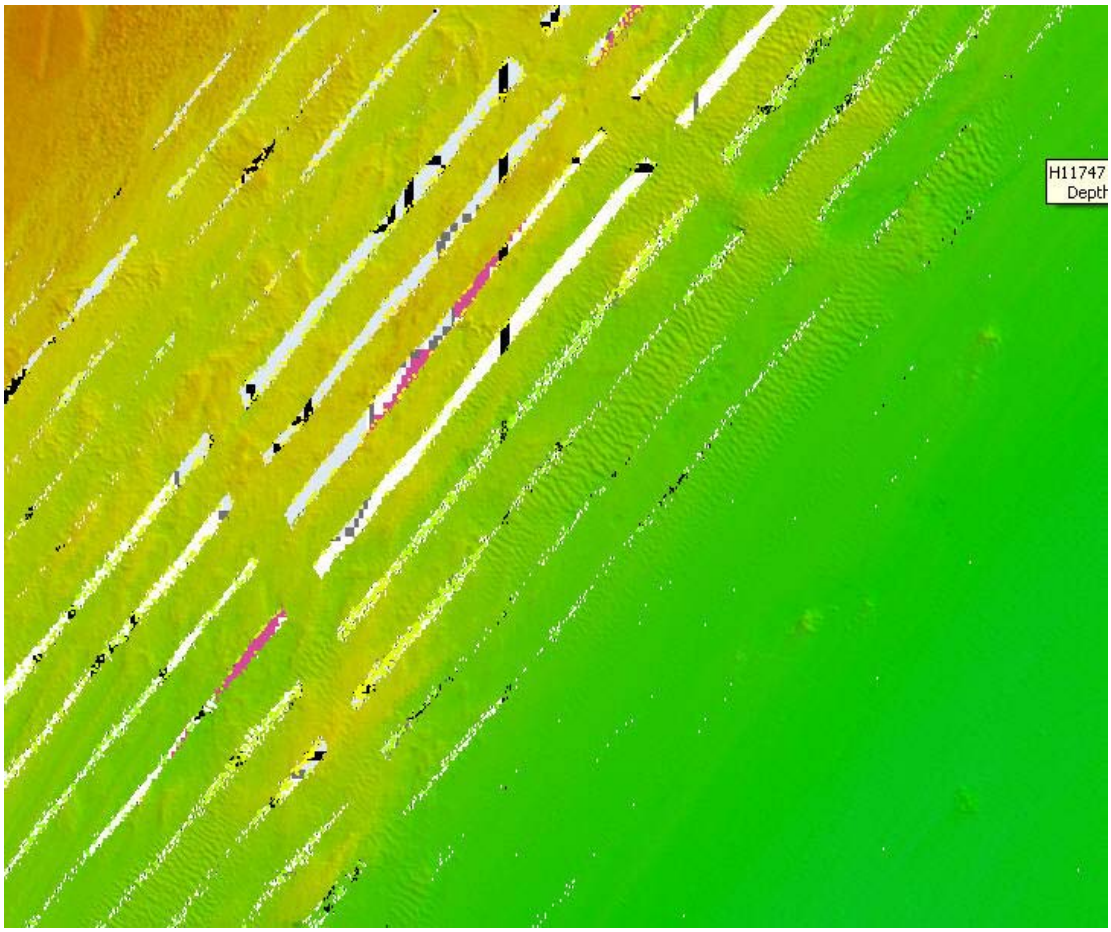
Daily confidence checks were made by observing the outer ranges of the side scan sonar images. A good check consisted of distinguishing contacts corresponding to charted features such navigational Fixed Aids and other cultural features across the entire range of the side scan trace. ***Concur.***

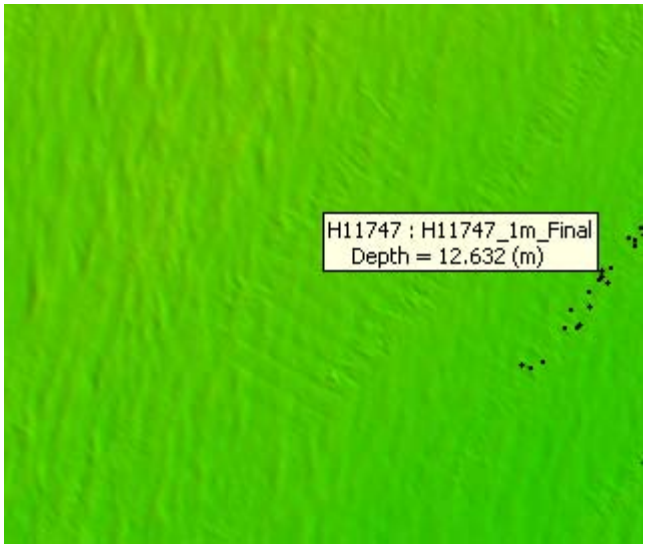
The majority of side scan sonar contacts and their subsequent multibeam developments reveal debris mounds that we believe to be dredge spoils. This is based on their physical characteristics and proximity to the charted "Disposal Area" on the northwest edge of the channel. New depths are charted as appropriate. ***Concur with clarification. Some of these dredge spoils deemed significant and are being recommended for charting as obstructions. See Appendix II of this report for charting recommendations.***

### B.2.2 Shallow Water Multibeam Quality Control

All calibrations and systems tests were conducted prior to the beginning of survey operations in San Pablo Bay. Refer to this project's DAPR* and HSRR* for detailed discussion of SWMB system calibrations, data acquisition, and data processing. ****Included with survey deliverables.***

Rapid changes in bottom texture and depth are evident in the gridded surface near the charted disposal area. Alternating lines display sand wave features and slightly shoaler depths than the lines between them. By examining the coordinating side scan sonar data lines for differences in bottom texture, it was verified that these discrepancies may be attributed to sediment flow, rather than a survey system error. ***Concur.***



Several of these apparent artifacts are present in the DTM. This is the result of two survey lines run over an area where sediment shifting had occurred. The shoaler line was run in a higher sea state, resulting in areas of compacted and rarefied pings in the along-track direction. The gridded surface nodes used less pings from this line in the rarefied areas, and more pings in the compacted areas, resulting in a "rippling" effect on the DTM. ***Concur.***

### B.2.3 BASE Surfaces

One CARIS HIPS BASE (*B*athymetry *A*ssociated with *S*tatistical *E*rror) surface, which incorporates each sounding's total propagated error (TPE), was created. The finalized BASE surface contains eight layers: depth, uncertainty, density, mean, standard deviation, hypothesis strength, hypothesis count and user nominated. Refer to this project's DAPR* for detailed discussion of BASE surface generation and processing. One Bathymetric Attributed Grid (BAG) was created from the finalized BASE surface. ***Concur with clarification. Finalized BASE surface also includes designated soundings. *Included with survey deliverables.***

The following Field sheet was generated as part of this survey:

Table 2: Fieldsheets, BASE Surfaces and BAG (Bathymetric Attributed Grid) surfaces created.

| Fieldsheet | #BASE Surfaces | Resolution | Purpose |
|---|---|---|---|
| H11747 | 1 | 1m | Coverage & Finalized |
| H11747_1m | 1 | 1m | BAG Generation |

***Concur.***

### B.2.4 Crosslines

A total of 175 lnm of mainscheme lines were planned and approximately 9 lnm of crosslines were conducted, totaling more than 5% of the planned survey lines. BASE surfaces were examined and no systematic errors in the SWMB system were found. ***Concur.***

### B.3 CORRECTIONS TO ECHO SOUNDING

All methods or instruments used are detailed in the project DAPR*. A table of all sound velocity casts is located in Separate II**. ***Concur. *Included with survey deliverables.***

****Table not found.***

## C. VERTICAL AND HORIZONTAL CONTROL

### C.1 VERTICAL CONTROL

The tidal datum for this project is Mean Lower Low Water (MLLW). The operating National Water Level Observation Network (NWLON) station at Richmond, CA (941-4863) was the sole water level station for this project. See Figure 2 for station location and tide zone boundaries. The tide zoning file "L430NRT62007CORP" was applied during processing. A 2009 tide zoning file was provided later in the processing of this project, but wasn't applied as the zoning and time and range correctors were identical to "L430NRT62007CORP". The uncertainty value of .25m, provided in the 2009 tides package, was used for the TPE computation in CARIS. ***Concur.***


**Figure 3: Preliminary Tide Zoning**

The preliminary/final zones and correctors used for this survey are as follows:

**Table 1: Preliminary Tide Zones & Correctors**

| Zone Name | Time Correctors (mins) | Range Ratio | Predicted Reference |
|---|---|---|---|
| SFB60 | +12 | X0.97 | 941-4863 |
| SFB62 | +24 | X0.98 | 941-4863 |
| SFB63 | +36 | X1.00 | 941-4863 |
| SFB64 | +42 | X1.01 | 941-4863 |
| SFB12 | 0 | X1.00 | 941-4863 |

A Request for Smooth Tides was sent to N/OPS1 on August 18, 2009 and is included in Appendix IV Tides & Water Levels. Observed water levels from the N/OPS1 CO-OPS website were downloaded and applied to all sounding data with preliminary tide zoning. Refer to the 2009 DAPR* for a summary of the methods used to determine, evaluate, and apply tide corrections to sounding data. ***Concur with clarification. Preliminary tides were applied to the data during field processing. Approved tides were applied during office processing. *Included with survey deliverables.***

## C.2 HORIZONTAL CONTROL *See also the H-Cell Report.*

The horizontal datum used for this survey is the North American Datum of 1983 (NAD 83), projected using UTM zone 10. ***Concur.***

Horizontal position was determined using the Global Positioning System (GPS) corrected by U.S. Coast Guard differential GPS (DGPS) beacon station at Pigeon Pt, CA (287 kHz). No horizontal control stations were established for this survey. ***Concur.***

Horizontal dilution of precision (HDOP) was monitored daily. The observed HDOP values did not exceed 4.00. ***Concur.***

# D. RESULTS AND RECOMMENDATIONS *See also the H-Cell Report.*

## D.1 CHART COMPARISON

Data accuracy standards and bottom coverage requirements have been met and survey data for survey H11747 are adequate to supersede charted data in their common areas. ***Concur.***

There are four raster charts affected by this survey:
There are two ENC cells covering the survey area.

Table 3: Affected Charts

| Chart Number | Edition | Edition Date |
|---|---|---|
| 18649 | 66th | 02/01/2009 |
| 18652 SC | 34th | 09/01/2007 |
| 18653 | 10th | 07/01/2005 |
| 18654 | 44th | 01/01/2008 |

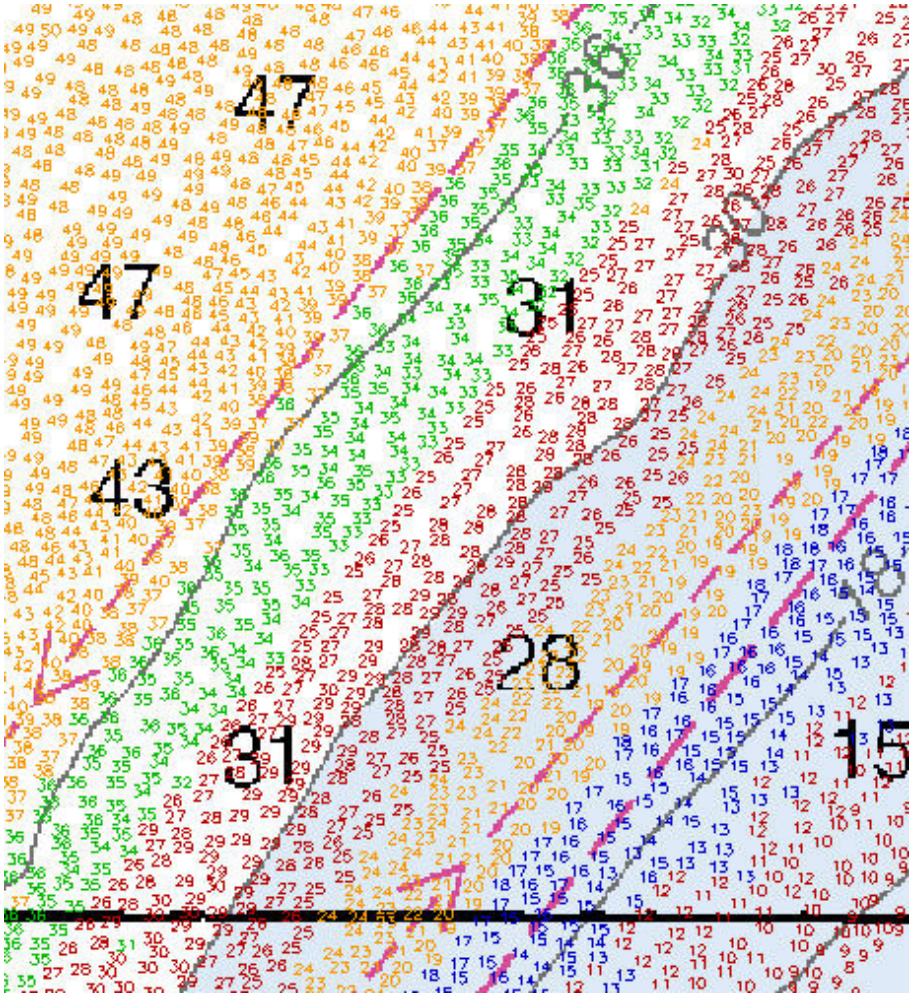
| ENC Cell | Last Updated | Issue Date | Edition |
|---|---|---|---|
| US5CA21M | 10/29/2008 | 01/08/2009 | 16th |
| US5CA31M | 10/29/2008 | 12/15/2008 | 8th |

***Concur.***

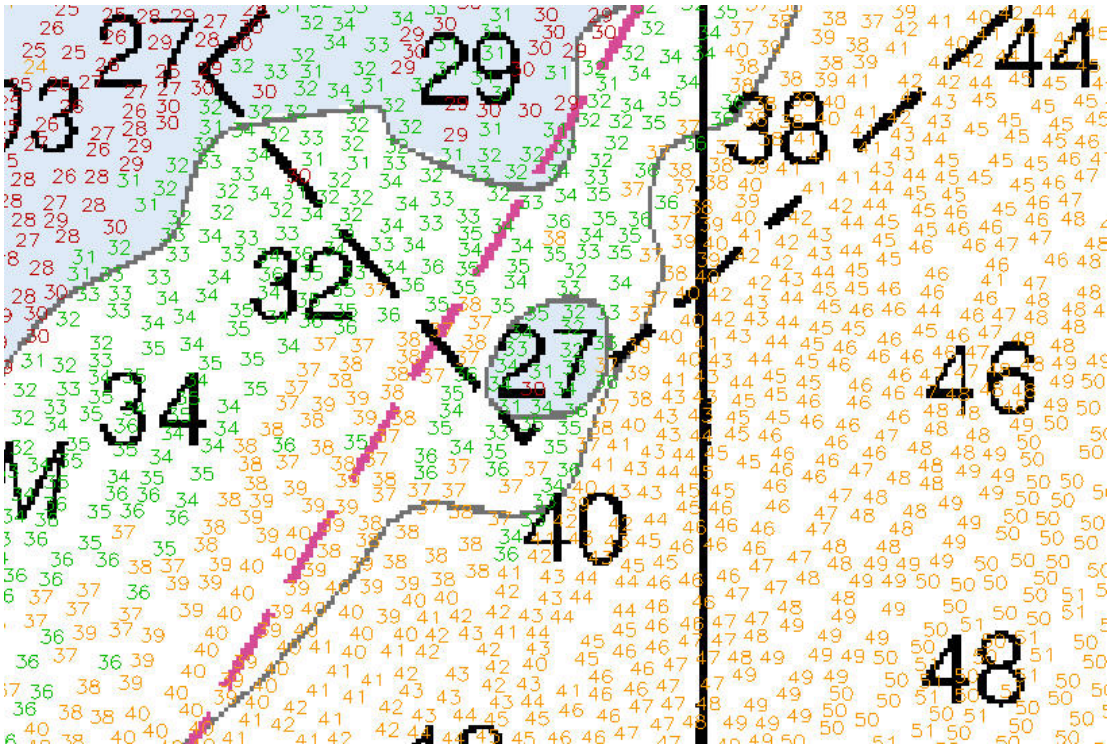
### D.1.1 General Agreement with Charted Soundings

Depths from survey H11747 generally agree with depths on chart 18654, with the exception of random shoal soundings that correlate with debris mounds in the survey area. Sounding recommendations and images of the shoal areas are included in the Pydro PSS and the survey feature report located in Appendix II. ***Concur.***

Significant shoaling as a general trend is most visible from the southeastern portion of the survey area where sediment is drifting and migrating northwestward towards the channel. The hydrographer recommends repositioning contour lines to reflect new survey data. See image below. ***Concur.***




The acquired survey data also disproves two charted shoal contours that are no longer present. See images below. ***Concur.***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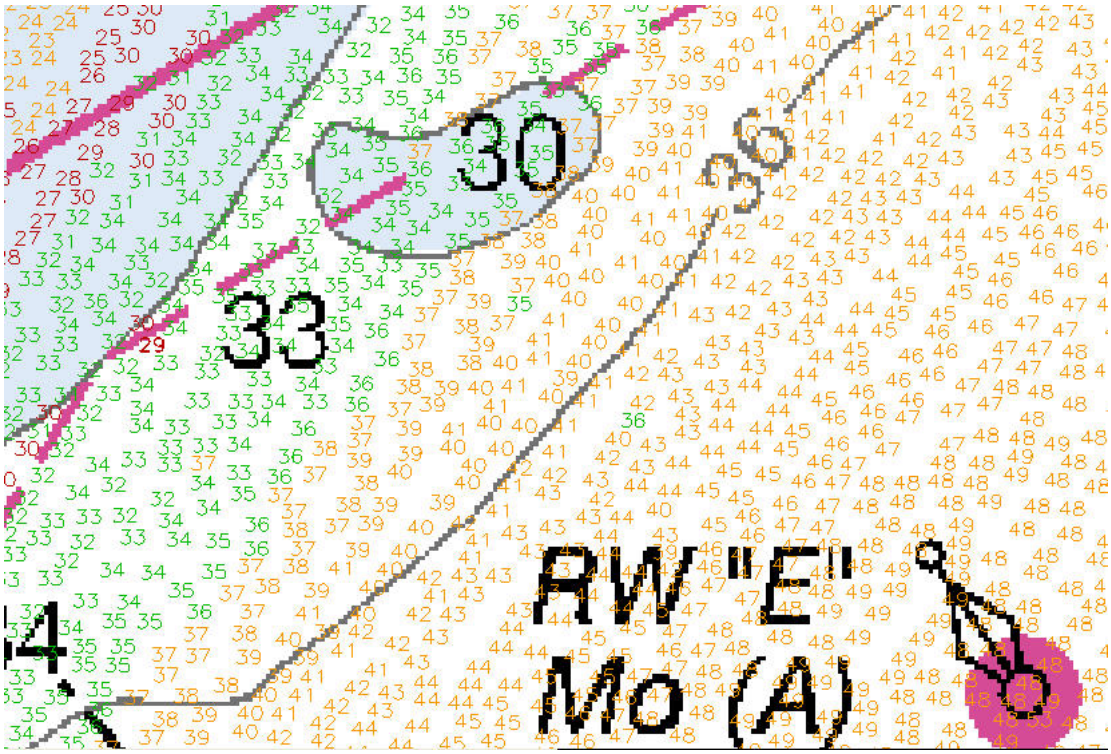
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33
RW"E"
Mo (A)

### D.1.2 Dangers to Navigation (DtoN's)

There are no DTONs located in survey H11747. ***Concur.***

### D.1.3 AWOIS Items

No AWOIS items were assigned for H11747. ***Concur.***

## D.2 ADDITIONAL RESULTS

### D.2.1 Prior Surveys

No prior surveys were listed for comparison in the project instructions. ***Concur.***

### D.2.2 Aids to Navigation and Other Detached Positions

No fixed or floating aids to navigation were positioned during this project. ***Concur***

### D.2.3 Bridges and Overhead Cables

There are no bridges or overhead cables in the survey area. ***Concur.***

### D.2.4 Ferry Routes

Charted ferry routes run along the channel from the south border, to the east border of Chart 18654 and are addressed with Note "C" on the chart. There no ferry terminals within the survey area of Sheet H11747. ***Concur.***

### D.2.5 Submarine Cables and Pipelines

No submarine cables or pipelines were located in the survey area. ***Concur.***

### D.2.6 Bottom Samples

Bottom samples were acquired in the survey area. A detailed table can be found in Appendix 5 of the descriptive report. ***Concur.***

# E. APPROVAL SHEET

**OPR-L430-NRT6-09**
**San Francisco Bay, California**
**Survey Registry No. H11747**

Field operations for this basic hydrographic survey were conducted under my daily supervision with frequent checks of progress and adequacy. All bathymetry models, this Descriptive Report, and all accompanying records and data are approved.

This survey is adequate to supersede all prior surveys in common areas and for application to the relevant NOS nautical charts.

Also submitted in association with this descriptive report has been a series of reports and data:

- SEPARATES TO ACCOMPANY PROJECT OPR-L430-NRT6-09
- OPR-L430-NRT6-09 HORIZONTAL AND VERTICAL CONTROL REPORT
- SEPTEMBER 2009 DATA ACQUISITION AND PROCESSING REPORT

Respectfully Submitted:

Approved and Forwarded:

_____

Eric Moore, NOAA
Physical Science Technician

# H11747 Uncharted Feature Report

**Registry Number:** H11747

**State:** California

**Locality:** San Pablo Bay

**Sub-locality:** San Pablo Point to 1.5 miles West of Pinole Point

**Project Number:** OPR-L430-NRT6-09

**Survey Dates:** 06/18/2009 - 07/14/2009

## Charts Affected

| Number | Edition | Date | Scale (RNC) | RNC Correction(s)* |
|---|---|---|---|---|
| 18654 | 44th | 01/01/2008 | 1:40,000 (18654_1) | USCG LNM: 06/09/2009 (07/21/2009)<br>NGA NTM: 11/06/2004 (08/08/2009) |
| 18652 | 34th | 09/01/2007 | 1:80,000 (18652_6) | [L]NTM: ? |
| 18645 | 26th | 09/01/2008 | 1:100,000 (18645_1) | [L]NTM: ? |
| 18640 | 25th | 08/01/2005 | 1:207,840 (18640_1) | [L]NTM: ? |
| 18680 | 31st | 06/01/2005 | 1:210,668 (18680_1) | [L]NTM: ? |
| 18010 | 21st | 03/01/2007 | 1:811,980 (18010_1) | [L]NTM: ? |
| 18022 | 35th | 08/01/2005 | 1:868,003 (18022_1) | [L]NTM: ? |
| 18007 | 33rd | 02/01/2009 | 1:1,200,000 (18007_1) | [L]NTM: ? |
| 18020 | 38th | 10/01/2007 | 1:1,444,000 (18020_1) | [L]NTM: ? |
| 501 | 12th | 11/01/2002 | 1:3,500,000 (501_1) | [L]NTM: ? |
| 530 | 32nd | 06/01/2007 | 1:4,860,700 (530_1) | [L]NTM: ? |
| 50 | 6th | 06/01/2003 | 1:10,000,000 (50_1) | [L]NTM: ? |

* Correction(s) - *source: last correction applied (last correction reviewed--"cleared date")*

## Features

| No. | Name | Feature Type | Survey Depth | Survey Latitude | Survey Longitude | AWOIS Item |
|---|---|---|---|---|---|---|
| 1.1 | 24 Obstn (Subm pile) - 14685/15 | Obstruction | 7.50 m | 38° 00' 43.1" N | 122° 24' 53.6" W | --- |
| 1.2 | 37 Obstn - 111/20 | Obstruction | 11.37 m | 37° 59' 51.0" N | 122° 25' 06.2" W | --- |

# 1 - DR_UnCharted

## 1.1) 24 Obstn (Subm pile) - 14685/15

### Survey Summary

**Survey Position:** 38° 00' 43.1" N, 122° 24' 53.6" W

**Least Depth:** 7.50 m (= 24.61 ft = 4.102 fm = 4 fm 0.61 ft)

**TPU (±1.96σ):** **THU (TPEh)** ±7.896 m ; **TVU (TPEv)** ±0.507 m

**Timestamp:** 2009-169.17:32:33.571 (06/18/2009)

**Survey Line:** hdcs_data / nrt6_s3003_em3000 / 2009-169 / 124_1713

**Profile/Beam:** 14685/15

**Charts Affected:** 18654_1, 18652_6, 18640_1, 18680_1, 18010_1, 18022_1, 18007_1, 18020_1, 501_1, 530_1, 50_1

**Remarks:**

submerged pile. old day mark.

### Feature Correlation

| Address | Feature | Range | Azimuth | Status |
|---|---|---|---|---|
| hdcs_data/nrt6_s3003_em3000/2009-169/124_1713 | 14685/15 | 0.00 | 000.0 | Primary |
| hdcs_data/nrt6_s3003_klein3000_sss200/2009-169/sonar_data090618131600 | 0002 | 1.07 | 312.7 | Secondary |
| hdcs_data/nrt6_s3003_klein3000_sss200/2009-205/sonar_data090724081000 | 0001 | 2.06 | 230.8 | Secondary |
| hdcs_data/nrt6_s3003_klein3000_sss100/2009-169/sonar_data090618081000 | 0003 | 4.76 | 220.7 | Secondary |

### Hydrographer Recommendations

Hydrographer recommends charting with a submerged pile symbol.

**Cartographically-Rounded Depth (Affected Charts):**

24ft (18654_1, 18652_6)

4fm (18640_1, 18680_1, 18010_1, 18022_1, 18007_1, 18020_1, 530_1)

7.5m (501_1, 50_1)

### S-57 Data

**Geo object 1:** Obstruction (OBSTRN)

**Attributes:** QUASOU - 6:least depth known

SORDAT - 20090812

SORIND - US,US,graph,H11747

TECSOU - 2,3:found by side scan sonar,found by multi-beam

VALSOU - 7.501 m

WATLEV - 3:always under water/submerged

## Office Notes

Concur_ Add 24 Obstn (Subm pile) in present survey location.

# Feature Images

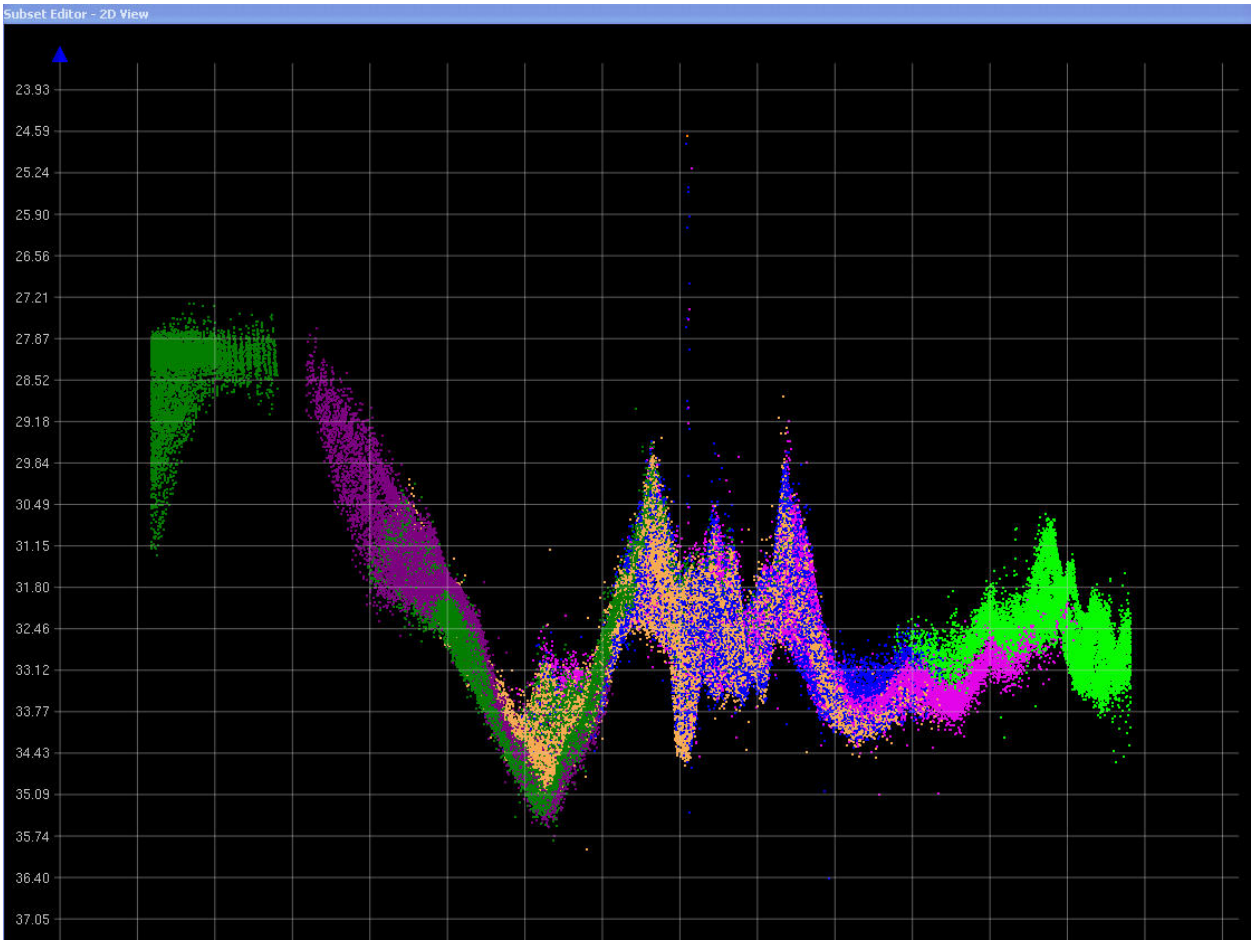



*Figure 1.1.1*

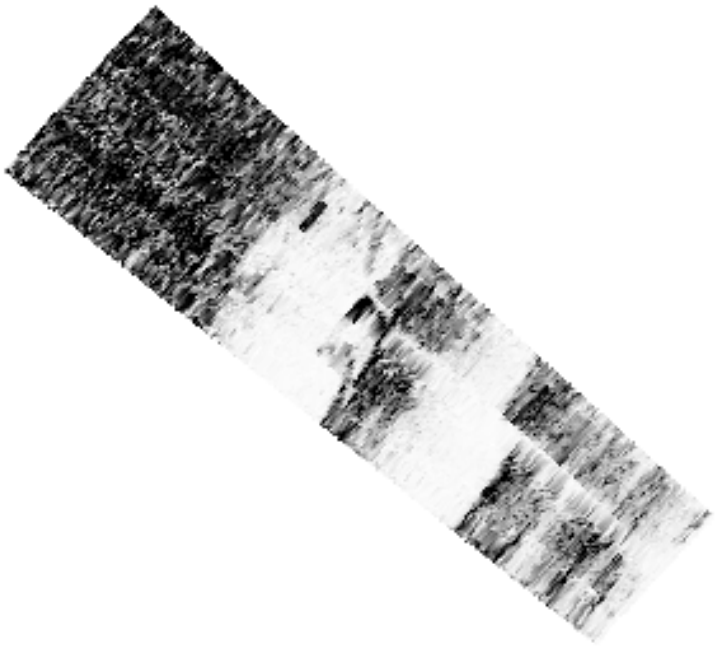


*Figure 1.1.2*

## 1.2) 37 Obstn - 111/20

### Survey Summary

**Survey Position:** 37° 59' 51.0" N, 122° 25' 06.2" W

**Least Depth:** 11.37 m (= 37.30 ft = 6.217 fm = 6 fm 1.30 ft)

**TPU (±1.96σ):** **THU (TPEh)** ±7.880 m ; **TVU (TPEv)** ±0.508 m

**Timestamp:** 2009-195.20:25:43.685 (07/14/2009)

**Survey Line:** hdcs_data / nrt6_s3003_em3000 / 2009-195 / 551_2025

**Profile/Beam:** 111/20

**Charts Affected:** 18654_1, 18652_6, 18645_1, 18640_1, 18680_1, 18010_1, 18022_1, 18007_1, 18020_1, 501_1, 530_1, 50_1

**Remarks:**

Large debris mound. Update chart.

### Feature Correlation

| Address | Feature | Range | Azimuth | Status |
|---|---|---|---|---|
| hdcs_data/nrt6_s3003_em3000/2009-195/551_2025 | 111/20 | 0.00 | 000.0 | Primary |
| hdcs_data/nrt6_s3003_klein3000_sss200/2009-160/sonar_data090609084900 | 0001 | 0.30 | 040.5 | Secondary |
| hdcs_data/nrt6_s3003_klein3000_sss100/2009-153/sonar_data090602072400 | 0001 | 6.45 | 140.7 | Secondary |

### Hydrographer Recommendations

Hydrographer recommends charting feature with an obstruction circle and updating the charted sounding to 37ft.

**Cartographically-Rounded Depth (Affected Charts):**

37ft (18654_1, 18652_6)

6 ¼fm (18645_1, 18640_1, 18680_1, 18010_1, 18022_1, 18007_1, 18020_1, 530_1)

11.4m (501_1, 50_1)

### S-57 Data

**Geo object 1:** Obstruction (OBSTRN)

**Attributes:** QUASOU - 6:least depth known

SORDAT - 20090812

SORIND - US,US,graph,H11747

TECSOU - 2,3:found by side scan sonar,found by multi-beam

VALSOU - 11.370 m

WATLEV - 3:always under water/submerged

## Office Notes

Concur - Add 37 Obstn in present survey location.

# Feature Images

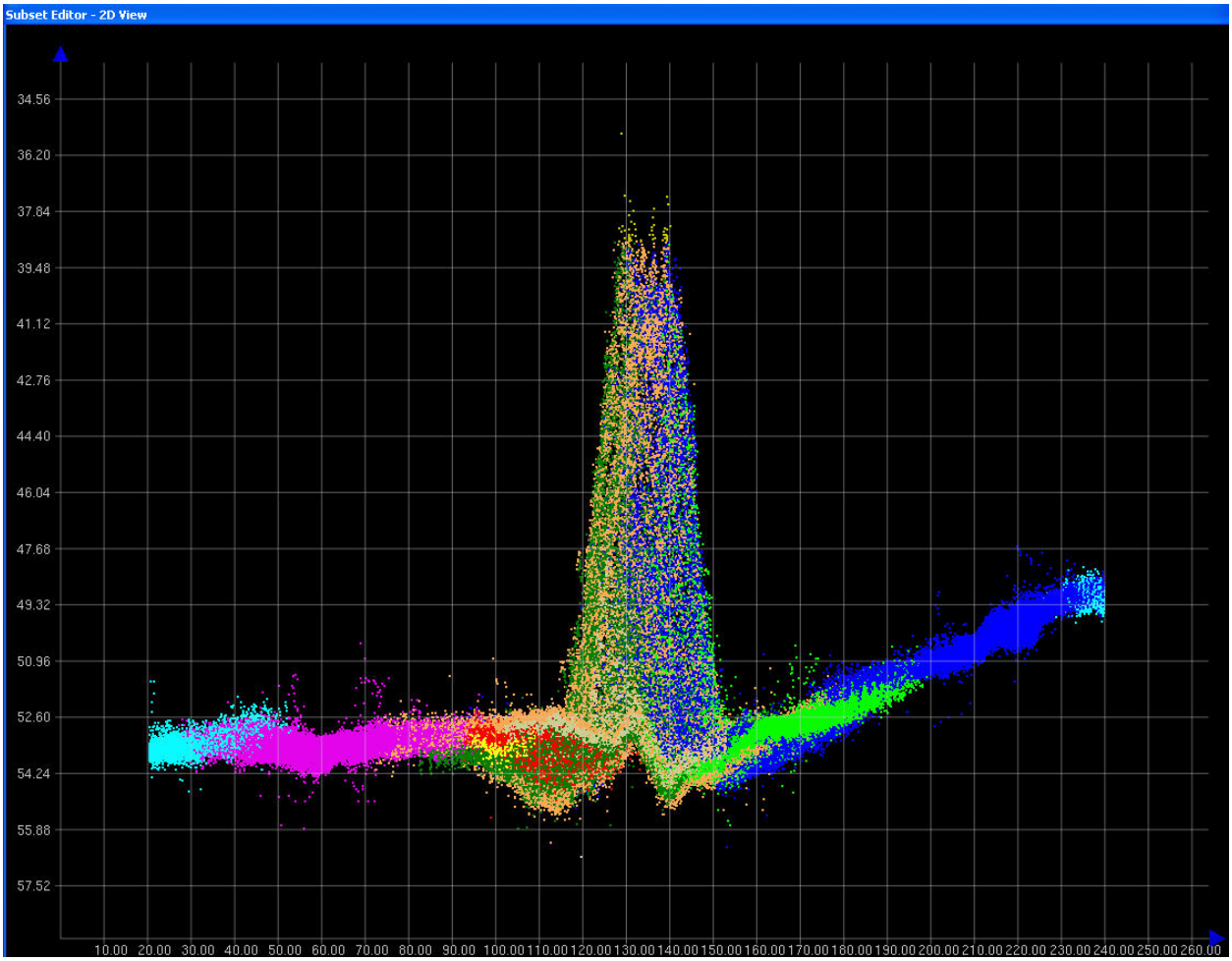



*Figure 1.2.1*

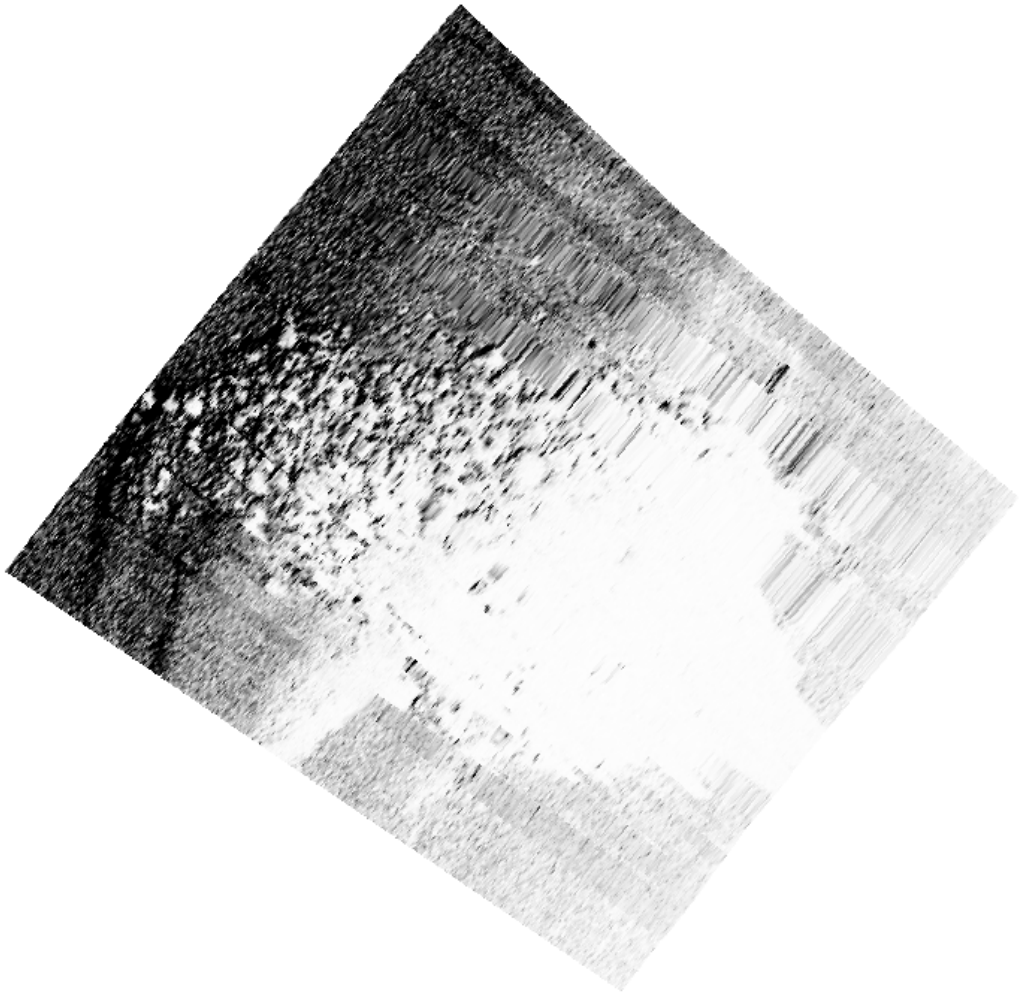


*Figure 1.2.2*

**UNITED STATES DEPARMENT OF COMMERCE**
**National Oceanic and Atmospheric Administration**
National Ocean Service
Silver Spring, Maryland 20910

# TIDE NOTE FOR HYDROGRAPHIC SURVEY

**DATE :** August 26, 2009

**HYDROGRAPHIC BRANCH:** Atlantic
**HYDROGRAPHIC PROJECT:** OPR-L430-NRT6-2009
**HYDROGRAPHIC SHEET:** H11747

**LOCALITY:** San Pablo Point to 1.5 miles of West of Pinole Point, CA
**TIME PERIOD:** June 2 - August 12, 2009

**TIDE STATION USED:** 941-4863 Richmond, CA
Lat. 37° 55.4'N Long. 122° 24.6' W
**PLANE OF REFERENCE (MEAN LOWER LOW WATER):** 0.000 meters
**HEIGHT OF HIGH WATER ABOVE PLANE OF REFERENCE:** 1.660 meters

**REMARKS: RECOMMENDED ZONING**

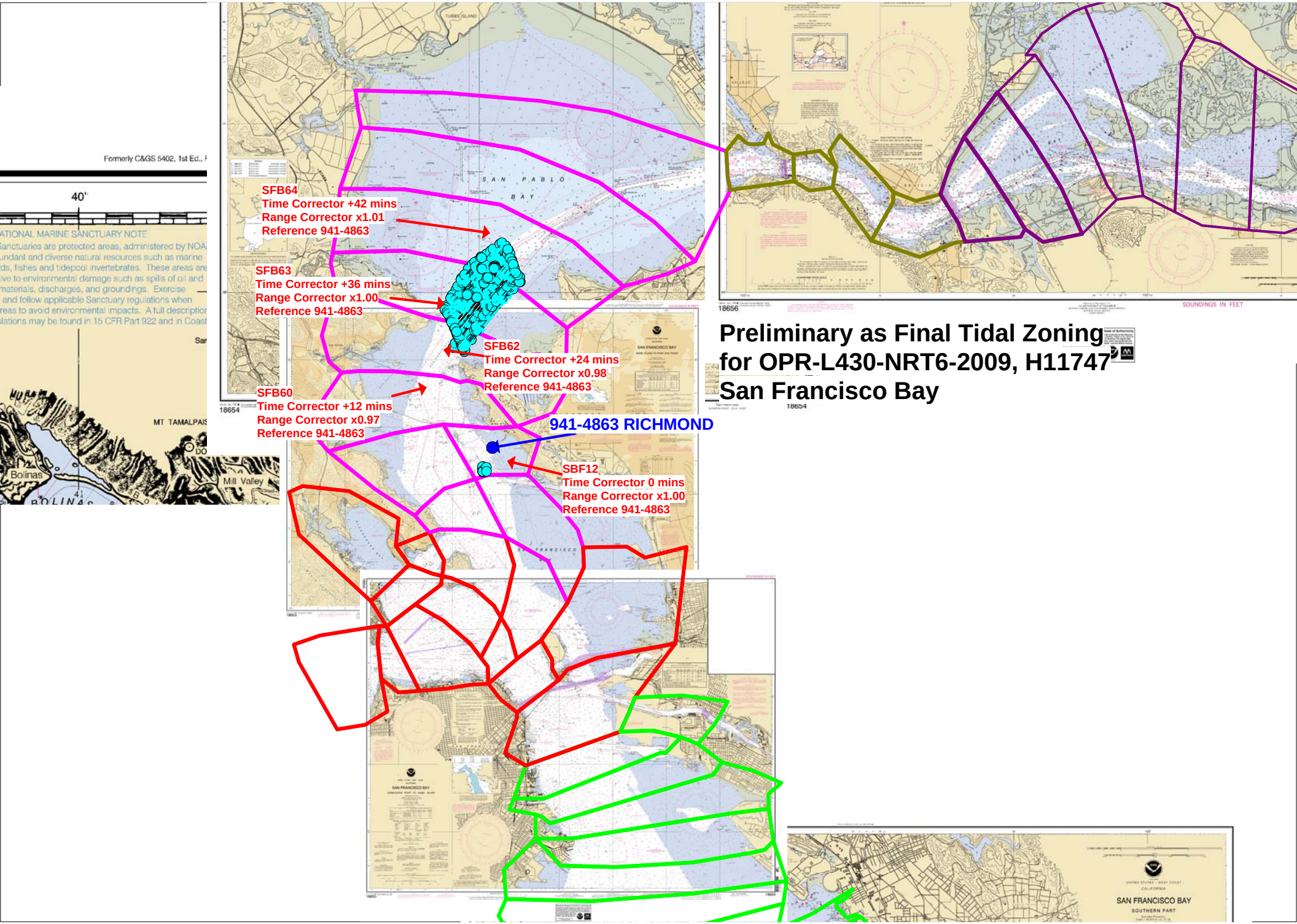
Preliminary zoning is accepted as the final zoning for project OPR-L430-NRT6-2009, H11747, during the time period between June 2 and August 12, 2009.

Please use the zoning file "L430NRT62009CORP" submitted with the project instructions for San Francisco Bay, CA. Zones SFB12, SFB60, SFB62, SFB63 and SFB64 are the applicable zones for H11747.

**Refer to attachments for zoning information.**

**Note 1:** Provided time series data are tabulated in metric units (meters), relative to MLLW and on Greenwich Mean Time on the 1983-2001 National Tidal Datum Epoch (NTDE).

_____
CHIEF, OCEANOGRAPHIC DIVISION


SFB64
Time Corrector +42 mins
Range Corrector x1.01
Reference 941-4863
SFB63
Time Corrector +36 mins
Range Corrector x1.00
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SFB62
Time Corrector +24 mins
Range Corrector x0.98
Reference 941-4863
SFB60
Time Corrector +12 mins
Range Corrector x0.97
Reference 941-4863
941-4863 RICHMOND
SBF12
Time Corrector 0 mins
Range Corrector x1.00
Reference 941-4863
Preliminary as Final Tidal Zoning
for OPR-L430-NRT6-2009, H11747
San Francisco Bay
SAN PABLO BAY
SAN FRANCISCO BAY
SOUTHERN PART
MT TAMALPAIS
Bolinas
Mill Valley
18654
18656

| Depth | Location (DD) | | Description | Location (DM) | |
|---|---|---|---|---|---|
| 11.5m | 38.00304308 | -122.4237327 | gy, so, M | 38-00-06 | 122-25-15 |
| 10.4m | 38.02287311 | -122.4024667 | dk gy, so, M | 38-01-26 | 122-24-03 |
| 12.0m | 38.00870931 | -122.4003124 | br, f, S | 38-00-36 | 122-23-59 |
| 8.5m | 37.99856156 | -122.403814 | gy, M, S, Sh | 37-59-56 | 122-24-13 |
| 20.0m | 37.98591769 | -122.4234778 | gy, sy, M | 37-59-12 | 122-25-24 |

# H11747 COMPILATION PROCESS LOG

| | |
|---|---|
| **REGISTRY No.** | ***H11747*** |
| **PROJECT No.** | ***OPR-L430-NRT6-09*** |
| **FIELD UNIT** | ***NRT-6*** |
| **LARGEST SCALE CHART** | ***#18653, edition #11, 20091001*** |
| **CHART SCALE** | ***1:20000*** |
| **SURVEY SCALE** | ***1:10000*** |
| **DATE OF SURVEY** | ***JUNE 1, 2009 – AUGUST 12, 2009*** |
| | |
| | |

| Components | File Names |
|---|---|
| **Contour Layer** | ***H11747_DEPTH_CONTOURS.hns*** |
| **Survey Scale Soundings** | ***H11747_SS_1M.hob*** |
| **Chart Scale Soundings** | ***H11747_CS_1M.hob*** |
| **Feature Layer** | ***H11747_Features.hob*** |
| **Meta-Objects Layer** | ***H11747_Meta_Layer.hob*** |
| **Blue Notes** | ***H11747_BlueNotes.hob*** |
| | |

**a. M_COVR attributes**

| Acronym | Value |
|---|---|
| **SORDAT** | ***20090812*** |
| **CATCOV** | ***Coverage available*** |
| **SORIND** | ***US,US,graph,H11747*** |

**b. M_QUAL attributes**

| Acronym | Value |
|---|---|
| **CATZOC** | ***CONFIDENCE U*** |
| **INFORM** | ***NOAA Survey Launch S3003*** |
| **POSACC** | ***10*** |
| **SORDAT** | ***20090812*** |
| **SORIND** | ***US,US,graph,H11747*** |
| **SUREND** | ***20090812*** |
| **SURSTA** | ***20090601*** |

**c. DEPARE attributes**

| Acronym | Value |
|---|---|
| **DRVALV 1** | ***3*** |
| **DRVALV2** | ***84*** |
| **SORDAT** | ***20090812*** |
| **SORIND** | ***US,US,graph,H11747*** |

**d. M_CSCL attributes**

| Acronym | Value |
|---|---|
| **CSCALE** | ***40000*** |
| **SORDAT** | ***20090812*** |
| **SORIND** | ***US,US,graph,H11747*** |

SPECIFICATIONS:

I. COMBINED SURFACE:
   a. Number of ESAR Final Grids: ***1***

II. SURVEY SCALE SOUNDINGS (SS):
   a. Radius
   b. Shoal biased
   c. Use Single-Defined Radius (mm at Map Scale): ; Radius Value = 1
   d. Queried Depth of All Soundings
      i. Minimum: ***3***
      ii. Maximum: ***84***

III. INTERPOLATED TIN SURFACE:
   a. Resolution (m):
   b. Linear
c. Shifted value: *[-0.229m (feet), (≤ 10 fathoms)]*
*[-1.372m (fathoms), (> 10 fathoms)]*

IV. CONTOURS:
   a. Use a Depth List: ***H11747_NOAA_depth_curves_list.txt***
   b. Line Object: ***DEPCNT***
   ***c.*** Value Attribute: ***VALDCO***

V. FEATURES:
   a. Total Number of Features: ***2***
   b. Number of Insignificant Features: ***4***

VI. CHART SURVEY SOUNDINGS (CS):
   a. Number of ENC CS Soundings: ***0***
   b. Radius
   c. Shoal biased
   d. Use Single-Defined Radius: m on the ground
      i. Radius Value (m):
      ii. Or use a Sounding Space Range Table (if applicable): HXXXXX_SSR.txt
   e. Filter: Interpolated != 1
   f. Number Survey CS Soundings: ***109***

VII. Notes:

**ATLANTIC HYDROGRAPHIC BRANCH**
**H-CELL REPORT to Accompany**
**Surveys H11747 (2009)**

This Evaluation Report has been written to supplement and/or clarify the original Descriptive Report. Sections in this report refer to the corresponding sections of the Descriptive Report.

## B. DATA ACQUISITION AND PROCESSING

### B.1 DATA PROCESSING

The following software was used to process and review data at the Atlantic Hydrographic Branch (AHB):

CARIS HIPS/SIPS version 6.1 SP2, HF 1-8
CARIS BASE Manager 2.1 SP1 HF 1-10
DKART INSPECTOR, version 5.0 Build 732 SP1
CARIS HOM ENC 3.3 SP3 HF8
PYDRO, version 9.10_r2824
CARIS S-57 Composer 2.1 HF 1-4

### B.2 QUALITY CONTROL

**H-Cells**

The AHB source depth grid for the survey's nautical chart update product entailed the field original 1M MBES CUBE surface. The survey scale soundings were created from a 10M resolution product surface with a single defined radius of one millimeter at chart scale, 1:20,000. Soundings were selected for charting by hand using the latest raster charts 18653 and 18654. Soundings were then checked for conflicts, corrected to remove conflicts, and edited to allow for proper sounding compilation placement with respect to existing charted depths outside the survey area. The BASE surface was referenced when selecting the chart scale soundings, to ensure that the selected soundings portrayed the bathymetry within the common area.

Depth contours were drawn from the Base surface. In order to create depth contours the 1 meter resolution SS interpolated tin was shifted , by a factor of negative 0.75 feet (in accordance with NOAA sounding rounding rules), and the contours were then derived from the interpolated and non-interpolated nodes. Therefore, using this method the contour are in harmony with the SS and CS soundings while

maintaining the chart equivalent contour values as whole integers. The depth contours are being forwarded to MCD for reference only. The contours were utilized during chart scale sounding selection and quality assurance efforts at AHB. The depth contours are incorporated into the SS H-Cell product as per 2009 H-Cell Specifications.

The compilation components (Stand Alone HOB files (SAHOB) are detailed in the Compile Log attached at the end of this document. The SAHOB files included depth areas (DEPARE), depth contours (DEPCNT), sounding selections (SOUNDG), features (OBSTN), Meta objects (M_QUAL, M_COVR, M_CSCL), Bottom samples (SBDARE), and cartographic Blue Notes ($CSYMB). All individual SAHOB files were assembled in BASE Editor during H-Cell compilation.

All of the components with the exception of the sounding selection and depth contours were inserted into one feature layer (including the Bluenotes, as dictated by Hydrographic Technical Directive 2008-8, and this layer was exported into S-57 format in order to create the H-Cell deliverable. Similarly, the sounding selection and depth contours were exported into S-57 format separately, and then both S-57 files were processed in CARIS HOM to convert the metric units to feet/fathoms and feet. The final products are two S-57 files, in Lat/Lon NAD-83, one that contains the chart soundings, all the features, Meta objects, and Bluenotes (H11747_CS.000), and one that contains the depth contours, and sounding selection (H11747_SS.000). Finally, quality assurance checks were made utilizing CARIS S-57 Composer version 2.1 validation CHECKS.

The H11747 CARIS H-Cell final deliverables include the following products:

| | | |
|---|---|---|
| H11747_CS.000 | 1:20,000 Scale | H11747 Selected Soundings (Chart Scale) |
| H11747_SS.000 | 1:10,000 Scale | H11747 Selected Soundings (Survey Scale) |

## C. VERTICAL AND HORIZONTAL CONTROL

Final vertical correction processing was not completed by the field unit. The field unit applied preliminary tides in conjunction with the preliminary tidal zoning which was accepted and approved by N/OPSI CO-OPS as the final zoning for H11747. Final verified water levels were applied during office processing. Sounding datum is Mean Lower Low Water (MLLW). Vertical datum is Mean High Water (MHW).

Horizontal control used for this survey during data acquisition is based upon the North American Datum of 1983 (NAD83), UTM projection zone 10. Office ENC processing of this survey required translating the datum to meet S-57 ENC requirements. The horizontal geodetic datum was translated to Latitude and Longitude (LLDG) World Geodetic System-84 (WGS-84) during CARIS Base Manager processing.

## D. RESULTS AND RECOMMENDATIONS

**Chart Comparison** — **18653 (11th. Edition, Oct. /09**
Corrected through NM, Oct. 24/09
Corrected through LNM, Oct. 13/09
Scale 1:20,000

**Chart Comparison** — **18654 (44th. Edition, Jan. /08**
Corrected through NM, Jan. 26/08
Corrected through LNM, Jan. 15/08
Scale 1:40,000

**ENC Comparison** — **US5CA21M**
San Francisco Bay – Angel Island to Point San Pedro
Edition 21
Update Application Date 2010-02-26
Issue Date 2010-03-05
References: Charts 18653

**ENC Comparison** — **US5CA31M**
San Pablo Bay
Edition 11
Update Application Date 2009-11-17
Issue Date 2009-11-17
References: Charts 18654

**Hydrography**

The charted Hydrography originates with prior surveys and requires no further consideration. The hydrographer makes adequate chart comparisons in section D. and Appendix 2. of the Descriptive Report. The following should be noted:

Four of the six features found during this survey were represented as CS soundings for the sake of clarity within the navigational channel. Three of these features

appeared to be the result of mis-positioned spoil dumps. The fourth feature appeared to be a sedimentary mound.

**Adequacy of Survey**

The present survey is adequate to supersede the charted bathymetry within the common area. Any features not specifically addressed either in the H-Cell File or the Blue Notes should be retained as charted. Refer to the Descriptive Report for further survey requirements recommended by the hydrographer.

**Miscellaneous**

Chart compilation was done by Atlantic Hydrographic Branch personnel, in Norfolk, Virginia. Compilation data will be forwarded to Marine Chart Division, Silver Spring, Maryland. See Section D.1. of this report for a list of the Raster Charts and Electronic Navigation Chart (ENC) used for compiling the present survey.

**APPROVAL SHEET**
**H11747**

The completed survey has been inspected with regard to survey coverage, delineation of depth curves, and representation of critical depths, cartographic symbolization, and verification or disproval of charted data. All revisions and additions made to the H-Cell files during survey processing have been entered in the digital data for this survey. The survey records and digital data comply with National Ocean Service and Office of Coast Survey requirements except where noted in the Descriptive Report and the Evaluation Report.

All final products have undergone a comprehensive review as per the Atlantic Hydrographic Branch Processing Manual and are verified to be accurate and complete except where noted.

Norris Wike

Digitally signed by Norris Wike
DN: cn=Norris Wike, o=NOAA, ou=AHB, email=norris.a.wike@noaa.gov, c=US
Date: 2010.04.22 14:46:54 -04'00'

**Norris A. Wike**
Cartographer
Atlantic Hydrographic Branch

I have reviewed the H-Cell files, accompanying data, and reports. This survey and accompanying Marine Chart Division deliverables meet National Ocean Service requirements and standards for products in support of nautical charting except where noted.

Richard T. Brennan
I am approving this document
2010.04.29 07:36:54 -04'00'

Approved:

**Richard T. Brennan**
Lieutenant Commander, NOAA
Chief, Atlantic Hydrographic Branch

Christopher Hare
AWOIS Check
2010.05.13 09:37:20
-04'00'