H10590

NOAA FORM 76-35A

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

DESCRIPTIVE REPORT

Type of Survey Navigable Area

Field No. PHP-5-1-95

Registry No. H-10590

LOCALITY

State Washington

General Locality Puget Sound

Sublocality Eagle Harbor

19 95

CHIEF OF PARTY
LT R.A. Fletcher

LIBRARY & ARCHIVES

DATE January 17, 1996

*U.S. GOV. PRINTING OFFICE: 1987—756-980

NOAA FORM 77-28 (11-72)

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

REGISTER NO.
H-10590

HYDROGRAPHIC TITLE SHEET

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

FIELD NO.
PHP-5-1-95

State: Washington

General locality: Puget Sound

Locality: Eagle Harbor

Scale: 1:5,000 Date of survey: Feb. 28 - May 18, 1995

Instructions dated: October 14, 1994 Project No.: OPR-N228-PHP

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

Chief of party: LT Richard A. Fletcher, NOAA

Surveyed by: LT R.A.Fletcher, LTJG P.Haines, ENS S.Smith, ET E.Wernicke, ST K. Simmons

Soundings taken by echo sounder, hand lead, pole: Innerspace 448 (VN 0652), DSF 6000 (VN 0651)

Graphic record scaled by: PHP Personnel

Graphic record checked by: PHP Personnel

Evaluation by: L. Deodato Automated plot by: HP Design Jet 550L

~~Protracted by~~

Verification by: D. Doles, J. Stringham, L. Deodato

Soundings in ~~XXXXXX~~ ~~fathoms~~ feet at ~~MLW~~ MLLW and tenths

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

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

DLG 1-17-96

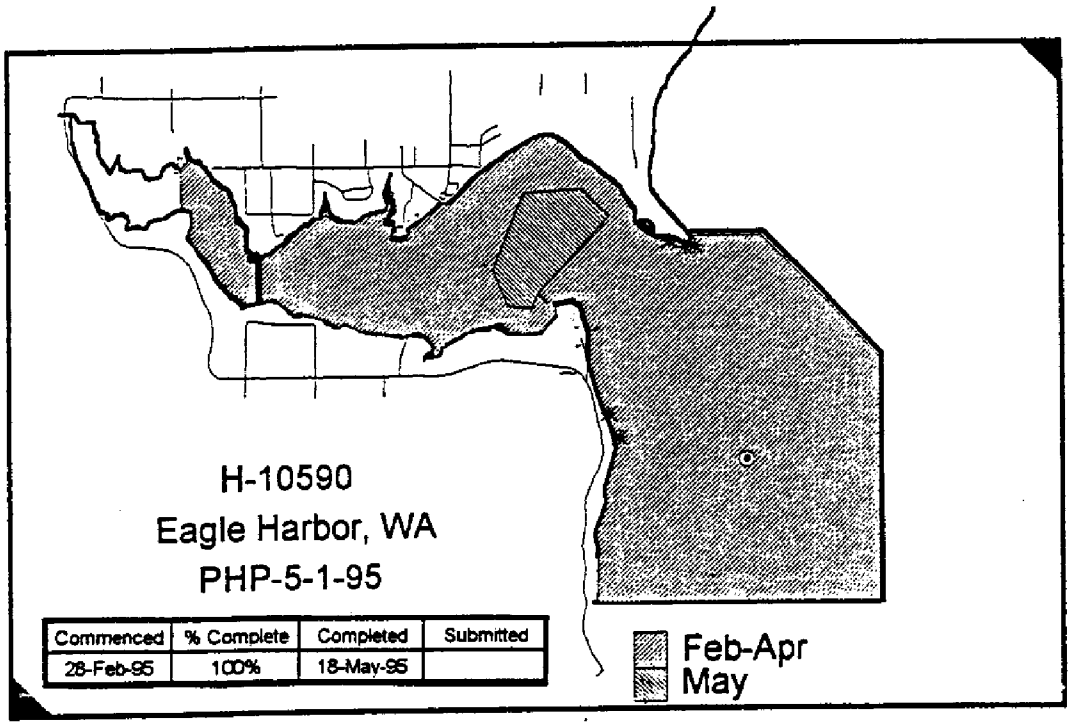
NOAA FORM 77-28 SUPERSEDES FORM C&GS-537.

U.S. GOVERNMENT PRINTING OFFICE: 1986 - 652-007/41215

proj 2 of 3

PACIFIC HYDROGRAPHIC PARTY
Progress Sketch

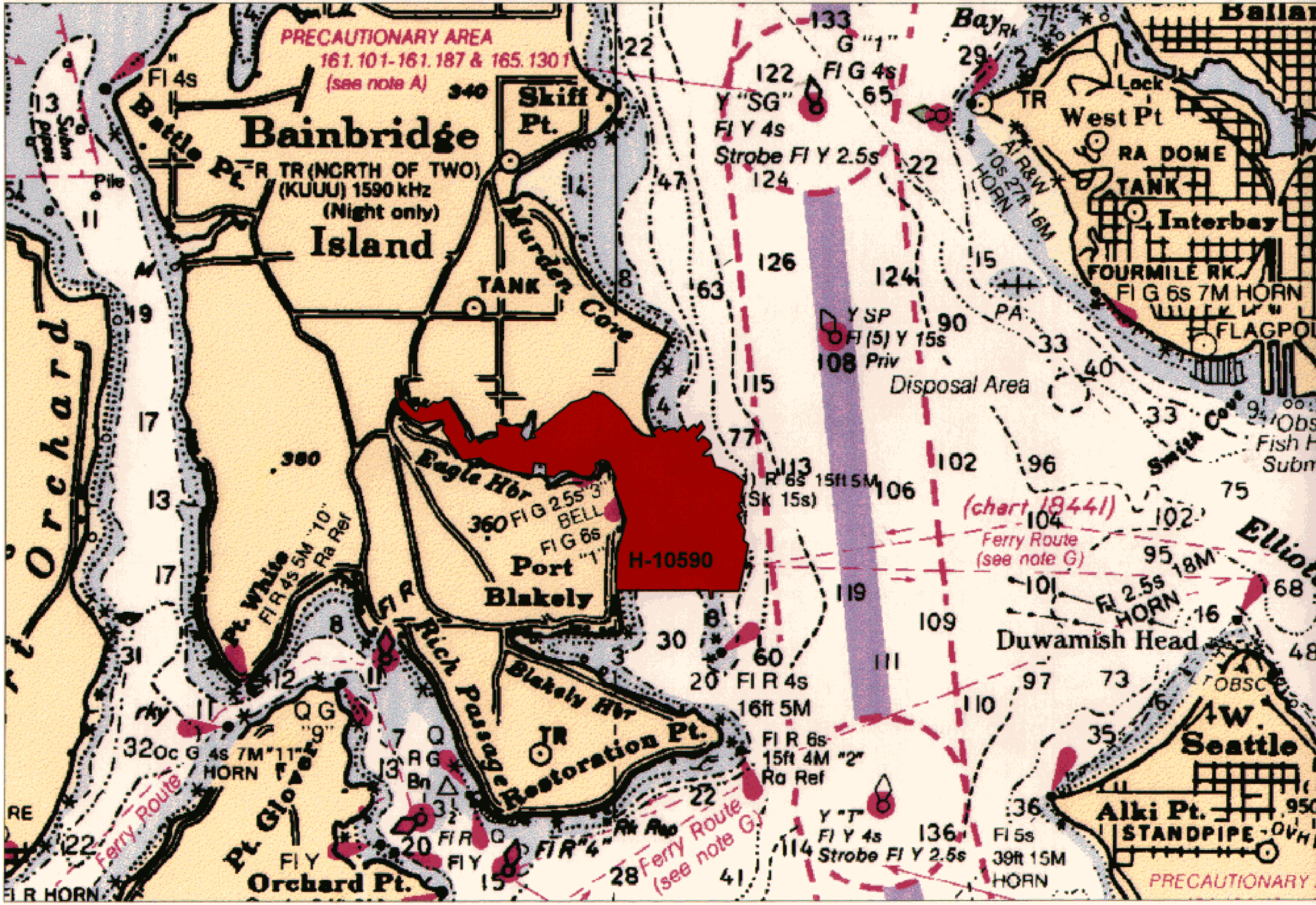
OPR-N228-PHP
May 1995



Commenced	% Complete	Completed	Submitted
28-Feb-95	100%	18-May-95	

DOWN TIME		
Weather	Electronics	Mechanical
0	0	0

Accomplished	Feb	Mar	Apr	May
LNM Hydro	0	82.9	29.6	11.3
LNM SSS	0	0	16.4	0
Sq. NM	0	1.5	0	0
DP	30	113	121	5
Dives	0	0	0	0
BS	0	0	0	0
SV Casts	0	2	1	0
Control Stations	4	0	0	0



H-10590
Bainbridge Island
PRECAUTIONARY AREA
161.101-161.187 & 165.1301
(see note A)
Skiff Pt.
Murden Cove
Eagle Hbr
Port Blakely
Blakely Hbr
Rich Passage
Restoration Pt.
Battle Pt.
Pt. White
Pt. Glover
Orchard Pt.
R TR (NORTH OF TWO)
(KUUU) 1590 kHz
(Night only)
TANK
Disposal Area
(chart 18441)
Ferry Route
(see note G)
Duwamish Head
West Pt
RA DOME
Interbay
FOURMILE RK.
FLAGPOL
W. Seattle
Alki Pt.
STANDPIPE
Elliott

Descriptive Report to Accompany Hydrographic Survey H-10590

Field Number PHP 5-1-95
Scale 1:5,000
1995

Pacific Hydrographic Party
Chief of Party: LT Richard A Fletcher

A. PROJECT ✓

This navigable area survey was conducted in accordance with Hydrographic Project Instructions OPR-N228-PHP, Eagle Harbor, Washington, issued October 14, 1994.

The project was authorized in response to a request from the Washington State Department of Transportation, Washington State Ferries. Eagle Harbor is a major ferry port where the primary concern of the Washington State Ferry System is to obtain adequate navigational information to insure safe transit for the large vehicle passenger ferries they pilot in and out of the harbor. Charted hydrography originates primarily from a 1934-36 lead line survey.

The spit on the west side of the channel entrance and north of Creosote is an Environmental Protection Agency (EPA) Superfund site.* A "cap" of dredged material was placed over the seabed west and northwest of the spit to contain the pollutants. Charted depths do not portray the existing conditions created by the man-made seabed cap and the Washington State Ferry captains are concerned that currents may be causing shifting and shoaling of the cap material.* The present survey found depths 2-12' shoaler around the Superfund site than currently charted.

Eagle Harbor also serves recreational boating interests. It provides anchorage for numerous small craft and is host to six small-craft marinas.

B. AREA SURVEYED See Eval Rpt., Section B

The area surveyed for H-10590 extends from longitude 122°32'30.0"W, east to longitude 122°28'36"W. North limit is the 2-meter curve inside the harbor and latitude 47°37'17.0"N outside the harbor. South limit is the 2-meter curve inside the harbor and latitude 47°36'08.0"N outside the harbor. The plotter sheet skew is 0° with overall sheet limits measuring 58.0 cm by 106.0 cm. Hydrographic limits for H-10590 are within those required by the Hydrographic Manual (Section 1.2.3, pp. 1-6). The hydrographer has basically defined the mean lower low water line within the survey area.
Data acquisition was conducted from February 28, 1995, (DN 059) through May 18, 1995 (DN 138).

C. SURVEY VESSELS ✓

NOAA Launch 1102 (EDP No. 0652), a 21-foot SeaArk, was the primary data acquisition vessel for this survey and was used for mainscheme and crossline hydrography as well as for detached positions and development hydrography. NOAA Launch 1101 (EDP No. 0651), a 29-foot Jensen was used for side scan sonar operations, crosslines, detached positions and development hydrography. No changes to the standard vessel sounding configuration were necessary for either vessel. The DPLOGGER back pack was used on DN's 108 and 109.

D. AUTOMATED DATA ACQUISITION AND PROCESSING ✓

The commercially produced and marketed HYPACK software was used on vessel No. 0652 for data acquisition from DN 059 to DN 061. Version 5.01 of the PC-DAS SURVEY Program was used for the remainder of data acquisition on vessel 0652. The master printout* was annotated whenever software problems affected the data.

The standard NOS HDAPS software suite was used for processing throughout this survey. Program names and versions are listed in Appendix VI.*

The following non-HDAPS computer programs were used in field work for data supporting this survey:

Program Name	Version	Date	Usage
VELOCITY	2.21	1994	Sound Velocity Corrections
SEASOFT	4.52	1994	SeaCat Sound Velocity Probe
NADCON	1.01	1989	NAD83 to NAD27
INVERS3D	1.00	1991	Horizontal Control
MONITOR	2.00	1994	DGPS beacon check
GEOID93	1.00	1993	GPS ellipsoidal elevation
LOGGER	1.00	1994	Detached positions
TARGET	1.00	1994	AWOIS investigations

E. SONAR EQUIPMENT ✓

Side scan sonar (SSS) operations were conducted using an EG&G model 260 slant-range correcting SSS recorder and an EG&G 272-T dual-channel (single frequency) towfish. The following sonar equipment was used throughout the survey:

Type	S/N
272-T Towfish	015598
260 Recorder	015602

* Filed with the hydrographic records.

The towfish was operated on the 100 kHz frequency and was configured with a 10° beam depression. It was deployed from the aft starboard quarter using a lightweight, 54-meter EG&G cable passed through a block and powered by an electric winch. Block and winch were mounted to a swing-arm davit. Tape markings at measured intervals indicated length of cable deployed from the block up to 50 meters, the maximum deployable. Markings were at one-meter intervals up to 10 meters and at five-meter intervals thereafter.

SSS operations were conducted at a speed of 5 knots or slower, using a range scale of 100 meters. The SSS towfish was maintained at a height off the bottom equivalent to 8 to 20 percent of the range scale except where depths exceeded the limits of the cable or when depths shoaled quickly. In such cases, the hydrographer believes the resolution of the sonargram is adequate for identification of any significant contacts.

The waters in the outer harbor often carry heavy loads of sediment, the presence of which rendered bottom tracking difficult. When this occurred, towfish height was controlled manually. Significant fish height errors were corrected in Graphic Edit.

In accordance with Section 7.3 of project instructions, 200 percent side scan coverage was acquired 100 meters either side of the charted ferry route. Additionally, hydrographers observed that the ferries deviated considerably from the charted route and, therefore, expanded the area to be side scanned in order to assure coverage of the entire route transited by the ferries. Side scan coverage of the approaches to the repair facility was not requested and was not performed.

The SSS recorder gain was adjusted for the best return for the prevalent bottom material. Contacts or identifiable features (e.g., anchor scours, change in bottom texture) visible on the outer edge of the sonargram assure acceptable SSS recorder tuning and served as confidence checks during operations. Because opening and closing the EG&G door caused sonargram interference, on-line annotations were kept to a minimum.

Following guidelines in Section 7.3.2 of Project Instructions, sonargrams were manually scanned for significant contacts; these were labeled and entered into two HDAPS contact tables. Where contacts appeared in a cluster on the sonargram, only the most significant was entered. Apparent significance was determined with the PHP-developed Contact-O-Meter, a scale proportioned for shadow length and fish height. Contact heights and raw depths were derived using the HDAPS Side Scan Utility Program. Contacts with computed heights of less than 1.0 meter were deleted; the remaining thirty-five contacts were plotted.

The HDAPS "group" function was used to identify possible duplicate contacts within a 30-meter radius. The "sift" function was then employed to identify significant contacts requiring further investigation; i.e., significance determined by comparison with surrounding sounding data. The program logic is based on the guidelines for developing groups of contacts as specified in Section 7.3.2 of the Project Instructions. User input parameters include navigationally hazardous depth threshold and radius for sounding comparisons.

The hydrographer sifted the contacts using a threshold depth of 20 meters and a chartable radius for two-digit depths of 3.3mm at the survey scale; i.e. 16.5 meters. The sonargram was reviewed together with the sifting printout. Seventeen contacts were selected for development based on the following factors: calculated significance, computed height, offset from towfish, and sonargram review; the review process included comparison of duplicate contacts. At the completion of contact development, contacts were resifted. At the survey scale no contacts were flagged "* SIG-O". Eight were flagged with "# SIG-I." Of these, six had already been developed with surveyed heights substantially less than computed heights. (See annotations on sifting printouts in Separate V.) One (5004.48S) had been annotated during initial scanning as a marginal contact with a weak shadow; a second look at the sonargram supported this analysis and the contact was not developed. The second undeveloped contact was 5437.31P, with a computed height of 1.7 meters. The contact was 15 meters from the tow fish and it was on a slope - factors which result in exaggerated computed heights. It was also a duplicate of contact 5112.10S, which, with a computed height of 1.0 meter, had not been flagged as significant. The sonargram was also reviewed and the hydrographer is satisfied that neither of these contacts represents a hazard to navigation.

The largest scale chart of the area is 18449 which is published at a scale of 1:25,000; final sifting at this scale produced no significant contacts not already discussed above. Contact tables and final sifting printouts are included in Separate V.* ✓

F. SOUNDING EQUIPMENT ✓

Innerspace Model 448 (IN-448) single frequency echosounder, Serial Number 239, modified with custom EPROMS for HDAPS, was used on Vessel No. 0652 from DN 059 to DN 138.

Raytheon, dual-frequency, Digital Sounding Fathometer (DSF) 6000N, Serial Number A221N, was used on Vessel No. 0651 from DN 102 to DN 107. The high-frequency beam was selected for plotting throughout the survey. The low-frequency depth was scanned and edited only when the high frequency did not track the bottom or when a more significant depth was acquired with the low-frequency beam. No problems were encountered with this fathometer.

Soundings were recorded in meters with an assumed speed-of-sound through water of 1500 m/sec. Depths encountered in the survey area range from -0.8 meters (Pos. No. 552, DN 072) to 65 meters (Pos. No. 552, DN 072) based on predicted tides. The smooth sheet has been plotted in feet and tenths.

Metric leadlines were used for depth comparisons with the echosounder. PHP fabricated the leadlines following Hydrographic Survey Guideline (HSG) 69. Each lead line is 1/4-inch steering tiller rope. Shrink tubing, secured with epoxy, marks one-meter intervals from one to thirty. With the line under six pounds of constant tension, markings were calibrated with a steel surveyor's tape. The throwing end is a standard six-pound lead weight shackled to a

* Filed with the hydrographic records

stainless steel thimble bent to the bitter end. Lead line calibration forms are included in Separate IV* (Sounding Equipment Calibration and Corrections).

A sounding pole was used for measuring the depth of submerged obstructions. The pole is 3.3 meters long and was made by PHP using commercial surveyor's level-rod tape. The self-stick, pre-printed tape is calibrated in centimeter intervals. It is laminated with clear epoxy to two-inch diameter wooden rods finished with white marine epoxy paint.

G. CORRECTIONS TO SOUNDINGS

Velocity of Sound

Corrections for the speed of sound through the water column were computed from data obtained with Applied Microsystems Laboratories (AML) Velocity of Sound Profilers: S/N 03004 on DN 089 and DN 116 and S/N 03042 on DN 072. Repeated difficulties were encountered in attempting to download the cast data from the sound velocity probe using the AML program in the TRS-80. AML software was obtained from manufacturer and was used to download data. The VELOCITY Program was used to determine the speed of sound correctors. Data from the following casts were used to determine the velocity correctors: All casts were taken outside the survey limits.

HDAPS Table	DN	DN Range	Extrapolated Depth	Cast Position Latitude	Longitude
1	072	059-086	40.3m	47°26'00"N	122°29'30"W
2	089	089-109	57.7m	47°37'06"N	122°28'41"W
3	116	116-138	58.2m	47°36'05"N	122°29'15"W

Separate IV* contains copies of all velocity cast data and HDAPS Velocity Corrector Tables.*

The AML instruments were calibrated by Northwest Regional Calibration Center on April 15, 1994 (DN 105). Copies of these calibration reports are included in Separate IV.*

Lead line Comparisons

Lead line comparisons were taken on most days of hydrography to confirm proper digitization of the echosounder depth. These are annotated on the echograms;* no systematic drift or error was observed.

Static Draft

Static draft for VN 0652 was determined on March 20, 1995 (DN 102). First, the depth of the transducer face from a reference mark on the hull was measured. Next, with the launch in the water (fuel tanks half full and two crewmen aboard) the depth from this reference mark to

* Filed with the hydrographic records.

the waterline was measured. Combining the two measurements, a static draft of 0.4 meters was calculated.

A static draft of 0.5 meters was determined for VN 0651 on May 3, 1994, (DN 123) using a method similar to above.

Dynamic Draft ✓

Settlement and squat measurements for VN 0652 were conducted on April 5, 1994, (DN 095) in Guemes Channel at Pier 1 in Anacortes, WA. Settlement and squat measurements

for VN 0651 were conducted on March 20, 1995, (DN 080) in Port Angeles Harbor. Field records are included in Separate IV.*

Settlement and squat correctors are applied on line to all survey data via the HDAPS Offset Tables.* Offset Table 1 corresponds to VN 0651; Offset Table 2 corresponds to VN 0652. Settlement and squat correctors are reapplied during field processing using the REAPPLY program in HDAPS.

Corrections to Echosoundings ✓

Problems with misdigitization occurred repeatedly with the Innerspace 448 echosounder, primarily because of suspended particles in deep water but also where bottom topography was both very steep and very deep. Where the echogram trace was adequate and unambiguous, the digital record was corrected to reflect the analog trace. Heavy prop wash from the frequent ferry traffic also caused occasional breaks in the continuity of the echogram. The hydrographer does not consider these breaks significant unless greater than 6mm at the survey scale (Section 1.4.6, Hydrographic Manual) or if they occurred over a shoaling trend (potential missed peak), in which cases the section or line was resurveyed.

Tide Correctors ✓

In compliance with Section 5.9 of Project Instructions, predicted tides from the existing primary station at Seattle (944-7130), were applied to soundings during field processing with times direct and a x1.02 range ratio. Approved tide note dated August 15, 1995 is attached.

H. CONTROL STATIONS See Eval Rpt, Section H

Horizontal Datum

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

* Filed with the hydrographic records.

Copy is attached.

Control Stations). A separate Horizontal Control Report OPR-N228-PHP, Eagle Harbor, is submitted to N/CG245 along with this report.

I. HYDROGRAPHIC POSITION CONTROL See Evel Rpt, section I

Position Control

Differential GPS (DGPS) provided hydrographic position control throughout this survey based on a DGPS beacon established and maintained by the United States Coast Guard at Point Robinson. A base station was also established although it was never used.

Reference Station	Latitude	Longitude	Ellips. Height
Point Robinson	47°23'18.953"N	122°22'26.745"W	-6.031m
Base Station	47°37'18.668"N	122°30'51.456"W	-5.202m

Per FPM, Section 3.4.6.3, the reference site was confirmed using the program MONITOR. A copy of the scatter plot and the outlier.sum files are included in Separate III (Horizontal Position Control and Corrections to Position Data). *

DGPS Performance Checks

Per FPM, Section 3.4.4.1, DGPS performance checks were obtained on days of hydrography using a piling at the end of a pier at the Ferry Repair Facility in Eagle Harbor. The mark was positioned to Third Order, Class I standards (see Horizontal Control Report). All DGPS performance checks were successful; check forms are located in Separate III.*

Positioning Equipment

The following GPS equipment was used:

Equipment Location	Type of Receiver/Antenna	Receiver Serial No.	Antenna Serial No.
VN 0651	Ashtech (v.1E08D) CSI Beacon Rcvr MBX1	700417B1139 X-1212	700378A0272
VN 0652	Ashtech (v.1E08D) CSI Beacon Rcvr MBX1	700417B1043 X-1211	700378B0402
DPLOGGER	Beacon Antenna M-2255 CSI Beacon Rcvr MBX1	700417B1044 X-1394	700391A0511

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

* Filed with the hydrographic records.

J. SHORELINE See Eval Report, section J.

Comparison with Digital Map

The shoreline source document for the survey is Digital Map 10041 which was derived from photogrammetry acquired on August 4, 1994, at 10:28:35 GMT. Numerous discrepancies were identified.

During the first three days of shoreline verification, hydrographers had access to the HYPACK survey software which enables on-line comparison of the digital shoreline and cultural features to the existing structures and shoreline. The north shoreline of the harbor (from longitude 122°31'52" to longitude 122°29'30") was verified with HYPACK. Reference numbers were used to indicate verification of digital map features or to report minor modifications to structures as depicted. Reference reports are included with the data files and reference numbers are annotated on the detached position plot.

Because of a problem converting the HYPACK data to the HDAPS format, the raw data printout for DN 059 does not include an HDOP column nor does it have recorded data for number of satellites, EPE or SMG. HDOP, EPE and speed are recorded on the Edited Data Listing; number of satellites is printed on the NOAA Datalist. The conversion problem was resolved and subsequent raw data printouts* include the above data.

The remainder of the shoreline was verified using PC-DAS software without access to on-line plotter or digital shoreline. With these limitations, together with the number of items to be confirmed, positioned or disproved, it was not possible to make the determinations in the field. For this reason, the hydrographer elected to position all shoreline features not verified with HYPACK for comparison with the digital map during post-processing. During the comparison the hydrographer identified:

1. Features depicted on the digital map but not located.
2. Existing features **not** depicted on DM-10041.
3. Features depicted on DM-10041 but with shapes or positions altered.
4. Existing features as depicted on DM-10041.
5. Disprovals of charted features.

All detached positions are plotted on the DP plot with all new and revised features annotated in red. The carto table plot includes all navigational aids as well as new and/or revised existing features. Several new shoreline structures and changes to existing shoreline map features were found during survey operations. These items have been shown in red on the smooth sheet.

To facilitate interpretation of the detached position listing, features in category 1 above are highlighted in blue; those in category 2 are highlighted in yellow; those in category 3 are highlighted in green; those in category 4 are highlighted in pink; and category 5 is orange. The DP listing is included with the data files.

* Filed with the hydrographic records.

The Washington State Ferry System is planning to expand the ferry terminal as well as the ferry repair facility over the next five years. Plans include replacing all wood pilings with steel and concrete. Brian Holling, Assistant Project Engineer for the Washington State Ferries (206-464-6837), supplied a diagram showing current configuration as well as expansion plans at the terminal (Appendix VI). *

K. CROSSLINES

Nautical miles of crossline total 22.49 (including side scan lines and buffer lines along shore), representing 12.4% of the mainscheme hydrography on H-10590. Agreement is generally good.

L. JUNCTIONS

Not applicable.

M. COMPARISON WITH PRIOR SURVEYS See Eval Report, Section M.

The survey was compared cursorily with prior surveys H-3373 (1912) and H-5711(1934). Surveyed depths are generally deeper than those surveyed in 1912; and, except for the cap and ferry terminal areas discussed in Section O below, are reasonably consistent with the 1934 survey. Comparisons of shoreline features are included in the Item Investigation Reports. A more rigorous comparison will be performed by Pacific Hydrographic Section following the application of smooth tides.

N. ITEM INVESTIGATION REPORTS

Item Investigation Reports for the following AWOIS items are included in Separate VI:
All copies attached.

N1	AWOIS Item 52126
N2	AWOIS Item 52127
N3	AWOIS Item 52128
N4	AWOIS Item 52129
N5	AWOIS Item 52130
N6	AWOIS Item 52131
N7	AWOIS Item 52132
N8	AWOIS Item 52133
N9	AWOIS Item 52134
N10	AWOIS Item 52135
N11	AWOIS Item 52136

* Filed with the hydrographic records.

N12	AWOIS Item 52137
N13	AWOIS Item 52138
N14	AWOIS Item 52139
N15	AWOIS Item 52140
N16	AWOIS Item 52141
N17	AWOIS Item 52142
N18	AWOIS Item 52143
N19	AWOIS Item 52144
N20	AWOIS Item 52145
N21	AWOIS Item 52146
N22	AWOIS Item 52147
N23	AWOIS Item 52148
N24	AWOIS Item 52149
N25	AWOIS Item 52150
N26	AWOIS Item 52151
N27	AWOIS Item 52152
N28	AWOIS Item 52153
N30	AWOIS Item 52154
N31	AWOIS Item 52155
N32	AWOIS Item 52156
N33	AWOIS Item 52157
N34	AWOIS Item 52158
N35	AWOIS Item 52159
N36	AWOIS Item 52160
N37	AWOIS Item 52161
N38	AWOIS Item 52162

O. COMPARISON WITH THE CHART See Eval Report, Section O.

This survey was compared to a stable-based 1:5,000-scale enlargement of Chart No. 18449, 1:25,000, 15th Edition, October 29, 1994. The Pacific Hydrographic Section will perform a follow-up comparison after smooth tides have been applied.

Dangers to Navigation

No dangers to navigation were identified within the limits of this survey. Concur

Comparison of Soundings

Soundings were converted to and plotted in feet to facilitate comparison with charted soundings. Although some shifting of contours is evident, most changes in the outer harbor are slight:

The near-shore portion of the West Point shoal has been subjected to some scouring as evidenced by generally deeper depths out to the 18-foot (5.5-meter) contour and the reduced area of the drying portion.

The mud flats at the west end of the harbor have been slightly eroded with the 0-meter curve shifted westward approximately 175 meters. Concur

The 13-foot (4.1-meter) sounding charted at latitude 47°36'53.489"N, longitude 122°29'01.578"W, was located 62 meters to the northwest at latitude 47°36'56.167"N, longitude 122°29'03.220"W (Pos. No. 5546+4, DN 107, VN 0651). The shoal itself is less extensive than charted, as is the Tyee Shoal. The latter, as charted, is centered around the 15-foot sounding at latitude 47°36'37.949"N, longitude 122°29'16.187"W, and measures 150 meters x 110 meters. The surveyed shoal has a least depth of 4.8 meters (15.7 feet) located at latitude 47°36'37.149"N, longitude 122°29'15.757"W (Pos. No. 1904+4, DN 095), and is half the size charted, measuring 125 meters x 60 meters.

More significant changes have occurred east of the ferry terminal and in the area of the seabed cap northwest of the Wyckoff spit. Some of these changes are attributable to the seabed cap placement and some have been caused by ferry prop wash:

Ferry Prop Wash: The ferry terminal consists of two docks; immediately east of each of these docks deep holes have been scoured by prop wash. The deepest hole with a maximum depth of ~~14.4~~ 15 meters (~~47.2~~ 49 feet)* is located at latitude 47°37'18.367"N, longitude 122°30'27.610"W (Pos. No. 3079+6, DN 138). The second has a maximum depth of ~~13.8~~ 14 meters (~~45.3~~ 46 feet) and is located at latitude 47°37'20.080"N, longitude 122°30'28.238"W, (Pos. No. 3075.4, DN 138). The scoured material has been piled up on both sides aft of the docked ferries, forming ridges along the two ferry lanes. The longest and highest ridge extends 275 meters from the ~~9.9~~ 10 meter (~~32.5~~ 33-foot) sounding at latitude 47°37'19.063"N, longitude 122°30'25.570"W (Pos. No. 3109+6, DN 138), westward to the 9.8-meter (~~32.1~~ 32-foot) sounding at latitude 47°37'19.344"N, longitude 122°30'30.700"W (Pos. No. 2189+4, DN 97). Least depth along the ridge is 9.2 meters (30.2 feet) at latitude 47°37'19.267"N, longitude 122°30'26.681"W (Pos. No 3093+2, DN 138). This plots over the 34-foot (10.4-meter) charted sounding centered at latitude 47°37'19.2 35"N, longitude 122°30'25.623"W. Least depth along the northernmost ridge is 9.7 meters (~~31.8~~ 32 feet) located at latitude 47°37'20.374"N, longitude 122°30'25.417"W (Pos. No. 3120+5, DN 138). * 49 feet depth at pos no 3079+6 has been excessed by a 47' sig shown on the smooth sheet.

Cap Placement: Two areas were targeted for cap placement. Area 1 is NNW of the Wyckoff spit and Area 2 is west of the spit. Depths in Area 2 are generally 0.5-1.0 meter (2-3 feet) shallower than charted soundings. Area 1 has undergone more significant changes. While it is not unlikely that some of the material scoured by the ferries has been carried eastward, the shoaler depths over Area 1 are most likely primarily due to cap placement.

The discrete mounds observed on side scan sonar in Area 1(see sonargram at Pos. Nos. 5063+3 to 5065+2, 5202+3 to 5203+4, 5441 to 5442, 5448+1 to 5450+2) were deposited in the course of seabed cap placement. According to the Corps of Engineers post-placement survey report, the "piles were formed by the release of materials from the split-hull barge at the end of a placement transect, when material release was more difficult to control." Two of these features were selected for development (Contacts 5065.13P and 5441.06S). A number of mounds were located during the development, most of which were one meter or less in height. The most significant was a mound with a height of 1.6 meters (5.2 feet) and a least depth of 11.0 meters (36 feet) located at latitude 47°37'22.684"N, longitude 122°30'12.491"W (Pos. No. 5385+7, DN 104, VN 0651). These deposits are expected to be dispersed and/or compacted over time.

A sounding of 13.2 meters (~~43.6~~ 42 feet) was located at latitude 47°37'19.773"N, longitude 122°30'15.038"W (Pos. No. 5448+5, DN 107, VN 0651), twenty-six meters east of the charted 54-foot (16.4-meter) sounding centered at latitude 47°37'19.721"N, longitude 122°30'16.284"W. Numerous depths in the vicinity of the charted 54-Foot sounding are From 9-12 feet shoaler as Found by this survey.

The 48-foot (14.6-meter) depth charted at latitude 47°37'21.988"N, longitude 122°30'09.579"W, is also superceded by shoaler depths: a sounding of ~~11.9~~ 12 meters (39 feet) was acquired at latitude 47°37'22.771"N, longitude 122°30'07.706"W (Pos. No. 5385+1, DN 104) 46 meters northeast of the charted sounding. Numerous depths in the vicinity of the charted 48-Foot sounding are From 2-7 feet shoaler as found by this survey.

Comparison of non-Sounding Features

With the exception of AWOIS Items, reports of which are located in Separate VI, the only charted structure which **was not confirmed is** the pier ruins charted at latitude 47°37'35.725"N, longitude 122°32'20.200"W. These pier ruins should be deleted. Concur Separate II with item investigations is attached to this report.

The sewer outfall charted at latitude 47°37'20.0"N, longitude 122°31'13.7"W, is now used only for storm water runoff; thus, the charted symbol should be changed from "sewer" to "outfall." According to Gretchen Robinson, Engineering Division, Public Works Department, City of Bainbridge Island (206-842-1212), a new wastewater treatment plant was built in 1976 and all sewer lines were diverted at that time to a second charted sewer outfall on the north side of Wing Point. The charted sewer outfall on the north side of Wing Point should be retained. Retain charted position. Concur

In 1990 an outfall was constructed extending offshore from the ground water treatment plant at the former creosoting plant. EPA divers located the offshore end 10-15 meters north of Light "1" at latitude 47°36'59.00"N, longitude 122°29'46.67"W. EPA's report is included in Appendix VI. Copy attached. Refer to the Smooth sheet for graphic portrayal of this feature.

Two mooring buoys are charted, one at latitude 47°37'13.564"N, longitude 122°31'03.935"W, the second at latitude 47°37'04.325"N, longitude 122°31'08.640"W. The latter was confirmed during hydrography (Pos. No. 5802, DN 116). More than two dozen boats are either moored or at anchor in the harbor which is a haven for offshore liveaboards; although it is not practical

to chart all mooring buoys, the hydrographer believes an indication of the availability of offshore mooring is warranted and, therefore, recommends retaining at least one mooring buoy symbol, locating it in the center of the anchorage area at latitude 47°37'09"N, longitude 122°31'10"W. The mooring buoy charted at latitude 47|37|13.564N, longitude 122|31|03.395 was not found.

The obstruction charted at latitude 47°37'28.879"N, longitude 122°31'53.723"W, is wreck debris (Pos. No. 7025, DN 108, DPLOGGER). See photo No. 71. Shown on the smooth sheet as a visible wreck uncovering 6 Ft at MLLW.

Kelp beds are charted off the south tip of Wing point as well as along the west shore from latitude 47°36'36.0"N northward to latitude 47°37'07.5"N. No kelp was seen in any area during the survey. Eel grass was observed in these areas but not in densities that would interfere with navigation. The hydrographer recommends removing the kelp symbols from the chart. concur

Annotation on CM-8707 marked a daybeacon at Wing Point for investigation. No daybeacon exists at this location. The hydrographer believes the charted symbol is intended to represent Second Order triangulation mark WING (1934) located at latitude 47°37'14.79740"N, longitude 122°29'31.61489"W. The symbol should be deleted. Concur

Note: On April 17, 1995, the U.S. Environmental Protection Agency (EPA) issued a request for public comment on its proposal to begin demolition at the Wyckoff/Eagle Harbor Superfund Site. The public comment period ended May 18 and demolition may begin in the summer. A copy of the announcement is included in Appendix VI* along with a map indicating structures to be demolished. Note also the location of the uncharted outfall from the groundwater treatment plant just south of the former Milwaukee dock.

* Attached to this report.

Ellen Hale, Superfund Project Manager (206-553-1215), will notify NOS when demolition is completed. She will also identify all structures which have been removed or dismantled. Because the complete removal of the offshore structures would leave holes through which the soil contaminants could seep into the harbor, it is probable that the offshore structures will not be removed, but will be cut off within a foot or two of the bottom. Warning buoys advising the public to keep off the beach will be anchored in the intertidal zone at the site. It is expected that demolition will occur prior to completion of post-processing of H-10590. Per phone conversation with Mr. Richard Burke (Eggledle Marine) demolition was scheduled to begin Nov 7, 1995.

P. ADEQUACY OF SURVEY

This survey is a complete navigable area hydrographic survey and is adequate to supercede all prior surveys within their common areas. The acquisition of 200% side scan sonar coverage of the navigable area on both sides of the charted ferry route ensures that no unknown hazards exist along that channel. Concur

Q. AIDS TO NAVIGATION · See Eval Report, Section Q.

Fixed aids to navigation were verified in accordance with Section 4.2.1. Check positions were obtained on separate days; the computed inverse between each position and check position, after adjustment for offset, was well within the specified limits of less than one millimeter at the scale of the survey (5 meters). The charted position of buoys C"5" and N"2" were verified.

The private aid charted in the center of Winslow Wharf Marina at latitude 47°37'15.991"N, longitude 122°31'15.670"W, was not found. Delete the charted light. concur

The charted positions of both Eagle Harbor Marina pier lights are inaccurate. The light charted at latitude 47°37'01.517"N, longitude 122°30'51.964"W, (Pos. No. 5803, DN 116) is located on the west end of the marina 72 meters to the northeast at latitude 47°37'03.114"N, longitude 122°30'49.479"W, (Pos. No. 2088). The light charted at latitude 47°37'02.5"N, longitude 122°30'46.0"W, is located 56 meters to the northeast at latitude 47°37'03.257"N, longitude 122°30'43.526"W (Pos No. 2089, DN 096). Form 76-40 attached

The following uncharted, private navigational aids were located (see Appendix II):

White light on dolphin at Ferry Repair Facility, eastmost (Pos. No. 35, DN 059)
White light on dolphin at Ferry Repair Facility, center (Pos. No. 33, DN 059)
White light on dolphin at Ferry Repair Facility, westmost (Pos. No. 34, DN 059)
Flashing yellow light, west end of pier, Eagledale Moorings (Pos. 2090, DN 096)
Flashing yellow light, east end Eagledale Moorings pier (Pos. No. 2091, DN 096)
Red light, west pier, Queen City Yacht Club (Pos. No. 22, DN 059)
Red light, east pier, Queen City Yacht Club (Pos. No. 23, DN 059)

Copies of Form 76-40 attached.

A new, fiberoptic telephone cable was placed across Eagle Harbor in February 1995. The route is to the west of the existing cables but still falls within the charted cable crossing which is marked by a sign on the south shore at latitude 47°37'04.770"N, longitude 122°31'34.610"W (Pos. No. 2059, DN 096). Teresa Watson, Field Engineer, U. S. West (360-478-4423) provided a schematic and profile of the route of the new cable (Appendix VI). The cable across Eagle Harbor is part of a larger project which includes the laying of cable from Alki Point across the Sound to Bremerton on the Kitsap Peninsula. Plans and diagrams for the entire project are also included in Appendix VI. Copies attached. Field Engineer Watson verified that the cable crossing area in the outer harbor which terminates just east of the ferry landing is accurately charted.

Superfund Project Manager Ellen Hale has indicated the stack located at latitude 47°37'02.30698"N, longitude 122°30'02.15449"W, will probably be demolished. The stack is a charted landmark positioned to Third Order standards. If and when the stack is scheduled for demolition, Ms Hale will notify the Coast Guard and request issuance of a Local Notice to Mariners.

R. STATISTICS ✓

Description	Quantities
Total Positions	3066
Total Detached Positions	347
Total Nautical Miles Hydrography	143
Nautical Miles Side Scan Hydrography	16
Square Nautical Miles Hydrography	1.5
Velocity Casts	3
Days of Production	21
Bottom Samples	0
Tide Stations	0

S. MISCELLANEOUS ✓

During the first few days of mainscheme hydrography, the selected sounding interval was inadvertently set for a 1:10,000-scale survey rather than a 1:5,000-scale survey. Additional lines of hydrography were acquired to achieve the appropriate spacing; however, in some areas, spacing was still inadequate and insertions were performed in Graphic Edit to obtain adequate density. These insertions are not annotated on the fathograms* or on the raw data printouts.*

Section 6.7 of Project Instructions specified that bottom samples should not be acquired because of the presence of toxic pollutants in the seabed. There were no bottom samples collected during survey operations.

Richard Burke, owner, Eagledale Moorings (206-842-7751), has requested that the 5-mph speed buoy (Pos. No. 2149) not be charted. According to Mr. Burke, the Bainbridge Island city ordinance states that the 5-mph limit begins 500 meters to the east at Sand Spit Lighted Buoy "5." He has asked the city to move the speed marker to that location. The city council has approved placement of speed buoy in vicinity of lighted buoy "5". Per Mr. Burke as of Dec 20, 1995 this action has not taken place.

T. RECOMMENDATIONS ✓

DM-10041 was remarkable for the number of existing features either not depicted or not depicted accurately. These discrepancies may be due to a small-scale compilation of the photogrammetry. At any rate, a more complete digital map would have significantly facilitated shoreline verification.

In view of the planned demolition at the Superfund site and the changes planned for the ferry terminal and repair facility over the next five years or less, the hydrographer recommends that up-to-date photogrammetry be acquired - and compiled at the largest scale possible - once these shoreline features have been modified. Concur

* Filed with the hydrographic records.

EPA has worked with the Corps of Engineers to obtain surveys to facilitate the planning of the seabed cap and to monitor the stability and rate of settling of the deposited material. EPA plans to contract for a final survey once all offshore structures have been removed. Since this final survey may reflect additional shifting and settling; perhaps a follow-up Field Exam of the capped areas would be warranted to assure the accuracy of the revised chart.

U. REFERRAL TO REPORTS

Title	Date
1995 Horizontal Control Report OPR-N228-PHP	May 1995
Coast Pilot Report	July 1995

Submitted for approval,

Kathryn Simmons
Survey Technician

Approved and forwarded,

Richard A. Fletcher
Lieutenant, NOAA
Chief of Party

ITEM INVESTIGATION REPORT

ITEM NO.:	N1 AWOIS Item #52126 ✓	**CHART NO.:**	18449 (1:25,000)
		EDITION:	15th Edition
SURVEY:	H-10590	**CHART DATE:**	October 29, 1994

DESCRIPTION: Two piles. AWOIS position is offshore pile.

SOURCE OF ITEM: T-6262 (1934)

SOURCE POSITION: latitude 47°36'49.73"N
longitude 122°29'55.27"W

SURVEY REQUIREMENTS: Full investigation with search radius of 100 meters.

METHOD OF INVESTIGATION: The target area was searched visually during a negative tide and the DPLOGGER backpack system was employed for positioning. Consultation with Gerald W. Elfendahl, Curator of the Bainbridge Island Historical Society, P. O. Box 11653, Bainbridge Island, Washington 98110 (206-842-2773).

RESULTS OF INVESTIGATION: Pier ruins in the form of concrete pile casings were located extending from the shoreline to the offshore end at latitude 47°~~33'65.0129~~ 36' 50.129"N, longitude 122°29'51.577"W (Pos. No. 7029). See photos #73 and #74. According to Mr. Elfendahl, the ruins are part of the former Parker Sand Mine operation. The pier was constructed to transport the sand to waiting barges.

COMPARISON WITH PRIOR SURVEYS: H-3373 depicts a pier extending 100 meters beyond the end of the ruins as surveyed. H-5711 depicts 4 pilings in a row extending offshore.

COMPARISON WITH THE CHART AND CHARTING RECOMMENDATIONS: The chart depicts two piles near shore. Delete the charted piles and chart the pier ruins as surveyed with offshore end at latitude 47°~~33'65.0129~~ 36' 50.129"N, longitude 122°29'51.577"W. ✓ amend

ITEM INVESTIGATION REPORT

ITEM NO.:	N2 AWOIS Item #52127 ✓	**CHART NO.:**	18449 (1:25,000)
		EDITION:	15th Edition
SURVEY:	H-10590	**CHART DATE:**	October 29, 1994

DESCRIPTION: Pier ruins. AWOIS position is offshore end. T-6262 depicts a pier extending offshore to green daymarker No. 1 with a narrow-gauge track running the length of the pier.

SOURCE OF ITEM: T-6262 (1934). CL601/53 revised pier to ruins.

SOURCE POSITION: latitude 47°36'59.29"N
longitude 122°29'50.20"W

SURVEY REQUIREMENTS: Full investigation - bottom drag/ visual search/salvage documentation

METHOD OF INVESTIGATION: The target area was searched visually during a negative tide on DN 108. On DN 116 development echosounder coverage was obtained (Pos. Nos. 5640 - 5671). Gerald W. Elfendahl, Curator of the Bainbridge Island Historical Society (206-842-2773), was consulted.

RESULTS OF INVESTIGATION: The two inshoremost piles depicted on DM-10041 are visible at high water (Pos. No. 892, DN 074; and Pos. No. 1128, DN 076); the third, a pile ruin, ~~has a least depth of 0.1 meter at MLLW~~ is submerged based on ~~predicted~~ actual tides and is visible at minus tide (see photo #10). The three piles appear to be power pole ruins rather than pier ruins. The AWOIS target is at the position where one would expect a fourth pole carrying power lines to the structure which now supports Green Lighted Daymarker #1. No ruin was located at this position. Concur

COMPARISON WITH PRIOR SURVEYS: Both H-3373 and H5711 depict a pier ending at the offshore navaid.

COMPARISON WITH THE CHART AND CHARTING RECOMMENDATIONS: The chart depicts pier ruins extending to the navigational aid. Delete the charted ruins; chart the two inshoremost piles at the surveyed positions: latitude 47°36'57.007"N, longitude 122°29'56.265"W (Pos. No. 1128) and latitude 47°36'57.379"N, longitude 122°29'54.186"W (Pos. No. 892). Chart the third pile as a submerged pile at the position depicted on DM-10041. Concur ✓

ITEM INVESTIGATION REPORT

ITEM NO.: N3
AWOIS Item #52128
SURVEY: H-10590

CHART NO.: 18449 (1:25,000)
EDITION: 15th Edition
CHART DATE: October 29, 1994

DESCRIPTION: Two piles. AWOIS position is on the offshore end.

SOURCE OF ITEM: T-6262 (1934).

SOURCE POSITION: latitude 47°37'00.21"N
longitude 122°29'54.12"W

SURVEY REQUIREMENTS: Full investigation in search radius of 100 meters. Bottom drag/visual search/salvage documentation

METHOD OF INVESTIGATION: Visual search; echosounder development (Pos. Nos. 5672-5688, DN 116). Consultation with Gerald W. Elfendahl, Curator of the Bainbridge Island Historical Society (206-842-2773).

RESULTS OF INVESTIGATION: The structure at the AWOIS site appears to be the remains of a vessel terminal. EPA has referred to the structure as the former Milwaukee Dock (Appendix VI).* Mr. Elfendahl confirms that the Milwaukee Railroad transported logs to and from barges at the creosote plant. T-6252 depicts multiple tracks converging on the dock. The central structure (Pos. Nos. 1131, 1132) is flanked by two dolphins (Pos. Nos. 893 and 1129) with one additional dolphin (Pos. No. 1130) located a bit farther offshore on the south side. A fourth dolphin is charted opposite Pos. No. 1130 and four dolphins are depicted on T-6262. DM-10041 depicts only the two dolphins at the south side of the terminal. Thus, the AWOIS item was not two piles, but two dolphins. The first was located (Pos. No. 893); however, the offshoremost dolphin on the north side was not located. See photos #8, #11, #22.

COMPARISON WITH PRIOR SURVEYS: H-3373 depicts a pier and no dolphins; H-5722 depicts a pier with four dolphins.

COMPARISON WITH THE CHART AND CHARTING RECOMMENDATIONS: The chart depicts a pier ending in a Y-shape with four dolphins at the offshore end. Delete the charted pier. Chart pier ruins with the terminal ruins as surveyed at latitude 47°36'59.636"N, longitude 122°29'55.575"W (Pos. No. 1131) and latitude 47°36'58.820"N, longitude 122°29'55.173"W (Pos. No. 1132). Chart the three dolphins as surveyed at latitude

47°36'59.636"N, longitude 122°29'54.823"W (Pos. No. 893), latitude 47°36'59.014"N, longitude 122°29'54.531"W (Pos. No. 1129), and latitude 47°36'59.238"N, longitude 122°29'53.684"W (Pos. No. 1130). Delete the fourth dolphin. Note that this structure is slated for removal in conjunction with the Superfund site cleanup.

ITEM INVESTIGATION REPORT

ITEM NO.: N4
AWOIS Item #52129
SURVEY: H-10590

CHART NO.: 18449 (1:25,000)
EDITION: 15th Edition
CHART DATE: October 29, 1994

DESCRIPTION: Foul Area.

SOURCE OF ITEM: CL222/50 issued by C&GS Ship PATHFINDER.

SOURCE POSITION: latitude 47°37'08.35"N
longitude 122°30'08.51"W

SURVEY REQUIREMENTS: Full investigation with 100-meter search radius. Bottom drag/visual search/salvage documentation.

METHOD OF INVESTIGATION: Visual search. Echosounder development: mainscheme Pos. Nos. 1173-1293 (DN 086), mainscheme splits Pos. Nos. 1432-1466 (DN 090) and development with 6-meter line spacing Pos. Nos. 1732-1792 (DN 095). A stray appeared on the echogram during acquisition of mainscheme splits (Pos. No. 1446+2, DN 090) and was also developed and disproved. (Pos Nos. 5697-5702, DN 116).

RESULTS OF INVESTIGATION: The foul area is on top of a shoal which is very steep and very shallow. Eel grass was observed on the top of the shoal but it does not represent a hazard to navigation. Although no obstructions were encountered during development hydrography, several submerged piles were exposed 0.2 to 0.3 meters at low tide (see photo #87). These are most likely the ruins of six dolphins or pilings depicted on H-5711 but not depicted on the chart.

COMPARISON WITH PRIOR SURVEYS: The foul area is not indicated on H-3373. Six dolphins or pilings are depicted on H-5711 in the vicinity of the charted foul area.

COMPARISON WITH THE CHART AND CHARTING RECOMMENDATIONS: The shoal itself represents a more significant hazard than the pile ruins. Delete the charted foul area centered at latitude 47°37'08.35"N, longitude 122°30'08.51"W. Chart the shoal soundings from this survey.

ITEM INVESTIGATION REPORT

ITEM NO.: N5
AWOIS Item #52130 ✓
SURVEY: H-10590

CHART NO.: 18449 (1:25,000)
EDITION: 15th Edition
CHART DATE: October 29, 1994

DESCRIPTION: Pier Ruins

SOURCE OF ITEM: . T-6262 (1934) is original source for pier. BP105984-- NOS Nanci N115/78--revised pier to ruins. AWOIS position is offshore end.

SOURCE POSITION: latitude 47°37'01.45"N
longitude 122°30'33.27."W

SURVEY REQUIREMENTS: Full investigation limited to area of charted ruins and 25 meters offset from each side and beyond offshore end. Bottom drag/visual search/salvage documentation.

METHOD OF INVESTIGATION: Echosounder; visual search at minus tide.

RESULTS OF INVESTIGATION: The shore was visited at a negative tide on DN 108 and pile ruins were located on shore 100 meters SE of the target (see photo #60). It appears that a building was removed and the piling supports were cut off at the bottom. The detached position acquired at that time was not retained by the DPLOGGER program. The site was revisited with VN 0652 on DN 116 when tide height was 2.1 meters. The ruins were not accessible by launch but were still visible shoreward of the two dolphins located at latitude 47°36'59.389"N, longitude 122°30'30.591"W (Pos. No. 5709) and at latitude 47°36'59.363"N, longitude 122°30'31.683"W (Pos. No. 5710). See photos #57, #58 and #59. No ruins were located at target position. Disproval detached position was taken on DN 117 at latitude 47°37'01.409"N, longitude 122°30'33.182"W (Pos. No. 5818).

COMPARISON WITH PRIOR SURVEYS: The feature is not depicted on H-3373. H-5711 depicts a pier with the offshore end at the AWOIS target. A small building is depicted on shore.

COMPARISON WITH THE CHART AND CHARTING RECOMMENDATIONS: The pile ruins located are on shore well above MHW. Delete the charted pier ruins. Chart the offshore dolphins located on this survey.

ITEM INVESTIGATION REPORT

ITEM NO.: N6
AWOIS Item #52131 ✓
SURVEY: H-10590

CHART NO.: 18449 (1:25,000)
EDITION: 15th Edition
CHART DATE: October 29, 1994

DESCRIPTION: Ferry landing ruins and dolphins. AWOIS position is offshore end.

SOURCE OF ITEM: CL222/50 issued by C&GS Ship PATHFINDER is source for ferry landing and associated dolphins. Air photo revisions (1953-59) revised landing to ruins. LNM25/90 reported CGD13 established a fixed aid to navigation at the end of this feature.

SOURCE POSITION: latitude 47°37'03.94"N
longitude 122°30'37.81"W

SURVEY REQUIREMENTS: Full investigation limited to area of the charted ruins and dolphins and 50 meters offser from each side and beyond the offshore end.

METHOD OF INVESTIGATION: Visual search; echosounder detached positions.

RESULTS OF INVESTIGATION: No ferry landing ruins exist at the AWOIS target. Fix No. 2094 is disproval DP. The site is now occupied by Bainbridge Island Marina located by detached positions 2096, 2097 (DN 096) and 5823, 5824, 5825, 5826 (DN 117). Pos. Nos. 2096 and 2097 also mark the location of the privately maintained aids to navigation.

COMPARISON WITH PRIOR SURVEYS: Neither H-3373 nor H-5711 depicts the ferry landing and dolphins.

COMPARISON WITH THE CHART AND CHARTING RECOMMENDATIONS:
Delete the charted ruins. Chart the marina with its aids to navigation as surveyed. ✓ ✓

ITEM INVESTIGATION REPORT

ITEM NO.: N7
AWOIS Item #52132 ✓
SURVEY: H-10590

CHART NO.: 18449 (1:25,000)
EDITION: 15th Edition
CHART DATE: October 29, 1994

DESCRIPTION: Pier ruins. AWOIS position is the offshore end.

SOURCE OF ITEM: T-6262 (1939) is source for pier. BP120016--NOS NANCI 1983--revised the pier to ruins.

SOURCE POSITION: latitude 47°36'58.98"N
longitude 122°30'51.97"W

SURVEY REQUIREMENTS: Full investigation limited to area of charted ruins and 25 meters offset from each side and beyond the offshore end.

METHOD OF INVESTIGATION: Visual search; echosounder.

RESULTS OF INVESTIGATION: Water visibility good, depth less than 1 meter; no pier ruins seen. Disproval detached position No. 5821 acquired at latitude 47°36'59.131"N, longitude 122°30'51.834"W (DN 117).

COMPARISON WITH PRIOR SURVEYS: Pier ruins are not depicted on H-3373 or H-5711.

COMPARISON WITH THE CHART AND CHARTING RECOMMENDATIONS: ✓
Delete the pier ruins charted at latitude 47°36'58.98"N, longitude 122°30'51.97"W. Concur

ITEM INVESTIGATION REPORT

ITEM NO.: N8
AWOIS Item #52133
SURVEY: H-10590

CHART NO.: 18449 (1:25,000)
EDITION: 15th Edition
CHART DATE: October 29, 1994

DESCRIPTION: Charted pier. AWOIS position is offshore end.

SOURCE OF ITEM: BP120016--NOS NANCI 1983--is source for pier.

SOURCE POSITION: latitude 47°36'59.16"N
longitude 122°30'53.94"W

SURVEY REQUIREMENTS: Full investigation limited to area of the charted pier and 25 meters offset from each side and beyond the offshore end. Bottom drag/visual search/salvage documentation.

METHOD OF INVESTIGATION: Visual search; echosounder.

RESULTS OF INVESTIGATION: The charted pier was not found. In water depth of less than one meter and good visibility, pile ruins were seen lying on the bottom at latitude 47°36'59.267"N, longitude 122°30'53.764" (Pos. No. 5820, DN 117). Pier ruins were also visible at the shoreline (see photo #66).

COMPARISON WITH PRIOR SURVEYS: The pier was not depicted on H-5711 and is beyond the limits of H-3373.

COMPARISON WITH THE CHART AND CHARTING RECOMMENDATIONS:
Delete the charted pier. Chart the pier ruins with the offshore end at latitude 47°36'59.267"N, longitude 122°30'53.764"W.

ITEM INVESTIGATION REPORT

ITEM NO.: N9
AWOIS Item #52134 ✓
SURVEY: H-10590

CHART NO.: 18449 (1:25,000)
EDITION: 15th Edition
CHART DATE: October 29, 1994

DESCRIPTION: Charted ruins. AWOIS position is offshore end.

SOURCE OF ITEM: BP120016--NOS NANCI 1983--is source of ruins.

SOURCE POSITION: latitude 47°37'00.48"N
longitude 122°31'02.04"W

SURVEY REQUIREMENTS: Full investigation limited to area of charted ruins and 25 meters offset from each side and beyond offshore end. Bottom drag/visual search/salvage documentation

METHOD OF INVESTIGATION: Visual search; echosounder.

RESULTS OF INVESTIGATION: No pier ruins are visible; a relatively new bulkhead runs along the shoreline and a new, L-shaped pier has been constructed; the NE offshore end is located at latitude 47°37'01.752"N, longitude 122°31'01.173"W (Pos. No. 2080, DN 096) and the NW end is located at latitude 47°37'01.730"N, longitude 122°31'02.030"W (Pos. No. 2081, DN 096). See photo #42.

COMPARISON WITH PRIOR SURVEYS: The ruins are not depicted on H-3373 or H-5711.

COMPARISON WITH THE CHART AND CHARTING RECOMMENDATIONS: Delete the charted ruins. Chart the L-shaped pier as surveyed with the NE end at latitude 47°37'01.752"N, longitude 122°31'01.173"W and the NW end located at latitude 47°37'01.730"N, longitude 122°31'02.030"W. Chart new L-shaped pier as shown on the smooth sheet. amdc

ITEM INVESTIGATION REPORT

ITEM NO.: N10
AWOIS Item #52135 ✓
SURVEY: H-10590

CHART NO.: 18449 (1:25,000)
EDITION: 15th Edition
CHART DATE: October 29, 1994

DESCRIPTION: Charted ruins. AWOIS position is offshore end.

SOURCE OF ITEM: BP120016--NOS Nanci 1983.

SOURCE POSITION: latitude 47°37'02.51"N
longitude 122°31'13.02"W

SURVEY REQUIREMENTS: Full investigation limited to area of charted ruins and 25 meters offset from each side and beyond the offshore end. Bottom drag/visual search/salvage documentation.

METHOD OF INVESTIGATION: Visual search; echosounder.

RESULTS OF INVESTIGATION: No ruins were located at the AWOIS target; however, pier ruins were located near shore 17 meters south of the target at latitude 47°37'01.948"N, longitude 122°31'13.006"W (Pos. No. 2068, DN 096). See photo #40.

COMPARISON WITH PRIOR SURVEYS: A pier is depicted on H-5711 in the vicinity of the AWOIS location. The item is beyond the limits of H-3373.

COMPARISON WITH THE CHART AND CHARTING RECOMMENDATIONS: The charted pier ruins extend 30 meters offshore. Delete the pier ruins charted at latitude 47°37'02.51"N, longitude 122°31'13.02"W; chart the ruins at the surveyed position: latitude 47°37'01.948"N, longitude 122°31'13.006"W.

ITEM INVESTIGATION REPORT

ITEM NO.: N11
AWOIS Item #52136
SURVEY: H-10590

CHART NO.: 18449 (1:25,000)
EDITION: 15th Edition
CHART DATE: October 29, 1994

DESCRIPTION: Charted ruins. AWOIS position is at offshore end.

SOURCE OF ITEM: Source for the pier is not known. The pier was charted on the first edition of 6446 from the canceled charts it replaced. BP120016--NOS NANCI 1983--is source for ruins.

SOURCE POSITION: latitude 47°37'03.04"N
longitude 122°31'15.64"W

SURVEY REQUIREMENTS: Full investigation limited to area of charted ruins and 25 meters offset from each side and beyond offshore end. Bottom drag/visual search/salvage documentation.

METHOD OF INVESTIGATION: Visual search; echosounder.

RESULTS OF INVESTIGATION: Water depth was less than two meters and visibility was good. No pier ruins were seen in the immediate target vicinity. Very minor pier ruins were located 14.5 meters to the southeast at latitude 47°37'02.634"N, longitude 122°31'15.291"W (Pos. No. 2066, DN 096). See photo #39.

COMPARISON WITH PRIOR SURVEYS: Small buildings and short piers are depicted on H-5711. The target is beyond the limits of H-3373.

COMPARISON WITH THE CHART AND CHARTING RECOMMENDATIONS: Delete the ruins charted at latitude 47°37'03.04"N, longitude 122°31'15.64"W. Chart pier ruins at the surveyed location: latitude 47°37'02.634"N, longitude 122°31'15.291"W

ITEM INVESTIGATION REPORT

ITEM NO.: N12
AWOIS Item #52137 ✓
SURVEY: H-10590

CHART NO.: 18449 (1:25,000)
EDITION: 15th Edition
CHART DATE: October 29, 1994

DESCRIPTION: Charted pier. AWOIS position is on offshore end.

SOURCE OF ITEM: C222/50--C&GS Ship PATHFINDER.

SOURCE POSITION: latitude 47°37'06.03"N
longitude 122°31'28.32"W

SURVEY REQUIREMENTS: Full investigation limited to area of the charted pier and 25 meters offset from each side and beyond the offshore end. Bottom drag/visual search/salvage documentation.

METHOD OF INVESTIGATION: Visual search; echosounder.

RESULTS OF INVESTIGATION: No pier was visible at the target. On DN 096 a disproval detached position was acquired at latitude 47°37'06.015"N, longitude 122°31'28.323"W (Pos. No. 2061). A floating dock was located to the east of the AWOIS position with the offshore end located 50 meters from the target at latitude 47°37'07.702"N, longitude 122°31'27.495"W (Pos. No. 2062). On DN 060 a row of piles was found twenty meters to the west of the target with the northeast offshoremost located 50 meters seaward of the AWOIS target at latitude 47°37'07.436"N, longitude 122°31'28.980"W (Pos. No. 171). The piles appear to be support piles for a T-shaped floating dock. The northwest support pile was located at latitude 47°37'07.410"N, longitude 122°31'29.636"W (Pos. No. 170).

COMPARISON WITH PRIOR SURVEYS: The pier is not depicted on H-5711 and is beyond the limits of H-3373.

COMPARISON WITH THE CHART AND CHARTING RECOMMENDATIONS: Delete the pier charted at latitude 47°37'03.04"N, longitude 122°31'15.64"W. Chart the floating dock with the offshore end at latitude 47°37'07.702"N, longitude 122°31'27.495"W. Also chart a t-shaped floating dock with the offshore ends at latitude 47°37'07.436"N, longitude 122°31'28.980"W and at latitude 47°37'07.410"N, longitude 122°31'29.636"W ✓ concur

ITEM INVESTIGATION REPORT

ITEM NO.: N13
AWOIS Item #52138 ✓
SURVEY: H-10590

CHART NO.: 18449 (1:25,000)
EDITION: 15th Edition
CHART DATE: October 29, 1994

DESCRIPTION: Pile

SOURCE OF ITEM: CL222/50--C&GS Ship PATHFINDER.

SOURCE POSITION: latitude 47°37'05.59"N
longitude 122°31'34.08"W

SURVEY REQUIREMENTS: Full investigation within 35-meter radius. Bottom drag/visual search/salvage documentation.

METHOD OF INVESTIGATION: Visual search; echosounder

RESULTS OF INVESTIGATION: The AWOIS target is located shoreward of the 0-meter curve. The target area was searched at a 2.4-meter tide on DN 096 in water depth of less than 1.5 meters. No pile was found and disproval position was recorded at latitude 47°37'05.551"N, longitude 122°31'34.041"W (Pos. No. 2056)

COMPARISON WITH PRIOR SURVEYS: The pile is not depicted on H-5711 and is beyond the limits of H-3373.

COMPARISON WITH THE CHART AND CHARTING RECOMMENDATIONS:
Delete the pile charted at latitude 47°37'05.59"N, longitude 122°31'34.08"W.

ITEM INVESTIGATION REPORT

ITEM NO.:	N14 AWOIS Item #52139	**CHART NO.:**	18449 (1:25,000)
		EDITION:	15th Edition
SURVEY:	H-10590	**CHART DATE:**	October 29, 1994

DESCRIPTION: Charted pier ruins. AWOIS position is on the offshore end.

SOURCE OF ITEM: BP105985--NOS NANCI N115/78--is source for the pier. BP120016--NOS NANCI 1983--revised pier to ruins.

SOURCE POSITION: latitude 47°37'04.62"N
longitude 122°31'35.51"W

SURVEY REQUIREMENTS: Full investigation limited to area of charted ruins and 25 meters offset from each side and beyond offshore end. Bottom drag/visual search/salvage documentation.

METHOD OF INVESTIGATION: Visual search; echosounder.

RESULTS OF INVESTIGATION: Pier ruins were not seen at the target location (Pos. No. 2055, DN 096). It appears the shoreline has been altered with fill material retained by a new bulkhead. The site of the original pier is now above MHW. (DM-10041 confirms the shoreline change.) However, pier ruins were located 19 meters NW of the target extending approximately 2 meters from the bulkhead at latitude 47°37'05.129"N, longitude 122°31'36.028"W (Pos. No. 2057, DN 096). See photo #47.

COMPARISON WITH PRIOR SURVEYS: The pier is not depicted on H-5711 and is beyond the limits of H-3373.

COMPARISON WITH THE CHART AND CHARTING RECOMMENDATIONS: Delete the pier ruins charted at latitude 47°37'04.62"N, longitude 122°31'35.51"W. Chart the shoreline as depicted on DM-10041; chart pier ruins at the surveyed location: latitude 47°37'05.129"N, longitude 122°31'36.028"W.

ITEM INVESTIGATION REPORT

ITEM NO.: N15
AWOIS Item #52140
SURVEY: H-10590

CHART NO.: 18449 (1:25,000)
EDITION: 15th Edition
CHART DATE: October 29, 1994

DESCRIPTION: Charted pier. AWOIS position is on offshore end.

SOURCE OF ITEM: BP120016--NOS NANCI 1983.

SOURCE POSITION: latitude 47°37'05.33"N
longitude 122°31'36.69"W

SURVEY REQUIREMENTS: Full investigation limited to area of charted pier and 25 meters offset from each side and beyond the offshore end. Bottom drag/visual search/salvage documentation.

METHOD OF INVESTIGATION: Visual search; echosounder.

RESULTS OF INVESTIGATION: The charted pier was not located. The disproval detached position was acquired 2 meters from the target at latitude 47°37'05.333 1223136.603 (Pos. No. 2054, DN 096). It appears the shoreline has been altered with fill material retained by a new bulkhead and the site of the original pier has been filled in; see photo #47. DM-10041 depicts the shoreline change.

COMPARISON WITH PRIOR SURVEYS: The pier is not depicted on H-5711 and is beyond the limits of H-3373.

COMPARISON WITH THE CHART AND CHARTING RECOMMENDATIONS: Delete the pier charted at latitude 47°37'05.33"N, longitude 122°31'36.69"W. Chart the shoreline as depicted on DM-10041.

ITEM INVESTIGATION REPORT

ITEM NO.: N16
AWOIS Item #52141 ✓
SURVEY: H-10590

CHART NO.: 18449 (1:25,000)
EDITION: 15th Edition
CHART DATE: October 29, 1994

DESCRIPTION: Charted pier ruins. AWOIS position is on offshore end.

SOURCE OF ITEM: CL222/50--C&GS Ship PATHFINDER is source for pier. BP120016--NOS NANCI 1983--revised part of the pier to ruins.

SOURCE POSITION: latitude 47°37'06.21"N
longitude 122°31'36.95"W

SURVEY REQUIREMENTS: Full investigation limited to area of charted ruins and 25 meters offset from each side and beyond the offshore end. Bottom drag/visual search/salvage documentation.

METHOD OF INVESTIGATION: Visual search.

RESULTS OF INVESTIGATION: A floating dock was located 10 meters from the AWOIS target at latitude 47°37'06.560"N, longitude 122°31'36.881"W (Pos. No. 2053, DN 096). See photo #46.

COMPARISON WITH PRIOR SURVEYS: H-5711 does not depict either pier or ruins; the AWOIS item is beyond the limits of H-3373.

COMPARISON WITH THE CHART AND CHARTING RECOMMENDATIONS: Delete the pier ruins charted at latitude 47°37'06.21"N, longitude 122°31'36.95"W. Chart the floating ~~dock~~ pier at latitude 47°37'06.560"N, longitude 122°31'36.881"W. Concur

ITEM INVESTIGATION REPORT

ITEM NO.: N17
AWOIS Item #52142 ✓
SURVEY: H-10590

CHART NO.: 18449 (1:25,000)
EDITION: 15th Edition
CHART DATE: October 29, 1994

DESCRIPTION: Charted pier ruins. AWOIS position is on offshore end.

SOURCE OF ITEM: Source of pier is not known. Pier was charted on the first edition of Chart 6446 from the canceled charts it replaced. BP120016--NOS NANCI 1983--revised the pier to ruins.

SOURCE POSITION: latitude 47°37'10.09"N
longitude 122°31'40.88"W

SURVEY REQUIREMENTS: Full investigation limited to area of charted ruins and 25 meters offset from each side and the offshore end. Bottom drag/visual search/salvage documentation.

METHOD OF INVESTIGATION: Visual Search; echosounder.

RESULTS OF INVESTIGATION: On DN 096 pier ruins were located approximately 28 meters from the target: Pos. No. 2050 was recorded 10 meters shoreward (225°) of the target at latitude 47°37'09.613"N, longitude 122°31'41.370"W. See photo #45. Fifteen meters SSE of the target a pier was located at latitude 47°37'10.264"N, longitude 122°31'40.738"W. The pier is depicted on DM 10041.

COMPARISON WITH PRIOR SURVEYS: The pier is not depicted on H-5711 and is beyond the limits of H-3373.

COMPARISON WITH THE CHART AND CHARTING RECOMMENDATIONS: Delete the pier ruins charted at latitude 47°37'10.09"N, longitude 122°31'40.88"W. Chart the pier ruins with a 10-meter offset at 225° from the surveyed position: latitude 47°37'09.613"N, longitude 122°31'41.370"W. Also chart the pier as surveyed with the offshore end at latitude 47°37'10.264"N, longitude 122°31'40.738"W. Chart pier ruins and a pier as shown on the smooth sheet

ITEM INVESTIGATION REPORT

ITEM NO.: N18
AWOIS Item #52143 ✓
SURVEY: H-10590

CHART NO.: 18449 (1:25,000)
EDITION: 15th Edition
CHART DATE: October 29, 1994

DESCRIPTION: Charted Ruins. AWOIS position is offshore end.

SOURCE OF ITEM: Photo revisions (1953-59) are source for charted ruins.

SOURCE POSITION: latitude 47°37'11.68"N
longitude 122°31'44.01"W

SURVEY REQUIREMENTS: This item was not assigned.

METHOD OF INVESTIGATION: The area was included in the general shoreline investigation on the south shore where the procedure was to record detached positions on all visible features.

RESULTS OF INVESTIGATION: No ruins were visible at the target.

COMPARISON WITH PRIOR SURVEYS: H-5711 does not depict either pier or ruins; the target is beyond the limits of H-3373.

COMPARISON WITH THE CHART AND CHARTING RECOMMENDATIONS: Delete the ruins charted at latitude 47°37'11.68"N, longitude 122°31'44.01"W. concur ✓

ITEM INVESTIGATION REPORT

ITEM NO.: N19
AWOIS Item #52144 ✓
SURVEY: H-10590

CHART NO.: 18449 (1:25,000)
EDITION: 15th Edition
CHART DATE: October 29, 1994

DESCRIPTION: Charted ruins. AWOIS position is on offshore end.

SOURCE OF ITEM: Photo revisions (1953-59)--source for charted ruins

SOURCE POSITION: latitude 47°37'12.65"N
longitude 122°31'43.63"W

SURVEY REQUIREMENTS: Full investigation limited to area of ruins and 25 meters offset from each side and beyond the offshore end. Bottom drag/visual search/salvage documentation.

METHOD OF INVESTIGATION: Visual search; echosounder.

RESULTS OF INVESTIGATION: No pier ruins were visible. Water was clear, less than 2 meters deep with good visibility and no submerged ruins were found. A disproval detached position was recorded at latitude 47°37'12.581 1223143.647 (Pos. No. 2048, DN 096.)

COMPARISON WITH PRIOR SURVEYS: H-5711 does not depict either pier or ruins. The target is beyond the limits of H-3373.

COMPARISON WITH THE CHART AND CHARTING RECOMMENDATIONS: Delete pier ruins charted at latitude 47°37'12.65"N, longitude 122°31'43.63"W. concur

ITEM INVESTIGATION REPORT

ITEM NO.:	N20 AWOIS Item #52145 ✓	**CHART NO.:**	18449 (1:25,000)
		EDITION:	15th Edition
SURVEY:	H-10590	**CHART DATE:**	October 29, 1994

DESCRIPTION: Charted pier ruins and new pier extension. AWOIS position is on offshore end of charted ruins.

SOURCE OF ITEM: T-6262 (1934) is original source of pier. Photo revisions (1953-59) revised the charted pier to ruins and added a new pier extension in a more easterly direction.

SOURCE POSITION: latitude 47°37'17.32"N
longitude 122°31'49.25"W

SURVEY REQUIREMENTS: Full investigation limited to area of the charted pier and 25 meters offset from each side and beyond the offshore ends. Bottom drag/visual search/salvage documentation.

METHOD OF INVESTIGATION: Visual search; echosounder.

RESULTS OF INVESTIGATION: On DN 076 pier ruins were located at latitude 47°37'17.065"N, longitude 122°31'49.075"W (Pos. No. 2043) 8.5 meters from the target. See photo #43.

COMPARISON WITH PRIOR SURVEYS: A pier is depicted on H-5711 in the vicinity of the AWOIS target. The target is beyond the limits of H-3373.

COMPARISON WITH THE CHART AND CHARTING RECOMMENDATIONS: Retain the charted pier ruins as shown on the smooth sheet.

ITEM INVESTIGATION REPORT

ITEM NO.: N21
AWOIS Item #52146 ✓
SURVEY: H-10590

CHART NO.: 18449 (1:25,000)
EDITION: 15th Edition
CHART DATE: October 29, 1994

DESCRIPTION: Charted pier ruins. AWOIS position is offshore end.

SOURCE OF ITEM: T-6262 (1934) is original source of pier structure which was only part of the present ruins. Photo revisions (1953-59) revised pier structure to the present shape. BP105985--NOS NANCI N115/78--revised pier to ruins.

SOURCE POSITION: latitude 47°37'22.62"N
longitude 122°32'11.87"W

SURVEY REQUIREMENTS: Full investigation limited to area of charted ruins and 25 meters offset from each side and beyond offshore ends. Bottom drag/visual search/salvage documentation.

METHOD OF INVESTIGATION: Visual search; echosounder.

RESULTS OF INVESTIGATION: No pier ruins were found at the AWOIS target. Four evenly spaced piles were located at the site; the offshoremost of these was positioned at latitude 47°37'24.289"N, longitude 122°32'10.220"W (Pos. No. 2029, DN 096). See photos #33, #34, #35.

COMPARISON WITH PRIOR SURVEYS: The pier is depicted on H-5711. The search area is beyond the limits of H-3373.

COMPARISON WITH THE CHART AND CHARTING RECOMMENDATIONS: (TS) Delete the charted pier ruins. Chart the four piles with the offshoremost at latitude 47°37'24.289"N, longitude 122°32'10.220"W. ifnew

ITEM INVESTIGATION REPORT

ITEM NO.: N22
AWOIS Item #52147 ✓
SURVEY: H-10590

CHART NO.: 18449 (1:25,000)
EDITION: 15th Edition
CHART DATE: October 29, 1994

DESCRIPTION: Pier ruins. AWOIS position is on offshore end.

SOURCE OF ITEM: T-6262 (1934) is original source of pier structure. Photo revisions (1953-59) revised pier to ruins.

SOURCE POSITION: latitude 47°37'24.73"N
longitude 122°32'13.70"W

SURVEY REQUIREMENTS: Full investigation limited to area of the charted ruins and 25 meters offset from each side and beyond the offshore end. Bottom drag/visual search/salvage documentation.

METHOD OF INVESTIGATION: Visual search, echosounder.

RESULTS OF INVESTIGATION: No pier ruins were seen during echosounder hydrography on DN 096. The site was revisited at low tide on DN 111 and it was evident no pier ruins exist at the site. See photo #32.

COMPARISON WITH PRIOR SURVEYS: The pier is depicted on H-5711 but it is beyond the limits of H-3373.

COMPARISON WITH THE CHART AND CHARTING RECOMMENDATIONS:
Delete pier ruins charted at latitude 47°37'24.73"N, longitude 122°32'13.70"W.

ITEM INVESTIGATION REPORT

ITEM NO.:	N23 AWOIS Item #52148 ✓	**CHART NO.:**	18449 (1:25,000)
		EDITION:	15th Edition
SURVEY:	H-10590	**CHART DATE:**	October 29, 1994

DESCRIPTION: Charted pier ruins. AWOIS position is on offshore end.

SOURCE OF ITEM: T-6262 (1934) is original source of pier structure. Photo revisions (1953-59) revised pier to ruins.

SOURCE POSITION: latitude 47°37'26.94"N
longitude 122°32.15.41"W

SURVEY REQUIREMENTS: Full investigation limited to area of charted ruins and 25 meters offset from each side and beyond the offshore end. Bottom drag/visual search/ salvage documentation.

METHOD OF INVESTIGATION: Visual search; echosounder.

RESULTS OF INVESTIGATION: No pier ruins were found at the AWOIS target. A single pile was located at latitude 47°37'27.133"N, longitude 122°32'16.228"W (Pos. No. 2028, DN 096) 18 meters from the target. The pile is the southeasternmost of six in a row; the northwesternmost is located at latitude 47°37'32.908"N, longitude 122°32'19.528"W (Pos. No. 2026, DN 096).

COMPARISON WITH PRIOR SURVEYS: The pier is depicted on H-5711. The search area is beyond the limits of H-3373.

COMPARISON WITH THE CHART AND CHARTING RECOMMENDATIONS: Delete the ruins charted at latitude 47°37'26.94"N, longitude 122°32.15.41"W. Chart the six piles extending from latitude 47°37'27.133"N, longitude 122°32'16.228"W to latitude 47°37'32.908"N, longitude 122°32'19.528"W.

ITEM INVESTIGATION REPORT

ITEM NO.: N24
AWOIS Item #52149 ✓
SURVEY: H-10590

CHART NO.: 18449 (1:25,000)
EDITION: 15th Edition
CHART DATE: October 29, 1994

DESCRIPTION: Charted Pile.

SOURCE OF ITEM: T-6262 (1934)

SOURCE POSITION: latitude 47°37'32.85"N
longitude 122°32'15.54"W

SURVEY REQUIREMENTS: Full investigation. Bottom drag/visual search/salvage documentation.

METHOD OF INVESTIGATION: Visual search.

RESULTS OF INVESTIGATION: On DN 108 the target area was visited during a low tide when the entire west end of the harbor becomes exposed. No pile was visible.

COMPARISON WITH PRIOR SURVEYS: Two piles are depicted on H-5711. The search area is beyond the limits of H-3373.

COMPARISON WITH THE CHART AND CHARTING RECOMMENDATIONS: Delete the pile charted at latitude 47°37'32.85"N, longitude 122°32'15.54"W. concur

ITEM INVESTIGATION REPORT

ITEM NO.:	N25 AWOIS Item #52150	**CHART NO.:**	18449 (1:25,000)
		EDITION:	15th Edition
SURVEY:	H-10590	**CHART DATE:**	October 29, 1994

DESCRIPTION: Two charted piles. AWOIS position is the southernmost pile.

SOURCE OF ITEM: T-6262 (1934).

SOURCE POSITION: latitude 47°37'34.61"N
longitude 122°32'18.68"W

latitude 47°37'35.87"N
longitude 122°32'19.39"W

SURVEY REQUIREMENTS: Full investigation within 50-meter radius of each pile.

METHOD OF INVESTIGATION: Visual search, echosounder.

RESULTS OF INVESTIGATION: According to the AWOIS description the two piles are 41.6 meters apart. On DN 096 two piles were located in the vicinity of AWOIS 52150: the northernmost was located 34.6 meters from the northernmost target at latitude 47°37'36.985"N, longitude 122°32'19.210"W (Pos. No. 2025). The second pile was located 63 meters to the south, 14 meters from the target, at latitude 47°37'34.942"N, longitude 122°32'19.132"W (Pos. No. 2024). The two piles anchor floating pier ruins - see photos #28 and #29.

COMPARISON WITH PRIOR SURVEYS: The two piles are depicted on H-5711. The target area is beyond the limits of H-3373.

COMPARISON WITH THE CHART AND CHARTING RECOMMENDATIONS: Delete the two piles charted at latitude 47°37'34.61"N, longitude 122°32'18.68"W; and at latitude 47°37'35.87"N, longitude 122°32'19.39"W. Chart the floating pier ruins and the two piles at the surveyed positions: 47°37'36.985"N, longitude 122°32'19.210"W and latitude 47°37'34.942"N, longitude 122°32'19.132"W. Concur

ITEM INVESTIGATION REPORT

ITEM NO.:	N26 AWOIS Item #52151 ✓	**CHART NO.:**	18449 (1:25,000)
		EDITION:	15th Edition
SURVEY:	H-10590	**CHART DATE:**	October 29, 1994

DESCRIPTION: Charted pier ruins. AWOIS position is on offshore end.

SOURCE OF ITEM: Photo revisions (1953-59) are original source of pier structure. BP120016--NOS NANCI 1983 revised pier to ruins.

SOURCE POSITION: latitude 47°37'37.88"N
longitude 122°32'17.64"W

SURVEY REQUIREMENTS: Full investigation limited to area of charted ruins and 25 meters offset from each side and beyond offshore end. Bottom drag/visual search/salvage documentation.

METHOD OF INVESTIGATION: Visual; DPLogger

RESULTS OF INVESTIGATION: A fixed pier was found at the AWOIS target and positioned at latitude 47°37'37.973"N, longitude 122°32'19.033"W (Pos. No. 7028, DN 108, DPLogger). See photos #29 and #30.

COMPARISON WITH PRIOR SURVEYS: Target is beyond limits of H-3373. H-5711 does not depict a feature in the search area.

COMPARISON WITH THE CHART AND CHARTING RECOMMENDATIONS: Delete the pier ruins charted at latitude 47°37'37.88"N, longitude 122°32'17.64"W; chart the fixed pier at latitude 47°37'37.973"N, longitude 122°32'19.033"W, as surveyed. Concur

ITEM INVESTIGATION REPORT

ITEM NO.:	N27 AWOIS Item #52152 ✓	**CHART NO.:**	18449 (1:25,000)
		EDITION:	15th Edition
SURVEY:	H-10590	**CHART DATE:**	October 29, 1994

DESCRIPTION: Two charted piles. AWOIS position is southernmost pile.

SOURCE OF ITEM: T-6262 (1934) is source for the southernmost pile. CL453/86--USACE Construction Permit is source for the northernmost pile.

SOURCE POSITION: latitude 47°37'29.50"N
longitude 122°31'49.40"W

latitude 47°37'30.72"N
longitude 122°31'48.94"W

SURVEY REQUIREMENTS: Full investigation within search radius of 25 meters. Bottom drag/visual search/salvage documentation.

METHOD OF INVESTIGATION: Visual search; DPLogger.

RESULTS OF INVESTIGATION: On DN 108 the target area was visited at a low tide when the entire west end of the harbor becomes exposed. No piles were visible at the target (Pos. No. 7016, DN 108, DPLogger). See photo #72.

COMPARISON WITH PRIOR SURVEYS: H-5711 depicts dolphins at the AWOIS target. Target is beyond the limtis of H-3373.

COMPARISON WITH THE CHART AND CHARTING RECOMMENDATIONS: Delete the piles charted at latitude 47°37'29.50"N, longitude 122°31'49.40"W, and latitude 47°37'30.72"N, longitude 122°31'48.94"W.

ITEM INVESTIGATION REPORT

ITEM NO.:	N28 AWOIS Item #52153	**CHART NO.:**	18449 (1:25,000)
		EDITION:	15th Edition
SURVEY:	H-10590	**CHART DATE:**	October 29, 1994

DESCRIPTION: Telephone poles.

SOURCE OF ITEM: T-6262 (1934)

SOURCE POSITION: latitude 47°37'13.44"N
longitude 122°31'35.26"W

SURVEY REQUIREMENTS: Full investigation within 30-meter search radius. Bottom drag/visual search/salvage documentation.

METHOD OF INVESTIGATION: Visual search on DN 096, follow-up echosounder drift search on DN 117 (Pos. Nos. 5811-5816).

RESULTS OF INVESTIGATION: No telephone pole nor submerged obstruction was found in the AWOIS target area. Water was clear, depth was less than 3 meters and visibility was good. A disproval detached position was recorded on DN 096 at latitude 47°37'13.474"N, longitude 122°31'35.218"W (Pos. No. 2060).

COMPARISON WITH PRIOR SURVEYS: Two telephone poles are depicted on H-5711. Target is outside limits of H-3373.

COMPARISON WITH THE CHART AND CHARTING RECOMMENDATIONS:
Delete the charted telephone pole at latitude 47°37'13.44"N, longitude 122°31'35.26"W
This feature is currently charted as a pile symbol with no specific notation. concur

ITEM INVESTIGATION REPORT

ITEM NO.: N29
AWOIS Item #52154 ✓
SURVEY: H-10590

CHART NO.: 18449 (1:25,000)
EDITION: 15th Edition
CHART DATE: October 29, 1994

DESCRIPTION: Two charted piles. AWOIS position is on easternmost pile.

SOURCE OF ITEM: Original source is not known. Piles first appeared on the 12th edition of Chart 18449, dated 8/25/84.

SOURCE POSITION: latitude 47°37'19.26"N
longitude 122°31'09.65"W

latitude 47°37'19.49"N
longitude 122°31'10.99"W

SURVEY REQUIREMENTS: Full investigation within 25-meter radius of each pile. Bottom drag/visual search/salvage documentation.

METHOD OF INVESTIGATION: Visual search, echosounder.

RESULTS OF INVESTIGATION: Pile ruins were visible in very shallow, clear water lying flat on the bottom. The piles are rotting and do not constitute a hazard to navigation. (Pos. No. 44, DN 60)

COMPARISON WITH PRIOR SURVEYS: The piles are not depicted on H-5711. The target is beyond the limits of H-3373.

COMPARISON WITH THE CHART AND CHARTING RECOMMENDATIONS: Delete the piles charted at latitude 47°37'19.26"N, longitude 122°31'09.65"W, and latitude 47°37'19.49"N, longitude 122°31'10.99"W. Concur

ITEM INVESTIGATION REPORT

ITEM NO.: N30
AWOIS Item #52155 ✓
SURVEY: H-10590

CHART NO.: 18449 (1:25,000)
EDITION: 15th Edition
CHART DATE: October 29, 1994

DESCRIPTION: Two charted piles. AWOIS position is on easternmost pile.

SOURCE OF ITEM: Original source is not known. The piles first appeared on the 12th edition of Chart 18449, dated 8/25/84.

SOURCE POSITION: latitude 47°37'18.56"N
longitude 122°31'05.46"W

latitude 47°37'18.91"N
longitude 122°31'06.64"W

SURVEY REQUIREMENTS: Full investigation within 25-meter radius of each pile. Bottom drag/visual search/salvage documentation.

METHOD OF INVESTIGATION: Visual search, echosounder

RESULTS OF INVESTIGATION: Pile ruins were visible in very shallow, clear water lying flat on the bottom. The piles are rotting and do not constitute a hazard to navigation. (Pos. No. 45, DN 60)

COMPARISON WITH PRIOR SURVEYS: The piles are not depicted on H-5711. The target is beyond the limits of H-3373.

COMPARISON WITH THE CHART AND CHARTING RECOMMENDATIONS: Delete the piles charted at latitude 47°37'18.56"N, longitude 122°31'05.46"W, and latitude 47°37'18.91"N, longitude 122°31'06.64"W. Concur

ITEM INVESTIGATION REPORT

ITEM NO.:	N31 AWOIS Item #52156 ✓	**CHART NO.:**	18449 (1:25,000)
		EDITION:	15th Edition
SURVEY:	H-10590	**CHART DATE:**	October 29, 1994

DESCRIPTION: Charted pier ruins. AWOIS position is on the offshore end.

SOURCE OF ITEM: CL107/69--PMC to C&GS is original source for pier structure. BP105985--NOS NANCI N115/78 revised pier to ruins.

SOURCE POSITION: latitude 47°37'15.65"N
longitude 122°31'00.23"W

SURVEY REQUIREMENTS: Full investigation limited to area of charted ruins and 25 meters offset each side and beyond offshore end. Bottom Drag/visual search/salvage documentation.

METHOD OF INVESTIGATION: Visual search, echosounder development of the search area with 3-meter line spacing (Pos. Nos. 49-145, DN 060).

RESULTS OF INVESTIGATION: No evidence of pier ruins was found.

COMPARISON WITH PRIOR SURVEYS: A piling is depicted at the AWOIS target on H-5711. Target is beyond the limtis of H-3373.

COMPARISON WITH THE CHART AND CHARTING RECOMMENDATIONS: Delete the pier ruins charted at latitude 47°37'15.65"N, longitude 122°31'00.23"W. error

ITEM INVESTIGATION REPORT

ITEM NO.:	N32 AWOIS Item #52157	**CHART NO.:**	18449 (1:25,000)
		EDITION:	15th Edition
SURVEY:	H-10590	**CHART DATE:**	October 29, 1994

DESCRIPTION: Abandoned marine railway. AWOIS position is on offshore end.

SOURCE OF ITEM: T-6262 (1934).

SOURCE POSITION: latitude 47°3720.06."N
longitude 122°30'39.58"W

SURVEY REQUIREMENTS: Limit search to the area of the charted ruins and 26 meters offset from each side and beyond the offshore end.

METHOD OF INVESTIGATION: Visual search; echosounder.

RESULTS OF INVESTIGATION: Ruins of the abandoned railway are visible on shore (see photo #51) and extend offshore to latitude 47°37'19.658"N, longitude 122°30'38.238"W (Pos. No. 2098, DN 096).

COMPARISON WITH PRIOR SURVEYS: The marine railway is depicted on H-5711. H3373 depicts a pier at the AWOIS location.

COMPARISON WITH THE CHART AND CHARTING RECOMMENDATIONS: Retain the symbol for the abandoned marine railway and extend the offshore end to latitude 47°37'19.658"N, longitude 122°30'38.238"W, as surveyed. concur

ITEM INVESTIGATION REPORT

ITEM NO.: N33
AWOIS Item #52158 ✓
SURVEY: H-10590

CHART NO.: 18449 (1:25,000)
EDITION: 15th Edition
CHART DATE: October 29, 1994

DESCRIPTION: Foul Area

SOURCE OF ITEM: CL222/50--C&GS Ship PATHFINDER.

SOURCE POSITION: latitude 47°37'23.59"N
longitude 122°30'30.82"W

SURVEY REQUIREMENTS: Full investigation in 100-meter search radius. Bottom drag/visual search/salvage documentation.

METHOD OF INVESTIGATION: Visual inspection during negative tides when the near shore portions of the target area were exposed. Echosounder development of offshore areas: Pos. Nos. 2138-2146 and 2171-2197 on DN 097 and Pos. Nos. 3072-3115 on DN 138.

RESULTS OF INVESTIGATION: No obstructions are visible near shore and none were located during echosounder development. .

COMPARISON WITH PRIOR SURVEYS: Foul area is not depicted on either H-3373. H-5711 depicts a wreck shoreward of the 0-meter curve.

COMPARISON WITH THE CHART AND CHARTING RECOMMENDATIONS:
Delete the charted foul area centered at latitude 47°37'23.59"N, longitude 122°30'30.82"W. concur

ITEM INVESTIGATION REPORT

ITEM NO.:	N34 AWOIS Item #52159	**CHART NO.:**	18449 (1:25,000)
		EDITION:	15th Edition
SURVEY:	H-10590	**CHART DATE:**	October 29, 1994

DESCRIPTION: Group of 13 pilings, position approximate

SOURCE OF ITEM: CL629/73--Coast Pilot 7 Field Inspection.

SOURCE POSITION: latitude 47°37'28.45"N
longitude 122°30'12.63"W

SURVEY REQUIREMENTS: Full investigation within 150-meter search radius.

METHOD OF INVESTIGATION: Visual search, echosounder.

RESULTS OF INVESTIGATION: Nine piles are fully exposed at all times. On DN 060, the piles were positioned: the offshoremost is located at latitude 47°37'27.275"N, longitude 122°30'13.291"W (Pos. No. 155); the corner pile is located at latitude 47°37'27.395"N, longitude 122°30'12.635"W, (Pos No. 156) and the inshoremost is located at latitude 47°37'27.903"N, longitude 122°30'13.760"W. Five pile stumps are visible at low tide and on DN 096 an effort was made to locate and position the submerged piles with DGPS (Pos. Nos. 2099-2109). The search was not fully successful; however, the pile stumps lie within the radius of the exposed piles (see photos #3 and #4). At an extreme low tide eight pile stumps are visible as is a deteriorating sunken boat located seven meters to the ~~east~~ west of the group of piles at latitude 47°37'27.443,"N, longitude 122°30'14.091 (Pos. No. 3200, DN 138). See photos #4 and #80.

COMPARISON WITH PRIOR SURVEYS: No piles are depicted on H-3373; H-5711 depicts a pier terminating at the AWOIS location.

COMPARISON WITH THE CHART AND CHARTING RECOMMENDATIONS: Delete the Pile (PA) charted at latitude 47°37'28.45"N, longitude 122°30'12.63"W. Chart the group of piles within the triangle as defined above: latitude 47°37'27.275"N, longitude 122°30'13.291"W to latitude 47°37'27.395"N, longitude 122°30'12.635"W, to latitude 47°37'27.903"N, longitude 122°30'13.760"W. Chart the sunken ~~boat as an obstruction~~ Wreck (1 wk) at latitude 47°37'27.443"N, longitude 122°30'14.091"W. Chart area as Foul with piles and show 1 wk as depicted on the smooth sheet. Concur

ITEM INVESTIGATION REPORT

ITEM NO.: N35
AWOIS Item #52160
SURVEY: H-10590

CHART NO.: 18449 (1:25,000)
EDITION: 15th Edition
CHART DATE: October 29, 1994

DESCRIPTION: Snag

SOURCE OF ITEM: T-6262 (1934).

SOURCE POSITION: latitude 47°36'17.96"N
longitude 122°29'47.35"W

SURVEY REQUIREMENTS: Full investigation in 100-meter search radius. Bottom drag/visual search/salvage documentation.

METHOD OF INVESTIGATION: On DN 076, a drift search over the target position was negative and was followed up by development of the search radius with 5-meter line spacing (Pos. Nos. 949-1094).

RESULTS OF INVESTIGATION: No snag was located. In view of the fact that the reported snag is now over sixty years old, it is reasonable to believe that it has either rotted away or has been carried away by currents or storms.

COMPARISON WITH PRIOR SURVEYS: The snag does not appear on H-3373, but is depicted on H-5711.

COMPARISON WITH THE CHART AND CHARTING RECOMMENDATIONS: Delete the snag charted at latitude 47°36'17.96"N, longitude 122°29'47.35"W.

ITEM INVESTIGATION REPORT

ITEM NO.:	N36 AWOIS Item #52161 ✓	**CHART NO.:**	18449 (1:25,000)
		EDITION:	15th Edition
SURVEY:	H-10590	**CHART DATE:**	October 29, 1994

DESCRIPTION: Snag

SOURCE OF ITEM: T-6262 (1934)

SOURCE POSITION: latitude 47°36'14.35"N
longitude 122°29'51.92"W

SURVEY REQUIREMENTS: Full investigation within 100-meter search radius. Bottom drag/visual search/salvage documentation.

METHOD OF INVESTIGATION: Visual search, echosounder development.

RESULTS OF INVESTIGATION: The drift search over the target (Pos. Nos. 938-944, DN 076) was negative. Depth at the target was 4-to-5 meters and visibility was good. No obstruction was observed. In view of the fact that the reported snag is now over sixty years old, it is reasonable to believe that it has either rotted away or has been carried away by currents or storms.

COMPARISON WITH PRIOR SURVEYS: The snag does not appear on H-3373, but is depicted on H-5711.

COMPARISON WITH THE CHART AND CHARTING RECOMMENDATIONS: Delete the snag charted at latitude 47°36'14.35"N, longitude 122°29'51.92"W.

cmau

ITEM INVESTIGATION REPORT

ITEM NO.:	N37 AWOIS Item #52162	**CHART NO.:**	18449 (1:25,000)
		EDITION:	15th Edition
SURVEY:	H-10590	**CHART DATE:**	October 29, 1994

DESCRIPTION: Charted pier ruins. AWOIS position is on offshore end.

SOURCE OF ITEM: T-6262 (1934) is original source of pier structure. CL690/50--C&GS Survey Party revised pier to ruins.

SOURCE POSITION: latitude 47°37'15.24"N
longitude 122°29'45.82"W

SURVEY REQUIREMENTS: Limit the search to the area of the charted ruins and 25 meters offset from each side and beyond the offshore end.

METHOD OF INVESTIGATION: Visual search, echosounder.

RESULTS OF INVESTIGATION: On DN 060 (VN 0652), two piles were positioned; the offshoremost at latitude 47°37'15.916"N, longitude 122°29'44.952"W (Pos. No. 159), and the inshoremost at latitude 47°37'16.123"N, longitude 122°29'44.430"W (Pos. No. 160). On DN 108 the site was revisited during a negative tide with the DPLogger; an inshore pile stump was visible as well as two offshore pile stumps. Pos. No. 7019 marks the inshore extent of the pier ruins at latitude 47°37'11.855"N, longitude 122°29'30.480"W. See photo #64. On DN 117 (VN 0652), one of the offshore submerged piles was visible and was positioned at latitude 47°37'15.660"N, longitude 122°29'46.092"W (Pos. No. 5804). The second was visible under water and was positioned at latitude 47°37'15.560"N, longitude 122°29'45.173"W (Pos. No. 5805). Its depth was measured with a sounding pole.

COMPARISON WITH PRIOR SURVEYS: A pier with a shed at the offshore end is depicted on H-3373. Pier and shed are also depicted on H-5711.

COMPARISON WITH THE CHART AND CHARTING RECOMMENDATIONS: Delete the pier ruins charted at latitude 47°37'15.24"N, longitude 122°29'45.82"W. Chart the piles extending from the pile ruin at latitude 47°37'11.855"N, longitude 122°29'30.480"W to the offshoremost submerged pile at latitude 47°37'15.560"N, longitude 122°29'45.173"W. ✓ concur
Revise charted pier ruins based on the smooth sheet information.

NOAA FORM 76-40
(8-74)

Replaces C&GS Form 567.

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

NONFLOATING AIDS OR LANDMARKS FOR CHARTS

ORIGINATING ACTIVITY
- [X] HYDROGRAPHIC PARTY
- [ ] GEODETIC PARTY
- [ ] PHOTO FIELD PARTY
- [ ] COMPILATION ACTIVITY
- [ ] FINAL REVIEWER
- [ ] QUALITY CONTROL & REVIEW GRP.
- [ ] COAST PILOT BRANCH

(See reverse for responsible personnel)

- [X] TO BE CHARTED
- [ ] TO BE REVISED
- [ ] TO BE DELETED

REPORTING UNIT (Field Party, Ship or Office): Pacific Hydrographic Party, N/CG2453

STATE: Washington

LOCALITY: Puget Sound/Eagle Harbor

DATE: 07/10/95

The following objects HAVE [ ] HAVE NOT [ ] been inspected from seaward to determine their value as landmarks.

OPR PROJECT NO.: OPR-N228-PHP

JOB NUMBER: PHA-5-1-95

SURVEY NUMBER: H-10590

DATUM:

CHARTING NAME	DESCRIPTION (Record reason for deletion of landmark or aid to navigation. Show triangulation station names, where applicable, in parentheses)	POSITION LATITUDE ° ′	LATITUDE ″ D.M. Meters	POSITION LONGITUDE ° ′	LONGITUDE ″ D.P. Meters	METHOD AND DATE OF LOCATION (See instructions on reverse side) OFFICE	METHOD AND DATE OF LOCATION FIELD	CHARTS AFFECTED
Not Charted Private Aid	Queen City Yacht Club West Pier Red Light	47°37′	15.234	122°31′	08.764		F-Hydro-DGPS	
Not Charted Private Aid	Queen City Yacht Club East Pier Red Light	47°37′	14.583	122°31′	07.360		F-Hydro-DGPS	
Not Charted Private Aid	Ferry Repair Facility - East White Light on Dolphin	47°37′	11.144″	122°30′	46.143		F-Hydro-DGPS	
Not Charted Private Aid	Ferry Repair Facility - Center White Light on Dolphin -	47°37′	11.235″	122°30′	49.328″		F-Hydro-DGPS	
Not Charted Private Aid	Ferry Repair Facility - West White Light on Dolphin	47°37′	10.985″	122°30′	57.344″		F-Hydro-DGPS	
Not Charted Private Aid	Eagledale Moorings - West End Fl Y 5 sec.	47°37′	03.215	122°30′	42.808″		F-Hydro-DGPS	
Not Charted Private Aid	Eagledale Moorings - East End Fl Y - 5 sec	47°37′	03.283	122°30′	41.290″		F-Hydro-DGPS	

NOAA FORM 76-40
(8-74)

Replaces C&GS Form 567.

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

NONFLOATING AIDS OR LANDMARKS FOR CHARTS

ORIGINATING ACTIVITY
- [X] HYDROGRAPHIC PARTY
- [ ] GEODETIC PARTY
- [ ] PHOTO FIELD PARTY
- [ ] COMPILATION ACTIVITY
- [ ] FINAL REVIEWER
- [ ] QUALITY CONTROL & REVIEW GRP.
- [ ] COAST PILOT BRANCH

(See reverse for responsible personnel)

- [ ] TO BE CHARTED
- [X] TO BE REVISED
- [ ] TO BE DELETED

REPORTING UNIT (Field Party, Ship or Office): Pacific Hydrographic Party, N/CG2453
STATE: Washington
LOCALITY: Puget Sound/Eagle Harbor
DATE: 7/10/95

The following objects HAVE [ ] HAVE NOT [ ] been inspected from seaward to determine their value as landmarks.

OPR PROJECT NO.: OPR-N228-PHP
JOB NUMBER: PHP-5-1-95
SURVEY NUMBER: H-10590
DATUM:

CHARTING NAME	DESCRIPTION (Record reason for deletion of landmark or aid to navigation. Show triangulation station names, where applicable, in parentheses)	POSITION LATITUDE ° ′	LATITUDE ″ D.M. Meters	POSITION LONGITUDE ° ′	LONGITUDE ″ D.P. Meters	METHOD AND DATE OF LOCATION (See instructions on reverse side) OFFICE	FIELD	CHARTS AFFECTED
Priv maintd PA ER	Eagle Harbor Marina - West End F R - priv.	47°37′	03.114	122°30′	49.479		F-Hydro-DGPS	
Priv maintd PA ER	Eagle Harbor Marina - East End F R - priv.	47°37′	03.257	122°30′	43.526		F-Hydro-DGPS	
Priv ~~Fpt~~ ~~FR~~ Fl Y	Bainbridge Island Marina and Yacht Club - East Light * Fl Y 4s - LLN 18017	47°37′	03.501	122°30′	36.453		F-Hydro-DGPS	
Priv Fl Y	Bainbridge Island Marina and Yacht Club - West Light * Fl Y 4s - LLN 18018	47°37′	03.500	122°30′	38.249		F-Hydro-DGPS	
	* Name change							

NOAA FORM 76-40
(8-74)

Replaces C&GS Form 567.

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

NONFLOATING AIDS OR LANDMARKS FOR CHARTS

ORIGINATING ACTIVITY
- [X] HYDROGRAPHIC PARTY
- [ ] GEODETIC PARTY
- [ ] PHOTO FIELD PARTY
- [ ] COMPILATION ACTIVITY
- [ ] FINAL REVIEWER
- [ ] QUALITY CONTROL & REVIEW GRP.
- [ ] COAST PILOT BRANCH

(See reverse for responsible personnel)

- [ ] TO BE CHARTED
- [ ] TO BE REVISED
- [X] TO BE DELETED

REPORTING UNIT (Field Party, Ship or Office)	STATE	LOCALITY	DATE
Pacific Hydrographic Party N/KC-2453	Washington	Puget Sound / Eagle Harbor	7/10/95

The following objects HAVE [ ] HAVE NOT [ ] been inspected from seaward to determine their value as landmarks.

OPR PROJECT NO.	JOB NUMBER	SURVEY NUMBER	DATUM
OPR-N228 PHP	PHP-5-1-95	H-10590	

CHARTING NAME	DESCRIPTION (Record reason for deletion of landmark or aid to navigation. Show triangulation station names, where applicable, in parentheses)	POSITION LATITUDE ° ′	POSITION LATITUDE ″ D.M. Meters	POSITION LONGITUDE ° ′	POSITION LONGITUDE ″ D.P. Meters	METHOD AND DATE OF LOCATION (See instructions on reverse side) OFFICE	METHOD AND DATE OF LOCATION FIELD	CHARTS AFFECTED
F R	Charted in center of Winslow Wharf Marina – not located	47°37	15.991"	122°31'	15.670"		F-Hydro	
							F 5	

RESPONSIBLE NNEL

TYPE OF ACTION	NAME	ORIGINATOR
OBJECTS INSPECTED FROM SEAWARD	Kathryn Simmons, Survey Technician LT Richard A. Fletcher, Chief of Party	☐ PHOTO FIELD PARTY ☒ HYDROGRAPHIC PARTY ☐ GEODETIC PARTY ☐ OTHER (Specify)
POSITIONS DETERMINED AND/OR VERIFIED		FIELD ACTIVITY REPRESENTATIVE
		OFFICE ACTIVITY REPRESENTATIVE
FORMS ORIGINATED BY QUALITY CONTROL AND REVIEW GROUP AND FINAL REVIEW ACTIVITIES		☐ REVIEWER ☐ QUALITY CONTROL AND REVIEW GROUP REPRESENTATIVE

INSTRUCTIONS FOR ENTRIES UNDER 'METHOD AND DATE OF LOCATION'

(Consult Photogrammetric Instructions No. 64,

OFFICE

I. OFFICE IDENTIFIED AND LOCATED OBJECTS
Enter the number and date (including month, day, and year) of the photograph used to identify and locate the object.
EXAMPLE: 75E(C)6042
8-12-75

FIELD

I. NEW POSITION DETERMINED OR VERIFIED
Enter the applicable data by symbols as follows:

F - Field	P - Photogrammetric
L - Located	Vis - Visually
V - Verified	
1 - Triangulation	5 - Field identified
2 - Traverse	6 - Theodolite
3 - Intersection	7 - Planetable
4 - Resection	8 - Sextant

A. Field positions* require entry of method of location and date of field work.
EXAMPLE: F-2-6-L
8-12-75

*FIELD POSITIONS are determined by field observations based entirely upon ground survey methods.

FIELD (Cont'd)

B. Photogrammetric field positions** require entry of method of location or verification, date of field work and number of the photograph used to locate or identify the object.
EXAMPLE: P-8-V
8-12-75
74L(C)2982

II. TRIANGULATION STATION RECOVERED
When a landmark or aid which is also a triangulation station is recovered, enter 'Triang. Rec.' with date of recovery.
EXAMPLE: Triang. Rec.
8-12-75

III. POSITION VERIFIED VISUALLY ON PHOTOGRAPH
Enter 'V-Vis.' and date.
EXAMPLE: V-Vis.
8-12-75

**PHOTOGRAMMETRIC FIELD POSITIONS are dependent entirely, or in part, upon control established by photogrammetric methods.

NOAA FORM 76-40 (8-74)

SUPERSEDES NOAA FORM 76-40 (2-71) WHICH IS OBSOLETE, AND EXISTING STOCK SHOULD BE DESTROYED UPON RECEIPT OF REVISION.

☆ U.S.GPO:1975-0-665-080/1155

Attachment 1

Form 9-1343

UNITED STATES
BOARD ON GEOGRAPHIC NAMES
DOMESTIC GEOGRAPHIC NAMES
REPORT

	Controversial name
	Name change
	Changed application
X	Other

Recommended name: Bill Point

State: Washington

County: Kitsap

Lat. 47° 37' 04" N. Long. 122° 30' 03" W. Mouth End Center (Circle one)

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

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

Point of land at south entrance to Eagle Harbor.
Site of former creosoting plant

Published Maps Using Recommended Name (Map name, date, agency, & scale)	Variant Name or Application	Map or Source Using Variant (Map name, date, agency, & scale)
Chart #156 - 1841 U.S. Exploration Expedition		

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

Bill Point is a locally familiar identification of the point. Other features employing the name are Bill Point Hill, Bill Point Crest, Bill Point Bluff, Bill Point View, Bill Point Circle, Bill Point Drive, Bill Point Court.

AUTHORITY FOR RECOMMENDED NAME	MAILING ADDRESS	OCCUPATION
Gerald W. Elfendahl	Bainbridge Island Historical Society P.O. Box 11653 Bainbridge Island, WA 98110 (206) 842-2773	Curator

Submitted by:
Name Title Date

Agency NOAA/NOS/Pacific Hydrographic Party Address N/CS34, 7600 Sand Point Way Seattle, WA

APS P -Survey Program Version: 7.11 PRE-SURVEY: CONTROL STATION TABLE 22:24:55 7 Mar 1995

Type	Lat	Lon	H	Cart	Freq	Vel Code	MM/DD/YY	Station Name
	047:23:18.953	122:22:26.745	-19	0	0.0	0	02/28/95	Point Robinson
	000:00:00.000	000:00:00.000	0	0	0.0	0	03/01/92	
	000:00:00.000	000:00:00.000	0	0	0.0	0	03/01/92	
	000:00:00.000	000:00:00.000	0	0	0.0	0	03/01/92	
	000:00:00.000	000:00:00.000	0	0	0.0	0	03/01/92	
	000:00:00.000	000:00:00.000	0	0	0.0	0	03/01/92	
	000:00:00.000	000:00:00.000	0	0	0.0	0	03/01/92	
	000:00:00.000	000:00:00.000	0	0	0.0	0	03/01/92	
	000:00:00.000	000:00:00.000	0	0	0.0	0	03/01/92	
	000:00:00.000	000:00:00.000	0	0	0.0	0	03/01/92	
	000:00:00.000	000:00:00.000	0	0	0.0	0	03/01/92	
	000:00:00.000	000:00:00.000	0	0	0.0	0	03/01/92	
	000:00:00.000	000:00:00.000	0	0	0.0	0	03/01/92	
	000:00:00.000	000:00:00.000	0	0	0.0	0	03/01/92	
	000:00:00.000	000:00:00.000	0	0	0.0	0	03/01/92	
	000:00:00.000	000:00:00.000	0	0	0.0	0	03/01/92	
	000:00:00.000	000:00:00.000	0	0	0.0	0	03/01/92	
	000:00:00.000	000:00:00.000	0	0	0.0	0	03/01/92	
	000:00:00.000	000:00:00.000	0	0	0.0	0	03/01/92	
	000:00:00.000	000:00:00.000	0	0	0.0	0	03/01/92	
	000:00:00.000	000:00:00.000	0	0	0.0	0	03/01/92	
	000:00:00.000	000:00:00.000	0	0	0.0	0	03/01/92	
	000:00:00.000	000:00:00.000	0	0	0.0	0	03/01/92	
	000:00:00.000	000:00:00.000	0	0	0.0	0	03/01/92	
	000:00:00.000	000:00:00.000	0	0	0.0	0	03/01/92	
	000:00:00.000	000:00:00.000	0	0	0.0	0	03/01/92	
	000:00:00.000	000:00:00.000	0	0	0.0	0	03/01/92	
	000:00:00.000	000:00:00.000	0	0	0.0	0	03/01/92	
	000:00:00.000	000:00:00.000	0	0	0.0	0	03/01/92	
	000:00:00.000	000:00:00.000	0	0	0.0	0	03/01/92	

EPA REGION 10 DIVE REPORT

From: Duane Kama, Regional Diving Officer **Date of Report:** June 27, 1995

To: Ron Kreizenbeck, Director, ESD
Christina Ngo, Superfund Project Manager

Project: An investigation of sediment contamination near the outfall from the Ground Water Treatment Plant (GWTP) outfall at the former Wyckoff wood-treating facility in Eagle Harbor.

Date of Dives: June 6-8, 1995

Locations: The outfall is located in outer Eagle Harbor on Bainbridge Island; the reference areas were in Murden Cove on the east side of Bainbridge Island and near Cutts Island in Carr Inlet.

Purpose: Collect bottom sediments to evaluate the affect of 5 years of discharge in the acute and chronic mixing zones at the GWTP outfall. Chemical analysis of the sediments will include semivolatile organic compounds and trace metals. Conventional analysis will include grain size, total solids, TOC, total nitrogen, total sulfides, and oil & grease. Bioassay tests (using PSEP protocol) will include 10-day amphipod mortality, echinoderm larvae mortality, and juvenile polychaete biomass.

List of Objectives Accomplished: (1) After the end of the outfall from the treatment plant was located, its water depth was measured and its GPS position was recorded. (2) The GWTP outfall, acute and chronic mixing zones, and the Murden Cove reference area were video taped. (3) Samples of surface sediment were collected from the GWTP outfall acute and chronic mixing zones and reference areas by EPA divers in accordance with the *Field Sampling Plan, Groundwater Treatment Plant Outfall Sediment Monitoring, Wyckoff Facility and Groundwater Operable Units, Wyckoff/Eagle Harbor Superfund Site, Bainbridge Island, Washington,* dated April 24, 1995.

Discussion: The water depth at the end of the outfall was measured at 9.8 m (32 ft) at 1010 hrs on June 6, 1995. Considering the tide height (approximately 7 ft) in Eagle Harbor (the nearest substation), the terminus of the outfall is located at 25 ft below MLLW. According to the field sampling plan, surface sediment was to be collected along the inside edge of the acute and chronic mixing zones and within ± 5 ft of the water depth of the outfall. After the mixing zone boundaries were determined, the divers collected sediment at equidistant points along a 4-m transect line placed near the north and south edges of the acute zone and along a 10-m transect line similarly placed near the north and south edges of the chronic zone.

Diver observations on water depth (recorded by diver's depth gauge and corrected to MLLW), time of sampling, water current, substrate type and other remarks are included in Table 1. The results of the field wet sieving analysis using PSEP protocol are also included in Table 1. Most of the sample stations on the 4-m and 10-m transects were within ± 5 ft of the outfall water depth. The exceptions occurred on the deep water sides of the 10-m transect line on the north and south edges of the chronic mixing zone. In both of these cases the slope of the bottom was too steep to position the line such that all sample points would have been within the ± 5 ft guideline. Further, each of the diver's depth gauges reads 1 to 2 ft deeper than the actual water depth (gauges are tested annually at the NOAA Diver Training Center in a test chamber equipped with a gauge with ± 0.25 of 1 % accuracy.

The discharge pipe, which apparently laid above the bottom for roughly the distal 150 ft after initial construction, was found by the divers to be almost entirely buried. The pipe was located about 10-15 m north of the fixed navigation aid *FL G 6sec 30ft 7M "1"* (NOAA chart 18449). The position of the end of the pipe, which was recorded by GPS and post-processed for the differential correction, is **47° 36' 59.00" N Latitude, 122° 29' 46.67" W Longitude.**

Hazards Encountered\Malfunctions\Lost Equipment: None

Other Problems Encountered: Kama sustained congestion of the inner ear during the 6/6 dive, which resulted in intermittent tinnitus.

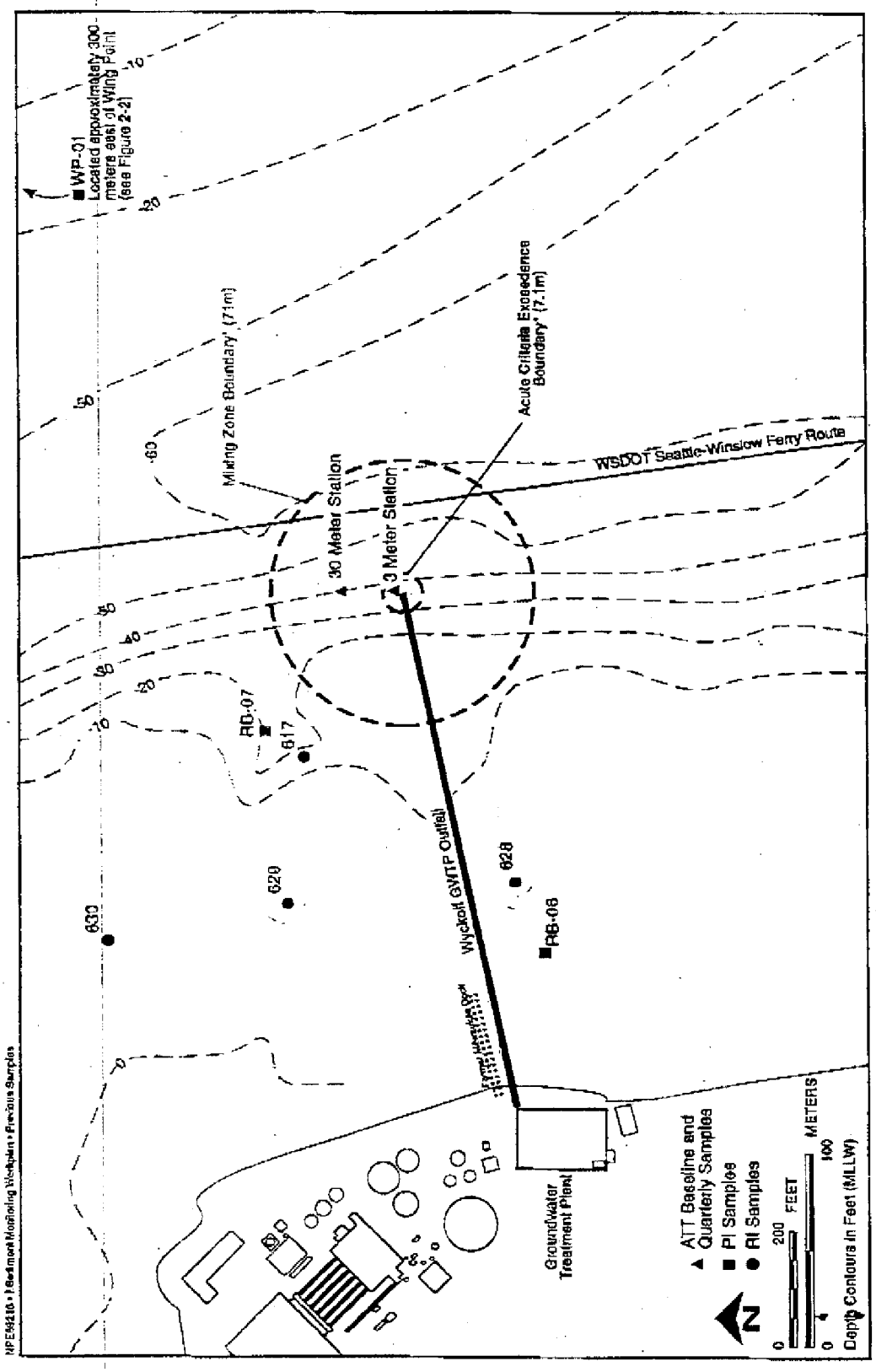
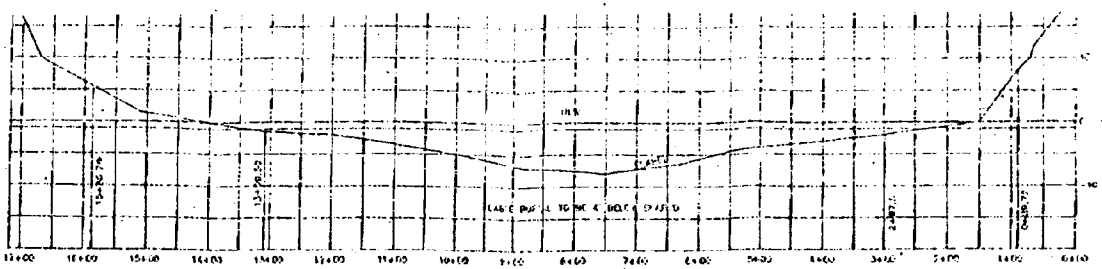


Figure 2-4
SAMPLING LOCATIONS IN PREVIOUS STUDIES

NOTE:

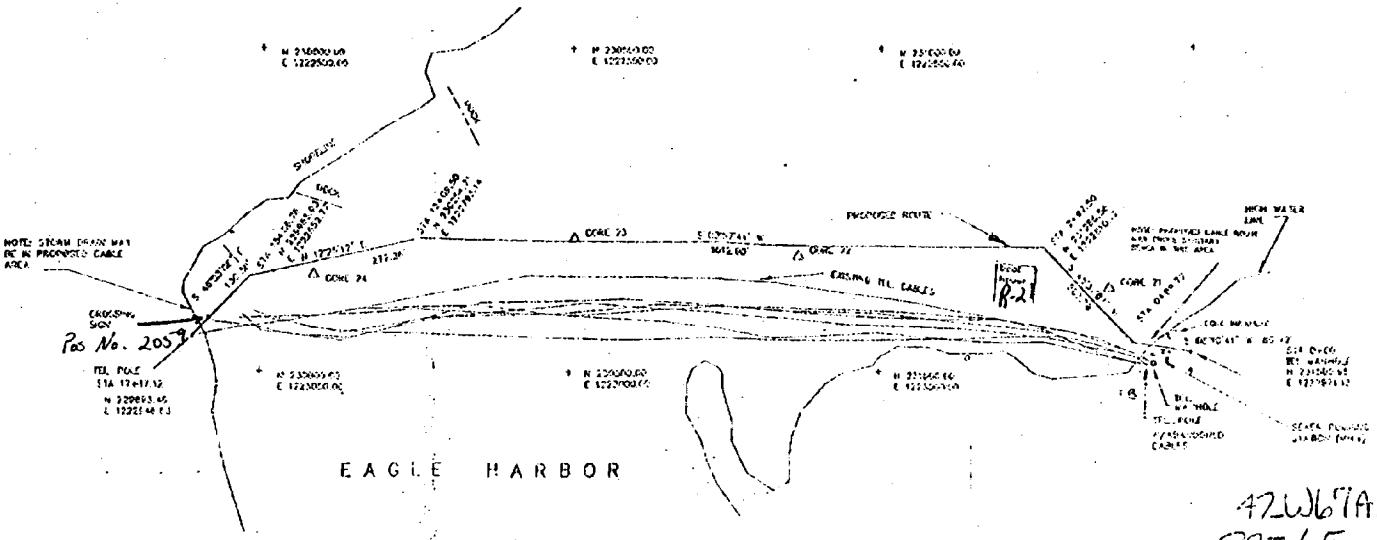
PORTIONS OF THIS CABLE ROUTE DRAWING ARE ILLEGIBLE ON ORIGINAL DOCUMENT



PROFILE OF CABLE ROUTE

CABLE LENGTH

HOR. DISTANCE	1717'
+FOR CONTOURS	10'
+FOR LAYING DEVIATION	10'
+FOR SPARE CABLE	170'
TOTAL LENGTH =	1907'



Provided by
Teresa Watson
Field Engineer
U.S West

42W67AK
PRT 65

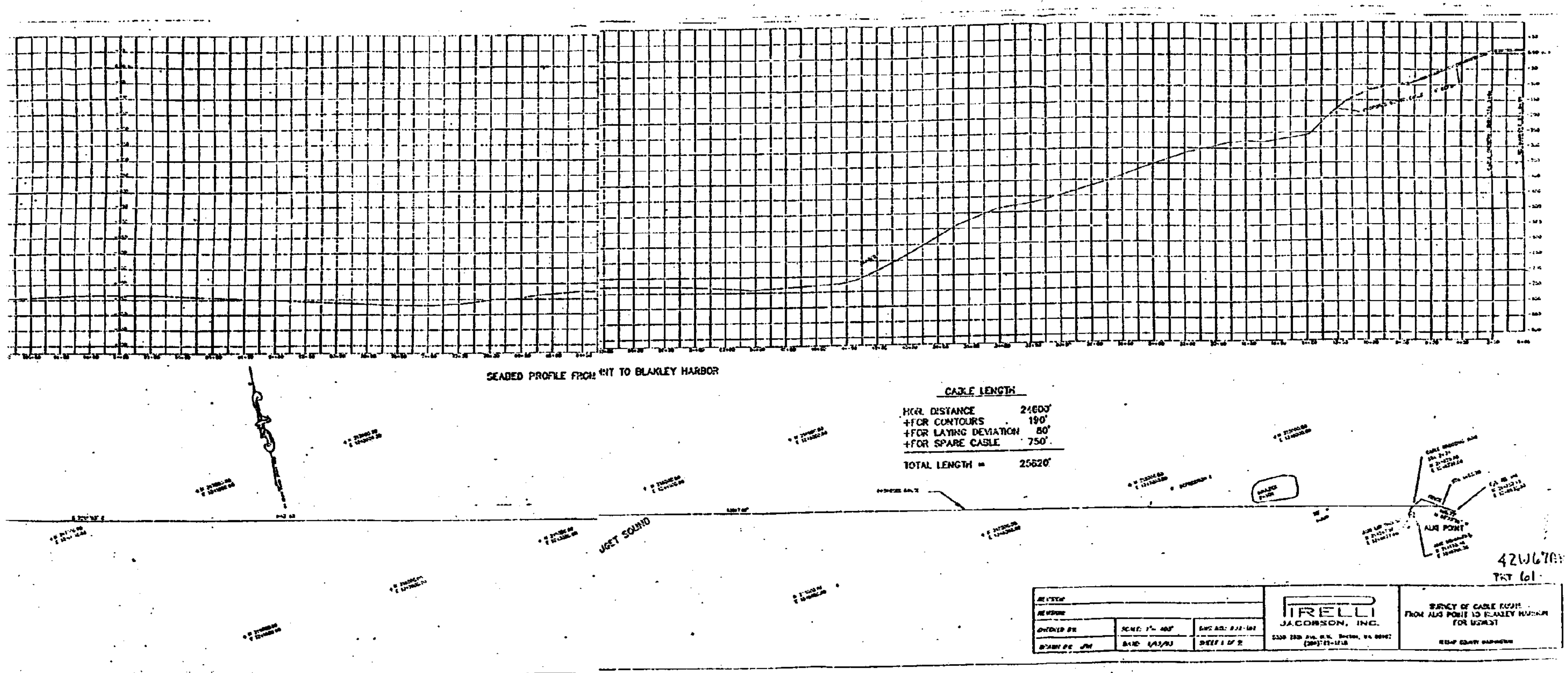
REVISION:
REVISION:

PIRELLI

SURVEY OF CABLE ROUTE
IN EAGLE HARBOR, BAINBRIDGE ISLAND

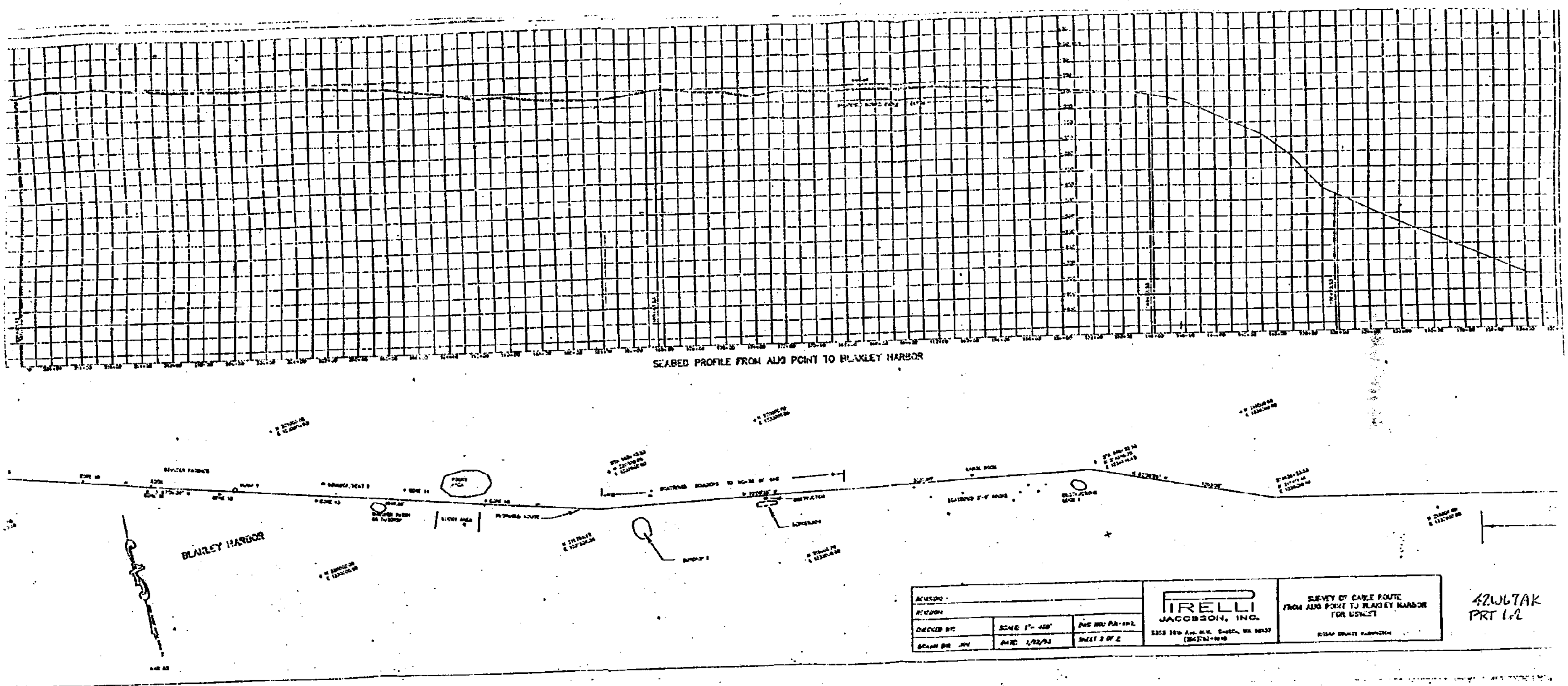
NOTE:

PORTIONS OF THIS CABLE ROUTE DRAWING ARE ILLEGIBLE ON ORIGINAL DOCUMENT



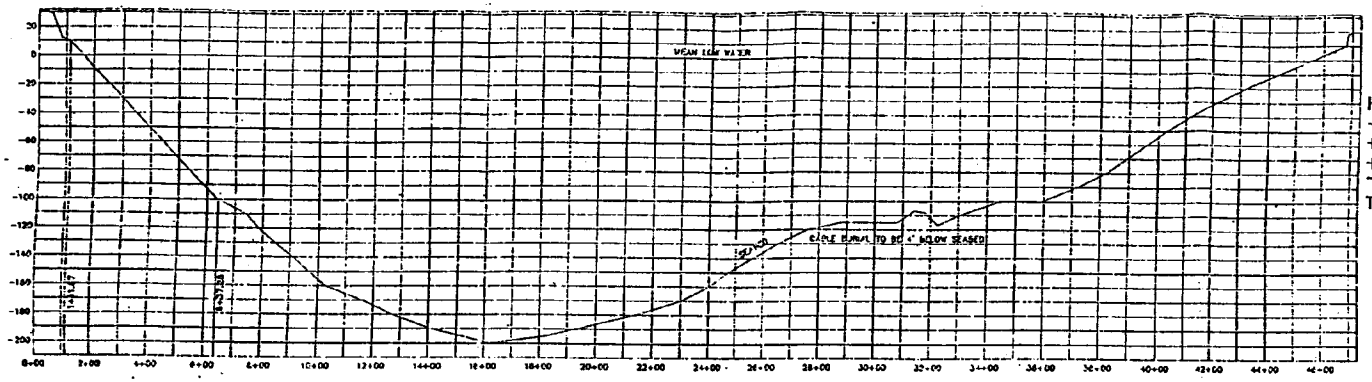
NOTE:

PORTIONS OF THIS CABLE ROUTE DRAWING ARE ILLEGIBLE ON ORIGINAL DOCUMENT



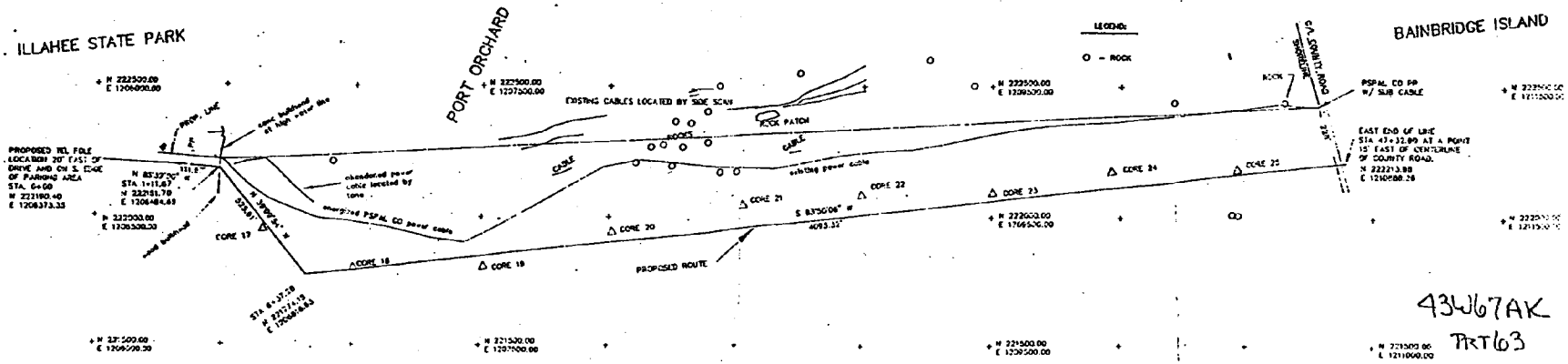
NOTE:

PORTIONS OF THIS CABLE ROUTE DRAWING ARE ILLEGIBLE ON ORIGINAL DOCUMENT



CABLE LENGTH	
HOR. DISTANCE	4733'
+FOR CONTOURS	30'
+FOR LAYING DEVIATION	25'
+FOR SPARE CABLE	380'
TOTAL LENGTH =	5168'

PROFILE OF ROUTE AT ILLAHEE



43467AK
PRT63

REVISION:			
REVISION:			
CHECKED BY:	SCALE: 1"=400'	DWG NO.: 931-153	
DRAWN BY: JRH	DATE: 1/12/93	SHEET 1 OF 1	

PIRELLI JACOBSON, INC.
5353 28th Ave. N.W. Seattle, WA 98107
(206)782-1618

SURVEY OF CABLE ROUTE
FROM ILLAHEE TO BAINBRIDGE ISLAND
FOR USWEST

KITSAP COUNTY WASHINGTON

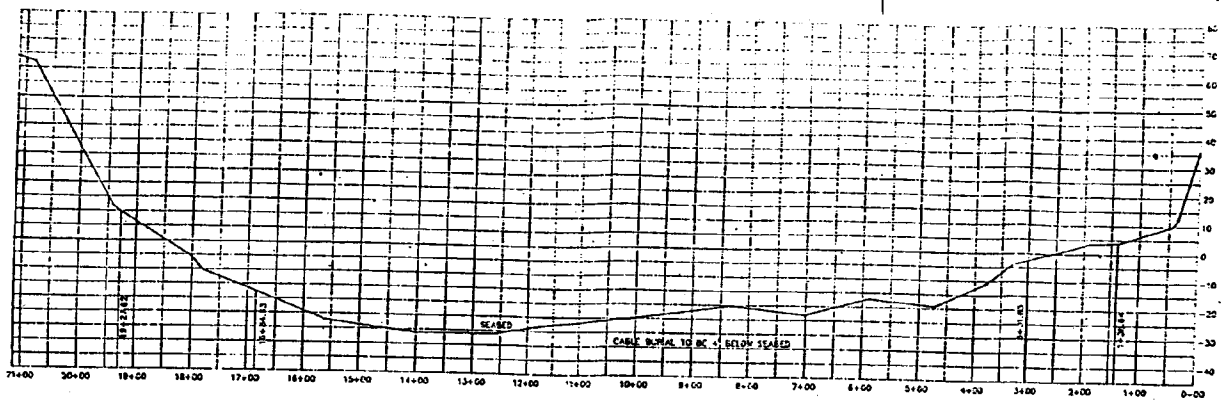
NOTE:

PORTIONS OF THIS CABLE ROUTE DRAWING ARE ILLEGIBLE ON ORIGINAL DOCUMENT

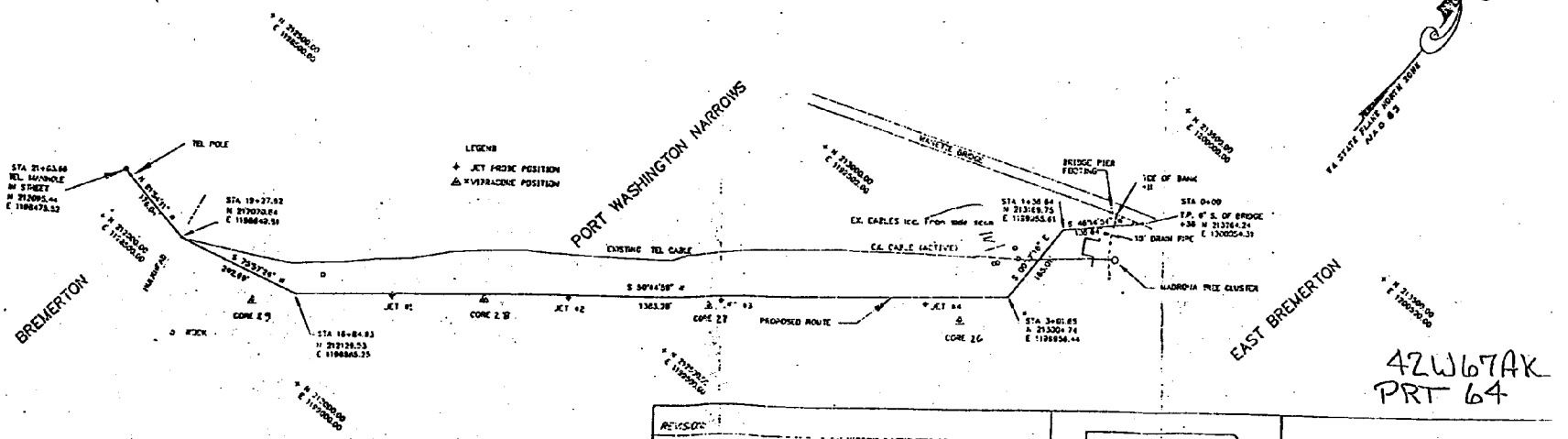
5

CABLE LENGTH

HOR. DISTANCE	2104'
+FOR CONTOURS	20'
+FOR LAYING DEVIATION	15'
÷FOR SPARE CABLE	210'
TOTAL LENGTH =	2349'



PROFILE OF CABLE ROUTE FROM BREMERTON TO MANETTE

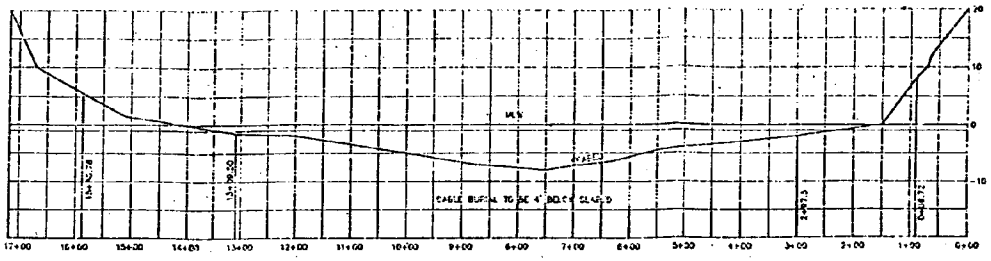


42W67AK
PRT 64

REVISION		IRELLI JACOBSON, INC. 5355 28th Ave. N.W. Seattle, WA 98107 (206)782-1618	SURVEY OF CABLE ROUTE FROM BREMERTON TO EAST BREMERTON FOR USWEST KITSAP COUNTY WASHINGTON
REVISION			
CHECKED BY:	SCALE: 1"=200'	DWG NO: P.J.-1A-4	
DRAWN BY:	DATE: 1/12/93	SHEET 1 OF 1	

NOTE:

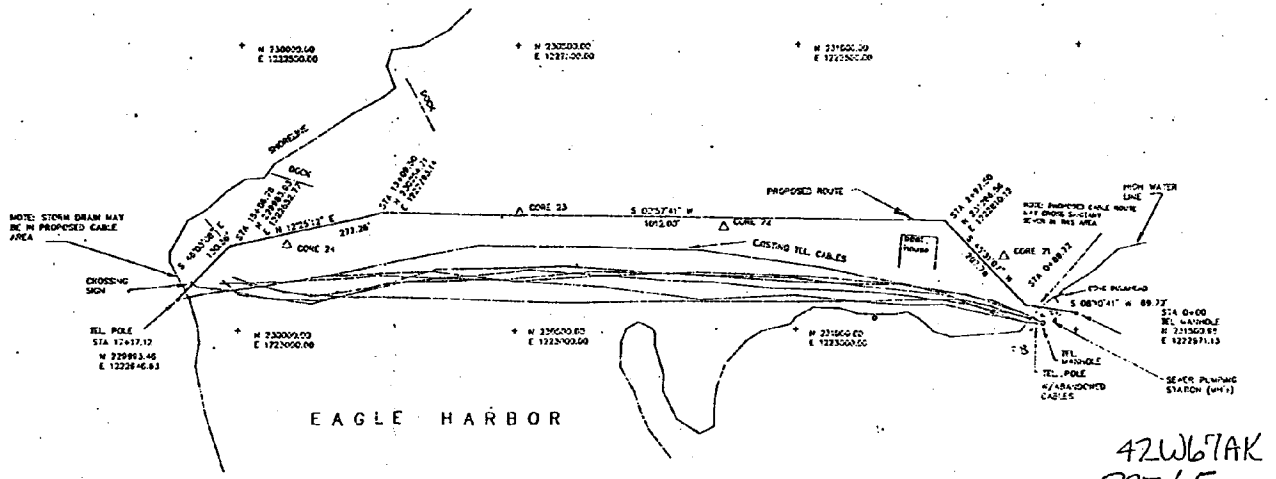
PORTIONS OF THIS CABLE ROUTE DRAWING ARE ILLEGIBLE ON ORIGINAL DOCUMENT



PROFILE OF CABLE ROUTE

CABLE LENGTH

HOR. DISTANCE	1717'
+FOR CONTOURS	10'
+FOR LAYING DEVIATION	10'
+FOR SPARE CABLE	170'
TOTAL LENGTH =	1907'



42W67AK
PRT 65

REVISION:			
REVISION:			
CHECKED BY:	SCALE: 1"=200'	DWG NO: 83-102	
DRAWN BY: JRH	1/12/83	SHEET 1 OF 1	

FIRELLI JACOBSON, INC.
5355 28th Ave. N.W. Seattle, WA 98107
(206)782-1618

SURVEY OF CABLE ROUTE
IN EAGLE HARBOR, BAINBRIDGE ISLAND
FOR USWEST
KITSAP COUNTY WASHINGTON

RON LILLICH
EPA
HW-113

Ellie Hal.

Kathryn – 5/17
Nice to talk to you.
This is the fact sheet
I mentioned – I've
also marked in-water
structures. Elly

Alaska
Idaho
Oregon
Washington

April 17, 1995

Superfund Fact Sheet

Wyckoff/Eagle Harbor Superfund Site
Bainbridge Island, Washington

You're Invited to Comment on EPA's Proposal to Begin Demolition at the Former Wyckoff Facility This Summer

The U. S. Environmental Protection Agency (EPA) would like your comments on its proposal to demolish all of the old, contaminated buildings at the former Wyckoff wood-treating facility. Demolition would clear the site for eventual cleanup of contaminated soil and eliminate existing health and safety hazards.

The focus of the proposed demolition plans is on all remaining abandoned and contaminated buildings, tanks, and structures. The actual demolition could start early this summer and would not interfere with other on-going cleanup efforts. The proposal does not include cleanup of the soils or groundwater which require further study.

Public Meeting:

May 1, 1995, 7:00 p.m.
The Bainbridge Island Commons
402 Bjune Drive SW
Bainbridge Island, WA

We invite you to comment on the "Engineering Evaluation & Cost Analysis" (EE/CA) report which outlines the proposed demolition. The report is available for public review at the information repository located in the Bainbridge Public Library, 1270 Madison Avenue North, Bainbridge Island, WA. Your comments will help EPA design how the demolition will actually take place. The public comment period is from April 18th to May 18th. Verbal comments will be accepted at the community meeting, and written comments should be addressed to:

Peter Rubenstein
EPA Site Manager,
Wyckoff/Eagle Harbor Site
U.S. Environmental Protection Agency
1200 6th Avenue, HW-113
Seattle, WA 98101

The Need for Demolition at the Site

The former Wyckoff Facility currently contains a number of deteriorating and contaminated structures which pose a health threat to workers and others entering the site. These structures (shaded in the map) include 13 buildings and one smoke stack associated with wood-preserving operations, an administration building, three unoccupied residences, and numerous tanks and piping networks.

Many of the aging, wood-frame structures are contaminated with flammable wood-treating chemicals which pose a fire hazard. A fire in these structures would release toxic emissions into the air and would expose workers at the site and nearby residents to toxic fumes from the chemicals. The structures are also deteriorating physically. Their collapse could pose a hazard to workers and trespassers on the site. Other hazardous materials of concern include asbestos-containing pipe, tank and boiler insulation, and lead based paint.

In addition to the elimination of hazards posed by these structures, demolition is also necessary to allow for future cleanup activities at the site.

Description of the Demolition

Specific design of demolition activities will not take place until public input on the proposed demolition has been received and reviewed. However, the EE/CA report outlines the general demolition activities that may be undertaken this summer. These activities include the following:

- Before structure demolition occurs, all of the asbestos-containing materials and lead-based paint from accessible buildings, tanks, and pipes would be removed and disposed of at an appropriate off-site facility.

- Deteriorating, contaminated wood-framed structures would be demolished to eliminate fire and safety hazards.

- Structures below ground level, such as concrete pads, pilings, and bulkheads, would be removed.

- All piping that is not required for water treatment or soil cleanup would be removed. All on-site tanks would be dismantled, decontaminated, and taken off site.

In general, materials that cannot be decontaminated would be disposed of off site at an EPA approved disposal facility. All materials would be segregated into categories such as concrete, wood, metal, and building debris. Any material from the demolition that is reusable or recyclable would be reused or recycled as appropriate. All other materials would be disposed of in an approved facility.

The Army Corps of Engineers (COE) will be managing the demolition. Field work could begin as early as June 1995, and the project is anticipated to last approximately six months. It is estimated that demolition, disposal, and COE oversight will cost approximately $3 million. The docks and pilings adjacent to the site are being considered for demolition as part of the East Harbor remedial action. This effort will also be managed by the Corps of Engineers and will take place this summer.

Community Involvement

The Bainbridge Island community, including the Association of Bainbridge Communities through its Technical Assistance Grant, has been actively involved in shaping past and current cleanup activities at the Wyckoff/Eagle Harbor Superfund site, and raising important issues that affect local citizens. EPA is already considering many issues that have been raised in the past which may be relevant to the demolition effort, including:

Control of Dust and Odors: EPA will implement dust and odor control measures as necessary to protect the health of workers and residents adjacent to the site. EPA is currently evaluating data on air emissions collected during earlier site activities. Efforts to control dust and odors will to a large degree be based on the results of this evaluation. On-site monitoring during the demolition will also be used to determine if additional efforts are needed.

Road Traffic: Demolition will require large amounts of material to leave the site. If the west dock on site is usable, there is an option to remove materials from the site by barge. Otherwise, materials will be transported by truck. EPA will coordinate with the City of Bainbridge Island to determine appropriate truck routes. When the routes have been determined, the public will be notified with a fact sheet.

Noise: EPA will evaluate proposed demolition activities to determine how best to minimize noise generation.

Background

The former Wyckoff wood-treating facility, located at the mouth of Eagle Harbor on Bainbridge Island, forms part of the Wyckoff/Eagle Harbor Superfund site. The facility operated as a wood-treating operation from 1903 until 1988. As a result of these wood-treatment operations, surface and subsurface soils at the facility, and groundwater beneath the facility have been severely contaminated with creosote and pentachlorophenol. Wood-treating chemicals have also contaminated bottom sediments in much of Eagle Harbor.

In 1987, the Wyckoff/Eagle Harbor site was added to EPA's National Priorities List of Superfund sites. Since that time, several cleanup actions have taken place which have been detailed in previous fact sheets.

At the facility, EPA is continuing a detailed study of soil and groundwater contamination. The study, known as a remedial investigation (RI), should be completed in winter 1995/96. After completing the RI report, EPA will evaluate potential cleanup alternatives in a feasibility study (FS) to be completed in early 1996. EPA will then propose a comprehensive facility cleanup plan for public comment and will consider public comments in making a final cleanup decision.

For More Information:

If you have questions about the information contained in this fact sheet, or you would like more information about the Wyckoff/ Eagle Harbor Superfund Site, please contact:

Peter Rubenstein, EPA Project Manager, Wyckoff Facility and Groundwater, **(206) 553-1067**

Michelle Pirzadeh, Community Relations Coordinator **(206) 553-1272**

or call EPA's toll free number **1-800-424-4372.**

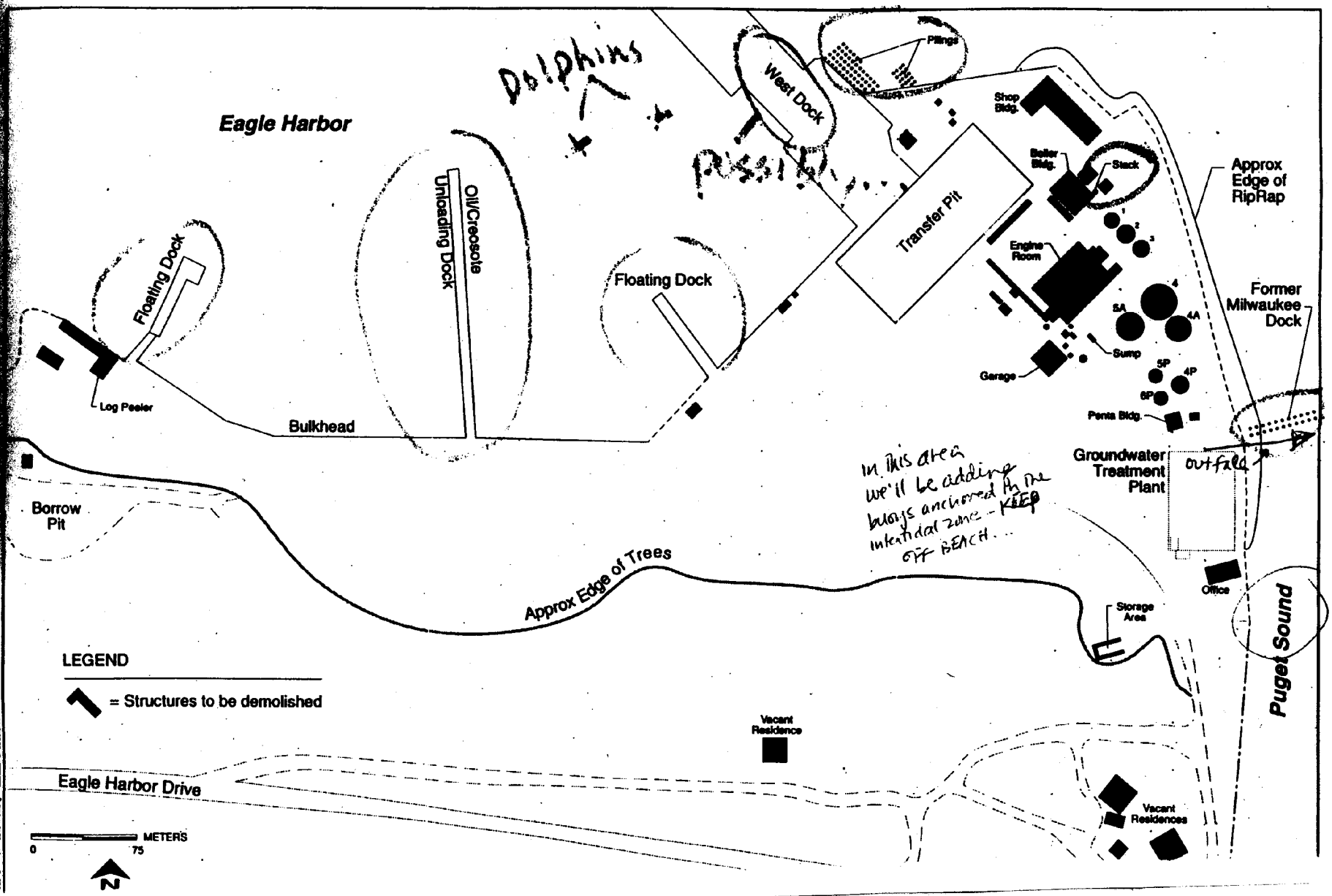
For those with impaired hearing or speech, please contact EPA's telecommunications device for the hearing impaired (TDD) at **(206) 553-1698.** To ensure effective communication with everyone, additional services can be made available to persons with disabilities by contacting one of the numbers listed above.

To review documents concerning the Wyckoff/Eagle Harbor project, you may visit the information repository located in the Bainbridge Island Public Library, 1270 Madison Avenue North, Bainbridge Island.

EPA
United States
Environmental Protection
Agency

Region 10 (HW-117)
1200 Sixth Avenue
Seattle WA 98101

Former Wyckoff Facility, Bainbridge Island



APPROVAL SHEET

for

SURVEY H-10590

Standard field surveying and processing procedures were followed in producing this survey in accordance with the Hydrographic Manual, Fourth Edition; the Hydrographic Survey Guidelines; and the Field Procedures Manual, as updated for 1995. The data were reviewed daily during acquisition and processing.

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

Approved and Forwarded,

DATE: July 20, 1995

Richard A. Fletcher
Lieutenant, NOAA
Chief, Pacific Hydrographic Party

UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL OCEAN SERVICE
Office of Ocean and Earth Sciences
Silver Spring, Maryland 20910

ORIGINAL

TIDE NOTE FOR HYDROGRAPHIC SURVEY

DATE: August 15, 1995

HYDROGRAPHIC BRANCH: Pacific

HYDROGRAPHIC PROJECT: OPR N228-PHP

HYDROGRAPHIC SHEET: H-10590

LOCALITY: Puget Sound, Eagle Harbor

TIME PERIOD: February 28 - May 18, 1995

TIDE STATION USED: 944-7130 Seattle, WA
Lat. 47° 36.2'N Lon. 122° 20.3'W

PLANE OF REFERENCE (MEAN LOWER LOW WATER): 7.77 ft.

HEIGHT OF HIGH WATER ABOVE PLANE OF REFERENCE: 10.5 ft.

REMARKS: RECOMMENDED ZONING

Times and heights are direct using Seattle, WA (944-7130).

Notes: 1. Hourly heights are tabulated on Greenwich Mean Time.
2. Data for Seattle, WA (944-7130 are temporarily on file #744-7130.

William M. Stevenson
CHIEF, DATUMS SECTION

NOAA FORM 76-155
(11-72)

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

GEOGRAPHIC NAMES

SURVEY NUMBER: H-10590

Name on Survey	A ON CHART NO. 18449, 18441, 18445	B ON PREVIOUS SURVEY NO. DM-10041	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	
BAINBRIDGE ISLAND	X		X							1
CREOSOTE (ppl)	X	X	X							2
EAGLEDALE (ppl)	X		X							3
EAGLE HARBOR	X	X	X							4
HAWLEY (ppl)	X	X	X							5
PUGET SOUND	X		X							6
TYEE SHOAL	X		X							7
WASHINGTON (title)	X	X	X							8
WING POINT	X	X	X							9
WINSLOW (ppl)	X	X	X							10
										11
										12
										13
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										25

Approved

Chief Geographer

DEC 15 1995

NOAA FORM 76-155 SUPERSEDES C&GS 197

NOAA FORM 77-27(H)
(9-83)

U.S. DEPARTMENT OF COMMERCE

REGISTRY NUMBER
H-10590

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	
DESCRIPTIVE REPORT	1	FIELD SHEETS AND OTHER OVERLAYS	

DESCRIPTION	DEPTH/POS RECORDS	HORIZ. CONT. RECORDS	SONAR-GRAMS	PRINTOUTS	ABSTRACTS/ SOURCE DOCUMENTS	
ACCORDION FILES	1					
ENVELOPES						
VOLUMES						
CAHIERS						
BOXES						

SHORELINE DATA

SHORELINE MAPS (List):

PHOTOBATHYMETRIC MAPS (List):

NOTES TO THE HYDROGRAPHER (List):

SPECIAL REPORTS (List):

NAUTICAL CHARTS (List):

OFFICE PROCESSING ACTIVITIES

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

PROCESSING ACTIVITY	AMOUNTS		
	VERIFICATION	*EVALUATION*	*TOTALS*
POSITIONS ON SHEET			3066
SITIONS REVISED			
OUNDINGS REVISED			
CONTROL STATIONS REVISED			

	TIME-HOURS		
	VERIFICATION	*EVALUATION*	*TOTALS*
PRE-PROCESSING EXAMINATION			
VERIFICATION OF CONTROL			
VERIFICATION OF POSITIONS	7		7
VERIFICATION OF SOUNDINGS			
VERIFICATION OF JUNCTIONS			
APPLICATION OF PHOTOBATHYMETRY			
SHORELINE APPLICATION/VERIFICATION			
COMPILATION OF SMOOTH SHEET	198.5		198.5
COMPARISON WITH PRIOR SURVEYS AND CHARTS	6		6
EVALUATION OF SIDE SCAN SONAR RECORDS			
EVALUATION OF WIRE DRAGS AND SWEEPS			
EVALUATION REPORT		40	40
GEOGRAPHIC NAMES			
OTHER*			
*USE OTHER SIDE OF FORM FOR REMARKS — TOTALS	211.5	40	251.5

Pre-processing Examination by LT. Pam Haines	*Beginning Date* 7/25/95	*Ending Date* 7/31/95
Verification of Field Data by D. Doles, J. Stringham, L. Deodato	*Time (Hours)* 211.5	*Ending Date* 11/20/95
rification Check by B.A. Olmstead	*Time (Hours)* 4	*Ending Date* 12/18/95
Evaluation and Analysis by L. Deodato	*Time (Hours)* 40	*Ending Date* 12/21/95
Inspection by B.A. Olmstead	*Time (Hours)* 13	*Ending Date* 12/22/95

EVALUATION REPORT

H-10590

A. PROJECT

Project information is discussed in the hydrographer's report.

B. AREA SURVEYED

This survey was conducted in Washington, and is located in Puget Sound. Specifically, the surveyed area includes all of Eagle Harbor which resides approximately eight nautical miles directly west of Seattle. Eagle Harbor provides a main ferry terminal which supports the transport of foot passengers and vehicles across Puget Sound. Both private and public docking facilities are available within the harbor and numerous mooring buoys are available west of the ferry repair facility. The large wharf and charted stack near Creosote are part of the Environmental Protection Agency's Superfund Cleanup Program and are slated for demolition in late 1995 or 1996. Depths range from 0 feet to 184 feet. The bottom consists primarily of mud.

C. SURVEY VESSELS

Survey vessel information is found in the hydrographer's report.

D. AUTOMATED DATA ACQUISITION AND PROCESSING

Survey data were processed using the same Hydrographic Data Acquisition/Processing System (HDAPS) software used by the hydrographer, the Hydrographic Processing System (HPS) and AutoCad, Version 12.0.

At the time of the survey certification the format for transmission of digital data had not been formally approved. In the interim, digital data for this survey exists in the standard HPS format which is a database format using the .dbf extension. In addition, the sounding plot was created with .dbf (extension) and enhanced using the AutoCad system, are filed both in the AutoCad drawing format, .dwg (extension); and in the more universally recognized graphics transfer format, .dxf (extension). Copies of these files will be retained at PHS until data transfer protocols are developed and improved.

The drawing files necessarily contain information which is not part of the HPS data set such as geographic names text, line-type data, and minor symbolization. In addition, those soundings deleted from the drawing for clarity purposes, remain unrevised in the HPS digital files to preserve the integrity of the original hydrographic data set. Cartographic codes used to describe the digital data are those authorized by Hydrographic Survey Guideline No. 75.

The field sheet parameters have been revised to center the hydrography on the office plot. The data is plotted using a Modified Transverse Mercator projection and are depicted on a single sheet.

E. SONAR EQUIPMENT

Side scan sonar was used on survey H-10590. Refer to section E of the hydrographer's report concerning set-up, operation and processing of survey data.

F. SOUNDING EQUIPMENT

Sounding equipment is discussed in the hydrographer's report.

G. CORRECTIONS TO SOUNDINGS

The sounding data have been reduced to Mean Lower Low Water (MLLW). The reducers include corrections for an actual tide, dynamic draft, and sound velocity. These reducers have been reviewed and are consistent with NOS specifications. Actual tide reduction is derived from Seattle, Washington, gage 944-7130.

H. CONTROL STATIONS

Control stations are discussed in the hydrographer's report and separates. A list of control stations used on survey H-10590 is attached to this report.

The positions of horizontal control stations used during hydrographic operations are published and field values based on NAD 83. The geographic positions of all survey data are based on NAD 83. The smooth sheet is annotated with an NAD 27 adjustment tick based on values determined with the NGS program NADCON.

Data based on NAD 27 may be referenced to this survey by applying the following corrections:

Latitude:	-0.650 seconds	(-20.087 meters)
Longitude:	4.479 seconds	(93.533 meters)

I. HYDROGRAPHIC POSITION CONTROL

Differential GPS (DGPS) was used to control this survey. As specified in the Project Instructions, section 6.3, 1:10,000 scale positioning requirements were authorized. Thus, a horizontal dilution of precision (HDOP) not to exceed 3.75 was computed for survey operations. The quality of several positions exceeds limits in terms of horizontal dilution of precision (HDOP). These positions are isolated and occur randomly throughout the survey area. A review of the data, however, indicates that none of these fixes are used to position dangers to navigation. The features or soundings located by these fixes are consistent with the surrounding information. These fixes are considered acceptable.

J. SHORELINE

The following digitally compiled shoreline map on NAD 83 datum applies to this survey.

Map Number	Photo Date	Scale
DM-10041	August 4, 1994	1:20,000

Shoreline from DM-10041 was merged with the survey file during ACAD processing. Changes to the alongshore and offshore features shown on the shoreline manuscript were verified and revised as warranted during survey operations. These changes have been shown on the smooth sheet. Numerous piers and other attached cultural features are depicted on the smooth sheet with a solid red line and transferred from the final field sheet with supporting positional information. These revisions are adequate to supersede the common photogrammetrically delineated shoreline.

K. CROSSLINES

Crosslines are discussed in the hydrographer's report.

L. JUNCTIONS

There are no contemporary surveys which junction H-10590.

M. COMPARISON WITH PRIOR SURVEYS

H-3373 (1912) 1:5,000

With the exception of a 13-foot sounding transferred to H-5711 (1934-35) at latitude 47/36/54N longitude 122/29/02W, this survey has been superseded within the common area and requires no further discussion.

H-5711 (1934-35) 1:10,000

H-5711 covers the entire of the present survey. With the exception of the area north of Creosote, which is an Environmental Protection Agency (EPA) Superfund Site, sounding agreement with the present survey generally differs between 1-2 feet. There appears to be no consistent pattern of shoaling or an increase in depth and the configuration and extent of depth curves common to both surveys depict little change. However, significant depth changes are noted in the Superfund Site north of Creosote where present survey depths are 3-12 feet shoaler than the prior survey. This is directly attributed to the cap placement of sand and gravel associated with the Superfund Site.

Significant cultural development has occurred since 1934-35. New construction along the shoreline in Eagle Harbor include a major Ferry Terminal, Ferry Repair Facility, four new marinas and numerous pier structures.

The greater sounding coverage and the and the relatively accuracy of the data acquisition methods account for these differences.

H-10590 is adequate to supersede the prior survey within the common area.

N. ITEM INVESTIGATIONS

There were thirty-seven AWOIS items assigned to this survey. These items have been adequately addressed and disposed of in the hydrographer's report.

O. COMPARISON WITH CHART

Survey H-10590 was compared with the following chart.

Chart	Edition	Date	Scale	Datum
18449	15th	October 29, 1994	1:25,000	NAD83

a. Hydrography

Charted hydrography originates with the above mentioned prior surveys and miscellaneous sources. The prior surveys are discussed in section 6 and require no further discussion. All miscellaneous source data has been satisfactorily addressed during survey operations and is discussed in the hydrographer's report.

Survey H-10590 is adequate to supersede charted hydrography within the common area.

P. ADEQUACY OF SURVEY

Hydrography contained on survey H-10590 is adequate to:

a. delineate the bottom configuration, determine least depths, and draw the required depth curves;

b. reveal there are no significant discrepancies or anomalies requiring further investigation; and

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

The hydrographic records and reports received for processing are adequate and conform to the requirements of the Hydrographic Manual, 4th Edition, revised through Change No. 3, the Hydrographic Survey Guidelines, and the Field Procedures Manual, April 1994 Edition.

Q. AIDS TO NAVIGATION

The charted position of two buoys and eight fixed aids to navigation were verified. Additionally seven fixed aids to navigation were located within the survey area.

A charted landmark near Creosote was not verified by the hydrographer. This feature has been digitized as part of the shoreline manuscript and graphically portrayed on the smooth sheet. This feature should be retained as charted. Refer to section Q of the hydrographer's report and the attached NOAA Form 76-40's for additional information.

R. STATISTICS

Statistics are itemized in the hydrographer's report.

S. MISCELLANEOUS

Miscellaneous information is discussed in the hydrographer's report. No dangers to navigation were discovered during office processing.

Due to toxic pollutants in the seabed, bottom sampling was not required as per project instruction. Therefore all charted bottom characteristics in the surveyed area should be retained.

T. RECOMMENDATIONS

This is a good hydrographic survey. Refer to Section T of the hydrographer's report for additional information.

U. REFERRAL TO REPORTS

Referral to reports is discussed in the hydrographer's report.

Bruce A. Olmstead
for Leonardo T. Deodato
Cartographer

APPROVAL SHEET
H-10590

Initial Approvals:

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

Bruce A. Olmstead Date: 12/26/95
Bruce A. Olmstead
Senior Cartographer, Cartographic Section
Pacific Hydrographic Branch

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

Kathy Timmons Date: 12/26/95
Kathy Timmons
Commander, NOAA
Chief, Pacific Hydrographic Branch

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Final Approval

Approved:

Andrew A. Armstrong III Date: Jan 18, 1996
Andrew A. Armstrong III
Captain, NOAA
Chief, Hydrographic Surveys Division

NOAA FORM 75-96
(10-83)

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

MARINE CHART BRANCH

RECORD OF APPLICATION TO CHARTS

FILE WITH DESCRIPTIVE REPORT OF SURVEY NO. H-10590

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
18449	12/27/95	B. MIHAILOV	Full ~~Part Before~~ After Marine Center Approval Signed Via
			Drawing No. Full application of soncys from smooth sheet
18441	1-29-97	T. Shepard	Full ~~Part Before~~ After Marine Center Approval Signed Via
			Drawing No. APPLIED IN FULL THRU 18449
18474	2/4/98	L. Bennett	Full Part Before After Marine Center Approval Signed Via
			Drawing No. Applied in full thru 18449 and
			BP 157258
18495SC	2/26/98	Wallen Hogan	Full ~~Part Before~~ After Marine Center Approval Signed Via
			Drawing No. 27 Appl'd in Full thru CHART
			18449
			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
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			Full Part Before After Marine Center Approval Signed Via
			Drawing No.

SUPERSEDES C&GS FORM 8352 WHICH MAY BE USED