

H11292

NOAA FORM 76-35A

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

## DESCRIPTIVE REPORT

*Type of Survey* ..... HYDROGRAPHIC

*Field No.* ..... RA-10-02-04

*Registry No.* ..... H-11292

### LOCALITY

*State* ..... Washington

*General Locality* ..... Lake Washington

*Sublocality* ..... Sand Point to Sammamish River Inlet

2004

### CHIEF OF PARTY

..... CDR John W. Humphrey, NOAA

### LIBRARY & ARCHIVES

DATE .....

**HYDROGRAPHIC TITLE SHEET**

H11292

INSTRUCTIONS The hydrographic sheet should be accompanied by this form, filled in as completely as possible, when the sheet is forwarded to the office.

FIELD NO.  
RA-10-02-04

State Washington

General Locality Lake Washington

Sublocality Sand Point to Sammamish River Inlet

Scale 1:10,000

Date of Survey 4/5/2004 - 10/27/2004

Instructions Date 2/3/2004

Project No. S-N904-RA-04

Vessel NOAA Ship launches 1006, 1016, 1021

Chief of Party CDR. John W. Humphrey, NOAA

Surveyed by RAINIER Personnel

Soundings taken by echo sounder Reson SeaBat 8101, 8125

Graphic record scaled by RAINIER Personnel

Graphic record checked by RAINIER Personnel

Evaluation by R. Davies

Automated plot by HP Designjet 1050C

Verification by R. Davies, E. Domingo

Soundings in Feet

at

LWLWL

REMARKS: Time in UTC. UTM Projection Zone 10

Revisions and annotations appearing as endnotes were

generated during office processing.

All separates are filed with the hydrographic data.

As a result, page numbering may be interrupted or non-sequential

# Descriptive Report to Accompany Hydrographic Survey H11292

Project S-N904-RA-04  
Lake Washington, Washington  
Scale 1:10,000  
March 2004

## NOAA Ship RAINIER

Chief of Party: Commander John W. Humphrey, NOAA

### A. AREA SURVEYED

Hydrographic survey H11292 was completed as specified by Hydrographic Survey Letter Instructions S-N904-RA-04, dated February 3, 2004, Draft Standing Project Instructions dated March 23, 2003 and NOS Hydrographic Specifications and Deliverables dated March 2003. The survey area is Lake Washington, Washington. This survey corresponds to Sheet A in the sheet layout provided with the Letter Instructions.

One hundred percent shallow-water multibeam (SWMB) coverage was obtained in the survey area in waters 8 meters and deeper. In 4-8 meters of water, SWMB coverage was obtained using 25-m line spacing and to acquire least depths over significant features or shoals.

Data acquisition was conducted on April 5, 2004 (DN 096) and from October 22, 2004 (DN 296) to October 27, 2004 (DN302).

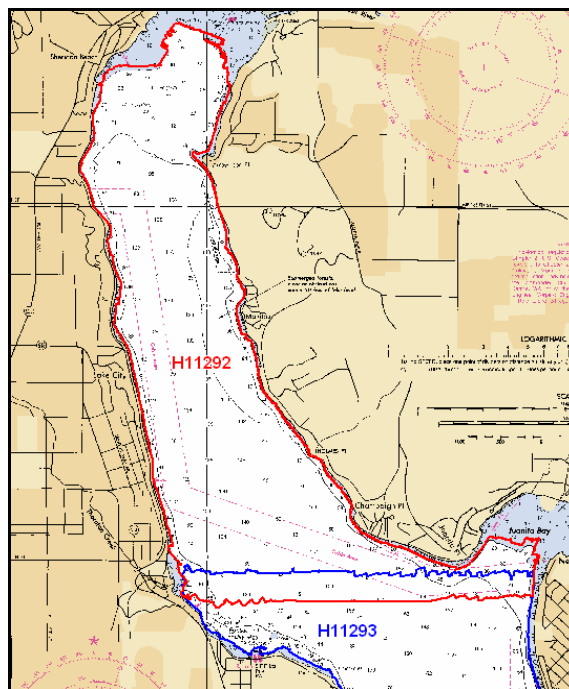


Figure 1. H11292 Survey Limits and Junction

## B. DATA ACQUISITION AND PROCESSING

A complete description of data acquisition and processing systems, survey vessels, quality control procedures and data processing methods can be found in the *S-N904-RA-04 Data Acquisition and Processing Report (DAPR)*, submitted under separate cover.<sup>1</sup> Items specific to this survey, and any deviations from the aforementioned report are discussed in the following sections. Note that this Survey was conducted and processed prior to the institution of BASE surface processing.

**Final Approved Water Levels have been applied to this survey.** See Section C. for additional information.

### B.1 Equipment and Vessels

Launches 1006 (RA-5), 1016 (RA-4), and 1021 (RA-3) were used to acquire shallow-water multibeam (SWMB) soundings and sound velocity profiles. No unusual vessel configurations were used for data acquisition.<sup>2</sup>

### B.2 Quality Control

#### B.2.a Crosslines

Shallow Water Multibeam (SWMB) crosslines totaled 8.93 linear nautical miles, comprising 7.10% of SWMB hydrography. The mainscheme bathymetry was manually compared to the XL nadir beams in CARIS subset mode and agreed well, with differences averaging less than 0.5 meter.

A statistical Quality Control Report has been conducted on representative data collected with each system used for this survey and is included in the *S-N904-RA-04 DAPR*.

Through manual examination of the data and statistical analysis of data, accuracy standards for this survey have been met.<sup>3</sup>

#### B.2.b Junctions

The following contemporary surveys junctions with H11292 (see *Figure 1*.)

<b>Registry #</b>	<b>Scale</b>	<b>Date</b>	<b>Junction side</b>
H11293	1:10,000	2004	South

A cursory comparison with survey H11293 indicates differences are generally less than 2 feet throughout the junction area.<sup>4</sup>

### B.2.c Data Quality Factors

In many areas near shore, thick milfoil obscured sonar detection of the bottom. In the SWMB data, removal of soundings obtained over milfoil was not possible in HDCS SwathEdit, as there is no definitive way to determine if a sounding is on a feature such as a rock, or on milfoil. In HDCS Subset Mode, in some instances, it was possible to discern the true bottom, as the milfoil often appeared as soundings “disconnected” from the continuous bottom (Figure 2). In these instances soundings over milfoil were rejected. However, when unable to clearly distinguish between the bottom and the milfoil in multi-beam and backscatter data, the soundings were not rejected. <sup>5</sup>

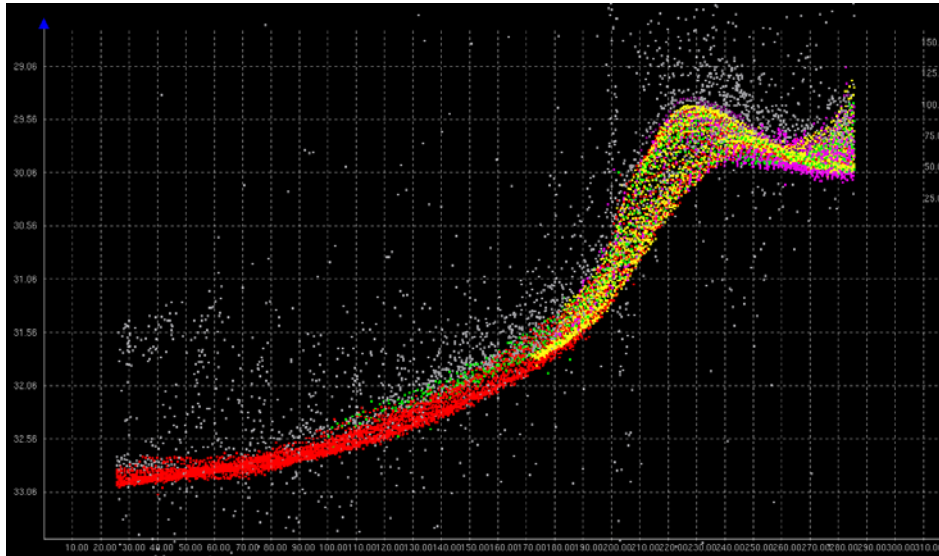


Figure 2. Milfoil cleaned from continuous bottom.

Data collected on multiple days showed slight Sound Velocity errors. Sound velocity profiles from other vessels were added to the concatenated \*.svp and applied to the data, reflecting time of acquisition and location. These files were applied to the data *nearest in time*. In some areas the sound velocity errors were not completely resolved. In these areas, the error is less than 1.0-meters.

With Final Approved Water Levels applied to the data, vertical offsets are prevalent throughout the survey area between data acquired on different days. While most of the discrepancies are on the order of 0.1m or less, bathymetry from DN 302, 2004 is consistently deeper than adjacent data by approximately 0.5m. RAINIER brought this issue to the attention of CO-OPS, which suggested that local weather events may have affected the accuracy of water level correctors throughout the project. (See email correspondence from Mr. Cary Wong of CO-OPS, attached to this report.)

### **B.3 Corrections to Echo Soundings**

Data reduction procedures for survey H11292 conform to those detailed in the *S-N904-RA-04 DAPR*. Note: This survey was processed by “traditional” methods, and does not include BASE Surfaces.

## **C. HORIZONTAL AND VERTICAL CONTROL**

A complete description of horizontal and vertical control for survey H11292 can be found in the *S-N904-RA-04 Horizontal and Vertical Control Report*, submitted under separate cover.<sup>6</sup> A summary of horizontal and vertical control for this survey follows.

### **C.1 Horizontal Control**

The horizontal datum for this project is the North American Datum of 1983 (NAD83). Differential GPS (DGPS) was the sole method of positioning. Differential corrections from U.S. Coast Guard beacons at Robinson Point (323 kHz), Whidbey Island (302 kHz) and Fort Stevens (287 kHz) were utilized during this survey. U.S. Coast Guard beacon at Whidbey Island (302 kHz) was used as the primary source for correctors. Launch-to-launch DGPS performance checks using U.S. Coast Guard beacons at Whidbey Island (302 kHz) and Fort Stevens (287 kHz) were performed in accordance with Section 3.2 of the FPM. Copies of the performance checks are included in the *S-N904-RA-04 Horizontal and Vertical Control Report*.

### **C.2 Vertical Control**

The vertical datum for this project is Lake Washington Low Water of Lake datum (LWLWD). The operating National Water Level Observation Network (NWLON) primary tide station at Sand Point, WA (944-7239) served as control for datum determination and as the primary source for water level reducers for survey H11292.

All data were reduced to ~~MLLW~~\*with final approved water levels from station Sand Point, WA (944-7239). The request for delivery of final approved (smooth) tides for survey H11292 was forwarded to N/OPS1 on November 3, 2004, and the Final Tide Note was received on June 3, 2005. This document is included in this report.

## **D. RESULTS AND RECOMMENDATIONS**

### **D.1 Chart Comparison**

#### **D.1.a Survey Agreement with Chart**

Survey H11292 was compared with chart 18447 (27<sup>th</sup> Ed, April 2004, updated through NTM dated 04/05/2005, 1:25,000)<sup>7</sup> with Final Approved Water Levels applied to all of the data. The soundings generally agreed within 6 feet (1 fathom), though many instances of significant

\* Replace MLLW with LWLWD

differences were found throughout the sheet in widespread near shore areas with depth differences from 20 up to 50 feet.

In several instances, this survey found shallower soundings between charted soundings even though agreement at the position of the charted depths was good. This can be attributed to increased bottom coverage using SWMB methods. The increased bottom coverage also redefined the 60 ft and 18 ft contours. In some instances these contours extend further offshore than reported on the chart. <sup>8</sup>

### **D.1.b Dangers to Navigation**

No DTONs were submitted for survey H11292. <sup>9</sup>

### **D.1.c. Other Features**

A total of five (5) AWOIS items were located within the limits of H11292 and investigated during this survey. Investigation methods, results, and charting recommendations have been entered into Pydro and are submitted with the digital data. <sup>10</sup> The AWOIS Feature Report generated by Pydro (H11292\_AWOIS\_Report.pdf) is included in this report.

## **D.2 Additional Results**

### **D.2.a Prior Survey Comparison**

No comparison was done with prior surveys for this area.

### **D.2.b Shoreline Verification**

#### **Shoreline Source**

NOAA ENC digital vector database files in native format and MapInfo tables of S-57 objects were supplied on the project CD for reference purposes only. In addition, features shown on the current editions of charts 18447, that were not depicted on the shoreline source document were digitized in MapInfo by RAINIER personnel and displayed in Hypack for field verification. <sup>11</sup>

#### **Shoreline Verification**

Complete shoreline verification was not conducted for survey H11292. Significant changes were positioned from bathymetric features flagged “Designated” in Caris 5.4 Subset Editor. Significant shoal depths were marked as outstanding in the CARIS Subset Editor and processed in Pydro. <sup>12</sup>

### **D.2.c Aids to Navigation**

Survey H11293 included two (2) aids to navigation (ATONs). Each ATON was found to serve its intended purpose. <sup>13</sup>

#### **D.2.d Overhead Features**

No Overhead Features were contained within the limits of H11292. <sup>14</sup>

#### **D.2.e Submarine Cables and Pipelines**

There is a charted submarine cable area on Chart 18447 contained within the survey limits of H11292. This cable area is approximately 300-m wide and runs along the West shore and then crosses the lake at the South end of sheet H11292. No indication of these cables was seen in the data. <sup>15</sup>

Several charted sewer pipelines and outfalls cross the survey area. Those located by the survey are discussed in the H11292 Shoreline Report in the Appendices. No indication of the charted "position approximate" sewage pipeline running from Champaign Pt. to Juanita Bay was found. <sup>16</sup>

#### **D.2.f Ferry Routes**

No ferry routes were contained within the limits of H11292. <sup>17</sup>

#### **D.2.g Bottom Samples**

No bottom samples were collected for this survey. <sup>18</sup>

#### **D.2.h Other Findings**

There is a submerged forest area denoted on Chart 18447 contained within the survey limits of H11292. The denoted submerged forest area extends approximately 3000-m along the East shore to a distance of about 500-m off shore. No indication of significant obstructions was apparent in the data in this area. <sup>19</sup>

A log storage area is portrayed on Chart 18447, centered at approximately 47°43'47" N, 122° 15' 52" W. Although numerous submerged timbers were found lying flat on the lakebed, no log storage operations were observed during the survey. The hydrographer recommends confirming the current status of this area with the local Navigation Manager prior to making a charting recommendation. <sup>20</sup>

As noted in Section B.2.c above, submerged aquatic vegetation was prevalent between approximately 3 and 7-m depths throughout the survey area. Although the least depths on this milfoil do not represent the actual lakebed, the bathymetry has been retained in areas where the possibility of hazards to surface navigation within the milfoil could not be ruled out. <sup>21</sup>

Numerous derelict piles and other submerged man-made items were found in the nearshore area in Lake Washington. Those which could be positively identified have been flagged as features in the Pydro PSS. Additional hazards may exist inshore of the limits of mainscheme



hydrography, but could not be effectively portrayed at current chart scale. The hydrographer recommends a note for the chart in Lake Washington that indicates that mariners shall navigate with caution in all waters along shore where private docks or commercial operations exist or may have existed in the past.<sup>22</sup>

### **D.3 Recommendations**

The Hydrographer recommends that the shoreline as depicted on the Bathymetric Feature plot and H11292 Final Field Sheet supersede and complement shoreline information on the charts, as noted.<sup>23</sup>

### **E. ADDITIONAL DOCUMENTATION**

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

<b><u>Title</u></b>	<b><u>Date Sent</u></b>	<b><u>Office</u></b>
Data Acquisition and Processing Report for S-N904-RA-04	Nov. 12, 2004	N/CS34
Horizontal and Vertical Control Report for S-N904-RA-04	May 28, 2004	N/CS34
Tides and Water Levels Package for S-N904-RA-04	May 28, 2004	N/OPS1
Approval Memo for Survey Sheet H11292	Feb. 24, 2006	N/CS34

## **Revisions Compiled During Office Processing and Certification**

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<sup>1</sup> Filed with the project records.

<sup>2</sup> Concur

<sup>3</sup> Concur

<sup>4</sup> Concur, the junction with survey H11293 is complete. A *Joins* note has been added to the smooth sheet.

<sup>5</sup> Additional editing was done during office review of this survey to remove noise and inaccurate depths.

<sup>6</sup> Filed with the project records.

<sup>7</sup> Chart 18447, 28<sup>th</sup> Edition, dated December 1, 2005 was used for comparison.

<sup>8</sup> Concur, overall soundings differ between 2 – 10 feet. This can be attributed to modern sounding techniques and natural processes over time.

<sup>9</sup> Do not concur, one danger to navigation was found and reported during office processing, see attached report from PYDRO.

<sup>10</sup> Filed with the hydrographic records.

<sup>11</sup> Shoreline in brown from chart 18447, 28<sup>th</sup> Edition was drawn on the smooth sheet for orientation only.

Charted data outside the survey limits should be retained as charted.

<sup>12</sup> There are several small shoreline changes shown in dashed red, approximate, on survey H11292. These revisions are considered adequate to supersede the charted shoreline in the common areas.

<sup>13</sup> Concur, the evaluator recommends that MCD is the latest information to chart aids to navigation.

<sup>14</sup> Concur

<sup>15</sup> There is not enough evidence for removal of this feature, retain as charted.

<sup>16</sup> There is not enough evidence for removal of this feature, retain as charted.

<sup>17</sup> Concur

<sup>18</sup> Concur, retain all charted bottom characteristics.

<sup>19</sup> Concur, remove charted note.

<sup>20</sup> It is recommended to remove the note *Log Storage* and replace it with a note *Submerged Obstructions*. Retain charted limit line.

<sup>21</sup> In areas where the hydrographer observed grass, a note has been added to the smooth sheet and HDrawing.

<sup>22</sup> Concur

<sup>23</sup> Concur, see smooth sheet for depiction of the area.



UNITED STATES DEPARTMENT OF COMMERCE  
National Oceanic and Atmospheric Administration  
NOAA Marine and Aviation Operations  
Marine Operations Center  
1801 Fairview Avenue East  
Seattle, Washington 98102-3767

MEMORANDUM FOR: CDR Donald Haines, NOAA  
Chief, Pacific Hydrographic Branch


FROM: CDR Guy Noll, NOAA  
Commanding Officer  
NOAA Ship RAINIER (s221)

DATE: February 24, 2006

TITLE: Approval of Hydrographic Survey H11292

Field operations for hydrographic survey H11292 were conducted under the direct supervision of the previous Commanding Officer, CDR John W. Humphrey, with frequent personal checks of progress and adequacy. I have reviewed the attached survey data and reports. The survey data meets or exceeds requirements as set forth in the NOS Hydrographic Surveys and Specifications Deliverables Manual, Field Procedures Manual, Standing and Letter Instructions, and HSD Technical Directives in effect during data acquisition and processing for this survey. These data are adequate to supersede charted data in their common areas. This survey is complete and no additional work is required. All data and reports are respectfully submitted to N/CS34, Pacific Hydrographic Branch.

Acquisition and preliminary processing for this survey were overseen by survey manager Senior Survey Technician Marsha Wilson and Field Operations Officer LT Kevin J. Slover. In addition, the following individuals were responsible for oversight of processing of this survey:

Survey Manager:   
Brent J. Pounds  
Lieutenant (junior grade), NOAA

Field Operations Officer:   
Benjamin K. Evans  
Lieutenant, NOAA



**Subject:** Re: Smooth Tides for S-N904-RA-2005

**From:** "Cary Wong" <Cary.Wong@noaa.gov>

**Date:** Mon, 27 Jun 2005 08:13:00 -0400

**To:** Brooke McMahon <brooke.mcmahon@noaa.gov>

**CC:** FOO RAINIER <foo.rainier@noaa.gov>, Don Haines <Don.Haines@noaa.gov>, Kim Sampadian <Kim.Sampadian@noaa.gov>, Gregory King <Gregory.King@noaa.gov>, Andrew.Halbach@noaa.gov, ChiefST.Rainier@noaa.gov, Tides.Rainier@noaa.gov, Manoj Samant <Manoj.Samant@noaa.gov>, Rolin Meyer <Rolin.Meyer@noaa.gov>, "David Jones" <David.Jones@noaa.gov>

Hi Ben,

The final tide correctors for N904 are the same as the preliminary correctors so you will not see any improvements in your processing. If you are having a water level issue in your soundings it may be that there is some weather issues from one side of the lake to the other. Do you remember if there were any winds during the survey and from what direction they came from. We may need to install additional water level (WL) stations or relocate the one at Sand Point to be closer to the area of your survey. Since there is no tides in Lake Washington there will be not time or range correctors from the water level station. In the Great Lakes where we have a similar situation we try to place WL stations on the same shore of the survey because wind effects of pushing water from one shore to the other.

If you could give me some more information about your conditions, I will try to figure out a better water level control scheme for the next survey in the Lake (that might mean two or three WL stations to give properly vertical control if your covering large or significantly different areas of the Lake). If you feel that the error budget is good enough that the water level error is not significant enough of a problem, I will continue to require only Sand Point for your vertical control.

Let me know how you want to proceed,  
Cary

Brooke McMahon wrote:

Hi Ben,

I'm glad that the smooth tides will help. I have attached the approved smooth tides for survey H11376 and H11377. Survey H11376 has two separate tide folders (H11376\_2004 and H11376\_2005) since it was conducted over the two years. Please make sure to state in the DR that final smooth tides were applied to the data before branch submission. Thanks.

- Brooke

FOO RAINIER wrote:

Brooke,

That would be very helpful. Believe it or not, it actually looks like we've got some water level problems on at least one of the sheets, so we're hoping the smooth tides will help. Please send them along, and we'll apply them here prior to submitting the surveys.

Ben

Brooke McMahon wrote:

Hi Ben,

PHB recently received smooth tide files for project S-N904-RA-2005, surveys H11376 and H11377. Did you also receive these files from CO-OPs? If not,

would you like them to apply to the surveys? I already created the .tid and .zdf files for the surveys and I can easily send them to you. Thanks.

Regards,  
Brooke

**1.1) Profile/Beam - 377/79 from h11292 / 1006\_reson8101\_hvf / 2004-296 / 175\_1738****DANGER TO NAVIGATION****Survey Summary**

**Survey Position:** 047° 44' 51.034" N, 122° 15' 58.155" W  
**Least Depth:** 4.84 m  
**Timestamp:** 2004-296.17:39:07.059 (10/22/2004)  
**Survey Line:** h11292 / 1006\_reson8101\_hvf / 2004-296 / 175\_1738  
**Profile/Beam:** 377/79  
**Charts Affected:** 18447\_3, 18441\_1, 18440\_1, 18003\_1, 18007\_1, 501\_1, 530\_1, 50\_1

**Remarks:**

Submerged wreck in the approaches to the Kennmore channel. Least depth is 16 ft. in charted 27 feet.

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

16ft (18447\_3)  
2 ½fm (18441\_1, 18440\_1, 18003\_1, 18007\_1, 530\_1)  
4.8m (501\_1, 50\_1)

**Office Notes**

**Chart 16 ft submerged wreck at survey position.**

# H11292 AWOIS Report

**Registry Number:** H11292  
**State:** WA  
**Locality:** Lake Washington  
**Sub-locality:**  
**Project Number:** S-N904-RA-04  
**Survey Date:** April 5, 2004

## Charts Affected

Number	Version	Date	Scale
18447	26th Ed.	01/25/97	1:25000
18441	42nd Ed.	05/01/02	1:80000
18440	26th Ed.	12/01/02	1:150000
18003	18th Ed.	01/06/01	1:736560
18007	31st Ed.	03/31/01	1:1200000
501	12th Ed.	11/01/02	1:3500000
530	30th Ed.	03/23/02	1:4860700
50	5th Ed.	07/30/94	1:10000000

## Features

No.	Feature Type	Survey Depth	Survey Latitude	Survey Longitude
1.1	AWOIS	[no data]	[no data]	[no data]
1.2	AWOIS	[no data]	[no data]	[no data]
1.3	AWOIS	[no data]	[no data]	[no data]
1.4	AWOIS	1.65 m	047° 44' 54.645" N	122° 16' 20.541" W
1.5	AWOIS	4.70 m	047° 41' 38.822" N	122° 16' 11.276" W

**1 - AWOIS**



## 1.1) AWOIS #53073 - OBSTRUCTION

### No Primary Survey Feature for this AWOIS Item

**Search Position:** 047° 44' 43.380" N, 122° 16' 22.040" W  
**Historical Depth:** [None]  
**Search Radius:** 1000  
**Search Technique:** ES, MB  
**Technique Notes:** [None]

#### History Notes:

Charted shoal report. CL27/76--Local knowledge reported by Davidson's Uplake Marina, Box 128, Kenmore WA, 98028: "Extreme shoaling observed in all areas of NE Lake Washington not shown on navigation charts. Average depth of water reduced to 8-10 ft." April 1975 ed. of chart 18447 reflects hydrography from H09337, DA-10-13-71. Position of search center scaled in MapInfo from raster chart. (ENT DAS 1/24/03)

### Survey Summary

**Charts Affected:** 18447\_3, 18441\_1, 18440\_1, 18003\_1, 18007\_1, 501\_1, 530\_1, 50\_1

#### Remarks:

Shoaling, AWOIS #53073

INVESTIGATION SUMMARY: AWOIS search radius covered with 100% SWMB. Shoaling is evident in the extreme north end of Lake Washington, however depths agree well with charted data in the area of the reported 8 ft and significant shoaling was not observed.

### Hydrographer Recommendations

Hydrographer recommends updating chart as per new data.

### Office Notes

Concur, chart eel grass at the survey position, remove charted note.

## 1.2) AWOIS #53074 - OBSTRUCTION

### No Primary Survey Feature for this AWOIS Item

**Search Position:** 047° 44' 41.140" N, 122° 15' 49.970" W  
**Historical Depth:** [None]  
**Search Radius:** 100  
**Search Technique:** VS, DI, HRSSS, HRSWMB, ES  
**Technique Notes:** [None]

#### History Notes:

Charted submerged piles. CL1143/81-- USCG Auxiliary investigation, 8/1/81: 7 piles charted on chart 18447, 19th ed. (3/7/81) between lat. 47/44/39N, lon. 122/15/26W and lat. 47/44/55N, lon. 122/15/46W do not exist. Position of search radius center scaled in MapInfo from raster chart. (ENT DAS 1/24/03)

### Survey Summary

**Charts Affected:** 18447\_3, 18441\_1, 18440\_1, 18003\_1, 18007\_1, 501\_1, 530\_1, 50\_1

#### Remarks:

Obst., AWOIS #53074

INVESTIGATION SUMMARY: Visual Search of the area revealed no piles in charted locations. Area was covered with 100% SWMB. Numerous submerged timbers along the bottom and several vertical pile members detected.

### Hydrographer Recommendations

Hydrographer recommends charting piles to reflect new positions.

### Office Notes

Concur with clarification, chart numerous submerged piles at the survey positions, see smooth sheet for depiction of the area.

### 1.3) AWOIS #53099 - OBSTRUCTION

#### No Primary Survey Feature for this AWOIS Item

**Search Position:** 047° 43' 19.000" N, 122° 15' 53.000" W  
**Historical Depth:** [None]  
**Search Radius:** 100  
**Search Technique:** S2,MB,ES,DI,SD  
**Technique Notes:** CONDUCT SEARCH 100M OUTSIDE THE DELINEATED BOUNDARY OF THE SUBMERGED FOREST.

#### History Notes:

POSITION INDICATES APPROXIMATE CENTER OF CHARTED SUBMERGED FOREST. H-4135, 1920, REPORTS THE EXISTANCE OF A SUBMERGED FOREST OFF THE NORTH EAST SHORE OF LAKE WASHINGTON NEAR THE CITY OF MANITOU. THIS WIRE DRAG SURVEY CLEARED THE AREA AT A DEPTH OF 30 FT. THE FOREST EXTENDS FROM LAT. 47/44/04 N TO LAT. 47/42/41 N AND WEST TO LON. 122/16/04W. (NAD83) SEE CHART FOR ENTIRE AREA. (ENTERED 12/03 BY KRW).

#### Survey Summary

**Charts Affected:** 18447\_3, 18441\_1, 18440\_1, 18003\_1, 18007\_1, 501\_1, 530\_1, 50\_1

#### Remarks:

Obst., AWOIS #53099

INVESTIGATION SUMMARY: AWOIS search radius covered with 100% SWMB. No evidence of a submered forest in this area.

#### Hydrographer Recommendations

Recommend removing notation of submerged forest from chart.

#### Office Notes

Concur, remove limit line and charted note.

## 1.4) AWOIS #53072 - OBSTRUCTION

### Primary Survey Feature is Profile/Beam - 670/9 from h11292 / 1006\_reson8101\_hvf / 2004-296 / 067\_1617

**Search Position:** 047° 44' 37.040" N, 122° 16' 36.620" W  
**Historical Depth:** [None]  
**Search Radius:** 1000  
**Search Technique:** ES, MB  
**Technique Notes:** [None]

#### History Notes:

Charted shoal report. CL27/76--Local knowledge reported by Davidson's Uplake Marina, Box 128, Kenmore WA, 98028: "Extreme shoaling observed in all areas of NE Lake Washington not shown on navigation charts. Average depth of water reduced to 20 - 30 ft." April 1975 ed. of chart 18447reflects hydrography from H09337, DA-10-13-71. Position of search center scaled in MapInfo from raster chart. (ENT DAS 1/24/03)

### Survey Summary

**Survey Position:** 047° 44' 54.645" N, 122° 16' 20.541" W  
**Least Depth:** 1.65 m  
**Timestamp:** 2004-296.16:17:46.587 (10/22/2004)  
**Survey Line:** h11292 / 1006\_reson8101\_hvf / 2004-296 / 067\_1617  
**Profile/Beam:** 670/9  
**Charts Affected:** 18447\_3, 18441\_1, 18440\_1, 18003\_1, 18007\_1, 501\_1, 530\_1, 50\_1

#### Remarks:

MBES least depth on top of submerged aquatic vegetation (eel grass). Eel grass prevalent in depths between 3 and 7m throughout survey. Hazards to surface navigation may be present in eel grass beds below survey soundings.

### Hydrographer Recommendations

[None]

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

5ft (18447\_3)

0 ¾fm (18441\_1, 18440\_1, 18003\_1, 18007\_1, 530\_1)

1.6m (501\_1, 50\_1)

## Office Notes

Concur, also remove charted note.

## 1.5) AWOIS #53091 - OBSTRUCTION

### Primary Survey Feature is Profile/Beam - 236/10 from h11292 / 1006\_reson8101\_hvf / 2004-302 / 402\_1700

**Search Position:** 047° 41' 39.360" N, 122° 16' 12.450" W  
**Historical Depth:** [None]  
**Search Radius:** 100  
**Search Technique:** VS,S2,MB,DI,SD  
**Technique Notes:** [None]

#### History Notes:

CL 1352, 10/22/84; USCG AUX. LETTER REPORTS TWO VISIBLE DOLPHINS (THREE MEMBERS EACH) 25 FT APART IN LAT. 47/41/40 N, LON. 122/16/08 W (NAD27) (ENTERED 12/03 BY KRW)

### Survey Summary

**Survey Position:** 047° 41' 38.822" N, 122° 16' 11.276" W  
**Least Depth:** 4.70 m  
**Timestamp:** 2004-302.17:00:42.301 (10/28/2004)  
**Survey Line:** h11292 / 1006\_reson8101\_hvf / 2004-302 / 402\_1700  
**Profile/Beam:** 236/10  
**Charts Affected:** 18447\_3, 18441\_1, 18440\_1, 18003\_1, 18007\_1, 501\_1, 530\_1, 50\_1

#### Remarks:

Probable submerged piling. Within AWOIS 53091 radius.

### Hydrographer Recommendations

[None]

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

15ft (18447\_3)

2 ½fm (18441\_1, 18440\_1, 18003\_1, 18007\_1, 530\_1)

4.7m (501\_1, 50\_1)

## Office Notes

Chart obstruction (subm pile) as found on this survey. A depth of 15 ft (subm pile) could not be portrayed on the chart due to the scale of the chart and other features nearby, a 10 ft obstruction and a 19 ft wreck. Remove charted note, dol and remove the two visible dol symbols at the AWOIS position. Chart area as shown on the Hdrawing and smooth sheet.

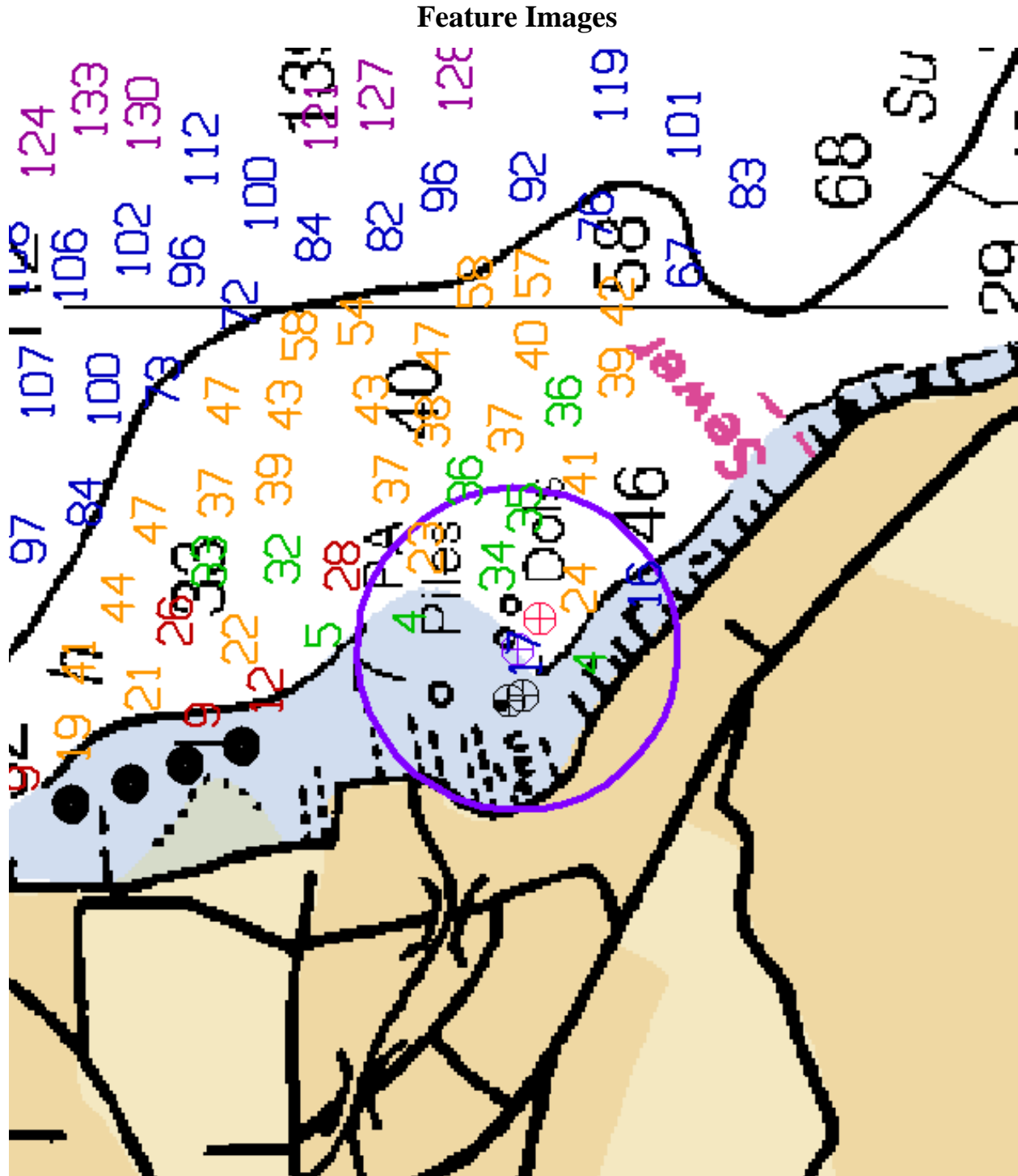


Figure 1.5.1



# H11292 Shoreline Report

**Registry Number:** H11292  
**State:** WA  
**Locality:** Lake Washington  
**Sub-locality:**  
**Project Number:** S-N904-RA-04  
**Survey Date:** April 5, 2004

## Charts Affected

Number	Version	Date	Scale
18447	26th Ed.	01/25/97	1:25000
18441	42nd Ed.	05/01/02	1:80000
18440	26th Ed.	12/01/02	1:150000
18003	18th Ed.	01/06/01	1:736560
18007	31st Ed.	03/31/01	1:1200000
501	12th Ed.	11/01/02	1:3500000
530	30th Ed.	03/23/02	1:4860700
50	5th Ed.	07/30/94	1:10000000

## Features

No.	Feature Type	Survey Depth	Survey Latitude	Survey Longitude
1.1	Wreck	4.84 m	047° 44' 51.034" N	122° 15' 58.155" W
1.2	Pile	2.17 m	047° 43' 38.709" N	122° 16' 49.274" W
1.3	Sounding	-0.23 m	047° 44' 10.931" N	122° 15' 58.449" W
1.4	Sounding	-0.43 m	047° 44' 08.966" N	122° 15' 57.549" W
1.5	Dolphin	-2.51 m	047° 41' 39.215" N	122° 16' 14.134" W
1.6	Pile	-2.71 m	047° 41' 46.196" N	122° 16' 15.987" W
1.7	Pile	-2.71 m	047° 41' 47.601" N	122° 16' 16.689" W
1.8	Pile	-0.51 m	047° 41' 48.959" N	122° 16' 17.394" W
1.9	Pile	-2.71 m	047° 41' 50.418" N	122° 16' 18.099" W
1.10	Wreck	15.52 m	047° 44' 14.650" N	122° 16' 10.424" W
1.11	Sounding	4.70 m	047° 41' 38.822" N	122° 16' 11.276" W

1.12	Sounding	1.67 m	047° 44' 35.503" N	122° 15' 53.399" W
1.13	Sounding	5.55 m	047° 44' 38.816" N	122° 15' 52.212" W
1.14	Sounding	6.14 m	047° 44' 30.274" N	122° 15' 56.687" W
1.15	Sounding	1.65 m	047° 44' 54.645" N	122° 16' 20.541" W
1.16	Sounding	6.68 m	047° 43' 36.964" N	122° 15' 44.330" W
1.17	Sounding	5.83 m	047° 44' 02.934" N	122° 15' 55.528" W
1.18	Sounding	4.34 m	047° 44' 02.941" N	122° 15' 55.283" W
1.19	Sounding	8.89 m	047° 42' 18.654" N	122° 16' 27.524" W
1.20	Sounding	3.99 m	047° 41' 54.225" N	122° 13' 07.769" W
1.21	Sounding	1.34 m	047° 43' 45.162" N	122° 15' 50.360" W
1.22	AWOIS	[no data]	[no data]	[no data]
1.23	AWOIS	[no data]	[no data]	[no data]
1.24	AWOIS	[no data]	[no data]	[no data]
1.25	Sounding	36.30 m	047° 41' 38.954" N	122° 15' 31.166" W
1.26	Sounding	7.43 m	047° 44' 40.094" N	122° 15' 55.567" W
1.27	Sounding	6.64 m	047° 44' 44.583" N	122° 15' 52.126" W
1.28	Sounding	2.25 m	047° 45' 00.882" N	122° 16' 10.145" W
1.29	GP	[None]	047° 43' 46.979" N	122° 15' 52.387" W
1.30	GP	[None]	047° 41' 52.827" N	122° 14' 12.928" W
1.31	AWOIS	1.65 m	047° 44' 54.645" N	122° 16' 20.541" W
1.32	AWOIS	4.70 m	047° 41' 38.822" N	122° 16' 11.276" W
1.33	Dolphin	-2.01 m	047° 41' 39.564" N	122° 16' 14.281" W
1.34	Sounding	6.86 m	047° 44' 39.208" N	122° 15' 53.755" W
1.35	Sounding	7.21 m	047° 44' 40.840" N	122° 15' 53.594" W
1.36	Sounding	9.38 m	047° 44' 02.881" N	122° 15' 56.240" W
1.37	GP	[None]	047° 42' 19.060" N	122° 16' 24.565" W

# **1 - Shoreline Report**

## 1.2) Profile/Beam - 400/1 from h11292 / 1006\_reson8101\_hvf / 2004-299 / 040\_2054

### Survey Summary

**Survey Position:** 047° 43' 38.709" N, 122° 16' 49.274" W  
**Least Depth:** 2.17 m  
**Timestamp:** 2004-299.20:54:42.760 (10/25/2004)  
**Survey Line:** h11292 / 1006\_reson8101\_hvf / 2004-299 / 040\_2054  
**Profile/Beam:** 400/1  
**Charts Affected:** 18447\_3, 18441\_1, 18440\_1, 18003\_1, 18007\_1, 501\_1, 530\_1, 50\_1

#### Remarks:

New Submerged Pile

### Hydrographer Recommendations

Chart New Pile

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

7ft (18447\_3)

1fm (18441\_1, 18440\_1, 18003\_1, 18007\_1, 530\_1)

2.1m (501\_1, 50\_1)

### Office Notes

Chart 7 ft obstruction (subm pile) at the survey position

### 1.3) Profile/Beam - 1/1 from h11292 / 1006\_nonechosounder\_dp / 2004-296 / h11292\_1006\_296\_dps

#### Survey Summary

**Survey Position:** 047° 44' 10.931" N, 122° 15' 58.449" W  
**Least Depth:** -0.23 m  
**Timestamp:** 2004-296.18:51:15.000 (10/22/2004)  
**DP Dataset:** h11292 / 1006\_nonechosounder\_dp / 2004-296 / h11292\_1006\_296\_dps  
**Profile/Beam:** 1/1  
**Charts Affected:** 18447\_3, 18441\_1, 18440\_1, 18003\_1, 18007\_1, 501\_1, 530\_1, 50\_1

#### Remarks:

New submerged pile

#### Hydrographer Recommendations

Chart New Pile

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

-1ft (18447\_3)

0fm (18441\_1, 18440\_1, 18003\_1, 18007\_1, 530\_1)

-.3m (501\_1, 50\_1)

#### Office Notes

Concur with clarification, chart pile uncovers 1 ft at survey position.

## 1.4) Profile/Beam - 2/1 from h11292 / 1006\_nonechosounder\_dp / 2004-296 / h11292\_1006\_296\_dps

### Survey Summary

**Survey Position:** 047° 44' 08.966" N, 122° 15' 57.549" W  
**Least Depth:** -0.43 m  
**Timestamp:** 2004-296.18:57:52.000 (10/22/2004)  
**DP Dataset:** h11292 / 1006\_nonechosounder\_dp / 2004-296 / h11292\_1006\_296\_dps  
**Profile/Beam:** 2/1  
**Charts Affected:** 18447\_3, 18441\_1, 18440\_1, 18003\_1, 18007\_1, 501\_1, 530\_1, 50\_1

#### Remarks:

New submerged pile

### Hydrographer Recommendations

Chart New Pile

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

-2ft (18447\_3)

0 ¼fm (18441\_1, 18440\_1, 18003\_1, 18007\_1, 530\_1)

-.5m (501\_1, 50\_1)

### Office Notes

Concur with clarification, chart pile uncovers 2 ft at survey position.

## 1.5) Profile/Beam - 1/1 from h11292 / 1006\_nonechosounder\_dp / 2004-302 / h11292\_1006\_302\_dps

### Survey Summary

**Survey Position:** 047° 41' 39.215" N, 122° 16' 14.134" W  
**Least Depth:** -2.51 m  
**Timestamp:** 2004-302.17:11:55.000 (10/28/2004)  
**DP Dataset:** h11292 / 1006\_nonechosounder\_dp / 2004-302 / h11292\_1006\_302\_dps  
**Profile/Beam:** 1/1  
**Charts Affected:** 18447\_3, 18441\_1, 18440\_1, 18003\_1, 18007\_1, 501\_1, 530\_1, 50\_1

#### Remarks:

Chd (18447) Dolphin

Obts., AWOIS #53091

INVESTIGATION SUMMARY: Search radius was covered with 100% SWMB and dolphins were located and detached positions recorded (DP #1006\_302\_1016 and DP #1006\_302\_1017).

### Hydrographer Recommendations

Reposition Charted (18447) Dolphin

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

-8ft (18447\_3)

-1 ¼fm (18441\_1, 18440\_1, 18003\_1, 18007\_1, 530\_1)

-2.5m (501\_1, 50\_1)

### Office Notes

Concur, chart MHW dolphin at the survey position.

## Feature Images



*Figure 1.5.1*



## 1.6) Profile/Beam - 3/1 from h11292 / 1006\_nonechosounder\_dp / 2004-302 / h11292\_1006\_302\_dps

### Survey Summary

**Survey Position:** 047° 41' 46.196" N, 122° 16' 15.987" W  
**Least Depth:** -2.71 m  
**Timestamp:** 2004-302.17:19:58.000 (10/28/2004)  
**DP Dataset:** h11292 / 1006\_nonechosounder\_dp / 2004-302 / h11292\_1006\_302\_dps  
**Profile/Beam:** 3/1  
**Charts Affected:** 18447\_3, 18441\_1, 18440\_1, 18003\_1, 18007\_1, 501\_1, 530\_1, 50\_1

#### Remarks:

New Pile SWM of 3 Piles

### Hydrographer Recommendations

Chart New Pile

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

-9ft (18447\_3)  
-1 ½fm (18441\_1, 18440\_1, 18003\_1, 18007\_1, 530\_1)  
-2.7m (501\_1, 50\_1)

### Office Notes

Concur, chart row of MHW piles at the survey position.

## Feature Images



*Figure 1.6.1*

## 1.7) Profile/Beam - 4/1 from h11292 / 1006\_nonechosounder\_dp / 2004-302 / h11292\_1006\_302\_dps

### Survey Summary

**Survey Position:** 047° 41' 47.601" N, 122° 16' 16.689" W  
**Least Depth:** -2.71 m  
**Timestamp:** 2004-302.17:21:59.000 (10/28/2004)  
**DP Dataset:** h11292 / 1006\_nonechosounder\_dp / 2004-302 / h11292\_1006\_302\_dps  
**Profile/Beam:** 4/1  
**Charts Affected:** 18447\_3, 18441\_1, 18440\_1, 18003\_1, 18007\_1, 501\_1, 530\_1, 50\_1

#### Remarks:

New Pile

### Hydrographer Recommendations

Chart New Pile

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

-9ft (18447\_3)  
-1 ½fm (18441\_1, 18440\_1, 18003\_1, 18007\_1, 530\_1)  
-2.7m (501\_1, 50\_1)

### Office Notes

Concur chart MHW pile at survey position.

## Feature Images



*Figure 1.7.1*

## 1.8) Profile/Beam - 5/1 from h11292 / 1006\_nonechosounder\_dp / 2004-302 / h11292\_1006\_302\_dps

### Survey Summary

**Survey Position:** 047° 41' 48.959" N, 122° 16' 17.394" W  
**Least Depth:** -0.51 m  
**Timestamp:** 2004-302.17:23:27.000 (10/28/2004)  
**DP Dataset:** h11292 / 1006\_nonechosounder\_dp / 2004-302 / h11292\_1006\_302\_dps  
**Profile/Beam:** 5/1  
**Charts Affected:** 18447\_3, 18441\_1, 18440\_1, 18003\_1, 18007\_1, 501\_1, 530\_1, 50\_1

#### Remarks:

New Pile SWM of 4 Piles

### Hydrographer Recommendations

Chart New Pile

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

-2ft (18447\_3)

0 ¼fm (18441\_1, 18440\_1, 18003\_1, 18007\_1, 530\_1)

-.5m (501\_1, 50\_1)

### Office Notes

Concur, chart row of MHW piles at survey position.

## Feature Images



*Figure 1.8.1*

## 1.9) Profile/Beam - 6/1 from h11292 / 1006\_nonechosounder\_dp / 2004-302 / h11292\_1006\_302\_dps

### Survey Summary

**Survey Position:** 047° 41' 50.418" N, 122° 16' 18.099" W  
**Least Depth:** -2.71 m  
**Timestamp:** 2004-302.17:25:07.000 (10/28/2004)  
**DP Dataset:** h11292 / 1006\_nonechosounder\_dp / 2004-302 / h11292\_1006\_302\_dps  
**Profile/Beam:** 6/1  
**Charts Affected:** 18447\_3, 18441\_1, 18440\_1, 18003\_1, 18007\_1, 501\_1, 530\_1, 50\_1

#### Remarks:

New Pile SWM of 3 Piles

### Hydrographer Recommendations

Chart New Pile

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

-9ft (18447\_3)  
-1 ½fm (18441\_1, 18440\_1, 18003\_1, 18007\_1, 530\_1)  
-2.7m (501\_1, 50\_1)

### Office Notes

Concur, chart row of MHW piles at survey position.

## Feature Images



*Figure 1.9.1*



## 1.10) Profile/Beam - 79/24 from h11292 / 1021\_reson8101 / 2004-096 / 265\_1827

### Survey Summary

**Survey Position:** 047° 44' 14.650" N, 122° 16' 10.424" W  
**Least Depth:** 15.52 m  
**Timestamp:** 2004-096.18:28:21.623 (04/05/2004)  
**Survey Line:** h11292 / 1021\_reson8101 / 2004-096 / 265\_1827  
**Profile/Beam:** 79/24  
**Charts Affected:** 18447\_3, 18441\_1, 18440\_1, 18003\_1, 18007\_1, 501\_1, 530\_1, 50\_1

#### Remarks:

Submerged barge

### Hydrographer Recommendations

[None]

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

51ft (18447\_3)

8 ½fm (18441\_1, 18440\_1, 18003\_1, 18007\_1, 530\_1)

15.5m (501\_1, 50\_1)

### Office Notes

Chart submerged 51 ft. wreck

## 1.12) Profile/Beam - 2562/85 from h11292 / 1006\_reson8101 / 2004-096 / 177\_1850

### Survey Summary

**Survey Position:** 047° 44' 35.503" N, 122° 15' 53.399" W  
**Least Depth:** 1.67 m  
**Timestamp:** 2004-096.18:53:29.968 (04/05/2004)  
**Survey Line:** h11292 / 1006\_reson8101 / 2004-096 / 177\_1850  
**Profile/Beam:** 2562/85  
**Charts Affected:** 18447\_3, 18441\_1, 18440\_1, 18003\_1, 18007\_1, 501\_1, 530\_1, 50\_1

#### Remarks:

Probable submerged piling near charted "Subm piles" area

### Hydrographer Recommendations

Chart submerged piling.

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

5ft (18447\_3)

0 ¾fm (18441\_1, 18440\_1, 18003\_1, 18007\_1, 530\_1)

1.6m (501\_1, 50\_1)

### Office Notes

Concur, chart 5 ft. obstruction (submerged piles) at the survey position.

## 1.13) Profile/Beam - 145/1 from h11292 / 1006\_reson8101 / 2004-096 / 201\_1832

### Survey Summary

**Survey Position:** 047° 44' 38.816" N, 122° 15' 52.212" W  
**Least Depth:** 5.55 m  
**Timestamp:** 2004-096.18:32:32.751 (04/05/2004)  
**Survey Line:** h11292 / 1006\_reson8101 / 2004-096 / 201\_1832  
**Profile/Beam:** 145/1  
**Charts Affected:** 18447\_3, 18441\_1, 18440\_1, 18003\_1, 18007\_1, 501\_1, 530\_1, 50\_1

#### Remarks:

Probable Submerged Pile. Correlates to AWOIS 53074.

### Hydrographer Recommendations

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

18ft (18447\_3)  
3fm (18441\_1, 18440\_1, 18003\_1, 18007\_1, 530\_1)  
5.5m (501\_1, 50\_1)

### Office Notes

Chart submerged pile at the survey position.

## 1.14) Profile/Beam - 902/1 from h11292 / 1006\_reson8101\_hvf / 2004-296 / 034\_1826

### Survey Summary

**Survey Position:** 047° 44' 30.274" N, 122° 15' 56.687" W  
**Least Depth:** 6.14 m  
**Timestamp:** 2004-296.18:27:44.846 (10/22/2004)  
**Survey Line:** h11292 / 1006\_reson8101\_hvf / 2004-296 / 034\_1826  
**Profile/Beam:** 902/1  
**Charts Affected:** 18447\_3, 18441\_1, 18440\_1, 18003\_1, 18007\_1, 501\_1, 530\_1, 50\_1

#### Remarks:

Probable submerged pile.

### Hydrographer Recommendations

[None]

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

20ft (18447\_3)

3 ¼fm (18441\_1, 18440\_1, 18003\_1, 18007\_1, 530\_1)

6.1m (501\_1, 50\_1)

### Office Notes

Chart 20 ft obstruction, (submerged piles) at the survey position.

## 1.16) Profile/Beam - 392/11 from h11292 / 1006\_reson8101\_hvf / 2004-296 / 132\_2033

### Survey Summary

**Survey Position:** 047° 43' 36.964" N, 122° 15' 44.330" W  
**Least Depth:** 6.68 m  
**Timestamp:** 2004-296.20:34:21.261 (10/22/2004)  
**Survey Line:** h11292 / 1006\_reson8101\_hvf / 2004-296 / 132\_2033  
**Profile/Beam:** 392/11  
**Charts Affected:** 18447\_3, 18441\_1, 18440\_1, 18003\_1, 18007\_1, 501\_1, 530\_1, 50\_1

#### Remarks:

Probable submerged piling

### Hydrographer Recommendations

[None]

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

22ft (18447\_3)

3 ½fm (18441\_1, 18440\_1, 18003\_1, 18007\_1, 530\_1)

6.7m (501\_1, 50\_1)

### Office Notes

Chart 22 ft obstruction, (submerged piles) at the survey position.

## 1.17) Profile/Beam - 562/92 from h11292 / 1006\_reson8101\_hvf / 2004-296 / 143\_2006

### Survey Summary

**Survey Position:** 047° 44' 02.934" N, 122° 15' 55.528" W  
**Least Depth:** 5.83 m  
**Timestamp:** 2004-296.20:07:17.432 (10/22/2004)  
**Survey Line:** h11292 / 1006\_reson8101\_hvf / 2004-296 / 143\_2006  
**Profile/Beam:** 562/92  
**Charts Affected:** 18447\_3, 18441\_1, 18440\_1, 18003\_1, 18007\_1, 501\_1, 530\_1, 50\_1

#### Remarks:

obstn

### Hydrographer Recommendations

[None]

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

19ft (18447\_3)

3 ¼fm (18441\_1, 18440\_1, 18003\_1, 18007\_1, 530\_1)

5.8m (501\_1, 50\_1)

### Office Notes

Chart obstructions, see smooth sheet for depiction of the area. See position 560/101

## 1.18) Profile/Beam - 560/101 from h11292 / 1006\_reson8101\_hvf / 2004-296 / 143\_2006

### Survey Summary

**Survey Position:** 047° 44' 02.941" N, 122° 15' 55.283" W  
**Least Depth:** 4.34 m  
**Timestamp:** 2004-296.20:07:17.226 (10/22/2004)  
**Survey Line:** h11292 / 1006\_reson8101\_hvf / 2004-296 / 143\_2006  
**Profile/Beam:** 560/101  
**Charts Affected:** 18447\_3, 18441\_1, 18440\_1, 18003\_1, 18007\_1, 501\_1, 530\_1, 50\_1

#### Remarks:

[None]

### Hydrographer Recommendations

[None]

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

14ft (18447\_3)

2 ¼fm (18441\_1, 18440\_1, 18003\_1, 18007\_1, 530\_1)

4.3m (501\_1, 50\_1)

### Office Notes

Chart 14 ft obstruction, see smooth sheet for depiction of the area.

## 1.19) Profile/Beam - 226/49 from h11292 / 1006\_reson8101\_hvf / 2004-302 / 010\_1624

### Survey Summary

**Survey Position:** 047° 42' 18.654" N, 122° 16' 27.524" W  
**Least Depth:** 8.89 m  
**Timestamp:** 2004-302.16:24:44.067 (10/28/2004)  
**Survey Line:** h11292 / 1006\_reson8101\_hvf / 2004-302 / 010\_1624  
**Profile/Beam:** 226/49  
**Charts Affected:** 18447\_3, 18441\_1, 18440\_1, 18003\_1, 18007\_1, 501\_1, 530\_1, 50\_1

#### Remarks:

Probable seaward extent of charted sewer outfall. No MBES backscatter acquired

### Hydrographer Recommendations

Retain charted sewer outfall

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

29ft (18447\_3)

4 ¾fm (18441\_1, 18440\_1, 18003\_1, 18007\_1, 530\_1)

8.9m (501\_1, 50\_1)

### Office Notes

Concur



## 1.20) Profile/Beam - 971/2 from h11292 / 1016\_reson8125 / 2004-096 / 137\_1830

### Survey Summary

**Survey Position:** 047° 41' 54.225" N, 122° 13' 07.769" W  
**Least Depth:** 3.99 m  
**Timestamp:** 2004-096.18:31:32.724 (04/05/2004)  
**Survey Line:** h11292 / 1016\_reson8125 / 2004-096 / 137\_1830  
**Profile/Beam:** 971/2  
**Charts Affected:** 18447\_3, 18441\_1, 18440\_1, 18003\_1, 18007\_1, 501\_1, 530\_1, 50\_1

#### Remarks:

MBES least depth on top of submerged aquatic vegetation (eel grass). Eel grass prevalent in depths between 3 and 7m throughout survey. Hazards to surface navigation may be present in eel grass beds below survey soundings.

### Hydrographer Recommendations

[None]

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

13ft (18447\_3)

2fm (18441\_1, 18440\_1, 18003\_1, 18007\_1, 530\_1)

4.0m (501\_1, 50\_1)

### Office Notes

Chart eel grass at the survey position.

## 1.21) Profile/Beam - 724/80 from h11292 / 1006\_reson8101\_hvf / 2004-296 / 116\_2023

### Survey Summary

**Survey Position:** 047° 43' 45.162" N, 122° 15' 50.360" W  
**Least Depth:** 1.34 m  
**Timestamp:** 2004-296.20:25:33.758 (10/22/2004)  
**Survey Line:** h11292 / 1006\_reson8101\_hvf / 2004-296 / 116\_2023  
**Profile/Beam:** 724/80  
**Charts Affected:** 18447\_3, 18441\_1, 18440\_1, 18003\_1, 18007\_1, 501\_1, 530\_1, 50\_1

#### Remarks:

MBES least depth on top of submerged aquatic vegetation (eel grass). Eel grass prevalent in depths between 3 and 7m throughout survey. Hazards to surface navigation may be present in eel grass beds below survey soundings.

### Hydrographer Recommendations

[None]

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

4ft (18447\_3)

0 ¾fm (18441\_1, 18440\_1, 18003\_1, 18007\_1, 530\_1)

1.3m (501\_1, 50\_1)

### Office Notes

Chart eel grass at the survey position.

## 1.26) Profile/Beam - 436/48 from h11292 / 1006\_reson8101 / 2004-096 / 200\_1937

### Survey Summary

**Survey Position:** 047° 44' 40.094" N, 122° 15' 55.567" W  
**Least Depth:** 7.43 m  
**Timestamp:** 2004-096.19:37:45.845 (04/05/2004)  
**Survey Line:** h11292 / 1006\_reson8101 / 2004-096 / 200\_1937  
**Profile/Beam:** 436/48  
**Charts Affected:** 18447\_3, 18441\_1, 18440\_1, 18003\_1, 18007\_1, 501\_1, 530\_1, 50\_1

#### Remarks:

Insig Obstn

### Hydrographer Recommendations

Chart Sounding Only

### Office Notes

Concur with clarification, chart area as shown on the smooth sheet.

## 1.27) Profile/Beam - 830/82 from h11292 / 1006\_reson8101 / 2004-096 / 312\_2045

### Survey Summary

**Survey Position:** 047° 44' 44.583" N, 122° 15' 52.126" W  
**Least Depth:** 6.64 m  
**Timestamp:** 2004-096.20:46:38.329 (04/05/2004)  
**Survey Line:** h11292 / 1006\_reson8101 / 2004-096 / 312\_2045  
**Profile/Beam:** 830/82  
**Charts Affected:** 18447\_3, 18441\_1, 18440\_1, 18003\_1, 18007\_1, 501\_1, 530\_1, 50\_1

#### Remarks:

Probable Submerged Pile. Correlates to AWOIS 53074.

### Hydrographer Recommendations

[None]

### Office Notes

Chart submerged pile at the survey position.

### **1.33) Profile/Beam - 2/1 from h11292 / 1006\_nonechosounder\_dp / 2004-302 / h11292\_1006\_302\_dps**

#### **Survey Summary**

**Survey Position:** 047° 41' 39.564" N, 122° 16' 14.281" W  
**Least Depth:** -2.01 m  
**Timestamp:** 2004-302.17:14:32.000 (10/28/2004)  
**DP Dataset:** h11292 / 1006\_nonechosounder\_dp / 2004-302 / h11292\_1006\_302\_dps  
**Profile/Beam:** 2/1  
**Charts Affected:** 18447\_3, 18441\_1, 18440\_1, 18003\_1, 18007\_1, 501\_1, 530\_1, 50\_1

#### **Remarks:**

Chd (18447) Dolphin

Obts., AWOIS #53091

INVESTIGATION SUMMARY: Search radius was covered with 100% SWMB and dolphins were located and detached positions recorded (DP #1006\_302\_1016 and DP #1006\_302\_1017).

#### **Hydrographer Recommendations**

Reposition Charted (18447) Dolphin

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

-7ft (18447\_3)

-1fm (18441\_1, 18440\_1, 18003\_1, 18007\_1, 530\_1)

-2.0m (501\_1, 50\_1)

#### **Office Notes**

Chart HW dolphin at survey position

## Feature Images



*Figure 1.33.1*

### 1.34) Profile/Beam - 305/18 from h11292 / 1006\_reson8101 / 2004-096 / 201\_1832

#### Survey Summary

**Survey Position:** 047° 44' 39.208" N, 122° 15' 53.755" W  
**Least Depth:** 6.86 m  
**Timestamp:** 2004-096.18:32:42.689 (04/05/2004)  
**Survey Line:** h11292 / 1006\_reson8101 / 2004-096 / 201\_1832  
**Profile/Beam:** 305/18  
**Charts Affected:** 18447\_3, 18441\_1, 18440\_1, 18003\_1, 18007\_1, 501\_1, 530\_1, 50\_1

**Remarks:**

Probable Submerged Pile. Correlates to AWOIS 53074.

#### Hydrographer Recommendations

[None]

#### Office Notes

Concur, chart area as shown on the smooth sheet.

## 1.35) Profile/Beam - 1279/38 from h11292 / 1006\_reson8101 / 2004-096 / 311\_2050

### Survey Summary

**Survey Position:** 047° 44' 40.840" N, 122° 15' 53.594" W  
**Least Depth:** 7.21 m  
**Timestamp:** 2004-096.20:52:18.424 (04/05/2004)  
**Survey Line:** h11292 / 1006\_reson8101 / 2004-096 / 311\_2050  
**Profile/Beam:** 1279/38  
**Charts Affected:** 18447\_3, 18441\_1, 18440\_1, 18003\_1, 18007\_1, 501\_1, 530\_1, 50\_1

#### Remarks:

Probable Submerged Pile. Correlates to AWOIS 53074.

### Hydrographer Recommendations

[None]

### Office Notes

Concur with clarification, chart numerous submerged piles at the survey positions, see smooth sheet for depiction of the area.



## 1.36) Profile/Beam - 565/33 from h11292 / 1006\_reson8101\_hvf / 2004-296 / 143\_2006

### Survey Summary

**Survey Position:** 047° 44' 02.881" N, 122° 15' 56.240" W  
**Least Depth:** 9.38 m  
**Timestamp:** 2004-296.20:07:17.744 (10/22/2004)  
**Survey Line:** h11292 / 1006\_reson8101\_hvf / 2004-296 / 143\_2006  
**Profile/Beam:** 565/33  
**Charts Affected:** 18447\_3, 18441\_1, 18440\_1, 18003\_1, 18007\_1, 501\_1, 530\_1, 50\_1

#### Remarks:

Seaward extent of unknown obstn.

### Hydrographer Recommendations

[None]

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

31ft (18447\_3)

5fm (18441\_1, 18440\_1, 18003\_1, 18007\_1, 530\_1)

9.4m (501\_1, 50\_1)

### Office Notes

Chart obstructions, see smooth sheet for depiction of the area. Same feature as position 560/92 and 562/92.



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

TIDE NOTE FOR HYDROGRAPHIC SURVEY

DATE : June 3, 2005

HYDROGRAPHIC BRANCH: Pacific  
HYDROGRAPHIC PROJECT: S N904-RA-2004  
HYDROGRAPHIC SHEET: H11292

LOCALITY: Lake Washington, WA  
TIME PERIOD: April 5, Oct 22- Nov 26, 2004

TIDE STATION USED: 944-7239 Sand Point, WA  
Lat. 47 41.3'N Long. 122 15.5' W

PLANE OF REFERENCE : 0.000 meters  
(LAKE WASHINGTON LOW WATER OF LAKE DATUM - [LWLWD])

REMARKS: RECOMMENDED ZONING  
Use zone(s) identified as: LW1.

Refer to attachments for zoning information.

Note 1: The provided time series data at Sand Point, WA (944-7239) are tabulated in metric units (meters), relative to LWLWD and on Greenwich Mean Time (GMT). Retrieve verified water level using the Station Datum option to retrieve water level data on LWLWD.

*Thomas V. Mero* 6/15/05  
\_\_\_\_\_  
CHIEF, REQUIREMENTS AND DEVELOPMENT DIVISION



Final tide zone node point locations for OPR-N904-RA-2004, Sheet H11292.

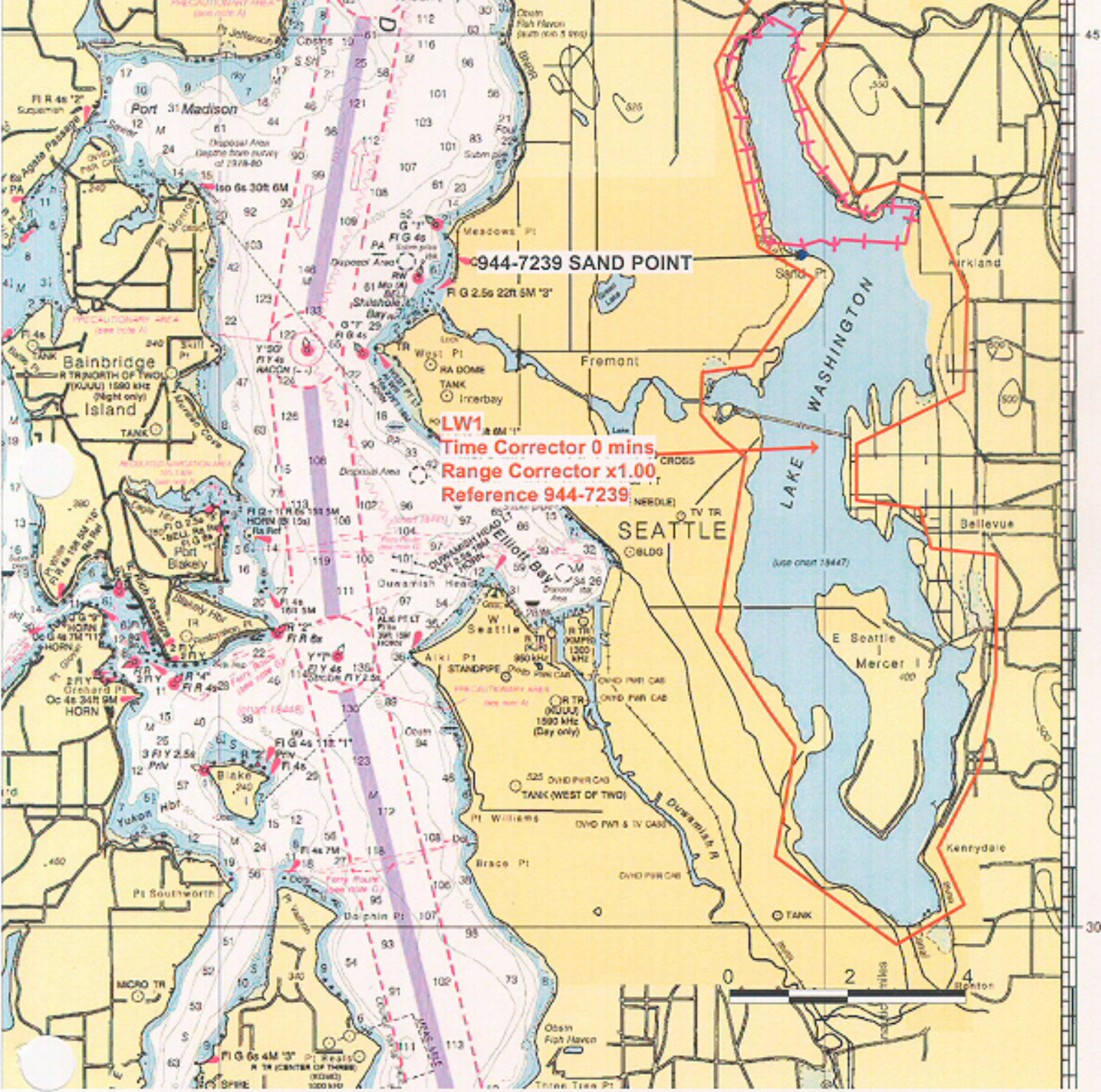
Format: Tide Station (in recommended order of use)  
 Average Time Correction (in minutes)  
 Range Correction  
 Longitude in decimal degrees (negative value denotes Longitude  
 West),  
 Latitude in decimal degrees

	Tide Station Order	AVG Time Correction	Range Correction
Zone LW1	944-7239	0	1.00
-13608193.63 6035808.64			
-13612016.42 6035579.25			
-13613774.87 6032291.53			
-13611787.03 6023881.03			
-13609263.99 6022428.31			
-13612092.85 6018375.99			
-13614386.54 6018070.16			
-13614463 6016158.69			
-13613621.99 6015164.72			
-13612398.7 6014170.75			
-13613698.45 6006142.55			
-13611328.29 6002472.52			
-13610105 6000790.43			
-13611022.48 5995744.13			
-13605441.19 5991691.8			
-13602306.53 5993526.82			
-13603529.82 5996126.43			
-13601541.94 5999949.38			
-13600853.85 6004078.16			
-13600777.38 6009659.66			
-13603835.63 6009965.5			
-13604370.83 6011800.52			
-13607276.15 6012182.8			
-13607276.15 6014782.41			
-13602306.53 6017229.11			
-13602153.6 6021816.64			
-13604141.44 6026327.72			
-13605517.66 6026862.94			
-13607276.15 6026327.72			
-13610028.54 6031297.56			
-13607734.89 6034738.2			
-13608193.63 6035808.64			

supplements information concerning aids to navigation

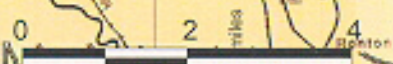
NOTE  
see 35  
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# Final. Zoning for S N904-RA-2004 Lake Washington, WA - Sheet H11292



944-7239 SAND POINT


**LW1**  
Time Corrector 0 mins  
Range Corrector x1.00  
Reference 944-7239



APPROVAL SHEET  
H11292

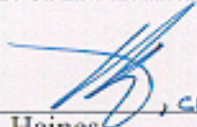
Initial Approvals:

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

  
\_\_\_\_\_  
Bruce Olmstead  
Cartographic Team  
Pacific Hydrographic Branch

Date: 4/13/2007

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

  
\_\_\_\_\_, CDR/NOAA  
Donald W. Haines  
CDR, NOAA  
Chief, Pacific Hydrographic Branch

Date: 19 APR 2007

