

H10978

NOAA FORM 75-35A

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

## DESCRIPTIVE REPORT

*Type of Survey* Hydrographic

*Field No.* RA-10-12-01

*Registry No.* H-10978

### LOCALITY

*State* ALASKA

*General Locality* SHELIKOF STRAIT

*Sublocality* SOUTHEAST APPROACH TO PUALE BAY

2001

### CHIEF OF PARTY

Captain James C. Gardner, NOAA

### LIBRARY & ARCHIVES

DATE

NOAA FORM 77-28 (11-72)	U.S. DEPARTMENT OF COMMERCE NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION	REGISTER NO.  <b>H-10978</b>
<b>HYDROGRAPHIC TITLE SHEET</b>		
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. <b>RA-10-12-01</b>
State <u>Alaska</u>		
General Locality <u>Shelikof Strait</u>		
Sublocality <u>Southeast Approach to Puale Bay</u>		
Scale <u>1:10,000</u> Date of Survey <u>5/21/2001 - 7/9/2001</u>		
Instructions Dat <u>4/30/01</u> Project No. <u>OPR-P164-RA</u>		
Vessel <u>(2121), (2123), (2124) , 2125), (2127)</u>		
Chief of Party <u>Captain J. C. Gardner, NOAA</u>		
Surveyed by <u>RAINIER Personnel</u>		
Soundings taken by echo sounder, hand lead, pole <u>Knudsen 320M, RESON 8101 MB, Seabear</u>		
Graphic record scaled by <u>RAINIER Personnel</u>		
Graphic record checked by <u>RAINIER Personnel</u>		
Evaluation by <u>R. Davies</u> Automated plot by <u>HP DesignJet 1050C</u>		
Verification by <u>E. Domingo, R. Mayor, R. Davies</u>		
Soundings in <u>Fathoms</u> at <u>MLLW</u>		
REMARKS: <u>Time in UTC. Revisions and annotations appearing as endnotes were generated during office processing.</u>		
<u>All depths listed in this report are referenced to mean lower low water unless otherwise noted.</u>		

# Descriptive Report to Accompany Hydrographic Survey H10978

Project OPR-P164-RA

Shelikof Strait, Alaska

Scale 1:10,000

May-July 2001

**NOAA Ship RAINIER**

Chief of Party: Captain James C. Gardner, NOAA

## A. AREA SURVEYED

This hydrographic survey was completed as specified by Hydrographic Survey Letter Instructions OPR-P164-RA-01, dated April 30, 2001, and the Draft Standing Project Instructions dated April 6, 1998. The purpose of this project is to provide contemporary hydrography with full bottom multibeam coverage in Shelikof Strait, Alaska. The project responds to requests from the Seventeenth U.S. Coast Guard District, the domestic commercial fishing industry, and NOAA.

The survey area is located on the east coast of the Alaska Peninsula in Southern Shelikof Strait, at the eastern entrance to Puale Bay, extending to approximately one nautical mile west of Cape Kukurnoi (see figure 1).<sup>1</sup>

One hundred percent shallow-water multibeam (SWMB) coverage was obtained in the survey area in waters 10 meters and deeper. In waters from 4 meters to 10 meters, SWMB data were obtained at 25-meter line spacing, and in these areas additional coverage was often obtained to obtain least depths over features or shoals. Vertical-beam echo sounder (VBES) data were acquired in depths from 4 to 30 meters, at a line spacing of 100 meters, to define the four-meter curve and to aid in the planning of SWMB data acquisition.<sup>2</sup>

Data acquisition was conducted from May 21 to July 09, 2001 (DN 141 to 190).

## B. DATA ACQUISITION AND PROCESSING

A complete description of data acquisition and processing systems, survey vessels, quality control procedures and data processing methods can be found in the *OPR-P164-RA-01 Data Acquisition and Processing Report*, submitted under separate cover. Items specific to this survey, and any deviations from the aforementioned report are discussed in the following sections.<sup>3</sup>

### B1. Equipment and Vessels

Data were acquired by RAINIER survey launches (vessel numbers 2121, 2122, 2124, 2125, 2126, and 2127). Vessels 2121, 2124 and 2126 were used to acquire shallow-water multibeam (SWMB) soundings and sound velocity profiles. Vessels 2122 and 2125 were used to acquire vertical-beam echo soundings (VBES). Vessels 2122, 2125, and 2127 were used to acquire detached positions (DPs) for shoreline verification. Vessel 2122 was also used to collect bottom samples. No unusual vessel configurations or problems were encountered during this survey.<sup>4</sup>

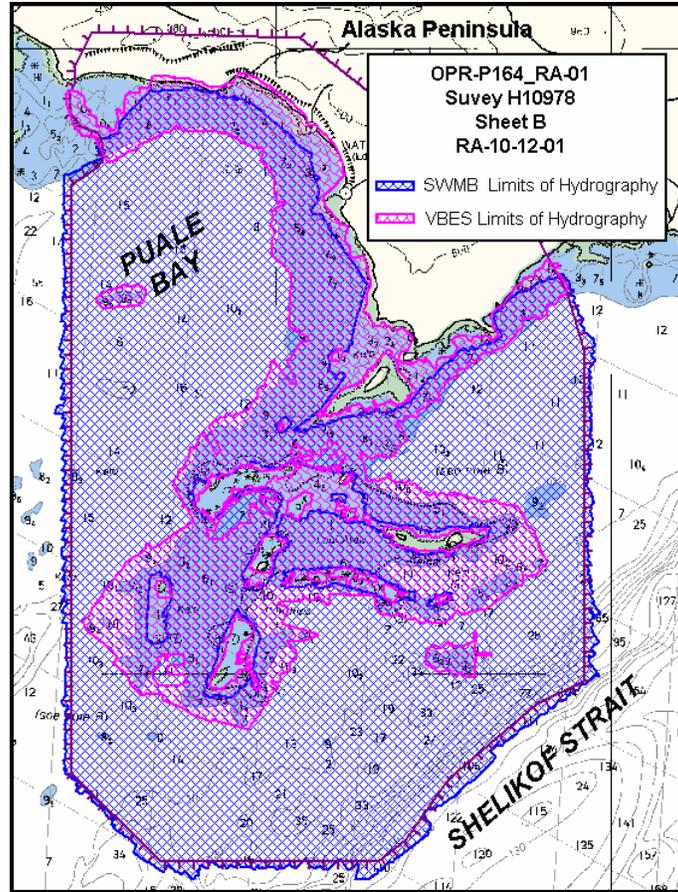


Figure 1. H10978 survey limits

**B2. Quality Control**

**Crosslines**

Vertical Beam Echo Sounder (VBES) crosslines totaled 27.44 nautical miles, comprising 12.49% of mainscheme hydrography. Crosslines generally agreed within 1 meter of mainscheme hydrography.<sup>5</sup>

Shallow-Water Multibeam (SWMB) crosslines totaled 38.17 nautical miles, comprising 5.67% of SWMB hydrography. The Quality Control Report (CARIS HIPS) for the checkline file averaged 95.93%, with a depth tolerance factor of 0.013, which conforms to International Hydrographic Organization Order 1 specifications detailed in Special Publication S-44, Edition 4, as well as NOS Hydrographic Surveys Specifications and Deliverables Manual.<sup>6</sup> See Appendix V<sup>7</sup> for the detailed report.

**Junctions**

The following contemporary surveys junction with H10978:

<b>Registry #</b>	<b>Scale</b>	<b>Date</b>	<b>Junction side</b>
H10977	1:20,000	2000	West
H10979	1:10,000	2001	East
H10980	1:20,000	2001	South

All junction surveys compare well with H10978, with differences of generally one fathom or less.

Final comparisons will be made at the Pacific Hydrographic Branch (PHB).<sup>8</sup>

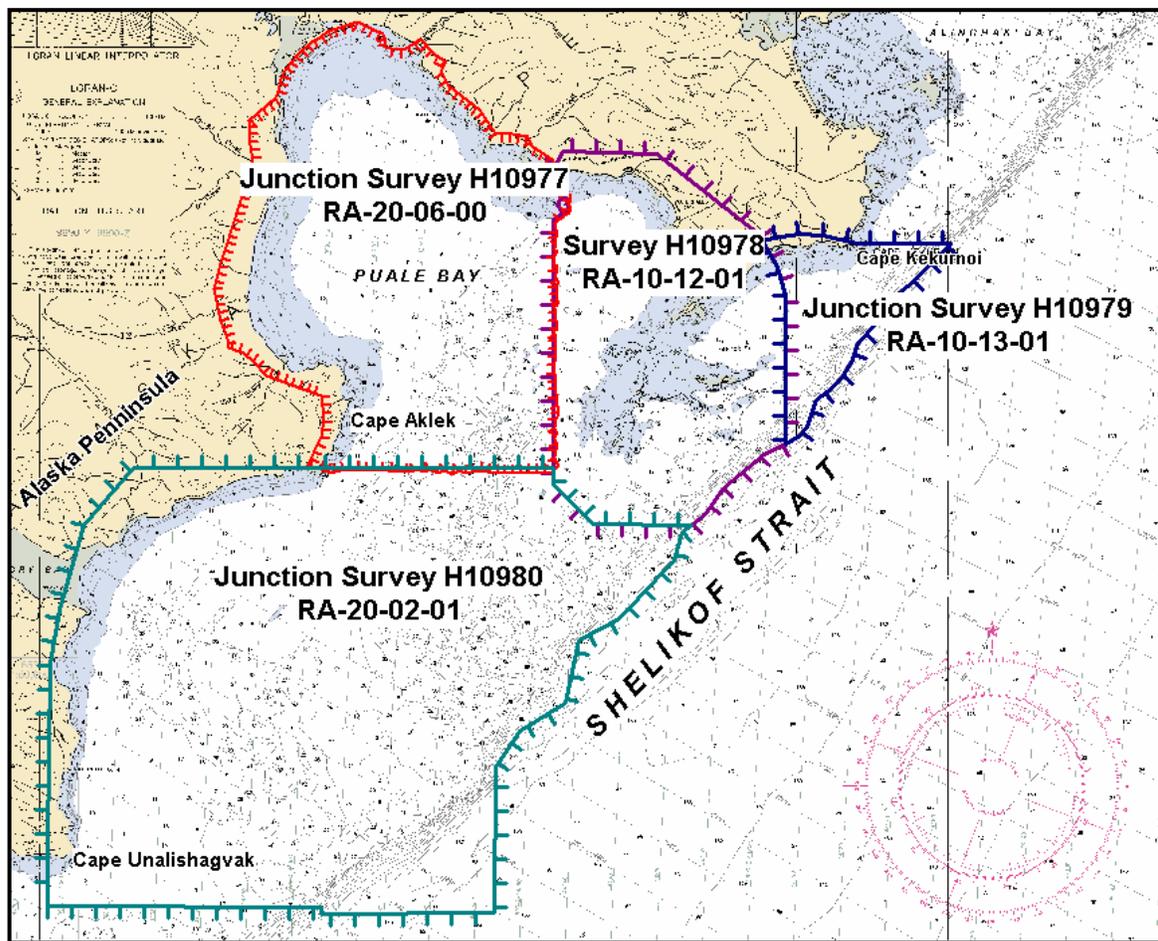


Figure 2. H10978 Junction Surveys.

### Data Quality Factors

In several areas near shore, thick kelp often obscured the detection of the bottom. In the SWMB data, removal of soundings over kelp was not always possible in HDCS SwathEdit, as there is no definitive way to determine if a sounding is on a feature such as a rock, or on kelp. In HDCS Subset Mode, in some instances, it was possible to discern the true bottom, as kelp often appeared as soundings “disconnected” from the continuous bottom. In these instances soundings over kelp were rejected. However, when unable to clearly distinguish between the bottom and kelp, the soundings on kelp were not rejected.

<sup>9</sup>Areas with kelp were noted by the Hydrographer during shoreline verification and are also indicated in the “H10978\_ShorelineNotes” table of the Detached Position and Bottom Sample Plot.<sup>10</sup>

**B3. Data Reduction**

Data reduction procedures for survey H10978 conform to those detailed in the *OPR-P164-RA-01 Data Acquisition and Processing Report*.

**C. VERTICAL AND HORIZONTAL CONTROL**

A complete description of vertical and horizontal control for survey H10978 can be found in the *OPR-P164-RA-01 Horizontal and Vertical Control Report*, submitted under separate cover. A summary of horizontal and vertical control for this survey follows.

**Horizontal Control**

The horizontal datum for this project is the North American Datum of 1983 (NAD83). Differential GPS (DGPS) was the sole method of positioning. Differential corrections from U.S. Coast Guard beacons at Kodiak Island (313 kHz), Kenai (310 kHz), and Cold Bay (289 kHz) were utilized during this survey. Launch-to-launch DGPS performance checks were performed weekly in accordance with Section 3.2 of the FPM. Copies of the performance checks are included in the *OPR-P164-RA-01 Horizontal and Vertical Control Report*.

**Vertical Control**

The vertical datum for this project is Mean Lower-Low Water (MLLW). The operating National Water Level Observation Network (NWLON) primary tide station at Kodiak, AK (945-7292) served as control for datum determination. The tertiary tide station at Puale Bay, AK (945-8209) was the primary source for water level reducers for survey H10978.

RAINIER personnel installed a Sutron 8210 “bubbler” tide gauge at the following tertiary station in accordance with the Letter Instructions:

Station Name	Station Number	Type of Gauge	Date of Installation	Date of Removal
Puale Bay	945-8209	30-day	May 21, 2001	July 10, 2001

All data were reduced to MLLW using final approved (smooth) tide correctors and zoning obtained from N/OPS1. SWMB and VBES data were corrected using the zoning function in CARIS HIPS for Windows 5.1a, and DPs were reduced using HP Tools. Elevations on features have not been corrected to MHW where appropriate. The Hydrographer recommends that the Pacific Hydrographic Branch (PHB) correct all elevations to MHW, including reclassification of features, as necessary. Copies of the request for smooth tides, and Final Tide Note,<sup>11</sup> are included in this report.<sup>12</sup>

## D. RESULTS AND RECOMMENDATIONS

### D.1 Automated Wreck and Obstruction Information System (AWOIS) Investigations

No AWOIS items were located within the limits of H10978.<sup>13</sup>

### D.2 Chart Comparison

Survey H10978 was compared with chart 16575 (1<sup>st</sup> Ed.; April 15, 1989, 1:80,000). There were no Notices to Mariners that affected the survey area since the publication of the charts.

#### Chart 16575

Soundings from survey H10978 generally agreed within one fathom of soundings on chart 16575. In many instances, this survey found shoaler soundings between charted soundings even though agreement at the position of the charted depths was good. This can be attributed to new features detected because of increased bottom coverage using SWMB.<sup>14</sup> Significant differences to these trends are addressed below.

In the vicinity of a charted (16575) 7.3-fathom sounding at 57°40'51.49"N, 155°21'01.94"W (359,844.8E, 6,395,622.7N), the present survey revealed a depth of 16.2 fathoms. This area was covered by 100% SWMB.<sup>15</sup>

In the vicinity of a charted (16575) 21-fathom sounding at 57°39'02.52"N, 155°24'53.69"W (355,887.3E, 6,392,388.9N), the present survey revealed a depth of 27 fathoms. This area was covered by 100% SWMB.<sup>16</sup>

In the vicinity of a charted (16575) 1-fathom sounding at 57°41'11.96"N, 155°24'11.96"W (356,720.7E, 6,396,365.7N) the present survey revealed a depth of 6.8 fathoms. This area was covered by 100% SWMB.<sup>17</sup>

The Hydrographer recommends retaining the charted (16575) "Tide Rips" notation at 57°40'28.73"N, 155°24'49.31"W (356,054.7E, 6,395,051.3N). Tide rips were frequently observed in this region.<sup>18</sup>

The Hydrographer has determined that data accuracy standards and bottom coverage requirements have been met and survey data are adequate to supersede charted data in their common areas.<sup>19</sup>

Final sounding comparisons will be made at the Pacific Hydrographic Branch.<sup>20</sup>

### D.3 Shoreline

N/NGS3 supplied photogrammetric shoreline data in raster format for TP-00626<sup>21</sup> for use as source shoreline. The TP-sheet (TS) raster image was registered and digitized in MapInfo by RAINIER personnel and the resultant vector data were used in Hypack for field verification. In addition, features shown on the current edition of chart 16575 that were not depicted on any shoreline source document were digitized in MapInfo by RAINIER personnel and displayed in Hypack for field verification. In instances in which charted features were digitized, RAINIER personnel attempted to identify the source of the feature by reviewing prior surveys.

## Shoreline Verification

Shoreline verification was conducted near predicted low water in accordance with the Standing Project Instructions and FPM 6.1 and 6.2. Detached positions (DPs) taken during shoreline verification were recorded in HYPACK and on DP forms, and processed in Pydro. These indicate revisions to features and features not found on the TP-Sheet or chart. In addition, annotations describing shoreline were recorded on hard copy plots of digital shoreline. DP forms are included in Section I of the *Separates to be Included with Survey Data*.<sup>22</sup>

A detailed Detached Position and Bottom Sample Plot,<sup>23</sup> in both paper copy and MapInfo format, is provided showing all detached positions and bottom samples with notes relating to each feature. The updated shoreline and features are also depicted on the Final Field Sheet.<sup>24</sup>

Verified TP-sheet shoreline that did not require revision is in the MapInfo table "H10978\_Shoreline." New features, changes to the shoreline, and features verified from the applicable TP-Sheet are depicted in the MapInfo table "H10978\_ShorelineUpdates."<sup>25</sup> Charted shoreline, when used for reference purposes or when source data were not available, is depicted in the MapInfo table "H10978\_ChartedShoreline."

The features found during this survey generally matched those of the source shoreline. In many cases TP-Sheet rocks were actually high points and extents of TP-Sheet ledges.<sup>26</sup> Several photographs were taken to complement the hydrographer's description of shoreline features. These photographs are submitted with the digital data<sup>27</sup> and are named according to the corresponding fix numbers.<sup>28</sup>

## Source Shoreline Changes and New Features

The TS reef at 57°43'08.69"N, 155°21'06.96"W (359,909.4 E, 6,399,865.5 N) was disproved after conducting a visual and echo sounder search (Detached Position 25140). The area was developed using a grid pattern with 20-meter VBES line spacing. VBES soundings were not collected over the 20-meter inshore portion of the TS reef due to heavy kelp. The water visibility was clear to three meters. The shoalest depth of the disproval area was 1.6 fathoms.<sup>29</sup> The limits of the TS foul area surrounding the reef generally matched the general limit of safe navigation determined during shoreline verification.<sup>30</sup> The Hydrographer recommends removing the TS reef from all charts and charting the area as foul as depicted on the Detached Position and Bottom Sample Plot.<sup>31</sup>

The TS headland extending from the mainland at 57°42'33.84"N, 155°22'55.56"W (358,074.6E, 6,398,852.1N), is more accurately portrayed by chart 16575 as an islet connected to the mainland by a gravel spit. Detached positions delineating the extents of the island were unable to be acquired due to the foul area surrounding the island. The Hydrographer recommends retaining the islet and low water line as charted.<sup>32</sup>

The TS foul area, located south of the southeastern most extent of land on the east side of Puale Bay, centered on position 57°42'16.90"N, 155°23'35.66"W (357,392.6E, 6,398,351.8N), had several revisions and new features:

- The southwestern extent of the TS ledge surrounding the island and islets was more accurately portrayed by chart 16575 than by TP-00626. Detached position 21,710 at 57°42'16.10" N, 155°23'57.46"W (357,007.4E, 6,398,341.0N) delineates the new extent of the ledge. Chart based on this survey.<sup>33</sup>
- Three new islets were positioned inside of the TS foul area. Detached positions delineating all extents of the islets were unobtainable due to the foul area surrounding the islets. Where DPs

were not obtained, the Hydrographer approximated the extents of the islets and depicted them as such on the DP and BS Plot. Chart these islets based on this survey:<sup>34</sup>

- The first new islet was positioned centered on position 57°42'14.82"N, 155°23'49.95"W (357,153.9E, 6,398,295.9N). Detached position 55,008 delineates the western extent of the new islet at 57°42'14.35"N, 155°24'01.87"W (357,128.8E, 6,398,293.4N).
- The second new islet was centered on position 57°42'14.58"N, 155°24'01.17"W (356,964.9E, 6,398,293.8N, detached position 21,713).
- The northwest extent of the third new islet (Detached Position 55,007) was positioned at 57°42'12.34"N, 155°23'57.94"W (357,018.9E, 6,398,223.9"N), and the southeastern extent of the islet was positioned at 57°42'10.27"N, 155°23'55.19"W (357,062.2E, 6,398,158.5N) with Detached Position 55,009.
- Several new rocks were located within the limits of the TS foul area. Throughout the foul area, detached positions were acquired on several seaward most rocks in a chain of several new rocks. The southwest extents of the TS foul area were extended approximately 40 meters seaward to include two new rocks delineated by DP 50094 at 57°42'14.04"N, 155°22'56.30"W (358,040.8E, 6,398,240.6N) and DP 50093 at 57°42'10.84"N, 155°23'02.14"W (357,940.7E, 6,398,144.9N). Chart based on this survey.<sup>35</sup>
- The position of the TS rock located at 57°42'24.10"N, 155°23'33.39"W (357,438.05E, 6,398,573.1N) was unable to be verified to the foul nature of the area. It is likely the high point of the ledge on which it is positioned.<sup>36</sup> Chart the ledge based on the TS and this survey.<sup>37</sup>

The TS rock located at 57°41'56.79"N, 155°24'57.03"W (356,024.0E, 6,397,778.0N) was positioned approximately 39-meters west-northwest (Detached Position 22,827) at 57°41'57.18"N, 155°24'59.43"W (355,984.7E, 6,397,791.5N) during shoreline verification. The southwest limit of the TS foul area was extended approximately 40 meters to include the TS rock's revised position.<sup>38</sup> The chart incorrectly depicts a rock awash at this position.<sup>39</sup> Chart the area based on this survey.<sup>40</sup>

The southern extent of the TS reef centered on position 57°41'37.03"N, 155°24'50.90"W was revised by DP 51,903 at 57°41'34.68"N, 155°24'55.08"W (356,031.9E, 6,397,093.5N).<sup>41</sup>

The TS foul area surrounding a TS islet and ledge at position 57°40'35.34"N, 155°22'27.93"W, had several revisions and new features. The TS ledge in the foul area was positioned approximately 20 meters southwest centered on position 57°40'36.05"N, 155°22'28.95"W, delineated by Detached Positions 51832, 51839, 51833, 51834, 51836, and 51838. The limits of the TS foul area were extended west and south to include two TS rocks and two new rocks, delineated by DPs 51831 and 51837. The Hydrographer recommends charting the area based on this survey.<sup>42</sup>

The TS foul area surrounding the TS islet centered at 57°40'38.64"N, 155°23'18.10"W (357,576.1E, 6,395,304.08N) had several revisions and new features:

- The limit of the TS foul area was extended west to include a new rock delineated by DP 51809 located at 57°40'40.33"N, 155°23'25.89"W (357,449.0E, 6,395,360.9N).
- The limit of the TS foul area was extended north to include a new islet delineated by DP 51810, located at 57°40'41.89"N, 155°23'24.5"W (357,469.0E, 6,395,414.3N) and a TS ledge that was extended north by DP 51811, located at 57°40'42.43"N, 155°23'22.01"W (357,515.5E, 6,395,423.4N).
- The limit of the TS foul area was extended south to include a new ledge delineated by Detached Positions 51815, 51814, and 51813.<sup>43</sup>
- The larger TS islet is not depicted on the chart. The Hydrographer recommends charting the new extents of the TS foul area, new extents of the TS ledges, new ledges, new rocks, and islet as depicted in the Detached Position and Bottom Sample Plot.<sup>44</sup>

The TS foul area centered on position 57°40'46.46"N, 155°24'09.81"W (356,728.4E, 6,395,576.09N) had several revisions and new features, including:

- The limits of the foul area should be extended west to include a new rock, DP 70014, located at 57°40'42.22"N, 155°24'52.96"W (355,991.8E, 6,395,477.7N).
- Two new islets were located inside of the TS foul area, centered on positions 57°40'47.24"N, 155°24'03.08"W (356,840.7E, 6,395,596.3N) and 57°40'48.81"N, 155°23'58.94"W (356,910.9E, 6,395,642.3N), and delineated by DPs 55041 and 55002; and 55003, 55004, 55006, and 55005 respectively. Detached positions delineating all the extents of the islets were unable to be acquired due to the foul area surrounding the islets. The remaining extents of the islets are depicted as approximated by the Hydrographer.<sup>45</sup>
- The TS rocks at 57°40'45.77"N, 155°23'47.35"W (357099.5E, 6,395,541.6N) and 57°40'44.38"N, 155°23'32.69"W (357,340.8E, 6,395,490.0N) were found to be high points of the broken reef between them. The extents of the reef have been revised to the positions of the TS rocks.<sup>46</sup>

The Hydrographer recommends charting this area based on this survey.<sup>47</sup>

Three TS rocks located at the following positions:

57°40'01.71"N, 155°25'47.02"W (355,069.0E, 6,394,250.2N)

57°39'59.63"N, 155°25'50.26"W (355,013.1E, 6,394,187.8N)

57°39'55.97"N, 155°25'56.18"W (354,910.9E, 6,394,078.2N)

are more accurately depicted on chart 16575 as a reef. The TS rocks are the high points of the charted reef.<sup>48</sup>

The TS foul area surrounding the islets centered at 57°40'56.31"N, 155°25'07.45"W (355,784.8E, 6,395,914.5N) had several revisions and new features:

- The extents of the foul area were positioned approximately 160 meters further north-northeast and 130 meters further west based on the general limit of safe navigation determined during shoreline verification. This area was foul with heavy kelp and rocks.
- A new ledge was positioned extending 90 meters northeast from the north islet located in the foul area, the extent was delineated by DP 70032, located at 57°41'02.79"N, 155°24'50.34"W (356,075.3E, 6,396,104.7N).
- A new ledge extended southwest from the southern islet, approximately 60 meters, delineated by Detached Position 20216, located at 57°40'51.34"N, 155°25'20.84"W (355,601.9E, 6,395,743.2N).

The Hydrographer recommends charting the new extents of the TS foul area, new rocks, and new ledges based on this survey.<sup>49</sup>

The limits of the TS foul area centered on position 57°41'16.22"N, 155°23'51.88"W (357057.8E, 6,396,485.5N) were extended to include several new rocks delineated by Detached Positions 22884, 22844, 22845, 22847, 22850, 22849, 22848, 22883, and 22885. The Hydrographer recommends charting the new rocks as depicted in the Detached Position and Bottom Sample Plot.<sup>50</sup>

The limits of the TS foul area located near the center of H10978, centered on position 57°41'19.42"N, 155°24'37.54"W (356305.4E, 6,396,611.2N) were extended approximately 130 meters further north and 80 meters further west based upon the general limit of safe navigation determined during shoreline verification. This area was foul with heavy kelp and rocks.<sup>51</sup>

The limit of the TS foul area centered on position 57°41'32.91"N, 155°25'25.52"W (355,526.0E, 6,397,056.6N) was extended approximately 140 meters further southwest west to include a TS rock and

delineate the general limit of safe navigation determined during shoreline verification. This area was foul with heavy kelp and rocks.<sup>52</sup>

### Charted Shoreline

In several areas on chart 16575, the charted shoreline differed greatly from photogrammetric shoreline data from TP-00626 (date of final compilation Nov. 1982). These were both positional discrepancies and what appeared to be omissions in chart compilation. For example, in Figure 3 below, the chart positioned the foul limit at 57°40'47.90"N, 155°23'54.20"W (356,988.4E, 6,395,611.5N) approximately 160 meters north of the TS foul limit. The TS foul limit was verified in the field. The islets depicted on the TP-sheet were not depicted on the chart. In the vicinity of a charted (16575) 0.3-fathom sounding at 57°40'45.09"N, 155°23'49.24"W (357,067.6 E, 6,395,521.7N), the present survey verified the TS reef (in red in Figure 3 below).<sup>53</sup>

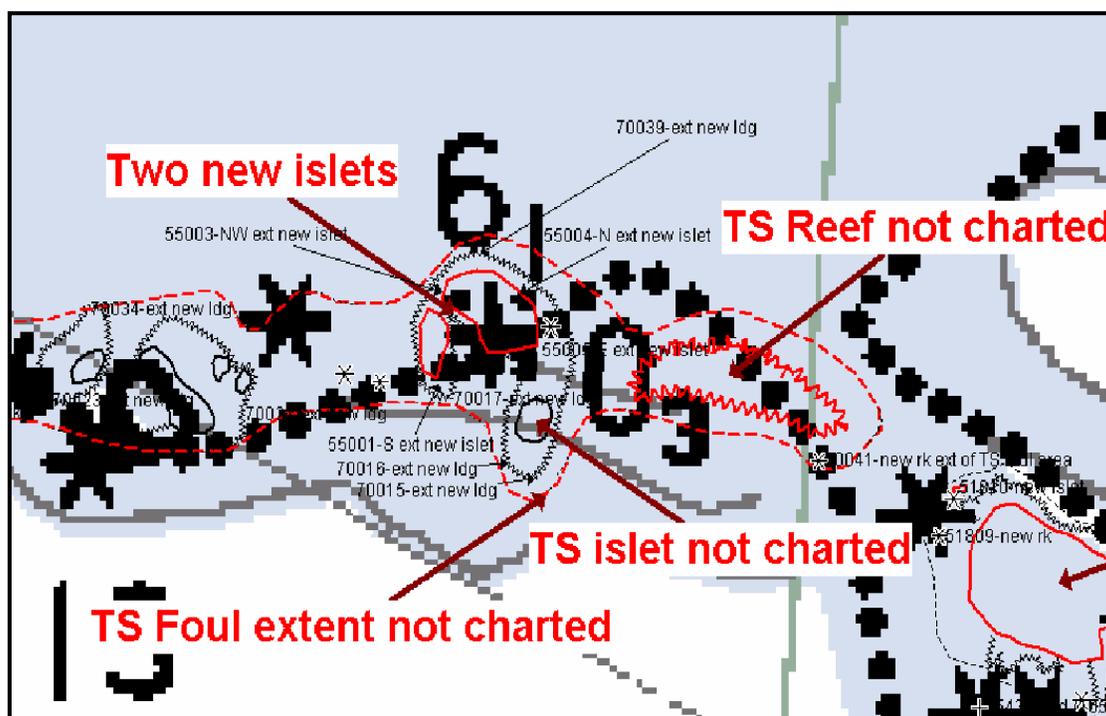


Figure 3. TS reef not on chart 16575

The TS islet at 57°40'38.59"N, 155°23'17.94"W (357,578.7E, 6,395,302.4N) is not charted on chart 16575. The TS islet was verified during the present survey. The Hydrographer recommends charting this islet (refer to figure 4).<sup>54</sup>

In the vicinity of a charted (16575) 1.3-fathom sounding<sup>55</sup> located at 57°42'32.57"N, 155°24'01.37"W (356,984.3E, 6,398,851.2N), the present survey verified a TS foul area (see figure 5 below). Due to the foul nature of this area, soundings were not acquired inside of the TS foul area limits. Two new rocks were positioned during shoreline verification in the vicinity of the 1.3-fathom charted sounding. The Hydrographer recommends charting the area based on this survey.<sup>56</sup>

The waterfall landmarks charted at 57°44'47.86"N 155°25'28.52"W (355,693.0E, 6,403,084.9N), 57°44'23.27"N 155°24'28.24"W (356,661.1E, 6,402,287.1N), and 57°43'50.54"N 155°23'57.89"W (357,127.4E, 6,401,259.4N) were verified during shoreline verification. Retain as charted.<sup>57</sup>

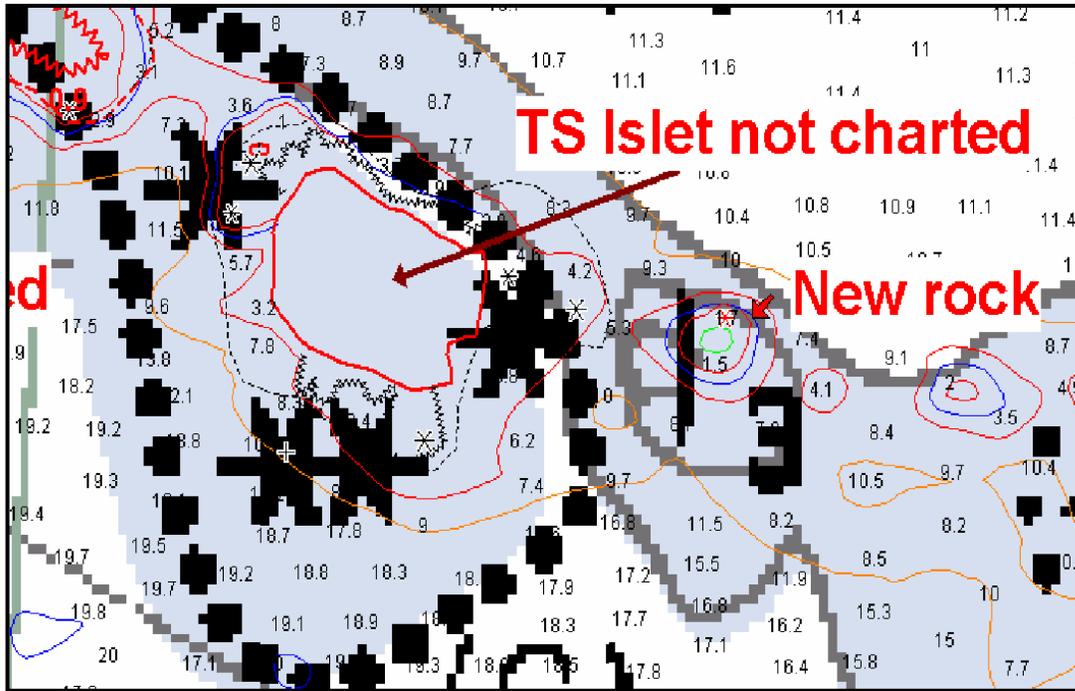


Figure 4. TS islet not on chart 16575

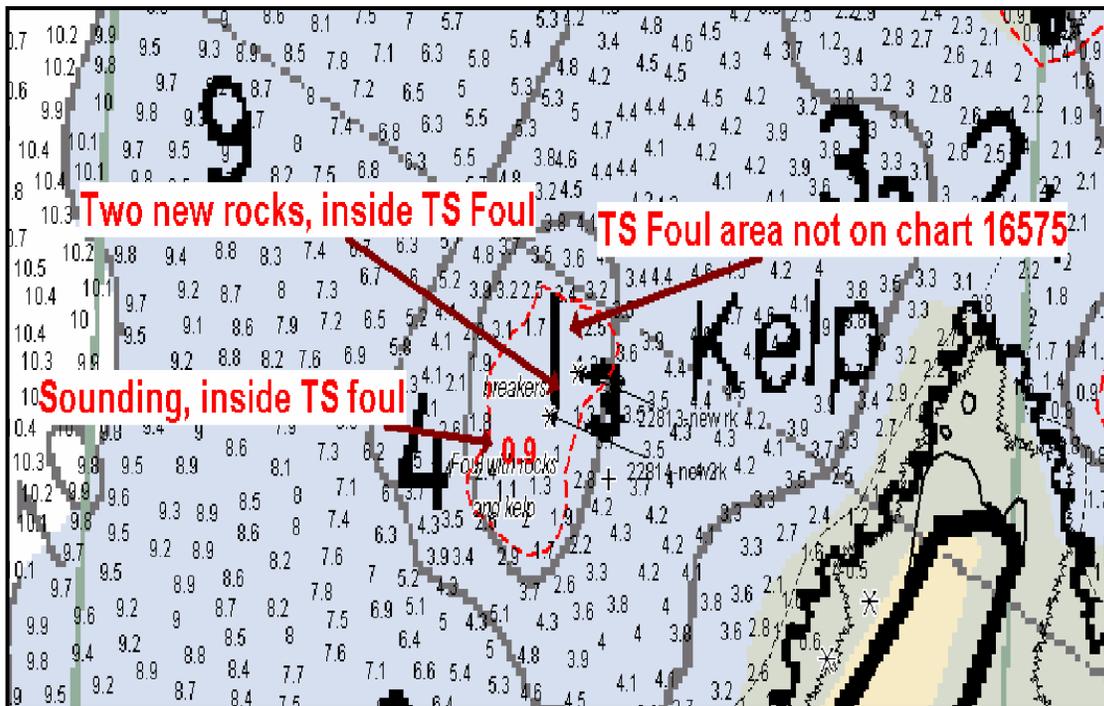


Figure 5. TS foul area not on chart 16575

The charted (16575) rock located at 57°41'28.93"N, 155°25'27.74"W (355,484.9E, 6,396,934.9N) was positioned 30 meters northwest (Detached Position 20,139) at 57°41'29.45"N, 155°25'29.32"W (355,459.4E, 6,396,952.0N). The Hydrographer recommends revising the position of the charted rock.<sup>58</sup>

The charted (16575) rock located at 57°40'27.09"N, 155°25'32.38"W (355339.6E, 6395026.0N) was positioned 70 meters northwest (DP 70,013) at 57°40'28.37"N, 155°25'35.45"W (355,290.2E, 6,395,067.3). This rock is depicted on prior survey H-7195. The Hydrographer recommends revising the position of the charted rock.<sup>59</sup>

The charted (16575) rock (awash) located at 57°40'16.83"N, 155°25'51.87"W (355,005.5E, 6,394,720.4N) was positioned 80 meters north-northwest (DP 51,090) at 57°40'19.25"N, 155°25'53.89"W (354,974.7E 6,394,796.5N). The Hydrographer recommends revising the position of the charted rock.<sup>60</sup>

The charted (16575) rock at 57°40'34.06"N, 155°23'22.93"W (357,491.1E, 6,395,165.5N) was disproved (DP 25431) after conducting a five-minute visual search and a VBES star pattern search (RA2, Dn150) over a 50-meter radius of the charted position. The water visibility was clear to three meters. One hundred percent SWMB coverage was obtain to 25 meters inshore of this rock, and seaward. The shoalest depth within a 50-meter radius of the charted rock was 8.1 fathoms. A new ledge was positioned inshore of the position of this rock. This rock is depicted on prior survey H-7195. The Hydrographer recommends removing the rock from the chart and charting the area based on this survey.<sup>61</sup>

The charted (16575) rock at 57°39'50.29"N, 155°25'18.01"W (355,537.0E, 6,393,879.9) was disproved (DP 51254) after conducting a five-minute visual search and a VBES star pattern search (RA5, DN 142) within 50-meter radius of the charted position. The water visibility was clear to four meters. One hundred percent SWMB coverage was obtained within the 50-meter radius. The shoalest depth within the 50-meter radius was 10.4 fathoms. A TS rock was verified 90 meters north-northeast at 57°39'53.18"N, 155°25'16.62"W (355,563.1E, 6,393,968.4N). The Hydrographer recommends removing the charted rock and charting the TS rock.<sup>62</sup>

The charted (16575) rock located at 57°41'05.35"N, 155°25'05.65"W (355,824.5 E, 6,396,192.9N) was not found. The rock was located inside of a foul area and was unable to be verified due to the foul nature of the surrounding area. Retain this rock as charted.<sup>63</sup>

The charted (16575) rock at 57°41'23.31"N, 155°24'05.87"W (356,834.0E, 6,396,713.0N) was disproved (DP 22,846) after conducting a five-minute visual search and a VBES star pattern search (RA2, Dn143) within 50-meter radius of the charted position. The water visibility was clear to three meters. A 20-meter radius about the charted rock was developed with 100% multibeam coverage. The shoalest depth within a 20-meter radius of the charted rock was 2.5 fathoms. Three new rocks were positioned approximately 50 meters south; the closest new rock was positioned at 57°41'21.73"N, 155°24'05.25"W (356,842.5E, 6,396,663.6N), DP 22845. The Hydrographer recommends removing the charted rock and charting the new rocks as depicted on the Detached Position and Bottom Sample Plot.<sup>64</sup>

The charted (16580) rock at 57°41'44.49"N, 155°25'43.81"W (355,236.1E, 6,397,425.5N) was disproved (DP 20138) after conducting a five-minute visual search and a VBES star pattern search (RA2, Dn141) over a 70-meter radius of the charted position. The water visibility was clear to three meters. A 210-meter radius of the charted rock was covered with 100% multibeam. The shoalest depth within a 50-meter radius of the charted rock was 7.7 fathoms. This rock is depicted on chart 16580 along with a group of rocks which likely represent the rocks and foul area shown in greater detail on chart 16575. Retain as charted.<sup>65</sup>

The charted (16580) rock at 57°41'46.16"N, 155°25'09.95"W (355,798.4E, 6,397,457.0N) was disproved (DP 20137) after conducting a five-minute visual search and a VBES star pattern search (RA2, Dn141) over a 70-meter radius of the charted position. The water visibility was clear to three meters. A 170-meter radius of the charted rock was covered with 100% multibeam. The shoalest depth within a 50-meter radius of the charted rock was 6.4 fathoms. This rock is depicted on chart 16580 along with a group of rocks which likely represent the rocks and foul area shown in greater detail on chart 16575. Retain as charted.<sup>66</sup>

## **Recommendations**

The Hydrographer recommends that the shoreline as depicted on the Detached Position and Bottom Sample plot and final sounding plot supersede and complement shoreline information compiled on the T-Sheets and charts as noted.<sup>67</sup> These revisions are recorded in the MapInfo digital files named "H10978\_Shoreline" and "H10978\_ShorelineUpdates". In addition, field notes made by the Hydrographer, including verification of source features and descriptions of shoreline classification, are submitted in the digital MapInfo file "H10978\_ShorelineNotes."

### **D.4 Dangers to Navigation**

Fourteen dangers to navigation were found and reported to the Marine Chart Division for verification and final submission to the Seventeenth Coast Guard District on March 13, 2002. A copy of the preliminary Danger to Navigation Report is included in Appendix I.<sup>68</sup>

### **D.5 Aids to Navigation**

No aids to navigation (ATONs) are located within the limits of H10978.<sup>69</sup>

### **D.6 Miscellaneous**

Bottom samples were collected and are depicted on the Detached Position and Bottom Sample Plot.<sup>70</sup>

## **E. APPROVAL**

As Chief of Party, I have ensured that standard field surveying and processing procedures were followed in producing this examination in accordance with the Hydrographic Manual, Fourth Edition, Hydrographic Survey Guidelines, Field Procedures Manual and the NOS Hydrographic Surveys Specifications and Deliverables, as updated for 2001.

The digital data and supporting records have been reviewed by me, are considered complete and adequate for charting purposes, and are approved. All records are forwarded for final review and processing to N/CS34, Pacific Hydrographic Branch.

Survey H10978 is complete and adequate to supersede charted soundings in their common areas. No additional work is required for this survey.<sup>71</sup>

Listed below are supplemental reports submitted separately that contain additional information relevant to this survey:

<u>Title</u>	<u>Date Sent</u>	<u>Office</u>
Data Acquisition and Processing Report for OPR-P164-RA-01	14 December, 2001	N/CS34
Horizontal and Vertical Control Report for OPR-P164-RA-01	14 December, 2001	N/CS34
Tides and Water Levels Package for OPR-P164-RA-01	16 July, 2001	N/OPS1
Coast Pilot Report for OPR-P164-RA-01	TBD	N/CS26

Approved and Forwarded:

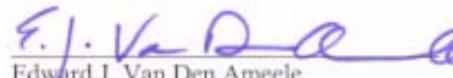
 3/12/02  
 James C. Gardner  
 Captain, NOAA  
 Commanding Officer

In addition, the following individuals were also responsible for overseeing data acquisition and processing of this survey:

Survey Sheet Manager:

\_\_\_\_\_  
 Angelika G. Messer  
 Lieutenant(Junior Grade), NOAA

Field Operations Officer:

  
 Edward J. Van Den Ameele  
 Lieutenant, NOAA

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<sup>1</sup> PHB revision - Concur

<sup>2</sup> PHB revision – Concur. The bottom consists mainly of shells with additional components of stones. Depths range from 0 to 123 fathoms.

<sup>3</sup> PHB revision - Office processing of survey data was conducted using the same Computer Aided Resource Information System (CARIS), Hydrographic Processing System (HPS) and PYDRO used by the hydrographer. The smooth sheet was compiled with MicroStation 95.

<sup>4</sup> PHB revision - Concur

<sup>5</sup> PHB revision - Concur

<sup>6</sup> PHB revision - Concur

<sup>7</sup> PHB revision – Detached positions and shoreline notes were analyzed during office processing and shown on the SS as warranted. The plot are filed with the hydrographic data

<sup>8</sup> PHB revision - The junction with H10977 was not formally completed since this survey was processed previously. A comparison of soundings between the surveys shows close agreement, within two fathoms. Some soundings from H10977 been transferred within the common area to better delineate the bottom configuration and to support depth curves common to both surveys. The junction with surveys H-10979 and H10980 are complete.

<sup>9</sup> PHB revision - Concur

<sup>10</sup> PHB revision - Filed with the hydrographic data

<sup>11</sup> PHB revision - Filed with the hydrographic data

<sup>12</sup> PHB revision – Approved tide note, dated October 26, 2001 attached to this report.

<sup>13</sup> PHB Revision - Concur

<sup>14</sup> PHB Revision - Concur

<sup>15</sup> PHB revision – Concur, chart according to this survey

<sup>16</sup> PHB revision – Concur, chart according to this survey

<sup>17</sup> PHB revision – Concur, chart according to this survey

<sup>18</sup> PHB revision – Do not concur, chart note according to this survey.

<sup>19</sup> PHB revision - Concur

<sup>20</sup> PHB revision - Prior surveys H-7195 and H-7196 are the source of all charted soundings with the addition of features and soundings the hydrographer submitted as dangers to navigation. Sounding agreement between these priors and the current survey is good, within plus or minus one to two fathoms.

A more thorough coverage of the area utilizing the shallow water multibeam (SWMB) system, supplemented by single beam echo sounding system, was accomplished during this survey. This recent survey has provided a better portrayal of the seafloor morphology and revealing new shoals. Single-beam echo sounding systems were used

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nearshore and in areas deemed too shallow for the safe navigation and effective use of vessels equipped with shallow-water multibeam systems.

Survey H-10978 is adequate to supersede all prior surveys within the area of common coverage.

The application of this survey to charts of a scale less than 1:40,000 may require the generalization of features such as ledges and reefs. The recommended charting disposition of specific ledges or reefs is their depiction as isolated rocks. The application of this survey to charts of a scale greater than 1:40,000 may be accomplished without generalization of features. Features from survey H-10978 have been generalized on chart 16575 along the high water line where applicable.

Charted shoreline changes were noted during this survey. A few charted rocks were identified in the field as part of existing ledges or reefs. Some other charted rocks were identified as the high point or extension of newly located ledges or reefs.

<sup>21</sup> PHB revision - date of photography, June 1976, a class I shoreline map compiled on NAD 27 at a scale of 1:20,000. A digitized file was created at PHB and merged with the survey file during MicroStation processing. The shoreline map and the fieldwork as portrayed on the smooth sheet should supersede charted shoreline.

<sup>22</sup> PHB revision - Filed with the hydrographic data.

<sup>23</sup> PHB revision –DP and BS plots are filed with the hydrographic data.

<sup>24</sup> PHB revision - Filed with the hydrographic data.

<sup>25</sup> PHB revision - This MapInfo table “H10978\_ShorelineUpdates” was exported to a .dxf file format and imported into the Microstation smooth sheet.

<sup>26</sup> PHB Revision - Concur

<sup>27</sup> PHB Revision – Filed with the hydrographic data.

<sup>28</sup> PHB revision - The shoreline map and the fieldwork as portrayed on the smooth sheet should supersede charted shoreline.

<sup>29</sup>PHB Revision – Concur

<sup>30</sup> PHB Revision - Concur

<sup>31</sup> PHB revision – Concur with clarification, delete charted reef and chart a kelp symbol at latitude 57/43/08.69N, longitude 155/21/06.96W. A foul limit line could not be charted due to the scale of chart 16575. Chart depths and features in the area according to the smooth sheet.

<sup>32</sup> PHB revision – Do not concur. Hydrography and shoreline verification conducted during this survey revealed a depiction of the charted area. Chart area according to the present survey findings.

<sup>33</sup> PHB revision - Concur

<sup>34</sup> PHB revision – Concur with clarification, the islets are high points on a ledge and are drawn in dashed red as approximate on the smooth sheet. They are adequate to supersede the charted shoreline in the area.

<sup>35</sup> PHB revision - Do not concur, chart rocks awash at the above positions and ledge as shown on the smooth sheet.

<sup>36</sup> PHB revision - Concur

<sup>37</sup> PHB revision - Concur

<sup>38</sup> PHB revision – This t-sheet rock uncovers 1 ft at MLLW and has been shown on the smooth sheet as positioned by the Hydrographer.

<sup>39</sup> PHB revision –Do not concur. Chart symbology is correct.

<sup>40</sup> PHB revision – Concur, chart a single rock with a height of 5 feet at MLLW at latitude 57/41/58.5N, longitude 155/24/55.3W and a danger curve to include the rock awashed as part of endnote 39.

<sup>41</sup> PHB revision – Concur, chart a reef as shown on the present survey.

<sup>42</sup>PHB revision – Concur, chart reef centered at latitude 57/40/35.9N, longitude 155/22/29.7W.

<sup>43</sup> PHB revision – Chart a ledge centered at latitude 57/40/34.6N, longitude 155/23/19.6W.

<sup>44</sup>PHB revision – Concur, the islet is centered at latitude 57/40/30.6N, longitude 155/23/18.7W, chart area according to the smooth sheet.

<sup>45</sup> PHB revision - Concur

<sup>46</sup> PHB revision - Concur

<sup>47</sup> PHB revision - Concur

<sup>48</sup> PHB revision – Concur, chart a reef with a height of 4 feet at MLLW, see the smooth sheet for the depiction of the area.

<sup>49</sup> PHB revision – Concur, chart the areas described above based on the present survey information.

<sup>50</sup> PHB revision – Concur with clarification, chart the area based on the smooth sheet information.

<sup>51</sup> PHB revision – Concur, chart area according to the smooth sheet

<sup>52</sup> PHB revision – Concur, chart area according to the smooth sheet

<sup>53</sup> PHB revision – Concur, chart area according to the smooth sheet

<sup>54</sup> PHB revision – Concur, chart islet and surrounding area as shown on the smooth sheet.

<sup>55</sup> PHB revision – The 1.3-fathom sounding is no longer charted at this position. A critical correction, danger to navigation, rock awash has been charted at 57/42/32.30N, longitude 155/24/2.33W.

<sup>56</sup> PHB revision – Concur with clarification, due to the scale of chart 16575, only one rock could be portrayed on the chart. The position of the rock is latitude 57/42/32.3N, longitude 155/24/2.3W.

<sup>57</sup> PHB revision - Concur

<sup>58</sup> PHB revision - Concur with clarification, delete charted rock and chart rock as shown on the smooth sheet.

<sup>59</sup>PHB revision - Concur with clarification, delete charted rock and chart rock as shown on the smooth sheet.

<sup>60</sup>PHB revision - Concur with clarification, delete charted rock and chart rock as shown on the smooth sheet.

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<sup>61</sup>PHB revision - Concur with clarification, Delete charted rock, chart rock as shown on the smooth sheet.

<sup>62</sup>PHB revision – Concur

<sup>63</sup> PHB revision - Concur

<sup>64</sup> PHB revision - Chart with clarification, delete charted rock, chart rock awash as shown on the smooth sheet.

<sup>65</sup> PHB revision – Do not concur. The area should be compiled on chart 16575 according to the smooth sheet and generalized on chart 16580.

<sup>66</sup> PHB revision – Do not concur, the area should be compiled on chart 16575 according to the smooth sheet and generalized on chart 16580.

<sup>67</sup> PHB revision – Concur chart according to the smooth sheet.

<sup>68</sup> PHB revision – Attached to this report

<sup>69</sup> PHB revision – Concur

<sup>70</sup> PHB revision – All bottom samples were transferred to the smooth sheet.

<sup>71</sup> PHB revision – Concur

HYDROGRAPHIC SURVEY STATISTICS

H10978

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

RECORD DESCRIPTION	AMOUNT	RECORD DESCRIPTION	AMOUNT
SMOOTH SHEET	1	SMOOTH OVERLAYS: POS., ARC, EXCESS	
DESCRIPTIVE REPORT	1	FIELD SHEETS AND OTHER OVERLAYS	2

DESCRIP-TION	DEPTH/POS RECORDS	HORIZ. CONT. RECORDS	SONAR-GRAMS	PRINTOUTS	ABSTRACTS/SOURCE DOCUMENTS
ACCORDION FILES	1				
ENVELOPES					
VOLUMES					
CAMERS					
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			
POSITIONS REVISED			
SOUNDINGS REVISED			
CONTROL STATIONS REVISED			
	TIME-HOURS		
	VERIFICATION	EVALUATION	TOTALS
PRE-PROCESSING EXAMINATION			
VERIFICATION OF CONTROL			
VERIFICATION OF POSITIONS			
VERIFICATION OF SOUNDINGS			
VERIFICATION OF JUNCTIONS			
APPLICATION OF PHOTOBATHYMETRY			
SHORELINE APPLICATION-VERIFICATION			
COMPLIATION OF SMOOTH SHEET			159
COMPARISON WITH PRIOR SURVEYS AND CHARTS			
EVALUATION OF SIDE SCAN SONAR RECORDS			
EVALUATION OF WIRE DRAGS AND SWEEPS			
EVALUATION REPORT			39
GEOGRAPHIC NAMES			
OTHER (Chart Compilation)			42
USE OTHER SIDE OF FORM FOR REMARKS	TOTALS		240

Pre-processing Examination by	Beginning Date	Ending Date
Verification of Field Data by R. Davies	Time (Hours) 159	Ending Date
Compilation Check by	Time (Hours)	Ending Date
Evaluation and Analysis by R. Davies	Time (Hours) 39	Ending Date 09/03/2003
Inspection by B. Olmstead	Time (Hours) 35	Ending Date 09/03/2003

# Danger to Navigation Report

Hydrographic Survey Registry Number: H10978

Survey Title: State: Alaska  
Locality: Shelikof Strait  
Sub-locality: Southeast Approach to Puale Bay  
Project Number: OPR-P164-RA-01  
Survey Dates: May 21 to July 09, 2001 (DN 141 to 190)

**ADVANCE  
INFORMATION**

Depths are reduced to Mean Lower Low Water using smooth (approved) tides.  
Positions are based on the NAD83 horizontal datum.

## CHARTS AFFECTED:

<u>Chart</u>	<u>Scale</u>	<u>Edition</u>	<u>Date</u>
Chart 16575	1:80,000	9 <sup>th</sup> Ed.	April 15, 1989
Chart 16580	1:350,000	11 <sup>th</sup> Ed.	August 18, 2001

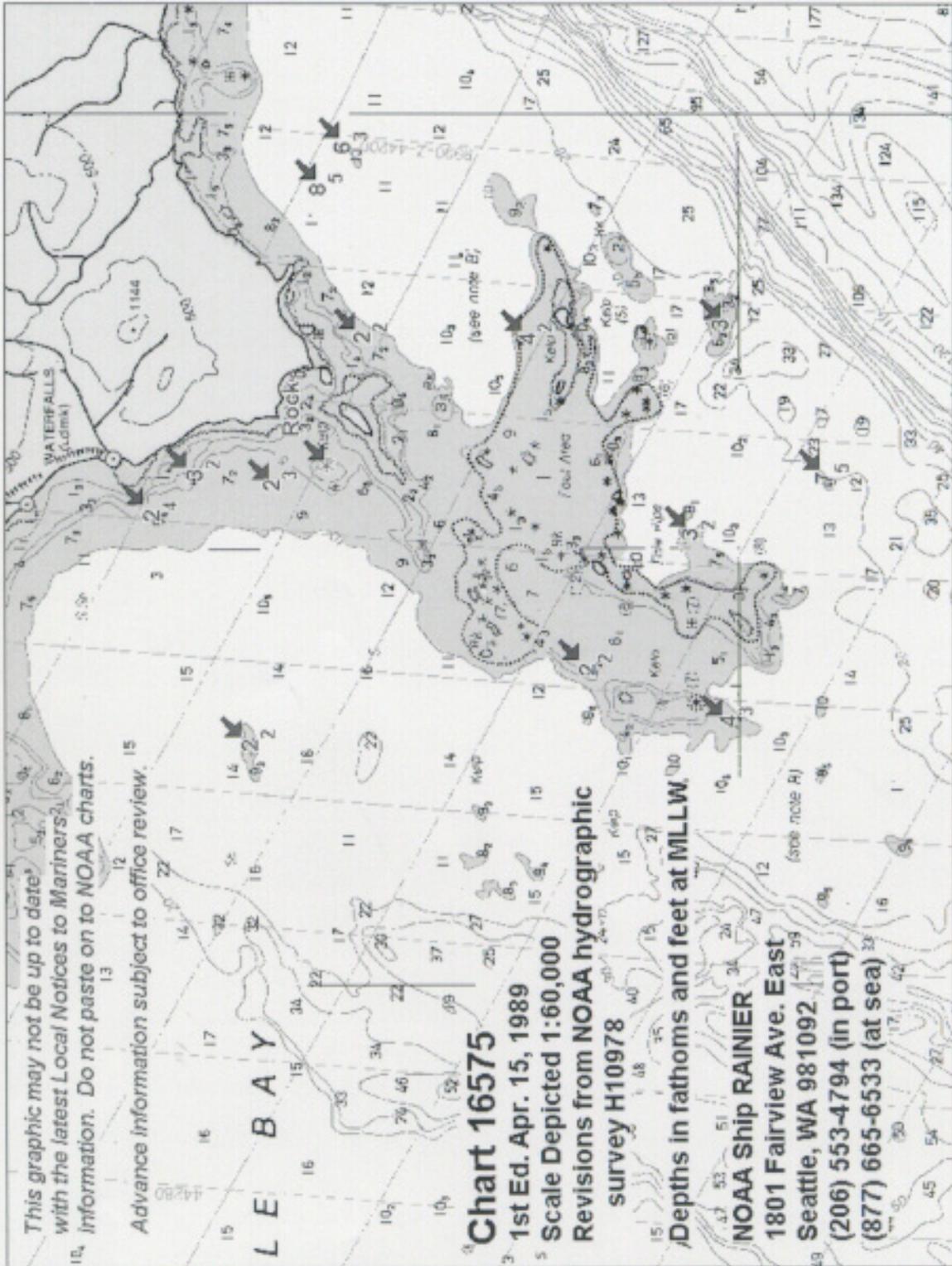
## DANGERS:

<u>Feature</u>	<u>Depth(fms, ft)</u>	<u>Latitude</u>	<u>Longitude</u>
Rock	Awash	57°42'32.315"N	155°24'02.226"W
Sounding	2 <sub>2</sub>	57°43'00.241"N	155°27'15.300"W
Sounding	2 <sub>2</sub>	57°42'18.583"N	155°22'34.845"W
Sounding	2 <sub>2</sub>	57°40'55.574"N	155°26'23.565"W
Sounding	2 <sub>3</sub>	57°42'52.002"N	155°24'16.495"W
Sounding	2 <sub>4</sub>	57°43'36.180"N	155°24'37.630"W
Sounding	3	57°40'06.251"N	155°22'25.915"W
Sounding	3 <sub>2</sub>	57°40'17.778"N	155°24'50.720"W
Sounding	3 <sub>2</sub>	57°43'20.599"N	155°24'09.233"W
Sounding	4 <sub>2</sub>	57°41'17.811"N	155°22'35.494"W
Sounding	4 <sub>3</sub>	57°40'03.891"N	155°26'59.294"W
Sounding	6 <sub>3</sub>	57°42'26.120"N	155°20'23.915"W
Sounding	7 <sub>5</sub>	57°39'28.487"N	155°24'11.670"W
Sounding	8 <sub>5</sub>	57°42'35.304"N	155°20'52.827"W

## COMMENTS:

Questions concerning this report should be directed to the Commanding Officer, NOAA Ship RAINIER, at (206) 553-4794 (until March 18, 2001), 1-(877) 665-6533 (at sea after March 18), or by e-mail at [co.rainier@noaa.gov](mailto:co.rainier@noaa.gov).

ADVANCE  
INFORMATION





UNITED STATES DEPARTMENT OF COMMERCE  
National Oceanic and Atmospheric Administration  
NATIONAL OCEAN SERVICE  
Silver Spring, Maryland 20910

TIDE NOTE FOR HYDROGRAPHIC SURVEY

DATE: October 26, 2001

HYDROGRAPHIC BRANCH: Pacific  
HYDROGRAPHIC PROJECT: OPR-P164-RA-2001  
HYDROGRAPHIC SHEET: H10978

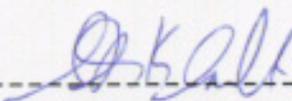
LOCALITY: Shelikof Strait, AK  
TIME PERIOD: May 21 - July 7, 2001

TIDE STATION USED: 945-8209 Puale Bay, AK  
Lat. 57° 42.5'N Lon. 155° 23.6'W  
PLANE OF REFERENCE (MEAN LOWER LOW WATER): 0.000 meters  
HEIGHT OF HIGH WATER ABOVE PLANE OF REFERENCE: 3.504 meters

REMARKS: RECOMMENDED ZONING  
Use zone(s) identified as: SS47 & SS48.

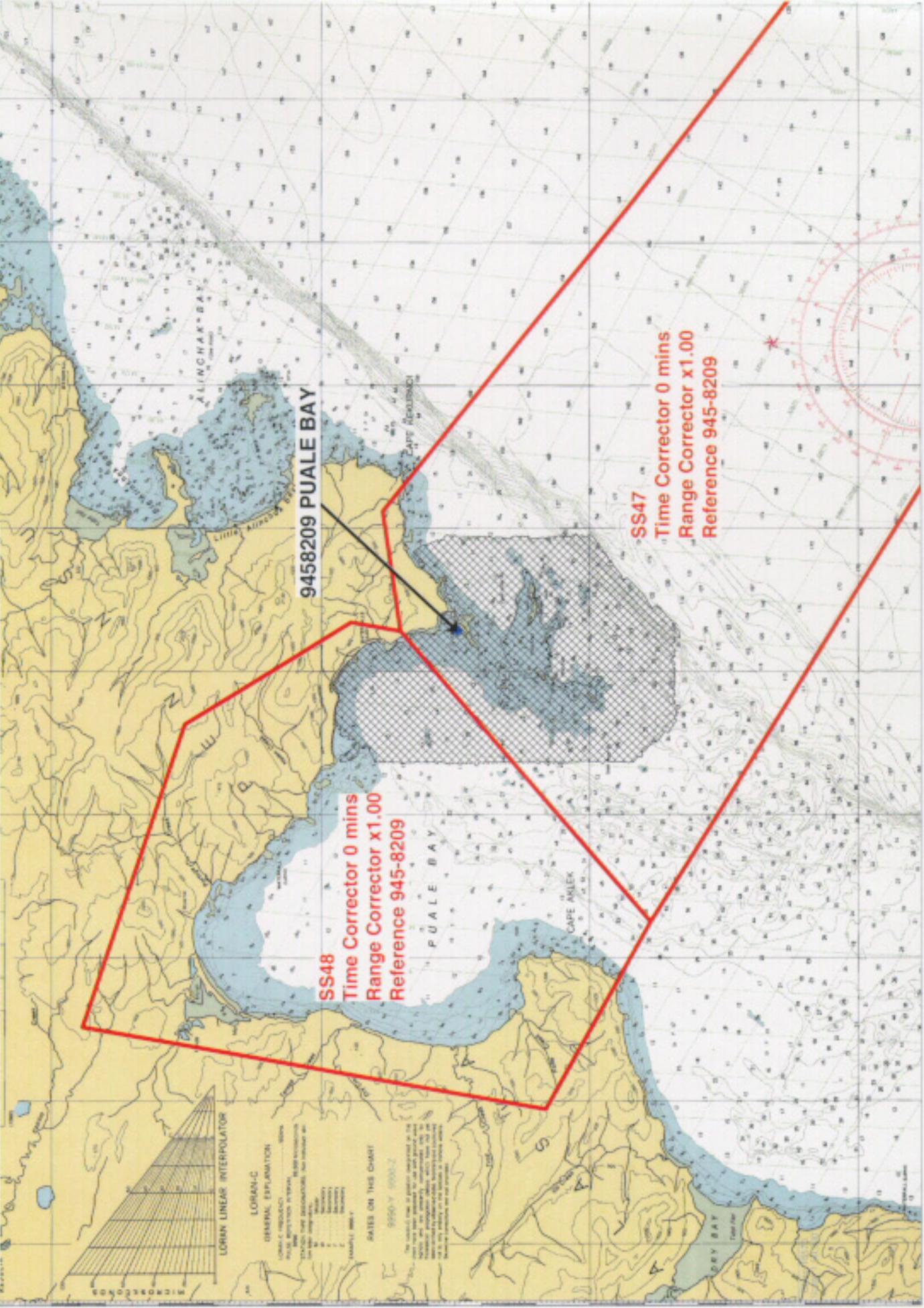
Refer to attachments for zoning information.

Note 1: Provided time series data are tabulated in metric units  
(meters), relative to MLLW and on Greenwich Mean Time.

For   
-----  
CHIEF, REQUIREMENTS AND DEVELOPMENT DIVISION



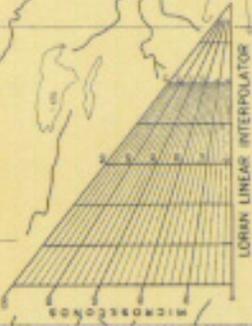
# Final Tidal Zoning for OPR-P164-A-2001 Shelikof Strait, AK - Sheet H10978



9458209 PUALE BAY

SS48  
Time Corrector 0 mins  
Range Corrector x1.00  
Reference 945-8209

SS47  
Time Corrector 0 mins  
Range Corrector x1.00  
Reference 945-8209



LORNY-C  
GENERAL EXPLANATION

RANGES ON THIS CHART  
9550-Y 9550-Z

The soundings in this chart are subject to the following corrections:



Final tide zone node point locations for **OPR-P164-RA-2001,**  
**Sheet H10978.**

Format:                   Tide Station (in recommended order of use)  
                               Average Time Correction (in minutes)  
                               Range Correction  
                               Longitude in decimal degrees (negative value denotes  
                               Longitude West),  
                               Latitude in decimal degrees

	Tide Station Order	AVG Time Correction	Range Correction
Zone SS47	945-8209	0	1.00
-154.885034 57.546648			
-155.146674 57.654785			
-155.323879 57.730761			
-155.393552 57.725278			
-155.562792 57.647953			
-155.336279 57.572524			
-155.041599 57.475564			
-155.006871 57.49286			
-154.885034 57.546648			
Zone SS48	945-8209	0	1.00
-155.388545 57.740625			
-155.447786 57.792143			
-155.62403 57.823666			
-155.671983 57.68032			
-155.562792 57.647953			
-155.393552 57.725278			
-155.388545 57.740625			

APPROVAL SHEET  
H10978

Initial Approvals:

The survey and associated records have been inspected with regard to survey coverage, delineation of the depths curves, development of critical depths, cartographic symbolization, and verification or disproof of charted data. The survey records and digital data comply with NOS requirements except where noted in the Descriptive Report and are adequate to supersede prior surveys and nautical charts in the common area.

*for* *Dennis A. Olmstead*  
Dennis Hill  
Chief, Cartographic Team  
Pacific Hydrographic Branch

Date: *9/4/2003*

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 Descriptive Report.

*J. E. Lowell, Jr.*  
John E. Lowell, Jr.  
Commander, NOAA  
Chief, Pacific Hydrographic Branch

Date: *9/15/03*

*AWOIS check  
11/5/03 mck*

