10244

Diagram No. 8802-3

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. RA-20-1-87

Registery No. H-10244

LOCALITY

State Alaska

General Locality Bristol Bay

Sublocality Kulukak Bay and Vicinity

1987

CHIEF OF PARTY
CAPT C.W. Fisher

LIBRARY & ARCHIVES

DATE September 22, 1988

☆U.S. GOV. PRINTING OFFICE: 1985—566-054

10244

"GP"
CHARTS
16315
16011
16006
SIGN OFF ON FORM IN REAR OF D.R.

NOAA FORM 77-28 (11-72)

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

HYDROGRAPHIC TITLE SHEET

REGISTER NO.

H-10244

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.

RA 20-1-87

State Alaska

General locality Bristol Bay

Locality Kulukak Bay and Vicinity

Scale 1:20,000 Date of survey May 31 - June 19, 1987

Instructions dated March 6, 1987 Project No. OPR-R184-RA-87

Vessel RAINIER 2120, 2123, 2124, 2125, 2126, 2129

Chief of party Carl W. Fisher, CAPT, NOAA

Surveyed by LT White, ENS Damm, ENS Poston, ENS O'Mara, ENS Hill, ENS Meis, ENS Larsen

Soundings taken by echo sounder, hand lead, pole DSF 6000N

Graphic record scaled by RAINIER Personnel

Graphic record checked by RAINIER Personnel

~~Protracted by~~ Verification by T.O. Jones Automated plot by PMC Xynetics Plotter

~~Verification by~~ Evaluation by C.R. Davies

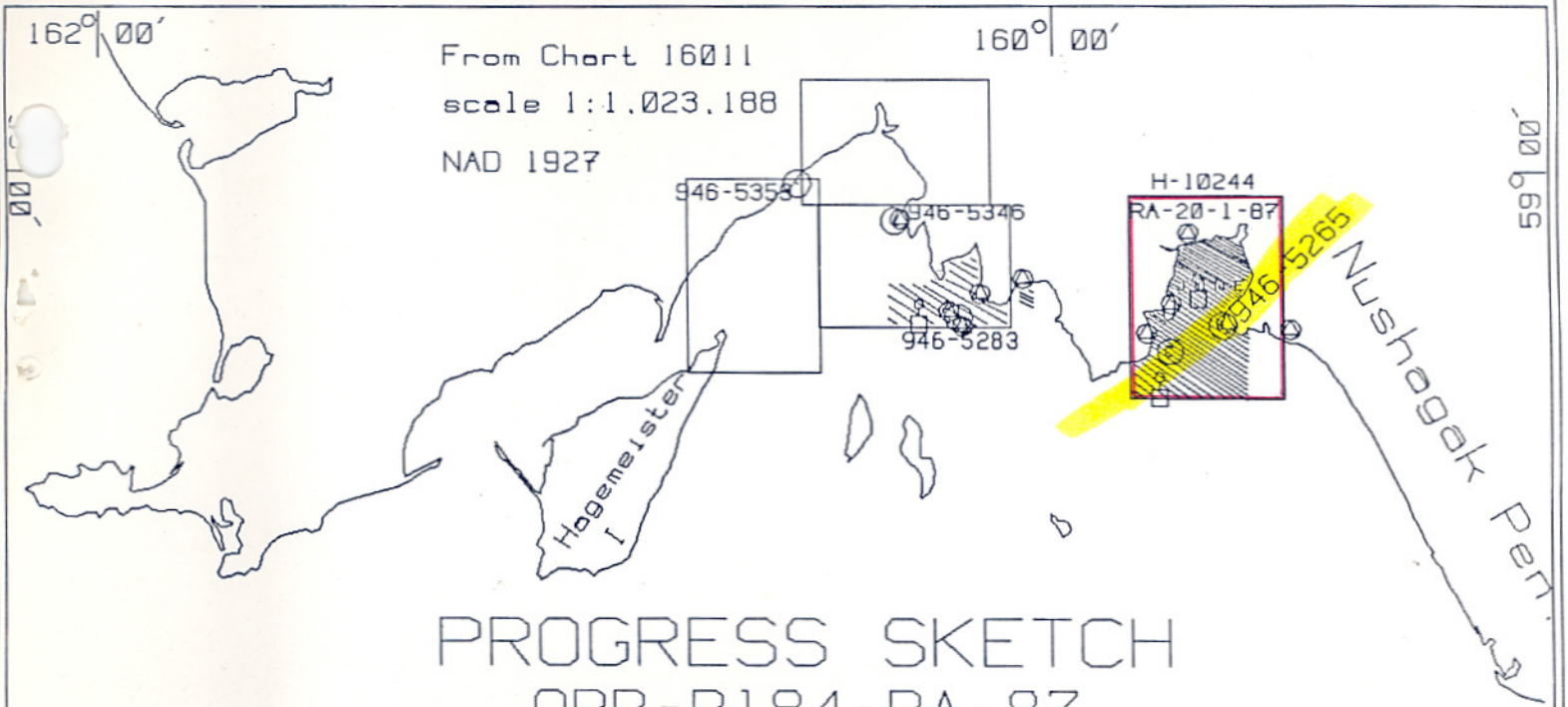
Soundings in fathoms ~~feet~~ at ~~MLW~~ MLLW

REMARKS: (All times UTC). Marginal notes in black generated during office processing. All separates are filed with the hydrographic data, as a result page numbering may be interrupted or non-sequential.

3-25-97 ✓ AWOIS + SURF 4/89 RWD

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

☆ U.S. GOVERNMENT PRINTING OFFICE: 1978-665-010-1174



PROGRESS SKETCH

OPR-R184-RA-87

HYDROGRAPHIC SURVEY

TOGIAK BAY, ALASKA

JUNE 7 -JUNE 30

NOAA SHIP RAINIER

CARL W. FISHER, CAPT, NOAA

COMMANDING

JUN	JUL	AUG	SEP	
81.4				SQ.N.M. Sounding
1108				L.N.M. Sounding
460				L.N.M. Misc. Distance
78				Bottom Samples (Grab)
10				Electronic Control Stations
4				Temp. Depth. Sound Velocity
—				Nansen Cast
4				Tide Gages ⊙
15				Geodetic Control Stations
3				Water Samples Analyzed
1.65				SQ. N.M. Side Scan Sonar
82				L.N.M. Side Scan Sonar
1				Current Stations Occupied ©

58° 00′

162° 00′

160° 00′

Descriptive Report to Accompany Hydrographic Survey H-10244

Field Number RA-20-1-87
Scale 1:20,000
1987

NOAA Ship RAINIER
Chief of Party: Captain Carl W. Fisher

A. Project ✓

A basic hydrographic survey of Kulukak Bay and vicinity was completed as specified by Project Instructions OPR-R184-RA-87, dated March 6, 1987, Change Number 1, dated March 20, 1987, and Change Number 2, dated June 2, 1987. See Eval Report, section 1

This was one of a series of surveys in a project to provide modern hydrographic survey coverage of Bristol Bay, Alaska, between Cape Newenham and Cape Constantine, for existing and new preliminary charts that are planned for the area. This project responds to requests from the Alaska congressional delegation, U.S. Coast Guard, State of Alaska, Bristol Bay Native Association, Togiak Fishing Fleet, and other commercial fishermen.

The survey was designated sheet AA on the original sheet layout for the project dated January 25, 1985. The field number for the survey was RA-20-1-87 and the assigned registry number was H-10244.

B. Area Surveyed ✓

The survey was located in northeast Bristol Bay, Alaska, near the northwest corner of the Nushagak Peninsula, approximately 24 nautical miles east-southeast of Togiak, Alaska. Kulukak Bay is an embayment in the coastline of the southwest Alaska mainland, 8 nautical miles long (north - south) and 5 nautical miles wide (east - west). The southern portion of the survey area encompassed the entrance to the bay and the associated offshore waters, bounded by steep rocky cliffs and headlands with rock ledges. The northern portion of the survey was characterized by low sand and rock cliffs and three large river-marsh systems at the head of the bay.

The bottom throughout the survey area was found to be flat to gently sloping, broken only by the irregular rocky bottom near the shoreline. The primary slope was a consistent one fathom increase in depth every two nautical miles from north to south. The shallowest soundings, which reduced to 0.78fathom above MLLW, were found on the north portion of the sheet at the head of Kulukak Bay and in Metervik Bay. The heads of these bays had extensive mud flats that were dry at MLLW. The deepest depths in the survey area, 8.0 fathoms, were observed at the southwest edge of the sheet in waters offshore of the bay. Bottom sediments in Kulukak Bay were green-black mud, while offshore the bottom was composed of fine-green-black silt.

Kulukak Bay is a major fishing ground for a salmon fleet operating from nearby Togiak as well as southeast Alaska. The bay also serves as a safe anchorage and resupply location for larger bottom-fishing trawlers that are part of the growing U.S. joint-venture fishing operations in Bristol Bay. The area is used similarly by mid-water fishing vessels, especially the Bristol Bay herring fleet.

The bay is biologically significant as a route for sockeye (red) salmon returning from the Bering Sea and Gulf of Alaska to spawning grounds in the Kulukak and Kanek Rivers during mid-June to late July. Fry emerge between April and June and return to the sea. Gray whales stopover to feed in the bay during the summer migration nearshore from the west coast of Baja, California (March - April) to the Bering Strait and St. Lawrence Island (July - November). The whales return to Kulukak Bay around October and November on their return trip south. During the survey, ship personnel were treated to spectacular displays of gray whales feeding on benthic invertebrates and rolling on the surface close to the survey boats and near shore stations.

The survey area was bounded by the following geographic limits:

North	58° 56' 00" N
South	58° 45' 00" N
East	159° 35' 00" W
West	159° 50' 18" W

Data acquisition was conducted from May 31 through June 19, 1987 (DN 151 - DN 170).

C. Sounding Vessels

All data were acquired from the ship's four automated survey launches, and a 19-foot, aluminum-hulled MonArk.

Vessel	EDP No.	Operation
RA-3	2123	R/R, R/AZ, Side scan
RA-4	2124	R/R, R/AZ
RA-5	2125	Velocity casts, Bottom samples R/R, R/AZ
RA-6	2126	R/R, R/AZ
RA-9 (MonArk)	2129	Shoreline verification R/R

No changes to the standard sounding configurations were necessary. The MonArk was not outfitted for acquiring automated sounding data on this survey, but was used for shoreline verification and detached positions.

D. Sounding Equipment and Corrections to Echo Soundings

The automated survey launches used for this survey were equipped with Raytheon DSF-6000N echo sounders. The echo sounders were operated in the HIGH + LOW (HIGH DIGITIZED) function, using manual gain controls on both high and low frequencies to obtain the best analog trace. Soundings were recorded in fathoms and tenths of fathoms. Two-fathom bar checks were conducted and recorded daily, using both the LOW and the HIGH + LOW (HIGH DIGITIZED) functions, in accordance with the Provisional Instructions "RAYTHEON DSF-6000N ECHO-SOUNDER OPERATING AND PROCESSING INSTRUCTIONS," dated July 5, 1983, and the N/CG2 memorandum "DSF-6000N Depth Errors as a Function of Receiver Gain," dated May 23, 1986. The echo-sounders were assigned to the vessels as follows.

Vessel	Serial Number	Day Numbers
2123	A117N	151-170
2124	B046N	153-154
2124	A114N	154-170
2125	A103N	151-170
2126	A119N	151-170

A Klein side scan unit was used to investigate AWOIS item #50924. The unit was operated in accordance with the Provisional Side Scan Sonar Manual, dated April 25, 1986.

Equipment	Model	Serial No.
Recorder	521T	254
Transducer	422XS-101AF	410M

Least depths over shoals were obtained with a leadline on DN 169. The leadline (SN RA-103) was last calibrated on April 9, 1987, by members of RAINIER survey department.

Corrections to Echo Soundings ✓

Corrections to all soundings were determined for sea conditions, draft, velocity of sound through water, settlement and squat, and tides. These correctors are eventually to be applied to all survey vessels and all areas of this survey. However, in plotting the final field sheet, the determined correctors were applied for sea conditions, draft, and velocity only. Settlement and squat correctors were not applied. Predicted tide correctors were used in lieu of field-determined correctors, and the field tide records have been forwarded to N/OMA121, in accordance with Hydrographic Survey Guideline #50 and the PMC OPORDER. Variations in the instrument initial, stylus arm length, and belt tension are not present with the DSF-6000N.

S/S correctors were applied during office processing.

Sea Surface Conditions ✓

Corrections for sea conditions were applied while scanning. The scanning technique used in comparing the analog trace with the digital record was chosen to eliminate fluctuations greater than 0.2 fathoms resulting from sea action, while at the same time preserving the trend of this gently sloping area. However, even with this scanning technique, some effects of sea conditions still appear on the final field sheet as slight irregularities in depth contours where the bottom is known to be smooth with a minimum slope.

Draft ✓

Transducer depths of 0.3 fathom were measured for all four launches on March 26, 1987, by divers using a large wooden T-square. The draft measurements were made at PMC with the fuel tanks all between full and half full, and with zero, then four, people aboard, and the average computed. The transducer depths of 0.3 fathom agree with RAINIER historical records. Transducers are mounted starboard, midships, in a location such that all sounding corrections apply to both the low and high-frequency echo-sounder signals.

Velocity Correctors

Velocity of sound through water and the associated corrections to echo soundings were determined by velocity probe casts using a Plessy/Grundy Sound Velocity Sensor (S/N 3444) coupled to a Hewlett-Packard 5315A Universal

Frequency Counter (S/N 1946A03637). The Plessy/Grundy velocity sensor was last calibrated in February 1987 at the Northwest Regional Calibration Center, Bellevue, Washington (Appendix IV).

Two velocity casts were performed on DN 153. There was a noticeable difference between the two casts. Cast #1 was located in the center of Kulukak Bay, taken to 3.4 fathoms depth. This data was not of sufficient depth for reducing the deeper soundings obtained during this survey. The velocity of sound in very shallow water is most likely quite variable due to tides, localized heating, and fresh water runoff. Cast #2 was located toward the southern limit of the survey area in the deepest water possible. It was taken to 8.2 fathoms and can reasonably be extrapolated to 10 fathoms, which would include all soundings observed during the survey. Data from cast #2 indicated that no corrector would be required for any sounding depths less than 13 fathoms. Thus, velocity tape #1, as listed in* Appendix IV, was used in plotting the final field sheet for this survey.

* filed w/ separates

Cast No.	Deepest Depth (m)	Day Number	Geographic Position
1	5	153	58°53.8'N, 159°40.0'W
2	15	153	58°45.1'N, 159°41.7'W

The Plessy-HP configuration provides data only at discreet, preselected depths, rather than continuously throughout the water column. Therefore, the method used to compute velocity correctors is similar to that outlined in the Hydrographic Manual Fourth Edition as Example 2 on page 4-77, except that more data points were necessary in the shallow water in order to define the velocity profile (Appendix IV).

As a system check of the Plessy probe, surface water samples were obtained at the times and locations of the velocity casts. The surface samples showed acceptable agreement with the probe velocities (Appendix IV).

Settlement and Squat ✓

Settlement and squat correctors were determined for the automated survey launches in Seymour Canal, Alaska, on April 28 and May 5, 1987, over hard bottom in a depth well exceeding seven times the vessels' drafts. Both sea and wind were calm. Observations were made through a Zeiss Ni2 leveling instrument (S/N 87102) to a rod held vertically on deck of each launch, almost directly over the transducer. Five level readings were made at each speed tested, and the average taken, to compute the correctors. Tide staff readings were taken concurrently with each set of level

readings, and all tide height differences were normalized to the tide height of the dead-in-the-water level readings before the correctors were computed.

Soundings on the final field sheet are not corrected for settlement and squat, although corrections of 0.1 fathom must be made for certain vessels at some RPMs. TC/TI tapes for each automated sounding vessel have been prepared and submitted with this survey. Records of settlement and squat data are included in Appendix IV. The settlement and squat correctors were revised during office processing to reflect appropriate RPM's during hydrographic operations

Tide Correctors

The final field sheet was plotted using predicted tide correctors provided by the Project Instructions. Field tide records and a request for approved tides have been submitted (see Field Tide Note in Appendix II and *Request for Approved Tides in Appendix XI).

* filed w/ Separates

Applicable Area	Time Corrector High Water	Time Corrector Low Water	Height Ratio
North of latitude 58° 50.0' N	- 25 min	- 25 min	x1.13
South of latitude 58° 50.0' N	- 15 min	- 15 min	x1.06

E. Hydrographic Sheets ✓

The field sheets were all prepared aboard RAINIER, on a Houston Instrument Complot DP-3 roll plotter, using the PDP-8/e Hydroplot system and program RK201, "Grid, Signal, Lattice Plot". Program RK201 draws a modified transverse mercator projection. The final field sheet, a 1:20,000-scale projection, was plotted on two plotter sheets designated RA-20-1N-87 and RA-20-1S-87.

Five expansion sheets at 1:5,000 scale were used to plot special investigations and are also included with the survey data:

Sheet	Survey Area	Boundaries
Expansion #1	AWOIS 50927 submerged rock (25m splits development)	North - 58° 52' 30" N South - 58° 51' 15" N East - 159° 42' 30" W West - 159° 45' 00" W
Expansion #2	AWOIS 50924 submerged rock (25m & 50m splits development)	North - 58° 50' 15" N South - 58° 49' 20" N East - 159° 44' 30" W West - 159° 47' 00" W

Expansion #3	AWOIS 50924 Side Scan Sonar Investigation	North - 58° 50' 15" N South - 58° 48' 45" N East - 159° 44' 15" W West - 159° 47' 15" W
Expansion #4	Southwestern Shoreline (25m & 50m splits development)	North - 58° 48' 30" N South - 58° 46' 45" N East - 159° 46' 30" W West - 159° 50' 15" W
Expansion #5	Shoreline Southeast of Kulukak Point (25m & 50m splits development)	North - 58° 50' 05" N South - 58° 49' 15" N East - 159° 34' 45" W West - 159° 37' 45" W
Expansion #5a	Shoreline Southeast of Kulukak Point (25m & 50m splits development)	North - 58° 50' 00" N South - 58° 49' 20" N East - 159° 37' 10" W West - 159° 36' 15" W

Least depths from these expansion sheets have been transferred to the final field sheet. The central meridian, false easting, and controlling latitude were held constant on all field sheets (Appendix I).

Depth contours are drawn on the final field sheet in accordance with the Hydrographic Manual.

Depth Contour(fm)	Color
0	Orange
1	Green
2	Red
3	Blue
4	Orange
5	Red
6	Green
7	Brown
8	Brown

The final field sheet and accompanying field records, along with this Descriptive Report, are being forwarded to the Pacific Marine Center for ~~verification.~~ office processing.

F. Control Stations ✓

Five geodetic stations were used to control this survey. Positions for DRY BAY (1947) and KULUKAK (1948) are from the NGS data base. The position for METERVIK (1983) is a preliminary adjusted field position from a data set provided by NOS Pacific Marine Center Field Surveys Branch N/MOP222.

METERVIK AZ MK (1983) was also part of that data set, but the station was repositioned during this survey and the unadjusted field position used. KULU (1987) was the only new station established during the survey and its position is an unadjusted field position.

DRY BAY and KULUKAK were used for range/range positioning only. METERVIK, METERVIK AZ MK, and KULU were used for range/range electronic positioning and range/azimuth positioning.

Station	Order,Class	Date Established	Signal #
DRY BAY	11	1947	117
KULUKAK	11	1948	116
METERVIK	31	1983	115
METERVIK AZ MK	31	1983	220
KULU	31	1987	118

DRY BAY, KULUKAK, and METERVIK were verified with check angles during the horizontal control field work. KULU was located by triangulation from the existing stations METERVIK and KULUKAK. Copies of field records and computations may be found in Appendix XIII.

Check angles at METERVIK AZ MK from KULUKAK to METERVIK, and at METERVIK from KULUKAK to METERVIK AZ MK did not verify the 1983 position of METERVIK AZ MK. METERVIK AZ MK was repositioned during the survey by triangulation from METERVIK and KULU. The inverse distance between the 1983 field position and the 1987 field position was computed to be 0.5249 meter. The 1987 position for METERVIK AZ MK was maintained for the survey. Data explaining this discrepancy between 1983 data and survey field work can be found in the Horizontal Control Report, OPR-0184-RA-87.

All stations met third-order, class I standards for positioning and further information can be found in the Horizontal Control Report, OPR-0184-RA-87.

The North American Datum of 1927 and Clark Ellipsoid of 1866 were used as the reference in calculating geographic positions. See Eval. Report, section 2, Control and Shoreline, for corrections to NAD83.

G. Hydrographic Position Control ✓

Range-range and range-azimuth positioning methods were used on this survey. Ranges were measured with Motorola's Mini-Ranger III electronic positioning system. Azimuths were measured with two Wild T-2 theodolites (S/N 68648 and 75599E).

To obtain the detached positions of features in shallow areas, vessel 2129, a 19 - foot skiff, was temporarily outfitted with the console/RT pair normally carried by vessel 2125. During this period, a mechanical failure in vessel 2123 made it necessary to transfer the console/TR from vessel 2123 to vessel 2125.

Mini-Ranger Mobile Equipment Configuration

Console/RT Serial Numbers	Vessel EDP NO.	Day Number
720/B1405	2123	152-158,169
720/B1405	2125	159-161
30269/C1712	2125	153-157
30269/C1712	2129	158-169
715/911615	2124	153-169
711/911102	2126	153-170

Mini-Ranger Shore Equipment

Transponder Serial Number	Code
G3510	A
G3500	C
911634	D
F3256	E
G3501	F
C1789	0
C1833	1
B1106	2
911635	3

Baseline Calibration and System Check Procedures

Opening baseline calibrations were conducted in Sitka, Alaska, in May, 1987, and some closing calibrations were conducted on Summit Island, Alaska, in June, 1987, both in accordance with PMC OPORDER 3.3. The opening baseline ranged from the U.S.C.G. Pier in Sitka to Station CHAN, an overwater distance of 1910.0 meters. The closing baseline ranged from CAL POINT 1 to CAL POINT 2, on Summit Island, an overwater distance of 855.0 meters. The two baselines were measured using a Hewlett-Packard model 3808A electronic distance measuring instrument (S/N 1723A0020). More detailed information on the calibrations may be found in the Electronic Control Report OPR-R184-RA-87.

A waiver of bi-monthly mini-ranger baseline calibrations was issued on March 23, 1987, from the Pacific Marine Center and

accordingly, closing calibrations have not been done at this time for all vessels. However, the closing baseline calibration for vessel 2126 was completed on 20 June, 1987.

Vessel 2126 was calibrated at Summit Island at the conclusion of this survey due to an average 10 meter discrepancy found in the corrector for code 3. This discrepancy was discovered during the first critical check of the survey and continued throughout the survey.

Vessel 2124 experienced a failure of RT unit 911615 after a period of data collection. Due to this failure, no closing calibration is possible for vessel 2124 (S/N 715/911615).

Closing correctors for the remaining vessels will be obtained by September, 1987, and the results may be found in the Electronic Control Report OPR-R184-RA-87.

System checks were conducted in accordance with the PMC OPORDER 3.3. Theodolite intersection was the critical check method used. Non-critical system checks were conducted using the launch-to-launch and baseline-crossing methods. Summary sheets of daily results can be found in the Electronic Control Report, OPR-R184-RA-87.

The final field sheet was plotted using the opening baseline correctors for all console/RT pairs, with the exception of vessel 2126 (S/N 711/911102), code 3. Data from this configuration was corrected with the average of the critical system check results obtained during the survey, which was 12 meters. However, it is recommended that the closing baseline corrector of 8 meters be used in smooth plotting these data. 8 meters was used during office processing.

Equipment Performance ✓

Shore station performance was good throughout the survey, although the occurence of null zones resulted in numerous time and course interpolations. Typically a launch running along on line would experience sporadic rate jumps or low signal strengths which resulted in lost fixes. Portions of lines with fix gaps of more than 6 centimeters at survey scale were rerun.

Unusual Procedures ✓

Several small bays in the area were out of mini-ranger range and extrapolation of fixes was necessary to complete lines of hydrography into them. The extrapolation was accomplished by using time and course in conjunction with the rate of change of X and Y from previous fixes.

The "see field sheet" method was used on DN 169 (fix 4905 - 4908) when range/azimuth control was not possible as a

result of poor visibility. Magnetic courses were steered by the launch while soundings were taken. Course changes were made on significant landmarks. Distances offshore were judged from the low waterline at the time of hydrography. Fixes and the trackline steered were annotated on the boat sheet. Miniranger rates were constructed from the fixes.

Andist ✓

Vessels 2123, 2124, 2125 and 2126 have the RT located over the transducer with an ANDIST of 0.0.

H. Shoreline ✓

Shoreline features on the field sheet were transferred from NOS shoreline manuscript:

NATIONAL OCEAN SERVICE
SHORELINE MANUSCRIPT
TP-01188
ALASKA
TOGIAK BAY TO
CAPE CONSTANTINE
SCALE 1:20,000
TRANSVERSE MERCATOR PROJECTION
10,000 FOOT GRID BASED ON
ALASKA STATE PLANE COORDINATE SYSTEM
ZONE 6
1927 NORTH AMERICAN DATUM

Shoreline details were verified by visual inspection from a skiff (vessel 2129) or launch (vessel 2125) at or near low tide. There were no areas where verification was not accomplished, except inshore of the river mouths where shallow water prohibited safe entry. Features which appeared as depicted on the TP-sheet, were assigned reference numbers and heights as directed in PMC OPORDER, Appendix P, Sec. I.A. The reference numbers were recorded with heights in a sounding volume and on a paper copy of the TP-sheet. Descriptive annotations were recorded on the TP-sheet and occasionally supplied on the raw data printouts at the inshore terminations of sounding lines. The paper copy of the TP sheet contains notes about topography behind the high water line over the entire area. Significant descriptions have been transferred to the final field sheet.

See Evac Report Section G

The location of significant offshore features, and additional features not shown on the TP-sheet, were recorded as detached positions in a sounding volume or on the raw data printouts. Detached positions recorded in a sounding

volume have been digitized and transmitted on a master data tape. Cartographic codes have been assigned in the field records.

Shoreline details and features have been transferred to the field sheet with additions shown in black and changes shown in red. Detached positions were plotted on the final field sheet with their four-digit position numbers. Reference positions were plotted with their three-digit numbers, preceded by an 'R'. Heights were given in feet and have been corrected for predicted tides. Heights given for ledges, reefs, rocks, and islets refer to the highest portion of each feature. Sounding lines were run alongshore by launch, at or near high water, which occasionally passed over ledges resulting in negative soundings. These heights have been retained in the records to confirm that the ledges are exposed at MLLW.

It was clearly evident during the field work that the photography for TP-01188 was flown during a stage of tide higher than MLLW, probably as high as mid-tide. The majority of shoreline features depicted on TP-01188 were isolated rocks and groups of rocks surrounded by a foul area delimitation. Field work performed at periods of low water proved most of the rocks, and foul area groups of rocks, to be ledges exposed at MLLW. On the final field sheet, wherever a dashed line (foul area delimitation) from TP-01188 was changed to a ledge symbol, it is shown in red representing a change to the manuscript. Wherever an isolated rock from the TP sheet was found to be a ledge, the ledge symbol is shown in black representing an addition to the manuscript. In some cases, isolated rocks near the shoreline were found to be foul area groups of rocks and are shown with a black dashed line (foul area delimitation) representing an addition to, or a verification of, the manuscript. See E.R, sect 6, for final disposition of nearshore features.

Additions

Three additions to the manuscript should be mentioned. These features are not related to items positioned as part of AWOIS inspections (addressed in Section L of this report), nor are they related to historical TP-sheet items which are addressed next in this section of the report.

1. Rock — ~~4.0~~ 5.0 feet above MLLW, Carto Code 291
   D.P. 9000, DN158/2340Z
   58° 50' 50.35"N
   159° 46' 42.49"W

2. Rock — ~~4.7~~ 5.0 feet above MLLW, Carto Code 291
   D.P. 9007, DN 159/0456Z
   58° 51' 35.22N
   159° 37'59.54W

3. Shoreline river
   R-144, DN 157/2200Z
   58° 53' 57"N
   159° 44' 06"W
   (The location of this feature was estimated by the hydrographer from offshore, relative to adjacent features on the TP-sheet).
   Not shown on Smooth Sheet
   Not navigable at MLLW

Disprovals

Two TP-01188 features were not seen at low water at the locations given below and are considered disproved. They are not shown on the final field sheet.

1. Rock — Fix 5242 + 3
   DN 157/1956Z
   58° 55' 45"N
   159° 42' 07.5"W
   Concur

2. Islet — R-119
   DN 155/0111Z
   58° 50' 16.5"N
   159° 38' 12.6"W
   This feature falls within a ledge limit.

Prior Photogrammetric Survey ✓ See Final Report, section 6

TP-01188 included 26 shoreline features that were labelled "5. Charted detail.....Not identifiable on photographs." The features were not shown by positions, but were presented as circled areas outlining rocks from prior maps. These items originated from U.S. Coast and Geodetic Survey Topographic Maps (1:20,000 scale polyconic projection, 1927 NAD) compiled in 1951 from aerial photographs taken in October, 1946, and August, 1950:

Map Number	Number of Features Transferred to TP-01188
T-9054	11
T-9044	6
T-9045	2
T-9055	7

T-9054 was made available for this project in 1986. T-9044, T-9045, and T-9055 were not supplied for comparison during this survey.

These features were investigated during shoreline verification and their status determined as follows:

Feature Location	Verification Position Number	Status	
58° 47.6' N 159° 49.9' W	R-176	Rocks not present, ledge not continuous with TP-01188 ledges R-175 to R-177. T-9054 indeed does not show significant rocks at this location.	
58° 47.7' N 159° 48.7' W	D.P.9033 D.P.3518	Rocks form a foul area from TP-01188 ledge feature out to the D.P.'s, agrees with T-9054 depiction.	Do not concur, rocks transferred from T-9054(1947), see EVAL Report, section 6
58° 48.2' N 159° 47.6" W	D.P.9032	Rocks not present offshore of TP-01188 ledge where T-9054 shows at least two offshore rocks.	Do not concur, rocks transferred at lat. 58°48'08"N, long. 159°47'36"W and lat. 58°48'10"N, long. 159°47'36"W See EVAL Report, section 6
58° 48.6' N 159° 47.4' W	D.P.9029 D.P.9030 (excessed)	Rocks form a continuous ledge joining two ledges on TP-01188. Agrees with foul area delimitation shown on T-9054.	Do not concur, rocks and ledges transferred from T-9054(1947) See EVAL Report, section 6
58° 49.7' N 159° 47.6' W	R-180	Rocks not present offshore of TP-01188 ledge where T-9054 shows at least two rocks offshore of the ledge.	Do not concur, T-9054 does not show rocks at this location. Rock and ledge transferred from T-9054 at lat. 58°49'38"N, long. 159°47'46"W.
58° 50.4' N 159° 48.4' W	R-128	Ledge is present continuous with TP-01188 ledge as described in R-128. Agrees with ledge location shown on T-9054.	Ledge transferred from T-9054
58° 50.7' N 159° 47.0' W	R-182	Rock is not observed offshore of the TP-01188 ledge. T-9054 shows one rock isolated offshore of the ledge.	Part of present ledge
58° 50.95' N 159° 46.6' W	R-183	Rock is observed, shown at an estimated position. Agrees with T-9054 position and height of 7 feet above MLLW.	
58° 50.2' N 159° 46.3' W	R-181	Rocks are not observed offshore of TP-01188 ledge described in R-148. T-9054 shows two rocks well offshore of the ledges.	One rock found, uncovers 1 ft at MLLW. Other carried forward from T9054 at lat. 58°50'13'N, long. 159°46'19"W.
58° 51.0' N 159° 44.7' W	D.P.9006	Rocks present offshore and between TP-01188 foul areas forming a continuous foul area R-115 to R-114. Agrees with ledge and rock features shown on T-9054.	

58° 52.2' N 159° 45.8' W	R-157	Rocks observed as isolated small boulders making up a foul area within the limits of the T-9054 delimitation, shown at an estimated position. T-9054 shows two substantial ledge features at that location, not observed at the time of this verification. Two ledges were carried forward from T-9054 at lat. 58°52'06"N, long. 159°45'55"W and lat. 58°52'25"N, long. 159°45'49"W.
58° 52.7' N 159° 45.3' W	R-159	Rocks observed as isolated small boulders making up a foul area within the T-9044 delimitation, shown at an estimated position. Two rocks, uncover 2 ft at MLLW at lat. 58°52'40"N, long 159°45'33"W and lat. 58°52'47"N, long. 159°45'16"W T-9044 does not show a foul area in this vicinity.
58° 53.4' N 159° 44.7' W	R-167	Rocks observed as a ledge, an extension of the T-01188 ledge described in R-108, all within the limits of the T-9044 delimitation. A foul limit line was carried forward from T-9044 at lat. 58°53'06"N, long. 159°44'48"W.
58° 53.4' N 159° 44.3' W	R-166	Rocks not observed. One rock was carried forward from T-9044 at lat. 58°53'24"N, long. 159°44'22"W.
58° 54.2' N 58° 43.9' W	R-164	Rocks observed as a ledge, within the limits of the T-9044 delimitation, shown at an estimated position.
58° 54.6' N 159° 43.6' W	R-163	Rocks not observed. (1) retain
58° 55.0' N 159° 43.6' W	R-140	Rocks observed as a ledge within the limits of the T-9044 delimitation, shown at an estimated position Islet bares 5 ft at MHW
58° 56.0' N 159° 38.5' W	R-161	Rocks observed as isolated small boulders (less than 0.5 meters diameter) all within the limits of T-9045 delimitations and above the zero fathom curve. No estimated positions shown. ok
58° 53.0' N 159° 36.0' W	D.P.9008 thru D.P 9019	TP-01188 shoreline change of T-9045 marsh islet features. Field observations verified a series of three spits within the limits of the T-9045 delimitation. The features are drawn on the field sheet based on detached positions and visual estimates, and represent a greater expanse of exposed shoreline than that shown on the TP-01188 change. Estimated shoreline drawn in dashed red on smooth sheet.

58° 51.9' N 159° 37.2' W	R-160	Rocks not observed within the limits of the T-9055 delimitation.
58° 51.8'N 159° 37.3' W	R-160	Rocks observed as one isolated boulder within the limits of the T-9055 delimitation, shown at an estimated position.
58° 50.2' N 159° 38.2' W	R-174	Rocks not observed offshore of TP-01188 ledge described in R-173.
58° 50.05' N 159° 37.5' W	D.P.9021 D.P.9022	Rocks not observed offshore of the TP-01188 ledge described by these detached positions.
58° 50.0' N 159° 36.3' W	R-178	Rocks observed as an offshore extension of the TP-01188 ledge described in R-124. Ledge is within the limits of the T-9055 delimitation and is shown at an estimated position.
58° 49.8' N 159° 35.8' W	R-179	Rocks observed as an offshore extension of the TP-01188 ledge described in R-124. Ledge is within the limits of the T-9055 delimitation and is shown at an estimated position.
58° 50.2' N 159° 35.2' W	R-125	Rocks observed as a consolidated set of large isolated ledges. Feature is within the limits of the T-9055 delimitation and is shown at an estimated position.

Rock uncovers 5-ft at MLLW. Added to smooth sheet w/o supporting position information.

Rock carried forward from T-9055 at lat. 58°50'15"N, long 159°38'12"W.

Two rocks and one islet were carried forward from T-9055 at lat. 38°50'05"N, long. 159°37'30"W

Rocks and ledge were carried forward from T-9055 at lat. 58°50'00"N, long. 159°36'15"W.

Two rocks were carried forward from T-9055 at lat. 58°49'48"N, long. 159°35'45"W.

Reefs were carried forward from H-9055 at lat. 58°50'12"N, long 159°35'20"W.

The above referenced features have been transferred to the final field sheet at their estimated positions.

The hydrographer recommends that the prior photogrammetric surveys be used to position the features that were observed and referenced, but not located with detached positions due to shallow water approaches. It was also noted that the T-9054 map presented a more accurate depiction of the shoreline features, such as ledges, than did the contemporary manuscript TP-01188.

See Final Report, section 2

Control Stations Seaward of the Shoreline

There were no control stations located seaward of the shoreline during this survey.

I. Crosslines ✓

A total of 55.7 nautical miles of crosslines were run, representing 9.9% of the mainscheme hydrography. In all cases, crossline soundings agreed with mainscheme soundings within three tenths of a fathom. A sample of 80 comparisons was made across the sheet.

Crossline/Mainscheme Agreement

Within 0.1 fathom	85%
Within 0.2 fathom	95%
Within 0.3 fathom	100%

With no major discrepancies noted, agreement between mainscheme and crossline soundings was evaluated to be very good.

J. Junctions ✓ See Final Report, section 5

This survey junctions with one contemporary survey, H-10220, along the extreme southwest edge of the sheet. H-10220 was a 1:20,000 scale survey completed by the RAINIER in 1986 as part of this project, covering the shoreline and offshore waters to the west of Kulukak Bay. A sample of twenty junction sounding comparisons were made at all locations where soundings directly overlapped. At all of these points junction agreement was within 0.3 fathom. Concur

Junction Sounding Agreement

Within 0.1 fathom	65%
Within 0.2 fathom	95%
Within 0.3 fathom	100%

One significant discrepancy was noted. A sounding of 3.6 5 fathoms (DN 157 Fix 3962 + insert at position 58° 46' 37.6" N/159° 50' 16.3" W) was taken on a mainsheme line which split the mainscheme lines of H-10220 at the junction. This 3.6 fathom sounding is located between a 5.1 0 fathom sounding to the north and a 5.3 fathom sounding to the south from this survey. The 3.6 5 fathom sounding is also located between a 3 4.6 fathom sounding to the west and a 5.2 1 fathom sounding to the east from survey H-10220. The contours on H-10220 should be adjusted to reflect this. This feature has been reported as a danger to navigation (Section L). Concur

Junction agreement between the sheets was considered very good, there being no discontinuities of depth curves between surveys except for that mentioned above. concur

K. Comparison With Prior Surveys ✓ See Evaluation Report, Section 6

There were no prior surveys that covered the area of this contemporary survey. concur

L. Comparison With the Chart ✓ See Evaluation Report, section 7

This survey was compared to the following charts:

Chart Number	Scale	Edition	Date
16011	1:1,023,000	31st	6/29/85
16315	1:100,000	3rd	2/28/87

Danger to Navigation Reports

One Danger to Navigation Report was filed containing 6 items that pertained to this survey area. A radio message was transmitted on July 22, 1987, and a letter with chartlet was mailed on July 24, 1987. This correspondence went to both the U.S.C.G. Seventeenth District (Juneau, AK.) and DMAHTC (Washington, D.C.). Copies of the correspondence are attached ~~in Appendix XII~~ to this report.

The following items were determined to be dangers to navigation. The positions shown here are final field positions and depths for the survey, and are slightly different from the preliminary positions included in the correspondence. Corrected correspondence was not considered necessary because corrections were very small. The following positions are final positions after correctors have been applied.

Item 1:Shoal
Position Number: 3894+2+ second insert
Survey Depth: 1.2 fm exceeded by 1 fm, lat. 58°49'41.51"N, long 159°36'37.35"W pos#4093/04
Surrounding Charted Depth: 2.0 fm 0.25 nm inshore
Position: 58° 49' 41.25" N/159° 36' 37.25" W
Method of Investigation: The least depth was obtained by echo-sounder on a mainscheme line in an area split by 25 meter line spacing.

Item 2:Rock
Position Number: 4913
Survey Height: ~~2.2~~ 3.0 ft above MLLW
Surrounding Charted Depth: none
Position: 58° 49' 45.~~15~~22" N/159° 45' 17.~~22~~33" W
Loran-C: 9990-Y 32599.99/9990-Z 45972.70
Method of Investigation: The least depth was obtained by visual estimate with detached position

Item 3: Shoal
Position Number: 4755~~+1+insert~~102
Survey Depth: ~~1.9~~1.6 fm
Surrounding Charted Depth: charted foul area
Position: 58° 49' 40.~~66~~32" N/159° 45' 37.~~36~~3" W
Method of Investigation: The least depth was obtained by echo-sounder on a 100 m split of the mainsheme in an area split by 50 meter line spacing.

Item 4: ~~Shoal~~ Rock
Position Number: 4860+2
Survey Depth: 0.~~6~~5 fm
Surrounding Charted Depth: none
Position: 58° 49' 43.~~75~~3" N/159° 46' 08.~~34~~40" W
Method of Investigation: The least depth was obtained by skeg sounding on a 100 meter split of the mainscheme in an area split by 25 meter line spacing. Chart a rock, covered ½ fm at MLLW

Item 5:Shoal
Position Number: 7207
Survey Depth: 2.~~8~~7 fm
Surrounding Charted Depth: none
Position: 58° 47' 00.~~72~~69" N/159° 49' 39.~~80~~" W
Method of Investigation:~~61~~ The least depth was obtained by echo-sounder detached position in an area developed by 50 meter line spacing.

Item 6: Shoal
Position Number: 3962~~+3~~/01
Survey Depth: 3.~~6~~5 fm
Surrounding Charted Depth: 4.0 fm 0.3 nm inshore
Position: 58° 46' 37.~~45~~71" N/159° 50' ~~17.55~~16.31" W
Method of Investigation:~~71~~ The least depth was obtained by echo-sounder on a mainscheme line at the west limit, a junction line with survey H-10220.

Comparison of Sounding Features ✓

Chart 16315 contained the same soundings and non-sounding features as chart 16011, except for a 2 fathom sounding at 58° 49' 30" N/159° 36' 30" W which is not present on chart 16011. Since chart 16315 was the largest scale covering the area, it was used for the comparison.

There were ~~4~~ 8 charted soundings within the limits of the survey. The markup of chart 16315* shows three soundings and one rock originating from BP 18063, 1916. That blueprint was not made available for comparison with this survey. The rock at position 58° 49' 17"N/159° 46' 36"W is addressed in this section with the AWOIS items. The origin of the fourth sounding (2 fathom) is unknown. A comparison was made for the four soundings as follows:

* markup of chart 16315 1st Edition

Charted Sounding	Geographic Position	H-10244 Sounding
5.0 fm	58° 46' 48"N 159° 46' 18"W	~~6.2~~ 3 fm
5.0 fm	58° 50' 45"N 159° 41' 54"W	~~3.5~~ 6 fm
1.0 fm	58° 53' 09"N 159° 40' 00"W	~~1.9~~ 2.0 fm
2.0 fm	58° 49' 30"N 159° 36' 30"W	~~3.7~~ 6 fm A 1.9 fm sounding was found 200 meters north of the 3.6 fm sounding*

Four additional soundings were also compared to, no significant differences were found.
No significant disagreements were found in this comparison.

A comparison was made between the charted channel entering the Kanik River in the north central part of Kulukak Bay, and the area of that entrance described by this survey. Survey data does not reveal a significant channel with water deeper than the zero fathom curve. Chart 16315 depicts a rather wide entrance of fair water into the river from the bay. It is recommended that the survey hydrography be used to change the depiction of the channel in the area around the following geographic location. concur

58° 56.0' N
159° 37.5' W

Due to the extensive coverage of soundings obtained in this survey, and the smaller scale of the charts, it is recommended that the survey depths supersede the charted depths in the survey area. Investigations of three specific shoal areas are discussed below. concur

AWOIS 50931

History: T9044/47 - shallow area; extends S.E. of Kulukak River entrance to approximate lat 58° 54'50"N long 159° 43'10"W (6/85).
TP01188/83 - Reviewed, Class III, NTH; not visible on photographs (updated 7/86).

Survey requirements: full - verify or disprove the extent of the charted feature using standard hydrographic procedures.

Mainscheme hydrography showed the area to be above the zero fathom curve with depths ranging from -0.1 to -0.7 fathom. The bottom was shown to be flat and featureless. The following set of positions describe the area.

Day Number	Vessel	Fix Numbers
154	2125	5049 - 5054
155	2126	6516 - 6519
		6531 - 6534
156	2126	6584 - 6594
		6614 - 6622
		6642 - 6656
156	2123	3801 - 3803
157	2125	5243 - 5251

Hydrography did not reveal anomalous shoaling, but described a continous zero fathom curve extending around the entire head of the bay, above which mud flats exist. No fair passage or channel into the Kulukak River from the bay was determined. It is recommended the chart show the contours derived from the hydrography in that area. The charted label "shallow" at the mouth of the Kulukak River should be maintained. concur

concur

Southwestern Shoreline Shoal Investigation

A nearshore area on the southwestern edge of the survey was developed with 50 meter and 25 meter NSP splits. Hydrography described an area of rough bottom nearshore along the coast southwest of Metervik Bay. The rough bottom extends up to 0.5 nautical miles offshore. The following data set describes the hydrography run in the area. Expansion Sheet #4 was plotted.

Day Number	Vessel Number	Fix Number	Type
157	2123	3900 - 3994	Mainscheme
161	2125	5413 - 5433	Mainscheme
161	2125	5356 - 5412	50 m splits NSP
161	2125	5434 - 5450	25 m splits NSP
170	2126	7204 - 7207	Drift soundings

A least depth of 2.~~8~~ 7 fathoms was discovered on fix 7207 at the following position, in an area with depths ranging from 4.3 to 5.3 fathoms.

58° 47' 00.~~72~~ 61" N
159° 49' 39.~~80~~ 69" W

Another least depth of 3.~~6~~ 5 fathoms was observed on a junction line with survey H-10220 (Section J). The rough bottom appears continuous with that observed during survey H-10220.

Other less significant pinnacles were also discovered in the data inshore along this stretch of shoreline, none considered dangers to navigation. concur

Shoreline Investigation Southeast of Kulukak Bay

A nearshore area southeast of Kulukak Point, on the eastern limit of the survey, was developed to 50 meter and 25 meter NSP splits. A relatively rough bottom was revealed over an area 0.9 fathom deep inshore and 3.5 fathom deep offshore of the shoal. A least depth of 1.~~2~~ 1 fathom was found on a small ridge surrounded by depths of 2.0 to 3.8 fathoms. The least depth is located on the seaward edge of a north - south oriented ridge extending up to 0.5 nautical miles offshore. The following hydrography was run at the site and Expansion Sheet #5 and #5a were plotted from the data.

Day Number	Vessel Number	Fix Number	Type
156-157	2123	3853 - 3899	Mainscheme
158	2123	Dup. 4078 - 4109	Mainscheme
159	2125	5282 - 5324	50 m and 25 m splits NSP

The least depth of 1.~~2~~ 1 fathoms MLLW was discovered on DN 157, in the mainscheme hydrography at fix number ~~3894 + 2~~ 4093/04 + second insert. The sounding is at the following geographic position.

58° 49' 41.~~25~~ 51" N
159° 36' 37.~~25~~ 35" W Same as Item 1 : Shoal, page 18

This feature was included in the danger to navigation message issued for the survey.

Comparison of Non-Sounding Features

All charted non-sounding features for the survey were related to presurvey review items and are discussed individually in the following descriptions of the AWOIS investigations. No new non-sounding features were discovered aside from the two rocks discussed as additions to the shoreline manuscript (Section H). concur

AWOIS 50924

History: BP18063(1916) - Pacific Am. Fish; subm. rock, position not scaled, hor. and vert. control dubious. Scaled from chart 16011 in lat 58° 49' 25"N long 159° 47' 30"W, and shown on chart 16315 in lat 58° 49' 15"N, long 159° 46' 35"W.
T9054/47 - Foul area, approx 200m in dia. scaled in lat 58° 49' 46"N, long 159° 45' 39"W at 1:20,000.
CL381/85 - Rock awash at MLLW reported, PA, east of Metervik Bay, scaled from overlay (1:100,000) in lat 58° 49' 41"N, long 159° 44' 55"W. Letter indicates that the rock is claimed to be the most dangerous in area.
NM23/85 - Rock awash "REP 1985" PA, in lat 58° 49' 41"N, long 159° 44' 55"W, from letter above.(6/85).
TP01188/83 - Reviewed, Class III, NTH; not visible on photographs. (7/86).

Description: The item appears to be the same feature reported in different positions through the years. The 1947 position is considered the best position available.

Survey Requirements: Full - verify or disprove.
Disprove the foul area from T-9054 and the subm. rock (PA) from CL381/85, with an investigation centered between the two (750m radius) and the subm. rock as charted (16315) from BP18063 (250m min. radius) by a bottom drag, diver, or SSS (depths permitting). Any obstruction found shall have GP and LD provided.

This item proved to be the most interesting and complex of all the presurvey review items. Mainscheme hydrography and development to 50 meter line spacing were run in the area of the charted foul area and over other rock pinnacles discovered in the vicinity of the eastern entrance to Metervik Bay. The following position data describes the hydrography for this area and the sounding data is plotted on Expansion Sheet #2.

Day Number	Vessel Number	Fix Number	Type
154	2124	4104 - 4285	Mainscheme
156	2124	4428 - 4605	Mainscheme
156	2125	5192	D.P.
159	2124	4669 - 4718	Mainscheme
161	2124	4804 - 4864	25m/50m split
169	2124	4909 - 4913	NSP D.P.

Sidescan sonar data was run for a 250 meter radius around the charted positions of the submerged rock and the PA rock awash. The device was set on 50 meter range scale and run at 50 meter line spacing for 200 percent coverage of each item. Expansion Sheet #3 was plotted for this data.

Day Number	Vessel Number	Fix Number	Feature
169	2123	2000 - 2032 2090 - 2112	subm rock
169	2123	2039 - 2089	PA rock awash

The sidescan investigation revealed no significant contacts. Both the submerged rock and PA rock awash are considered disproved and it is recommended that these features be removed from chart 16315 and 16011. concur

Feature	Charted Position
Subm rock	58° 49' 15" N 159° 46' 35" W
PA rock awash	58° 49' 41" N – 2.1" 159° 44' 55" W + 9"

The most significant feature located in the area was a large rock exposed ~~2.2~~ 3.0 feet and ~~3.6~~ 3.8 feet above MLLW at opposite ends. The rock was located 0.29 nautical miles southeast of the point on the eastern entrance to Metervik Bay in surrounding depths of 2.0 - 4.0 fathoms. The hydrographer believes this rock to be the most dangerous in this area, and agrees with the presurvey review assessment that the PA rock awash is the same feature reported in different positions through the years. Positional data from this survey follows.

Day Number	Vessel Number	Fix Number	Height	Geographic Position
156	2125	5192	~~3.6~~ 3.8 ft.	58° 49' 44.~~99~~51"N 159° 45' 16.~~91~~65"W
169	2124	4913	~~2.2~~ 3.0 ft. (excessed)	58° 49' 45.~~15~~42" N 159° 45' 17.~~22~~33" W

It is recommended that the rock be charted at a central point for the above positions. This rock was included in the danger to navigation message issued for the survey. The position for the more conservative ~~2.2~~ 3.0 foot high section of the rock was used. concur

A submerged rock with a depth of ~~0.6~~ 5 fathoms ~~sounding~~ was also located at fix 4860 + 2 (skeg sounding) during hydrography run in the following data set. Latitude 58°49'43.73"N, longitude 159°46'08.40"W

Day Number	Vessel Number	Fix Number	Type
159	2124	. 4690 - 4697	Mainscheme
161	2124	4853 - 4862	50 m and 25 m splits NSP

It was located 0.25 nautical miles southwest of the point on the eastern side of Metervik Bay in surrounding depths of 2.5 - 3.5 fathoms, and at the following geographic position.

58° 49' 43.75" N
159° 46' 08.34" W

It is recommended that this rock be charted at the above position. This item was also included in the danger to navigation report for the survey.

Other shoal depths* were encountered in the area, and the bottom appears rough off of the point. However, there was no visual evidence of a foul area at MLLW, and it is recommended that the foul area charted at 58° 49' 46" N, 159° 45' 39" W be deleted.

* See Item 3, page 19.

AWOIS 50940

History: T-9054 - Foul area, approx. 400m in dia. in the center of Metervik Bay, scaled in lat. 58° 50' 10"N, long. 159° 47' 05"W at 1:20,000 The LWL shown extends in an EW direction from this position.
CL381/85 - LWL shown on sketch provided (not as accurate as T-9054 above).(6/85).
TP-01188/83 - Reviewed, Class III, NTH; rock cluster, 200m in diameter shown, centered in lat. 58°50' 11.1"N, long. 159° 47' 04.9"W. (7/86).

Survey Requirements: Full - verify or disprove the difference of foul area between T-9054 and TP-01188 at LW, the common area not uncovering shall be bottom dragged or diver investigated, GP and LD required on features located.

This feature was verified and positioned with mainscheme hydrography (DN 156 - vessel 2124 - 100 meter splits), shoreline hydrography, and detached positions. The shoreline positions and detached positions are listed below.

Day Number	Vessel	Fix Numbers	Type
156	2124	4444-4472	SH
158	2129	9001-9005	D.P.

The feature was observed to be a ledge. The detached positions taken at low water delineated the outer edge of the ledge. The area consisted of large ledge-type rocks exposed 2 to 4 feet at MLLW, making up a consolidated ledge

with crenulated surface. The central highest portion of the feature was exposed 10 feet at MLLW. The shoreline and mainscheme hydrography was run immediately offshore of the detached positions at a higher stage of tide, revealing depths of water 0.1 to ~~0.5~~ 1.0 fathom just seaward of the edge of the ledge.

T-9054 depicts a larger foul zone than that shown on TP-01188. Survey data located the limits of the ~~ledge~~ reef over a slightly larger area than shown on TP-01188, yet slightly smaller than T-9054. The visual investigation performed on DN 158, and associated detached positions, were conducted near a time of zero tide. At that time, the entire feature had exposed, such that its extent was confidently proven to lie within the surveyed position. Shallow, low visibility water existed over a muddy bottom adjacent to the foul zone. These factors, as well as the feature's close proximity to shore precluded either a diver investigation, wire drag, or side scan of the differential area between the survey position and the T-9054 delimitation.

It is recommended that a ~~ledge~~ reef, with highest point exposed 10 feet at MLLW, be charted at the delimitations described by the detached positions and the zero fathom curve derived from the hydrography. latitude 58°50'0985"N, longitude 159°47'0908"W Concur

Fix Number		Geographic Position
9001	uncovers 5ft at mllw	58° 50' 10.99~~6~~" N 159° 47' 11.7~~1~~5" W
9002	uncovers ~~5~~ ft at mllw	58° 50' 14.2~~6~~4" N 159° 47' 10.~~67~~71" W
9003	uncovers 5ft at mllw	58° 50' 13.58~~6~~" N 159° 47' 03.7~~0~~5" W
9004	uncovers 3ft at mllw (excessed)	58° 50' 09.4~~5~~3" N 159° 47' 01.1~~4~~9" W
9005	uncovers 3ft at mllw	58° 50' 07.0~~6~~4" N 159° 47' 08.~~56~~60" W

AWOIS 50927

History: T-9054 - "Not visible on photographs" (Compilation scale 1:20,000).
BP125151(1985) - AK. Dept. of Public Safety; subm. rock, PA (REP 85) scaled from provisional chart 16315 in lat. 58° 51' 57"N, long.159° 44' 03"W. Hor. and vert. control dubious.(6/85).

TP-01188/83 - Reviewed, Class III, NTH; not visible on photographs.(7/86).

Survey Requirements: Full - verify or disprove by a bottom drag or diver investigation for a 0.5 nm minimum radius. If found GP and LD required.

This feature was not observed in hydrography run to 25 meter split development within 0.5 nautical mile radius of the scaled position. On DN 170 a visual search was conducted at low water (2 foot tide) within 100 meters of the scaled position. Waters were calm with a 1 foot swell running in the area. Detached position 9034 was taken to position the visual search. Hydrography revealed the area to be shallow over a flat, featureless bottom. Depths ranged from 0.0 to 2.0 fathoms adjacent to the scaled position. Shallow, low visibility water precluded a diver investigation, wire drag, or side scan for this item. The following table describes the data set gathered within 0.5 nautical miles of the feature. Expansion Sheet # 1 was plotted for the development.

Day Number	Vessel Number	Fix Number	Type
155	2123	3628 - 3673	Mainscheme 100m
159	2126	6916 - 6969	Mainscheme 100m
161	2126	6974 - 7196	25 m splits (NSP)
170	2129	9034	D.P.

The visual search conducted at detached position 9034 was at the following geographic position.

58° 51' 56.99" N
159° 44' 03.00" W

The hydrographer believes that any rocks that may exist on the bottom in this area are less than 2 to 3 feet above the bottom. They would be similar to the small isolated boulders that were observed bare on the mud flats near shore in this area. Therefore, it is recommended that the submerged rock PA, charted at the following location, be removed from chart 16315.

Return
See Evaluation Report, Section 7
Do not concur

58° 51' 57" N (9)
159° 44' 03" W (6)

AWOIS 50930

History: T-9044/46 - Rock awash: scaled at 1:20,000 in lat. 58° 54' 19"N, long. 159° 43' 35"W. (6/85).
TP01188/83 - Reviewed, Class III, NTH; not visible on photographs. (7/86).

Survey Requirements: Full - verify or disprove. Disprove by a bottom drag or diver investigation for a 200m radius. If found LD and GP required.

A rock exposed ~~0.9~~ 2.0 feet above MLLW was verified at a position 0.12 nautical miles south of the scaled AWOIS position. The area within 0.5 nautical miles of the scaled position was surveyed with mainscheme hydrography and found to be at and above the zero fathom curve. The bottom was observed to be flat and featureless. A visual search at low water was conducted by skiff on DN 162. The search was within 200 meters of the scaled position with less than two feet of water over the mud flats at the time. No evidence of the feature was seen near the scaled position. The skiff hit the rock when leaving the area in 2 feet of water, as the tide was falling. D.P. 9020 was taken as a pole sounding to position the rock. Shallow, low visibility water over mud flats precluded a diver investigation or wire drag in the area. The following table describes the data set gathered within 0.5 nautical miles of the scaled position.

Day Number	Vessel Number	Fix Number	Type
156	2123	3797 - 3814	Mainscheme
157	2126	6709 - 6718	Mainscheme
162	2129	9020	D.P.

It is recommended that this feature be charted as a rock, exposed ~~0.9~~ 2.0 feet above MLLW, at the following location.

Fix Number	Geographic Position
9020 uncovers 2ft at mllw	58° 54' 11.55" N 159° 43' 29.33" W

It is also recommended that the charted rock at the following position be removed from chart 16315.

58° 54' 19" N
159° 43' 35" W

concur

M. Adequacy of Survey

This survey is the first basic survey to be conducted over this area. The data is complete and adequate to be used for charting purposes, and to supersede any historical data.

Except for the rocks and features carried forward from the prior shoreline maps. concur

N. Aids to Navigation

There are no fixed or floating aids to navigation within the survey area.

concur

O. Statistics

EDP No.	Number of Positions	Reference Numbers	Nautical Miles of Sounding Lines
2123	1184	--	261.3
2124	1018	--	205.6
2125	464	--	83.2
2126	1194	--	301.6
2129	35	180	--
TOTAL	3895	180	851.7

SQUARE MILES OF HYDROGRAPHY	:	63.1
MILES OF SIDE SCAN	:	5.3
BOTTOM SAMPLES	:	48
TIDE STATIONS	:	1
VELOCITY CASTS	:	2
DAYS OF PRODUCTION	:	18
MAGNETIC STATIONS	:	0
CURRENT STATIONS	:	1

P. Miscellaneous

All bottom samples have been submitted to the Smithsonian Institution (Appendix IX).

Currents

A thirteen-hour current observation was made during spring tide conditions at a location 0.5 nautical miles offshore of the coastline southwest of Metervik Bay, in the southwest corner of the survey area:

58° 48' 24" N
159° 46' 42" W

The current was observed to be reversing: flooding at 030° true with a speed of 0.6 knots, and ebbing at 190° true with a speed of 0.85 knots. Further information on this current observation can be found in the Current Report OPR-R184-RA-87.

Siltation

During periods of ebb current a large turbidity plume was observed extending down Kulukak Bay, and was especially pronounced after storms. K-Meter measurements, made near this survey area during the 1986 field season, confirmed a high level of suspended load in the waters. It is probable that the high rate of siltation is an important process occuring in the survey area, and may explain the changes observed, especially shoaling at the mouths of rivers.

Low visibility water made diver investigations impossible.

Loran-C

Fixes were simultaneously acquired with Loran-C and Mini-Ranger control across the survey area on DN 153 - DN 156. Vessel 2123 was designated to gather the comparison data in order to present a sample of Loran-C performance in the area (in accordance with the Project Instructions and Hydrographic Survey Guideline No. 41). The launch Loran system used was an Internav LC204.

Loran-C available in the area is the 9990 chain, using the Y and Z secondary-station lines of position. Loran-C control was compared to Mini-Ranger control by converting Mini-Ranger rates to a geographic position, then plottng the G.P. along with the associated Loran rates on chart 16315 (1987 edition). A sample of twenty comparisons were made. A distinct difference in the offset of Loran-C positions from Mini-Ranger positions was observed between comparisons made in Kulukak Bay and those made offshore of the bay. Loran-C was offset an average value of 0.09 nautical miles/bearing

170° T from Mini-Ranger positions in Kulukak Bay. Loran-C was offset an average value of 0.10 nautical miles/bearing 200° T from Mini-Ranger positions offshore of Kulukak Bay.

Q. Recommendations ✓

The hydrographer considers field work on this survey to be complete. No construction or dredging is planned in this area. concur

R. Automated Data Processing ✓

Data acquisition and processing were accomplished with a PDP 8/e Hydroplot computer system, using the standard programs.

Computer Programs Used For Data Processing

NUMBER	DESCRIPTION	VERSION
RK 112	HYPERBOLIC,R/R HYDROPLOT	3/01/86
RK 116	RANGE-AZIMUTH RTS	3/01/86
RK 201	GRID, SIGNAL, AND LATTICE PLOT	4/18/75
RK 221	COMB R/R & HYPER PLOT NON-RT	7/25/86
RK 226	RANGE-AZ POSN & SND PLOT NON-RT	7/25/86
RK 300	UTILITY COMPUTATIONS	10/21/80
RA 362	RK 330 AND AM 602 COMBINED	8/20/84
RK 407	GEODETIC INVERSE/DIRECT COMP	9/25/78
RK 409	GEODETIC UTILITY PACKAGE	9/20/78
AM 500	PREDICTED TIDE GENERATOR	11/10/72
RK 530	LAYER CORRECTIONS FOR VELOCITY	5/10/76
RK 561	H/R GEODETIC CALIBRATION	12/01/82
RK 562	THEODOLITE CALIBRATION	9/05/84
AM 602	ELINORE - LINE ORIENTED EDITOR	12/08/82
RK 606	TAPE DUPLICATOR	8/22/74
AM 607	SELF-STARTING BINARY LOADER	8/10/80
RK 610	BINARY TAPE DUPLICATOR	1/31/85
RK 900	PLOT TEST TAPE GENERATOR FOR AM902	5/07/76
PM 901	CORE CHECK	3/01/72
AM 902	REAL TIME CHECKOUT	11/10/72
DA 903	DIAGNOSTIC-INSTRUCTION TIMER	2/27/76
RK 905	HYDROPLOT CONTROLLER CHECKOUT	3/18/81
RK 935	HYDROPLOT HARDWARE TESTS	3/15/82
RK 950	HARDWARE TESTS (DOCUMENTATION ONLY)	6/02/75

In plotting the final field sheet, overprints were removed by various techniques. The pen was manually lifted and special corrector tapes were made to edit out individual soundings. These tapes have not been submitted. Some

soundings, especially least depths, have been transferred by hand to the final field sheet from NSP data.

Fix Numbers

A standard series of fix numbers was assigned to each survey vessel.

Vessel Number	Assigned Fix Numbers	Survey Fixes
2123	3000-3999	3000-4113
		2000-2112
2124	4000-4999	4000-4913
2125	5000-5999	5000-5485
2126	6000-6999	6000-7207
2129	9000-9999	9000-9034

Vessel 2123 exceeded the assigned series and used fixes 2000-2112. Vessel 2126 also exceeded the assigned series and used fixes 7000-7207.

Duplicate Fix Numbers

The following duplicate fix numbers were recorded during this survey.

Vessel Number	Day Number	Duplicate Fix Number
2123	154	3454
2123	156	3853
2123	156	3857
2123	158	4000-4113*
2124	154	4149
2124	155	4398
2124	157	4406-4529
2124	159	4674
2124	159	4690

*On DN 158 vesno 2123 exceeded its range of fix numbers and duplicated fix numbers reserved for vessel 2124.

S. Referral to Reports

Several supplementary reports contain additional information relevant to this survey.

Supplemental Reports

TITLE	DATE SENT TO MARINE CENTER
Horizontal Control Report, OPR-R184-RA-87	October, 1987
Electronic Control Report, OPR-R184-RA-87	October, 1987
Marine Mammal Report, RP-12-87	October, 1987
Coast Pilot Report, OPR-R184-RA-87	October, 1987
Current Report, OPR-R184-RA-87	October, 1987

Respectfully Submitted;

George E. White

George E. White
LT, NOAA

FIELD TIDE NOTE
OPR-R184-RA-87

Field-tide reduction of soundings was based on predicted tides computed with program AM 500, Predicted Tide Generator, by using the predicted tides for Black Rock, Walrus Islands, Bristol Bay tide station (946-5182) provided by the Sea and Lake Levels branch of the National Ocean Service (attached). The correctors that were used for Kulukak Bay are as follows:

	Time Correction		Height
	High Water	Low Water	Ratio
N of 58° 50.0'N	-0hr 25min	-0hr 25min	x1.13
S of 58° 50.0'N	-0hr 15min	-0hr 15min	x1.06

Tide station information follows:

KULUKAK POINT, ALASKA (946-5265)

Geographic Locale- Lat: 58° 50.4' N, Long: 159° 38.8' W.

Installation Date- May 31, 1987 (This was a reinstallation of a gage operated for 93 days in 1986, and 74 days in the 1985 field season.)

Removal Date- June 18, 1987

Gage Type- Bristol Bubbler (S/N 62A-092). There was a backup Bristol Bubbler, (S/N 64A-11028), which was installed at the same time. The gages were secured to a rock face approximately 15 feet above the high water line.

Staff- The staff was constructed from aluminum angle iron with 4-inch webs. It was secured to a rock face 30 feet south of bench mark 5265 D with lag bolts. The scale was standard vitrified mounted to the staff. The staff stop was a stainless steel hex machine bolt located at 21.000 feet on the staff.

Staff Zero/Gage Zero- For S/N 62A-092: 5.0 ± 0.1 feet
For S/N 64A-11028: 3.3 ± 0.1 feet

Gage Time- Universal Coordinated Time

Bench Marks- Five bench marks were connected by the initial and final leveling. They are: 5265 A 1985, 5265 B 1985, 5265 C 1985, 5265 D 1985, 5265 E 1985.

Levels- Installation levels were run on May 31, 1987, connecting the five bench marks mentioned above. Closing levels were run on June 18, 1987. The installation and closing elevations agreed to within 0.011 m (0.036 feet).

Marigram Records- The marigram records are continuous from 6/2/87 at 1924 Z, when the three hour observations began, until 6/19/87 at 2230 Z when both gages were removed.

Station Problems- None

MASTER STATION LIST
OPR-R184-RA-87, TOGIAK BAY, ALASKA

VERSION 7/20/87

115 3 58 50 40451 159 45 27359 250 0224 000000
/METERVIK

116 3 58 56 17184 159 42 17278 250 0292 000000
/KULUKAK

117 3 58 50 18601 159 31 07492 250 0325 000000
/DRY BAY

118 4 58 50 26333 159 38 51869 250 0021 000000
/KULU

220 3 58 49 45747 159 47 52921 250 0012 000000
/METERVIK AZ

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

NOAA Ship RAINIER S-221
1801 Fairview Ave. East
Seattle, WA 98102

July 22, 1987

Commanding Officer
Seventeenth Coast Guard District
P.O. Box 3-5000
Juneau, AK 99802

RE: Notice to Mariners

REF: My Radio Message P220050Z JUL 87

Dear Sir:

We request the following be published in the Local Notice to Mariners for the Seventeenth District:

The NOAA ship RAINIER of the National Ocean Service is conducting charting operations in Togiak Bay and has completed charting operations in Kulukak Bay. The following dangers to navigation have been discovered (all depths and heights reduced to MLLW using predicted tides):

A. 3.3 FATHOM SHOAL AT 58/50/55.4N 160/08/53.6W ABOUT 0.8 NAUTICAL MILE SOUTH OF THE HEADLAND BETWEEN NUNAVACHAK AND UNGALIKTHLUK BAYS.

B. 2.5 FATHOM SHOAL AT 58/51/22.0N 160/08/45.0W ABOUT 0.4 NAUTICAL MILE SOUTH OF THE HEADLAND BETWEEN NUNAVACHAK AND UNGALIKTHLUK BAYS.

C. ROCK BARING 1 FOOT AT MLLW AT 58/53/11.4N 160/14/45.6W ABOUT 0.2 NAUTICAL MILE SOUTH-SOUTHWEST OF ROCKY POINT.

D. 1.4 FATHOM SHOAL AT 58/49/41.5N 159/36/37.1W ABOUT 1.4 NAUTICAL MILES EAST-SOUTHEAST OF KULUKAK POINT AND ABOUT 0.4 NAUTICAL MILE FROM CLOSEST POINT OF LAND TO NORTHEAST.

E. ROCK BARING 2 FEET AT MLLW AT 58/49/45.28N 159/45/17.24W LORAN C RATES CHAIN 9990 Y32599.99 Z45972.70 ABOUT 0.3 NAUTICAL MILE SOUTHEAST OF EASTERN POINT OF METERVIK BAY ENTRANCE.

1.9 FATHOM SHOAL AT 58/49/40.1N 159/45/37.0W ABOUT 0.3 NAUTICAL MILE SOUTH-SOUTHEAST OF EASTERN POINT OF METERVIK BAY ENTRANCE.

0.6 FATHOM SHOAL AT 58/49/43.8N 159/46/08.3W ABOUT 0.3 NAUTICAL MILE SOUTHWEST OF EASTERN POINT OF METERVIK BAY ENTRANCE.

F. 2.8 FATHOM SHOAL AT 58/47/00.5N 159/49/39.4W ABOUT 2.7 NAUTICAL MILES EAST-NORTHEAST OF RIGHT HAND POINT AND ABOUT 0.5 NAUTICAL MILE FROM CLOSEST POINT OF LAND TO NORTH.

G. 3.6 FATHOM SHOAL AT 58/46/38.2N 159/50/15.0W ABOUT 2.3 NAUTICAL MILES EAST-NORTHEAST OF RIGHT HAND POINT AND ABOUT 0.6 NAUTICAL MILE FROM CLOSEST POINT OF LAND TO WEST-NORTHWEST.

The following NOS charts are affected:

16315	3RD ED FEB28/87	1:100000	NAD27 DATUM
16011	31ST ED JUN29/86	1:1023188	NAD27 DATUM
16006	29TH ED AUG23/86	1:1534076	NAD27 DATUM.

This is advance information subject of office review.

Sincerely,

Carl W. Fisher

Carl W. Fisher
Captain, NOAA
Commanding Officer

Enclosure
cc:DMAHTC
N/CG222
N/MOP

3rd Ed., Feb. 28/87

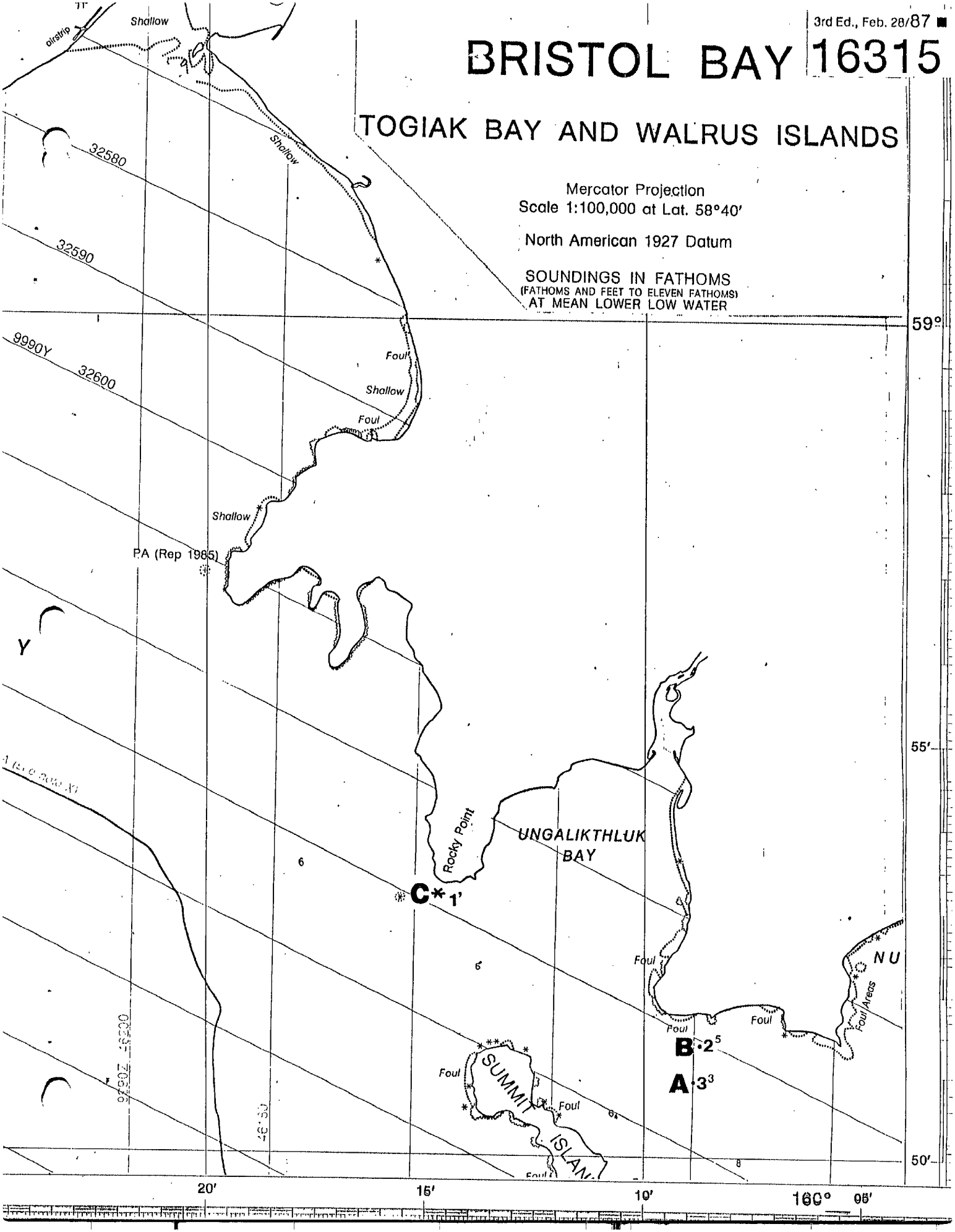
BRISTOL BAY 16315

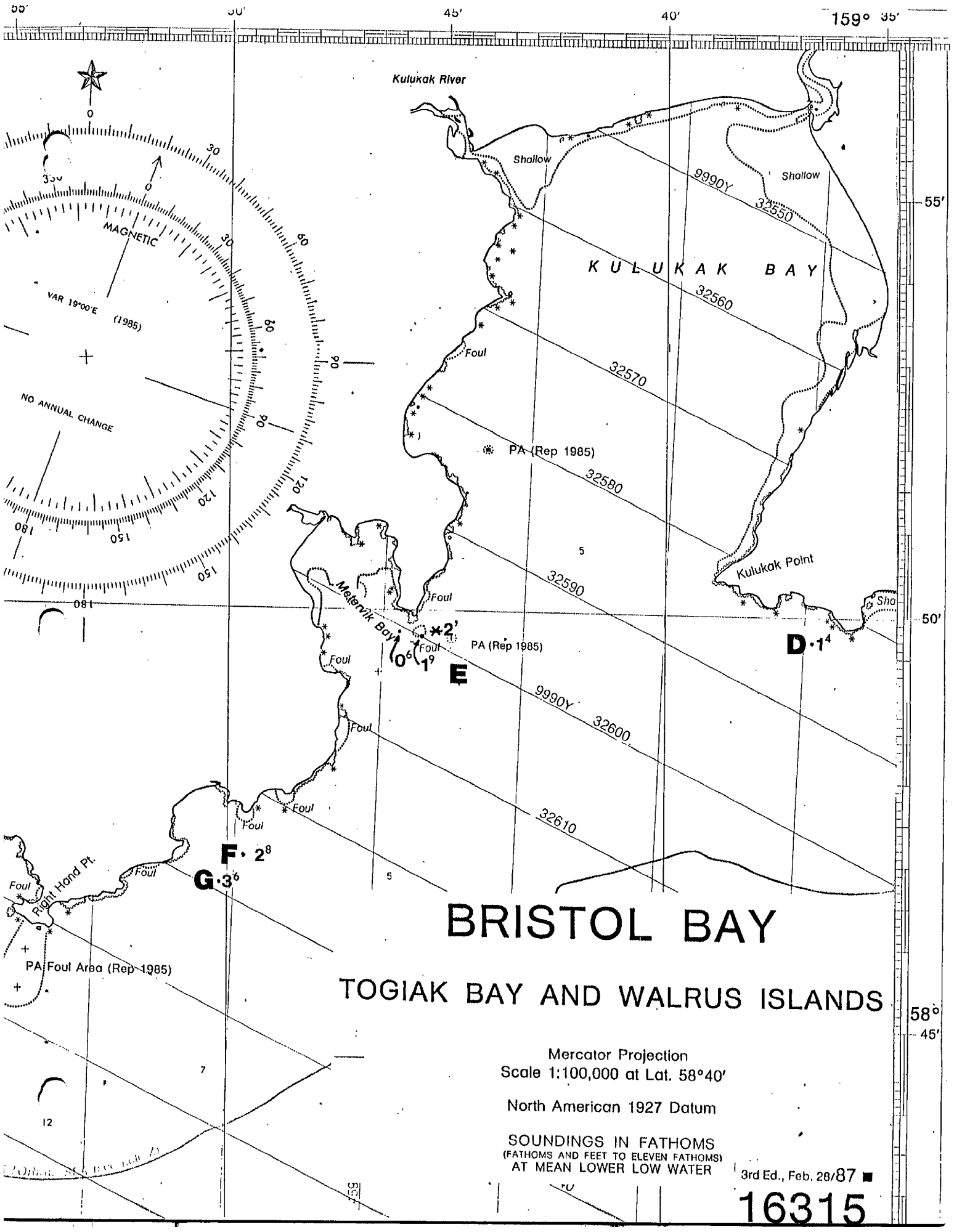
TOGIAK BAY AND WALRUS ISLANDS

Mercator Projection
Scale 1:100,000 at Lat. 58°40'

North American 1927 Datum

SOUNDINGS IN FATHOMS
(FATHOMS AND FEET TO ELEVEN FATHOMS)
AT MEAN LOWER LOW WATER





BRISTOL BAY

TOGIAK BAY AND WALRUS ISLANDS

Mercator Projection
Scale 1:100,000 at Lat. 58°40'

North American 1927 Datum

SOUNDINGS IN FATHOMS
(FATHOMS AND FEET TO ELEVEN FATHOMS)
AT MEAN LOWER LOW WATER

3rd Ed., Feb. 28/87 ■
16315

PTTUZYUW RUHPTEF0219 2030050-UUUU--RUHPSUU.
ZNR UUUUU
R 220050Z JUL 87
FM NOAAS RAINIER
TO CCGDSEVENTEEN JUNEAU AK
INFO NOAAMOP SEATTLE WA
DMAHTC WASHINGTON DC //NVS//
ACCT CM-VCAA
BT
UNCLAS

CO CWF
XO AWB
Ford CWS

NOJ 04237 22 Jul 87
MCA 4332

REQUEST THE FOLLOWING BE PUBLISHED IN THE LOCAL NOTICE TO MARINERS FOR THE SEVENTEENTH DISTRICT:
//THE NOAA SHIP RAINIER OF THE NATIONAL OCEAN SERVICE IS CONDUCTING CHARTING OPERATIONS IN TOGIAK BAY AND HAS COMPLETED CHARTING OPERATIONS IN KULUKAK BAY. THE FOLLOWING DANGERS TO NAVIGATION HAVE BEEN DISCOVERED (ALL DEPTHS AND HEIGHTS REDUCED TO MLLW USING PREDICTED TIDES):

A. 3.3 FATHOM SHOAL AT 58/50/55.4N 160/08/53.6W ABOUT 0.8 NAUTICAL MILE SOUTH OF THE HEADLAND BETWEEN NUNAVACHAK AND UNGALIKTHLUK BAYS.
B. 2.5 FATHOM SHOAL AT 58/51/22.0N 160/08/45.0W ABOUT 0.4 NAUTICAL MILE SOUTH OF THE HEADLAND BETWEEN NUNAVACHAK AND UNGALIKTHLUK BAYS.
C. ROCK BARING 1 FOOT AT MLLW AT 58/53/11.4N 160/14/45.6W ABOUT 0.2 NAUTICAL MILE SOUTH-SOUTHWEST OF ROCKY POINT.
D. 1.4 FATHOM SHOAL AT 58/49/41.5N 159/36/37.1W ABOUT 1.4 NAUTICAL MILES EAST-SOUTHEAST OF KULUKAK POINT AND ABOUT 0.4 NAUTICAL MILE FROM CLOSEST POINT OF LAND TO NORTHEAST.
E. ROCK BARING 2 FEET AT MLLW AT 58/49/45.28N 159/45/17.24W LORAN C RATES CHAIN 9990 Y32599.99 Z45972.70 ABOUT 0.3 NAUTICAL MILE SOUTHEAST OF EASTERN POINT OF METERVIK BAY ENTRANCE.
1.9 FATHOM SHOAL AT 58/49/40.1N 159/45/37.0W ABOUT 0.3 NAUTICAL MILE SOUTH-SOUTHEAST OF EASTERN POINT OF METERVIK BAY ENTRANCE.
0.6 FATHOM SHOAL AT 58/49/43.8N 159/46/08.3W ABOUT 0.3 NAUTICAL MILE SOUTHWEST OF EASTERN POINT OF METERVIK BAY ENTRANCE.
F. 2.8 FATHOM SHOAL AT 58/47/00.5N 159/49/39.4W ABOUT 2.7 NAUTICAL MILES EAST-NORTHEAST OF RIGHT HAND POINT AND ABOUT 0.5 NAUTICAL MILE FROM CLOSEST POINT OF LAND TO NORTH.
G. 3.6 FATHOM SHOAL AT 58/46/38.2N 159/50/15.0W ABOUT 2.3 NAUTICAL MILES EAST-NORTHEAST OF RIGHT HAND POINT AND ABOUT 0.6 NAUTICAL MILE FROM CLOSEST POINT OF LAND TO WEST-NORTHWEST.

THE FOLLOWING NOS CHARTS ARE AFFECTED:
16315 3RD ED FEB28/87 1:100000 NAD27 DATUM
16011 31ST ED JUN29/85 1:1023188 NAD27 DATUM
16006 29TH ED AUG23/86 1:1534076 NAD27 DATUM.
THIS IS ADVANCE INFORMATION SUBJECT TO OFFICE REVIEW.//
A LETTER WITH ATTACHED CHARTLET IS BEING MAILED TO YOU TO CONFIRM THIS MESSAGE.
BT
#0219

NNNN

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

NOAA Ship RAINIER S-221
1801 Fairview Ave. East
Seattle, WA 98102-3767

July 22, 1987

Director
DMAHTC
6500 Brooks Lane
Washington, DC 20315-0030

RE: Notice to Mariners

REF: Radio Messages P220050Z JUL 87

Dear Sir:

In the last month, during surveys in northern Bristol Bay, Alaska, the NOAA ship RAINIER has discovered nine dangers to navigation. These have been reported to the Seventeenth Coast Guard District for publication in the Local Notice to Mariners. A copy of the report describing these dangers is attached.

Sincerely,

Carl W. Fisher

Carl W. Fisher
Captain, NOAA
Commanding Officer

Enclosure

APPROVAL SHEET

Descriptive Report to Accompany

Hydrographic Survey

RA-20-1-87

H-10244

Standard procedures were followed in accordance with the Hydrographic Manual, Third Edition; Hydrographic Survey Guidelines; and PMC OPORDER in producing this survey. The data were examined daily during acquisition and processing phases of the survey.

The field sheet and accompanying records have been examined by me, are considered complete and adequate for charting purposes, and are approved.

Carl W. Fisher

Carl W. Fisher
Captain, NOAA
Commanding Officer

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

TIDE NOTE FOR HYDROGRAPHIC SHEET

DATE: September 2, 1987

Marine Center: Pacific

OPR: R184

Hydrographic Sheet: H-10244

Locality: Kulukak Bay and Vicinity, Bristol Bay, Alaska

Time Period: June 1 - 19, 1987

Tide Station Used: 946-5265 Kulukak Point, AK

Plane of Reference (Mean Lower Low Water): 8.72 ft.

Height of Mean High Water Above Plane of Reference: 11.4 ft.

Remarks: Recommended Zoning:

1. Zone Direct

James R. Hubbard
Chief, Tidal Datum Quality
Assurance Section

NOAA FORM 76-155 (11-72)

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

GEOGRAPHIC NAMES

SURVEY NUMBER

H-10244

Name on Survey
ALASKA, BRISTOL BAY
KULUKAK BAY & VICINITY

	A ON CHART NO. 16011, 16315	B ON PREVIOUS SURVEY NO.	C ON U.S. QUADRANGLE MAPS	D FROM LOCAL INFORMATION	E ON LOCAL MAPS	F P.O. GUIDE OR MAP	G RAND MCNALLY ATLAS	H U.S. LIGHT LIST	K TP-01188	
ALASKA (TITLE)										1
BRISTOL BAY	X								X	2
KANIK RIVER									X	3
KULUKAK BAY	X								X	4
KULUKAK POINT	X								X	5
KULUKAK RIVER	X								X	6
METERVIK BAY	X								X	7
										8
										9
										10
										11
										12
										13
										14
										15
										16
										17
				Approved:						18
										19
				Charles L. Harrington						20
				Chief Geographer - N/CG275						21
				FEB 8 1988						22
										23
										24
										25

NOAA FORM 76-155 SUPERSEDES C&GS 197

UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL OCEAN SERVICE
Pacific Marine Center
1801 Fairview Avenue East
Seattle, Washington 98102-3767

FILE COPY

SEP 4 1987 N/MOP21x2/MM

TO: Commanding Officer
NOAA Ship RAINIER

FROM: for N/MOP - Robert L. Sandquist Sigmund R. Petersen

SUBJECT: Preprocessing Examination of H-10244, Alaska, Togiak Bay, Kulukak Bay and Vicinity

Hydrographic survey H-10244 has been reviewed in accordance with Hydrographic Survey Guideline No. 15, and the Preprocessing Examination Critique for this survey is attached. Survey H-10244 is accepted for Pacific Marine Center processing.

Horizontal control stations and several detached positions (DPs) appear to be erroneously plotted on the final field sheets. Differences of up to 70m (3.5mm at survey scale) in position between final field sheets and a Nautical Chart Branch plot are evident. The hydrographer was notified of the discrepancies and to date, the source of the discrepancies has not been determined. A stable base plot using data tape values for stations and DPs was generated by Nautical Chart Branch and will be sent to Rockville in order to update the advance copies of the final field sheets which were forwarded on July 31, 1987.

The Preprocessing Examination Critique is designed to provide information which will be useful to the Command for maintaining the quality of future hydrographic surveys. I encourage you to use this information constructively. Your comments on specific critique items are welcome.

Attachments

cc: N/MOP2x1
N/MOP21x2
N/MOP211
N/CG2

UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL OCEAN SERVICE
Pacific Marine Center
Nautical Chart Branch
7600 Sand Point Way NE
Seattle, Washington 98115-0070

September 1, 1987 N/MOP21x2/MM

TO: N/MOP - Robert L. Sandquist

FROM: N/MOP 21 - Thomas W. Richards

SUBJECT: Preprocessing Examination for H-10244

I. SURVEY INFORMATION

A. Field No. RA-20-1-87 Registry No. H-10244

B. State: Alaska

General Locality: Togiak Bay

Sublocality: Kulukak Bay and Vicinity

C. Project Instructions: OPR-R184-RA-87

Original dated: March 6, 1987

Change No. 1 dated: March 20, 1987
Change No. 2 dated: June 2, 1987

D. Dates:

Field Work Commenced: May 31, 1987
Field Work Completed: June 19, 1987

plus 6 weeks: July 31, 1987

Data received at Marine Center: August 4, 1987

plus 1 month: September 4, 1987

Examination critique transmitted to field September 4, 1987

Target for completion of Marine Center processing March 4, 1988

II. PREPROCESSING EXAMINATION CRITIQUE

Hydrographic survey H-10244 was performed by personnel of the NOAA Ship RAINIER, Captain Carl W. Fisher, Commanding Officer. The following personnel supervised portions of the data acquisition: Lieutenant Commander Schomaker, Lieutenant White, Ensign Damm, Ensign Poston, Ensign O'Mara, Ensign Hill, Ensign Meis and Ensign Larsen.

In accordance with the Preprocessing Examination System set forth in Hydrographic Survey Guideline (HSG) No. 15, Section III, the following items are brought to your attention:

A. Danger to Navigation Report:

RAINIER reported six dangers to navigation within the limits of H-10244.

No additional dangers to navigation were identified during the preprocessing examination.

B. Compliance with Instructions:

Survey H-10244 generally complies with the Project Instructions. The hydrographer was unable to comply with AWOIS item investigations requiring wire drag or dive operations due to water turbidity and shallow depths (0-2fms). It appears the hydrographer did conduct item investigations as thoroughly as conditions and equipment allowed.

C. Final Field Sheets:

Control stations and approximately 15 DPs on the final field sheets appear to be plotted 40m-70m south of the positions generated from data tape information. Geographic positions of control stations are correct on the signal tape. It appears the errors may originate from positions transferred manually to the final field sheet or from an intermediate plot with an inconsistent grid (see Attachment A). Soundings appear to be plotted correctly.

There is a disagreement of up to 0.5fm between mainscheme lines and mainscheme splits in one area of the survey (see Attachment B). The hydrographer states that all visible wave action was not removed during scanning the echograms. Echograms should be scanned to eliminate visible wave action (HM 4.9.8.1). Examination of echograms does not show wave action to be great enough to account for the large discrepancy. Hydrographic position control for the sounding lines does not appear to be suspect; the disagreement is likely to have been caused by poor predicted tides in the area.

Bottom sample spacing on the final field sheets was approximately 9cm. Spacing of bottom samples for inshore surveys should not exceed 6cm [HM 1.6.3].

D. Descriptive Report:

Section H (Shoreline) states 2 manuscript rocks were disproved. One of the rocks still appears on the final field sheet at latitude 58°55'54"N, longitude 159°42'07.5"W (see Attachment C). Disproved items should not appear on final field sheet (OPORDER Section 3.6.2).

E. Echograms:

An incorrect depth of an inserted sounding was noted on the echogram for vessel number 2124, DN 161. The actual depth of the shoal is 2.0fms; the insert on the echogram and the unchecked corrector tape listing state 2.2fms. A notation for the insert on the raw data printout had been corrected from 2.2fms to 2.0 fms (see Attachment D). It is probable similar errors and inconsistencies exist within the survey data. Echograms and tape listings should be carefully reviewed to ensure changes and additions to the raw data are correct and complete [HM 4.8.1, 4.9.8.1].

F. Sounding Volumes and/or Raw Data Printouts:

Some raw data printouts contained "development" notations but didn't state what feature was being developed. Additional raw data printout notations stating the type of development (shoal, deep, etc.) would greatly aid in processing survey data [HM 4.8.3.10].

G. Sounding Correctors:

An incorrect RPM value was determined from the settlement & squat graph for VESNO 2124 (see Attachment E). The TC/TI tape listing for this sounding vessel should appear as shown in Attachment F .

K. Special and/or Ancillary Reports:

All information normally found in the Corrections to Echo Soundings Report was included within the Descriptive Report. The Electronic Control Report was not available for consideration in the preprocessing examination. The Horizontal Control Report was not reviewed.

L. Automated Data Check:

The three-digit control code within the day record on one master tape was incorrectly entered as "041" which is a code for range-range positioning in lanes and measured to hundredths of lanes. The code for Mini-Ranger, in whole meters, is "042" [Program RK211 documentation].

Five range-azimuth master data tapes contained an incorrect three-digit control code of "111" in the day record. When the sounding vessel is navigating a range arc, the control code should appear as "110" on the master tape [Program RK216 documentation].

N. Survey Acceptance:

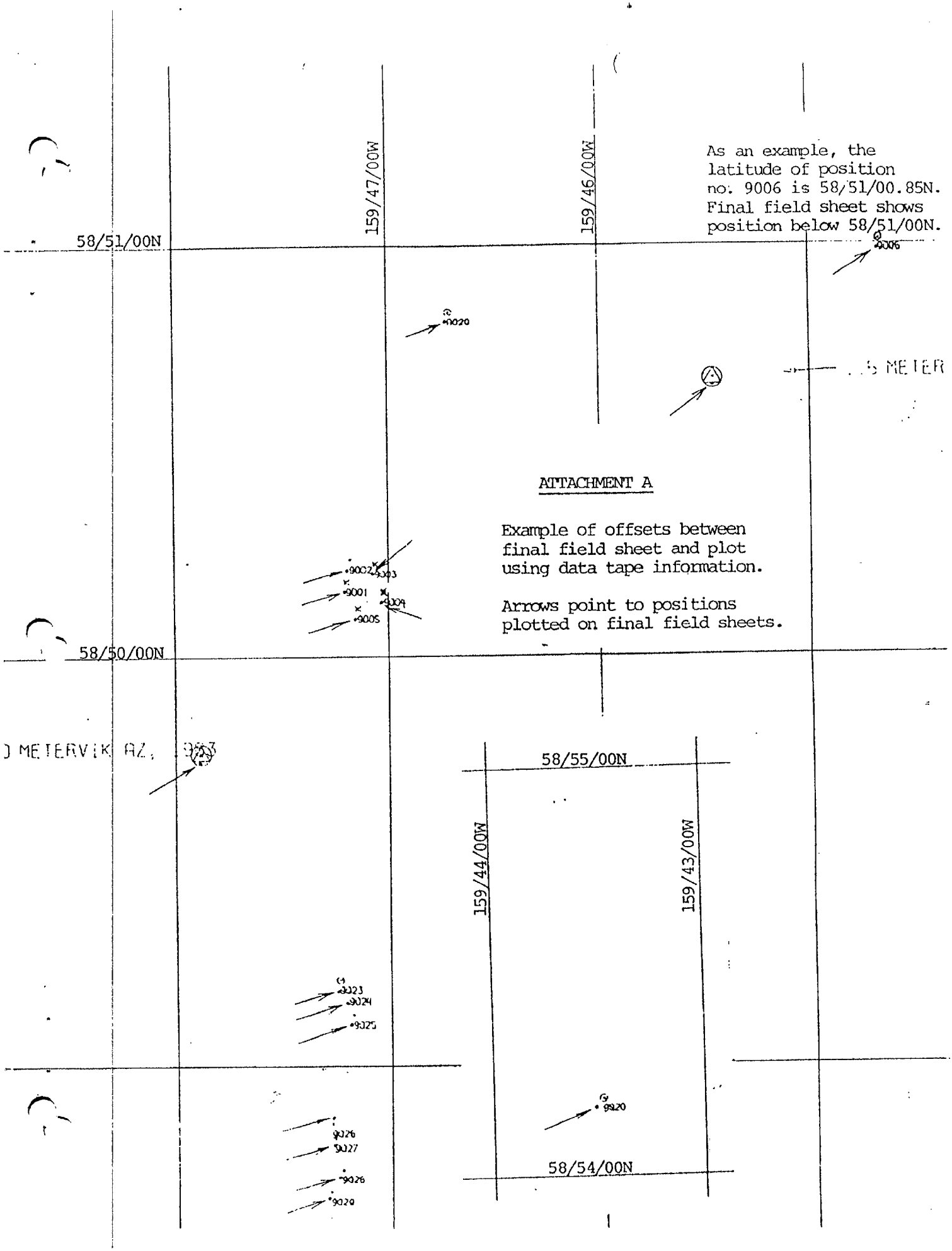
The preprocessing examination for H-10244 was conducted under the time constraints of HSG 15. All comments contained herein are based on a spot check of the data, and it is possible that some problem areas have not been addressed.

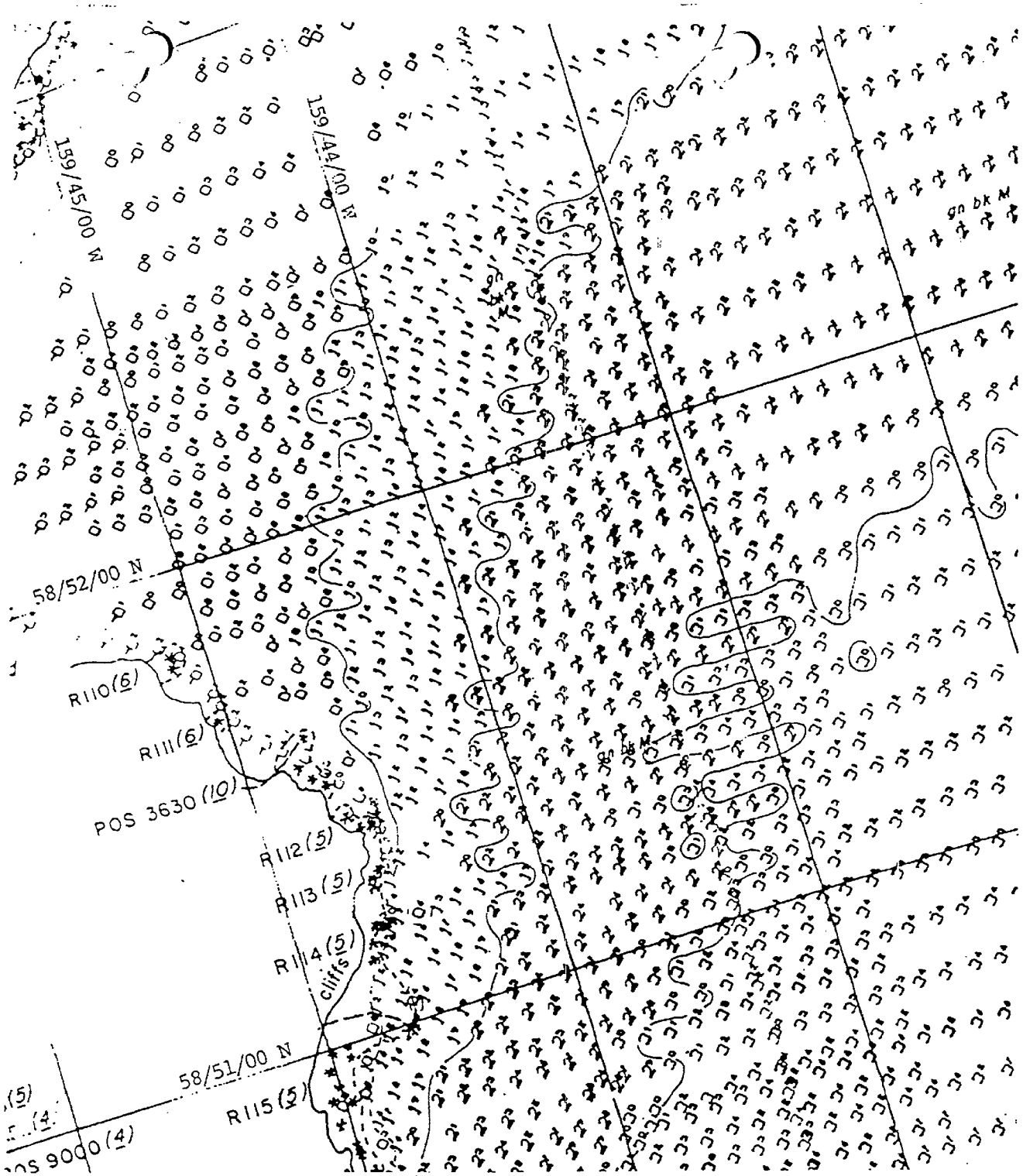
Except for the items noted in the critique, survey H-10244 is in compliance with the Project Instructions. I recommend that H-10244 be accepted for Nautical Chart Branch processing.

Prepared by:

Marlene Mozgala

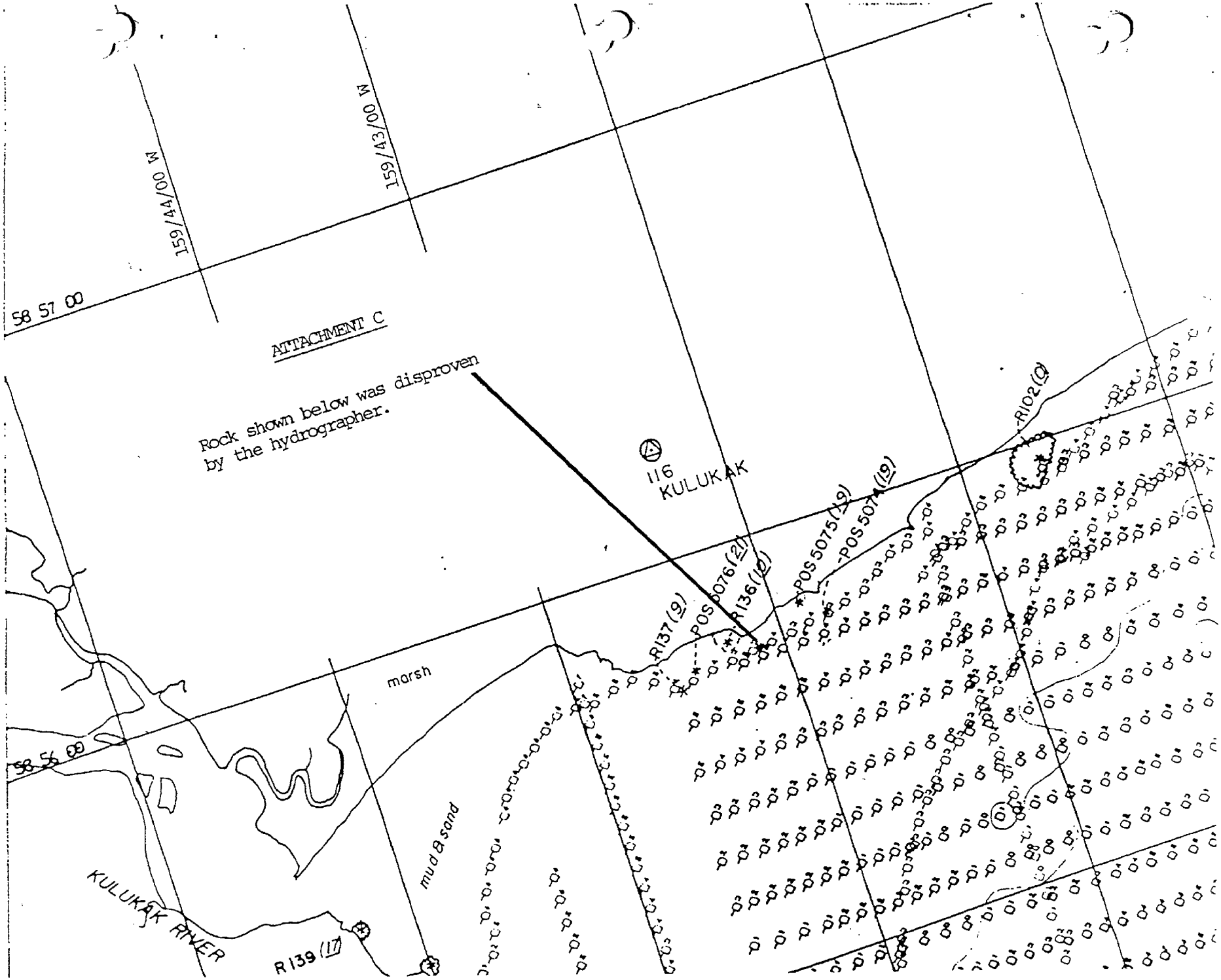
Marlene Mozgala

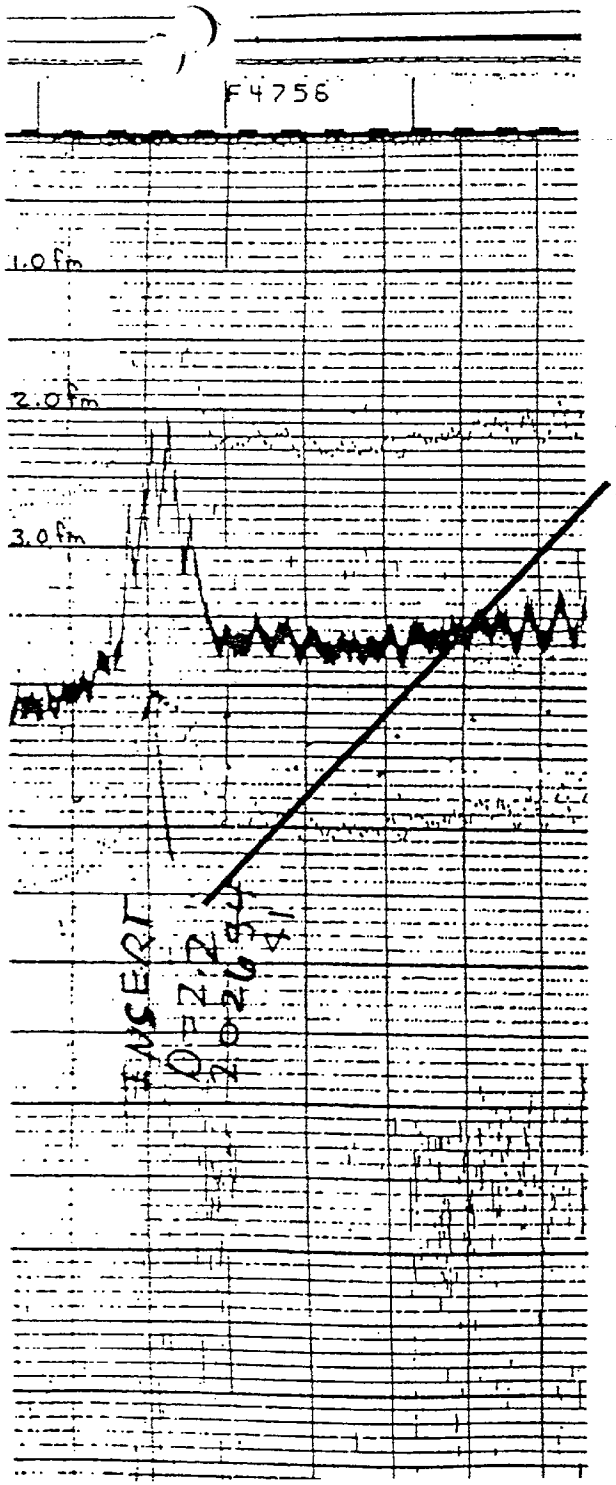

As an example, the latitude of position no. 9006 is 58/51/00.85N. Final field sheet shows position below 58/51/00N.
58/51/00N
159/47/00W
159/46/00W
9006
9020
ATTACHMENT A
Example of offsets between final field sheet and plot using data tape information.
Arrows point to positions plotted on final field sheets.
9002
9003
9001
9004
9005
58/50/00N
58/55/00N
159/44/00W
159/43/00W
9023
9024
9025
9020
9026
9027
9028
9029
58/54/00N



ATTACHMENT B

Irregularities in depth curves between mainscheme lines and mainscheme splits are shown here.


159/44/00 W
159/43/00 W
58 57 00
ATTACHMENT C
Rock shown below was disproven by the hydrographer.
116
KULUKAK
R102 (9)
POS 5075 (19)
POS 5074 (19)
POS 5076 (21)
R136 (10)
R137 (9)
marsh
58 56 00
mud & sand
KULUKAK RIVER
R139 (17)



ATTACHMENT D

Corrector tape does not reflect the change to the master tape printout for the least depth of the inserted peak.

MASTER PRINTOUT

```
NAV DOWN

202635 00025 .
NAV UP 202694 2.2 2.0
202658 00036 04756 001998 :
202721 00036-       002036
202744 00036.       002088 :
202807 00035'       002146 :
202830 00034        002210 :
                    34
202853 00034        002268 :
202916 00032 04757  002335 :
202939 00031        002397 :
203002 00029        002468 :
203025 00027        002540 :
203048 00023        002621 :
203103 00022 04758  002665 :
203138 00020        002718 :
203213 00020 4759   002769 :
203248 00017        002898 :
*B

NAV DOWN
```

CORRECTOR TAPE PRINTOUT

```
001 202417 3 0003 2124 141 000(illegible)
002 202417 5 0021
003 202417 7 0001
004 202454 1 0028
005 202435 1 0025
006 202641 1 0022
007 202830 1 0034
008 203248 4 2000
009 203350 4 3000
010 203701 3 0018
011 203736 3 0019
012 203805 3 0020
013 203828 3 0021
014 203851 3 0024
015 203914 3 0028
016 203937 3 0031
017 204132 3 0037
018 204241 3 0040
019 204350 3 0042
020 205308 3 0045
021 205331 3 0044
022 205417 3 0039
023 205440 3 0034
024 210417 3 0054
025 211057 3 0058
026 211830 1 9999
```

SETTLEMENT AND SQUAT WORKSHEET

vessel: ~~2125~~ 2124 locale: King Salmon Tide Station

start time(local): ~~1415~~ 1425 end time(local): 1430

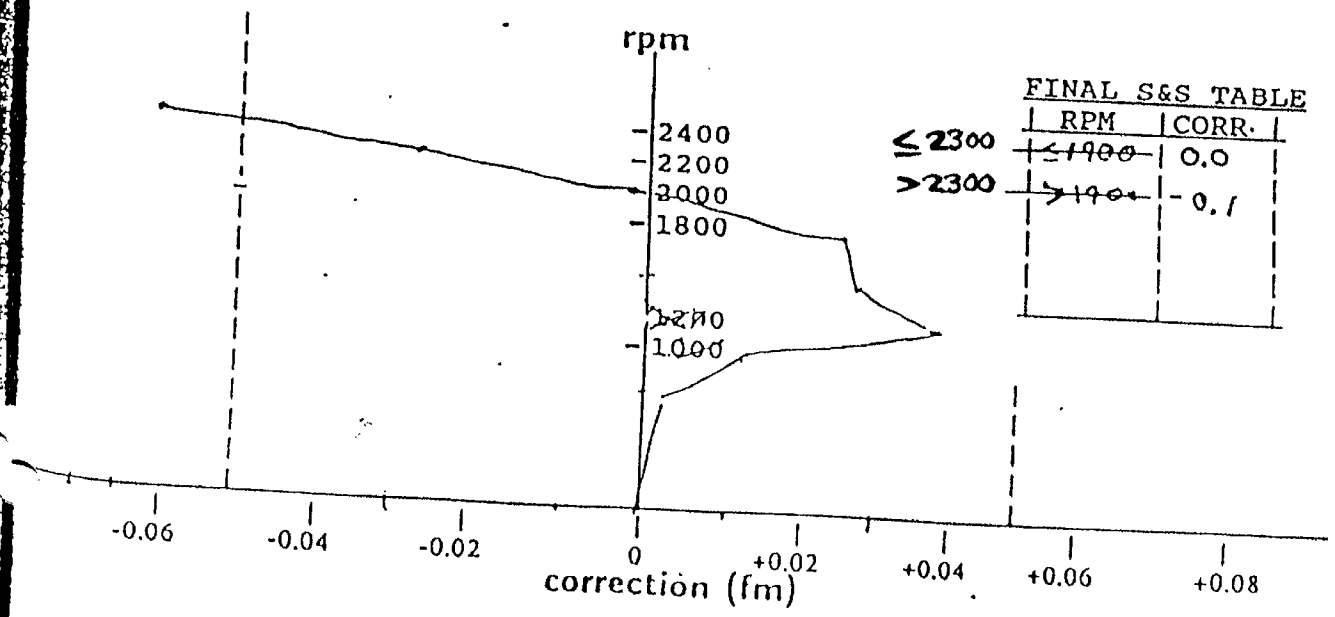
start time(GMT): ~~2215~~ 2225 end time(GMT): 2230

date (local): 4/29/87 Day Number (local): 119

pass #	DIW	700	1000	1200	1500	1800	2000	2200	2400
1	~~4.55~~ 4.50	4.40					4.25	4.10	3.80
2	4.40	4.48					4.25	4.00	3.70
3	4.42	4.47					4.21	4.05	3.75
4	4.35	4.51					4.20	4.10	3.80
5	4.48	4.40					4.30	4.00	3.70
average height	4.43	4.45					4.24	4.05	3.75
tide staff	31.4	31.4					31.6	31.6	31.7
normal-ized tide	0	0					+0.2	+0.2	+0.3
normal-ized height	4.43	4.45	4.51	4.65 ~~4.45~~	4.60 4.40	4.59 ~~4.19~~	4.44 ~~4.04~~	4.25 ~~3.85~~	4.05 ~~3.45~~
correc-tion-ft	0	+0.02	+0.08	+0.23 ~~+0.02~~	+0.17 ~~-.003~~	+0.16 ~~-0.24~~	+0.01 ~~-0.39~~	-0.18 ~~-0.59~~	-0.38 ~~-0.98~~
correc-tion-fm	0	+.003	+.013	+0.038 ~~+.003~~	+0.028 ~~-.005~~	+0.027 ~~-.040~~	-0.002 ~~-.065~~	-0.03 ~~-.113~~	-0.063 ~~-.163~~

ATTACHMENT E

Final S&S Table at bottom of page shows corrected values for rpms.



FINAL S&S TABLE

	RPM	CORR.
≤2300	~~≤1900~~	0.0
>2300	~~>1900~~	-0.1

TC/TI TAPE LISTING

RA 20-1-07

(H-10211)

LAUNCH-2121(RA-1)

ATTACHMENT F

Error in settlement and squat graph for VESNO 2124 caused an incorrect draft value to be added to the TC/TI tape listing.

Line to be deleted is crossed out (below).

```
L
010227 0 0002 0001 154 212400 000000
015638 0 0003
029558 0 0002
024145 0 0003
025304 0 0002
033242 0 0003
200034 0 0002
200905 0 0003
204631 0 0002
212136 0 0003
212818 0 0002
231146 0 0003
233325 0 0002
003826 0 0003 0001 155 000000 000000
005953 0 0002
011912 0 0003
012453 0 0002
020656 0 0003
022210 0 0002
065456 0 0003
21[illegible]45 0 0002
215[illegible]31 0 0003
215541 0 0002
222221 0 0003
222625 0 0002
224657 0 0003
011858 0 0002 0001 157 000000 000000
012631 0 0003
013652 0 0002
015108 0 0003
020243 0 0002
022116 0 0003
024321 0 0002
025310 0 0003
030944 0 0002
031832 0 0003
~~202839 0 0002 0001 159 000000 000000~~
~~191131 0 0003 0001 161 000000 000000~~
211043 0 0002 0001 161 000000 000000
220630 0 0003
232104 0 0000 0000 169 000000 000000
235736 0 0003 0001 169 000000 000000
000320 0 0000 0000 170 000000 000000
000500 0 0000
```

NOAA FORM 77-27(H) (9-83) | U.S. DEPARTMENT OF COMMERCE | REGISTRY NUMBER H-10244

HYDROGRAPHIC SURVEY STATISTICS

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

RECORD DESCRIPTION	AMOUNT	RECORD DESCRIPTION	AMOUNT
SMOOTH SHEET	1	SMOOTH OVERLAYS: POS., ARC, EXCESS	7
DESCRIPTIVE REPORT	1	FIELD SHEETS AND OTHER OVERLAYS	5

DESCRIPTION	DEPTH/POS RECORDS	HORIZ. CONT. RECORDS	SONAR-GRAMS	PRINTOUTS	ABSTRACTS/ SOURCE DOCUMENTS	
ACCORDION FILES	3					
ENVELOPES						
VOLUMES	3					
CAHIERS						
BOXES						

SHORELINE DATA

SHORELINE MAPS (List): TP-01187, TP-01188, T-9055, 9054, 9045, 9044

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			3885
POSITIONS REVISED			3497
SOUNDINGS REVISED			366
CONTROL STATIONS REVISED			
	TIME-HOURS		
	VERIFICATION	*EVALUATION*	*TOTALS*
PRE-PROCESSING EXAMINATION			
VERIFICATION OF CONTROL			
VERIFICATION OF POSITIONS	129		129
VERIFICATION OF SOUNDINGS	104.5		104.5
VERIFICATION OF JUNCTIONS			
APPLICATION OF PHOTOBATHYMETRY			
SHORELINE APPLICATION/VERIFICATION			
COMPILATION OF SMOOTH SHEET			
COMPARISON WITH PRIOR SURVEYS AND CHARTS	92		92
EVALUATION OF SIDE SCAN SONAR RECORDS		48	48
EVALUATION OF WIRE DRAGS AND SWEEPS			
EVALUATION REPORT		58	58
GEOGRAPHIC NAMES			
OTHER* Digitization			
*USE OTHER SIDE OF FORM FOR REMARKS — TOTALS	321.5	106	

Pre-processing Examination by LT M. Mozgala	*Beginning Date* 6/19/87	*Ending Date* 9/4/87
Verification of Field Data by T.O. Jones	*Time (Hours)* 3215	*Ending Date* 6/9/88
Verification Check by J.S. Stringham, B.A. Olmstead	*Time (Hours)* 56	*Ending Date* 5/27/88
Evaluation and Analysis by C.R. Davies	*Time (Hours)* 106	*Ending Date* 9/1/88
Inspection by D. Hill	*Time (Hours)* 15	*Ending Date* 9/1/88

☆ U.S. GOVT. PRINTING OFFICE 1983: 764-006/6061

PACIFIC MARINE CENTER
Evaluation Report
H-10244

1. INTRODUCTION

Survey H-10244 is a basic hydrographic survey accomplished by the NOAA Ship RAINIER under the following Project Instructions.

OPR-R184-RA-87, dated March 6, 1987
CHANGE No. 1, dated March 20, 1987
CHANGE No. 2, dated June 2, 1987
CHANGE No. 3, dated August 10, 1987
CHANGE No. 4, dated May 2, 1988
CHANGE No. 5, dated July 19, 1988

This survey is in northeast Bristol Bay, Alaska and covers Kulukak Bay and its entrance, which is just northwest of Nushagak Peninsula. The surveyed area extends from longitude 159°35'00"W westward to longitude 159°50'00"W and from the head of Kulukak Bay southward to latitude 58°45'00"N. The survey area is characterized by extensive mud and sand flats at the head of the bay, and a gentle sloping bottom broken only by irregular rocky areas near the east and west shorelines. The bottom consists of mud and silt. Depths range from zero to 8.1 fathoms.

Predicted tides for Black Rock, Walrus Islands were used for the reduction of soundings during field processing. Approved hourly heights zoned from Kulukak Point, gage 946-5265, were used during office processing.

The field sheet parameters have been revised to center the hydrography on the smooth sheet and to change the projection to polyconic. The TRA, sound velocity and electronic correctors are adequate. An accompanying computer printout contains the parameters and the correctors.

A digital file, generated for this survey, includes categories of information required to comply with N/CG2 Hydrographic Survey Guideline No. 23, Completion of Digital Hydrographic Surveys, September 7, 1983. 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 F and G of the hydrographer's report and the Horizontal and Electronic Control Reports for OPR-R184-RA-87 contain adequate discussions of horizontal control and hydrographic positioning.

Positions of horizontal control stations used during hydrography are NGS published and 1983 and 1987 field values based on NAD 27. These values were used during office processing for the computation of positions. The smooth sheet and accompanying overlays are annotated with NAD 83 adjustment ticks based on values determined by N/CG121. Geographic positions based on NAD 83 may be plotted on the smooth sheet utilizing the NAD 27 projection by applying the following corrections:

latitude: 2.748 seconds (85.0 meters)
longitude: -7.907 seconds (-126.5 meters)

The year of establishment of control stations shown on the smooth sheet originates with the hydrographer's signal list and is subject to change pending certification of the data by NGS.

There are 99 weak fixes (angles of intersection less than 30 degrees or more than 150 degrees) noted in this survey. However, there are no significant plotting differences between the soundings located by these fixes and those in adjacent areas. Also, none of these fixes are used to position dangers to navigation. These fixes are considered acceptable. The following shoreline map applies to this survey.

	Photo Date	Class
TP-01188	July, August, 1983	III

The hydrographer positioned a change to the shoreline, a series of three sand and gravel spits, by detached positions and visual estimates. The location of this feature, in the vicinity of latitude 58°52'45"N, longitude 159°35'50"W, is considered to be approximate and is shown on the smooth sheet with a dash red 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.

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 PMC OPORDER, except as noted in the attached copy of the Preprocessing Examination, dated September 4, 1987, and as follows.

Several charted rocks which originate from prior shoreline map, T-9054, were searched for at a high stage of tide and not found. Shoreline features or offshore dangerous features should be searched for at a low tide or if this is not possible, a thorough investigation for these features has to be accomplished for disproval, e.g., drift soundings, diver-search, wire-drag, and side-scan. These rocks were transferred to survey H-10244 smooth sheet.

The field records contain a note regarding scattered, small boulders near the entrance to Kanik River. This note, in a sounding volume, contains no position information or description of the extent of the rocks. The rocks are not indicated on the final field sheet. A note has been added to the smooth sheet in the vicinity of the river mouth to inform users of the rocky condition.

5. JUNCTIONS

Survey H-10244 junctions with the following survey.

Survey	Year	Scale	Area
H-10220	1986	1:20,000	southwest

The junction with survey H-10220 has not been formally completed since that survey was previously processed and forwarded for charting. The junction comparison was made using a copy. Soundings are in good agreement except for the 3.5-fathom sounding mentioned in section J of the hydrographer's report. In addition, a rock was transferred to survey H-10244 to better portray the bottom in the common area. Depth curves on survey H-10220 should be adjusted to conform with those on survey H-10244.

6. COMPARISON WITH PRIOR SURVEYS

There are no prior hydrographic surveys in the area.

CHANGE No. 5 of the Project Instructions, issued subsequent to the field work, required a comparison with the following prior shoreline maps.

	Year	Scale
T-9044	1947	1:20,000
T-9045	1947	1:20,000
T-9054	1947	1:20,000
T-9055	1947	1:20,000

These shoreline maps are considered to be superior in quality to the maps compiled under project CM 8207 since it is apparent the older photography was flown at or near low water. The contemporary maps originate with photography flown at a mid-tide and fail to accurately define nearshore features such as rocks, ledges and reefs. The hydrographer, aware of this significant deficiency, attempted to define the numerous features but the amount of work involved exceeded his available time to accomplish it. Accordingly, much of the inshore detail, approximately depicted on the final field sheet, has been substantially revised based on these prior shoreline maps. The user is referred to the smooth sheet for information pertaining to the location and specific source of the changes.

AWOIS items 50930, 50931, and 50940, originating with the prior shoreline maps, were adequately investigated and their disposition is addressed in section L of the hydrographer's report.

With the rocks and features carried forward from the above listed prior shoreline maps, survey H-10244 is adequate to supersede all prior data which is common to the survey area.

7. COMPARISON WITH CHART

Chart 16011, 31st Edition, dated June 29, 1985; scale 1:1,023,000.
Chart 16315, 3rd Edition, dated February 28, 1987; scale 1:100,000.

a. Hydrography

All charted information originates from the prior shoreline maps and miscellaneous sources and requires no further discussion. Survey H-10244 is adequate to supersede charted hydrography within the common area except as noted in section 7.b of this report.

b. AWOIS

There are five AWOIS items originating from shoreline maps and miscellaneous sources. They were discussed in section L of the hydrographer's report and are supplemented as follows.

AWOIS item 50927, rock awash, PA, charted at latitude 58°51'57"N, longitude 159°44'03"W, was investigated by echo sounder at 25-meter line spacing. AWOIS survey requirements for a diver or bottom drag search were not adhered to for complete disproval. Although the prescribed survey requirements were not strictly adhered to for disproval the investigation provides information sufficient to conclude that the reported rock is an extremely isolated feature in very turbid, shallow water. The recommended technique is a bottom drag. It is recommended that the rock awash, PA, be retained as charted.

c. Controlling Depths

There are no charted channels with controlling depths within the area of this survey.

d. Aids to Navigation

There are no fixed or floating aids located within the area of this survey.

e. Geographic Names

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

f. Dangers to Navigation

The hydrographer reported six shoal depths to the USCG. Copies of the messages/reports are attached. No additional dangers were discovered during office processing

8. COMPLIANCE WITH INSTRUCTIONS

Survey H-10244 complies with the Project Instructions, except as noted in sections 4 and 7 of this report.

9. ADDITIONAL FIELD WORK

This is a good hydrographic survey. Additional field work is recommended on a low priority basis for disproval of AWOIS item 50927.

Charles R. Davies

C R. Davies
Cartographer

This survey has been examined and it meets Charting and Geodetic Services' standards and requirements for use in nautical charting. Approval is recommended.

Dennis Hill

Dennis Hill
Chief, Hydrographic Section

APPROVALS

I have reviewed the smooth sheet, accompanying data, and reports associated with hydrographic survey H-10244. This survey meets or exceeds Charting and Geodetic Services' standards for products in support of nautical charting.

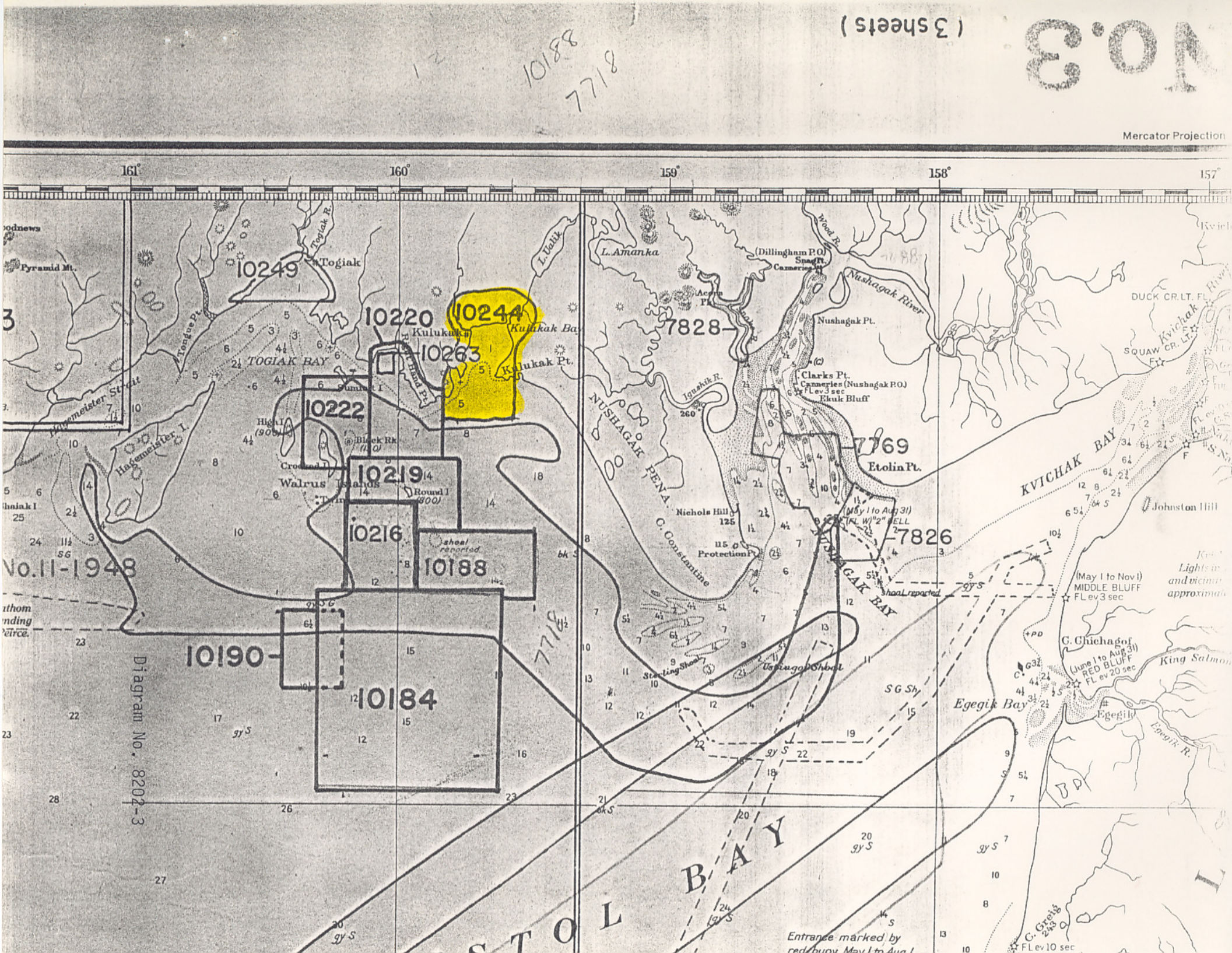
Dennis Hill 9-8-88
For Chief, Nautical Chart Branch (Date)

CLEARANCE: SIGNATURE AND DATE:

N/MOP2:LWMordock 9-8-88

After review of the smooth sheet and accompanying reports, I hereby certify this survey is accurate, complete, and meets appropriate standards.

Robert L. Sandt 9-8-88
Director, Pacific Marine Center (Date)


(3 Sheets)
10188
7718
Mercator Projection
161°
160°
159°
158°
157°
Pyramid Mt.
Togiak
Togiak R.
10249
10220
10244
10263
Kulukak Bay
Kulukak Pt.
TOGIAK BAY
Hagemeister Strait
Hagemeister I.
Summit I.
High I. (905)
Black Rk (10)
Crossed I.
Walrus Islands
Round I (800)
10222
10219
10216
10188
shoal reported
10190
10184
No.11-1948
Diagram No. 8202-3
L. Amanka
L. Ualik
Nushagak River
Nushagak Pt.
Clarks Pt.
Canneries (Nushagak P.O.)
Fl ev 3 sec
Eluk Bluff
7828
7769
Etolin Pt.
NUSHAGAK PENA.
C. Constantine
Nichols Hill 125
115
Protection Pt.
NUSHAGAK BAY
(May 1 to Aug 31)
(FL W) "2" BELL
7826
shoal reported
KVICHAK BAY
DUCK CR. LT. FL
SQUAW CR. LT.
Kvichak River
Johnston Hill
(May 1 to Nov 1)
MIDDLE BLUFF
Fl ev 3 sec
C. Chichagof
(June 1 to Aug 31)
RED BLUFF
Fl ev 20 sec
King Salmon
Egegik Bay
Egegik
Egegik R.
Sterling Shoal
Ushagat Shoal
BRISTOL BAY
Entrance marked by
red buoy May 1 to Aug 1
C. Greig
243
Fl ev 10 sec

NOAA FORM 75-96
(10-83)

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

MARINE CHART BRANCH

RECORD OF APPLICATION TO CHARTS

EXAMINED FOR NM
GDBU
12-12-89

FILE WITH DESCRIPTIVE REPORT OF SURVEY NO. H-10244

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
16315	10-28-88	Eli N Bodorunar	Full ~~Part Before~~ After Marine Center Approval Signed Via
			Drawing No. 4
16011	3-14-89	Russell P Kennedy	Full ~~Part Before~~ After Marine Center Approval Signed Via
			Drawing No. 30 Applied through Chart 16315
16006	3-21-90	John Pierce	Full ~~Part Before~~ After Marine Center Approval Signed Via
			Drawing No. 26 Applied through chart 16011
			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.
			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.
			Full Part Before After Marine Center Approval Signed Via
			Drawing No.

SUPERSEDES C&GS FORM 8352 WHICH MAY BE USED.

app'd To Stds 9-27-88