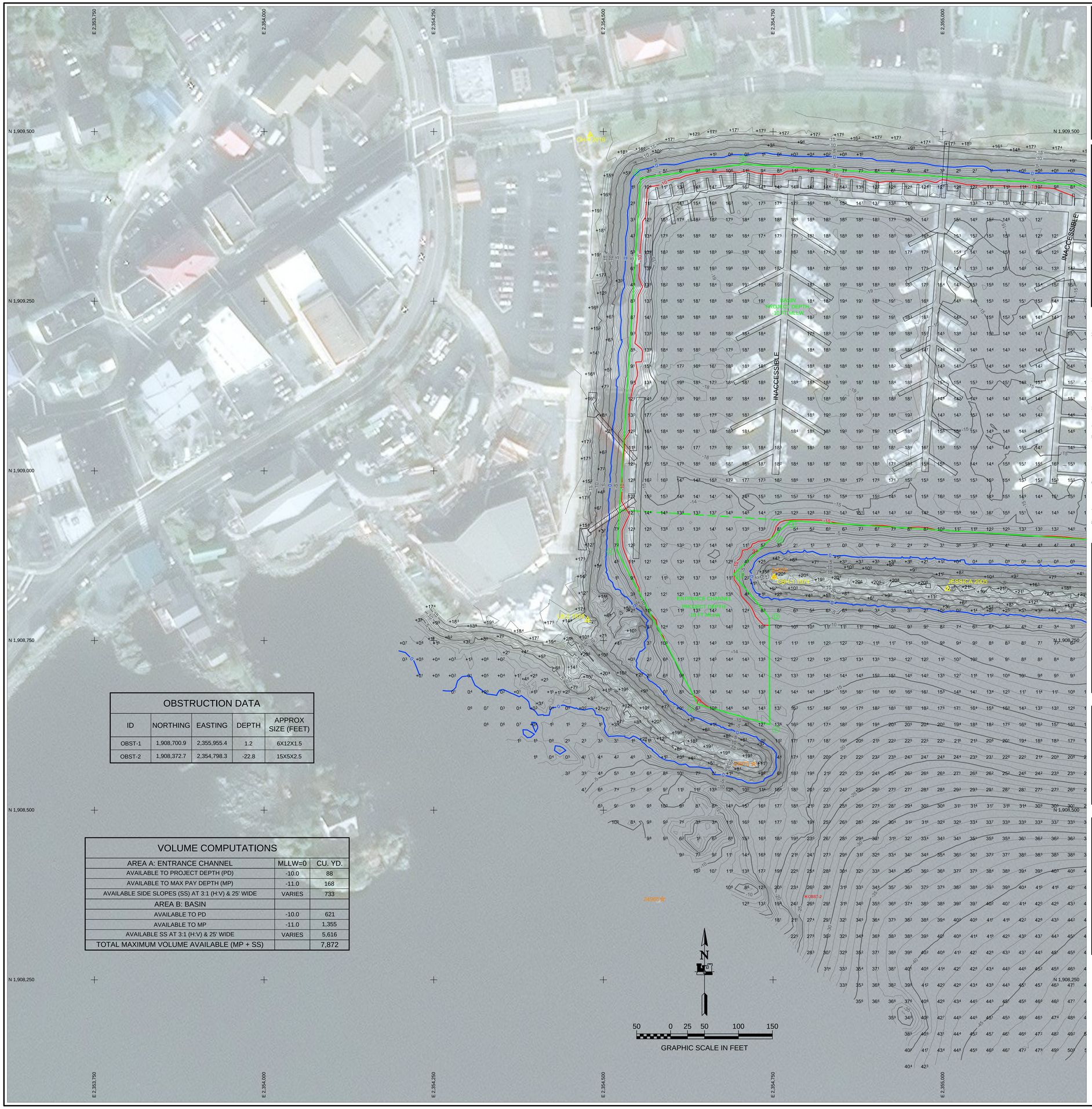

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4. SOUNDINGS ARE IN US SURVEY FEET AND ARE MINUS UNLESS OTHERWISE INDICATED.

5. BATHYMETRY WAS COLLECTED MARCH 24 - 28, 2016. SOUNDINGS WERE COLLECTED USING AN R2SONIC 2022 MULTIBEAM ECHOSOUNDER OPERATING AT 200 KHZ. SOUND VELOCITY THROUGH THE WATER COLUMN WAS DETERMINED WITH AN AML BASE X SOUND VELOCITY PROBE. POSITIONING AND VESSEL ORIENTATION WERE MEASURED USING AN APPLANIX POS OCEANMASTER V5 SYSTEM. DATA WAS COLLECTED AND PROCESSED USING QINSY 8.1 SOFTWARE. HORIZONTAL CONTROL WAS SURVEYED USING RTK GNSS EQUIPMENT AND TECHNIQUES. VERTICAL CONTROL WAS SURVEYED USING DIFFERENTIAL LEVELING TECHINQUES.

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SURVEY CONTROL DATA

STATION	NORTHING	EASTING	MLLW	DESCRIPTION
1600 P 1998	1,908,750.35	2,352,961.21	22.83	3.5" DOMED NOS BC
CBH-1 1974	1,908,843.60	2,354,751.50	20.74	3.5" DOMED USACE BC
CH-9 2016	1,909,495.16	2,354,480.57	19.62	3.5" DOMED USACE BC
CH-10 2016	1,909,305.43	2,355,776.39	18.09	3.5" DOMED USACE BC
CH-11 2016	1,908,762.66	2,355,883.14	18.69	3.5" DOMED USACE BC
FORD 2005	1,908,796.05	2,355,567.34	21.48	3"" DOMED SBC
JESSICA 2005	1,908,826.21	2,355,006.80	21.39	3" DOMED SBC
LB-2 1978	1,908,780.34	2,354,476.60	14.61	3.5" DOMED NOS BC

NAVIGATION AIDS

USCG NO.	NORTHING	EASTING	DESCRIPTION
24965	1,908,369	2,354,587	CRESCENT BOAT HARBOR DAYBEACON 1
24970	1,908,844	2,354,752	CRESCENT HARBOR WEST BREAKWATER LIGHT 4, FL. G.
24975	1,908,568	2,354,721	CRESCENT HARBOR WEST BREAKWATER LIGHT 3, FL. G.

OBSTRUCTION DATA

ID	NORTHING	EASTING	DEPTH	APPROX SIZE (FEET)
OBST-1	1,908,700.9	2,355,955.4	1.2	6X12X1.5
OBST-2	1,908,372.7	2,354,798.3	-22.8	15X5X2.5

VOLUME COMPUTATIONS

AREA A: ENTRANCE CHANNEL	MLLW=0	CU. YD.
AVAILABLE TO PROJECT DEPTH (PD)	-10.0	88
AVAILABLE TO MAX PAY DEPTH (MP)	-11.0	168
AVAILABLE SIDE SLOPES (SS) AT 3:1 (H:V) & 25' WIDE	VARIES	733
AREA B: BASIN		
AVAILABLE TO PD	-10.0	621
AVAILABLE TO MP	-11.0	1,355
AVAILABLE SS AT 3:1 (H:V) & 25' WIDE	VARIES	5,616
TOTAL MAXIMUM VOLUME AVAILABLE (MP + SS)		7,872

PROJECT LIMITS CRESCENT HARBOR

CORNER#	NORTHING	EASTING
0	1,908,626.17	2,354,745.04
1	1,908,655.80	2,354,639.41
2	1,908,882.60	2,354,519.94
3	1,909,431.52	2,354,554.53
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PROJECT LIMITS CRESCENT HARBOR

CORNER#	NORTHING	EASTING
7	1,909,058.26	2,355,866.65
8	1,908,858.66	2,355,854.07
9	1,908,926.54	2,354,776.72
10	1,908,904.57	2,354,751.78
11	1,908,847.73	2,354,691.83
12	1,908,783.81	2,354,744.17

STATE OF ALASKA 49TH GREGORY W. GIBSON No. LS14824 PROFESSIONAL LAND SURVEYOR

THIS HYDROGRAPHIC SURVEY WAS COMPLETED UNDER THE OVERSIGHT OF AN ACSM/THSOA CERTIFIED HYDROGRAPHER

David R. Neff C.H. (275)

US Army Corps of Engineers
ALASKA DISTRICT

CONTRACT NO. W912JR-14-D-0013
CONTRACTOR ETRAC INC.
CITY MADELIA
COUNTY MADELIA
STATE ALASKA
Project Manager MICHAEL E. MUELLER PRIME CONTRACTOR
Approved By THOMAS A. SLOAN CHIEF GEOMATICS SECTION
Date 03/08/2018

REVISION	DATE	DESCRIPTION	BY	APPROV	REVISION	DATE	DESCRIPTION	BY	APPROV

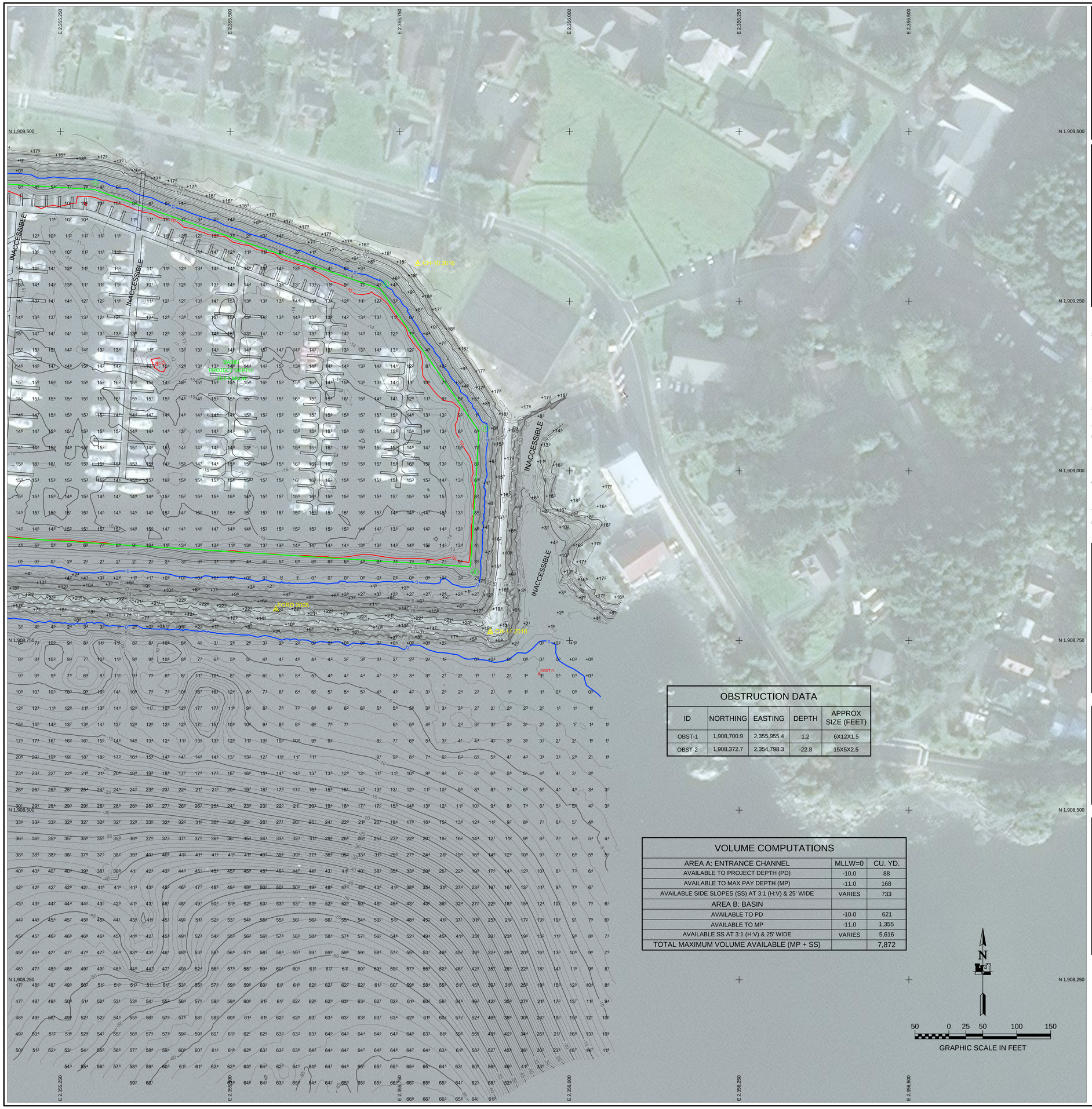
SURVEYED BY: Gregory W. Gibson
DRAWN BY: Gregory W. Gibson
APPROVED BY: Thomas A. Sloan, Chief Geomatics Section
CHECKED BY: FAS/DWJ/JBG/GWG
DATE: 03/08/2018
Version: 1.0
UPC: 010560
CONTRACT NO. W912JR-14-D-0013
JOB NO. 1430
SCALE: 1" = 50'
SIZE: ARCH E
PLOT DATE: 03/08/2018
FILE NAME: 010560-0-0001.DWG

U.S. ARMY CORPS OF ENGINEERS
ALASKA DISTRICT
P.O. BOX 6898
JBER, ALASKA 99506-0898

eTrac Inc.
617 S Knik-Goose Bay Rd, Suite C
Wasilla, AK 99654

SITKA, ALASKA
CRESCENT BAY HARBOR
PROJECT CONDITION SURVEY
03/18-29/2016

SHEET IDENTIFICATION
1-SIT-92-07-14
Sheet 1 of 6



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N

50 0 25 50 100 150

GRAPHIC SCALE IN FEET

STATE OF ALASKA 49TH GREGORY W. GIBSON No. LS14824 PROFESSIONAL LAND SURVEYOR

THIS HYDROGRAPHIC SURVEY WAS COMPLETED UNDER THE OVERSIGHT OF AN ACSM/THSOA CERTIFIED HYDROGRAPHER

David R. Neff C.H. (275)

US Army Corps of Engineers
ALASKA DISTRICT

CONTRACT NO. W912EB-14-D-0013
CONTRACTOR ETRAC INC.
CITY WASILLA STATE ALASKA
DATE 03/08/2016
PROJECT MGR. MICHAEL E. MUELLER
PRIME CONTRACTOR
APPROVED BY THOMAS A. SLOAN
CHIEF GEOMATICS SECTION

REVISION	DATE	DESCRIPTION	BY	APPROVED	REVISION	DATE	DESCRIPTION	BY	APPROVED

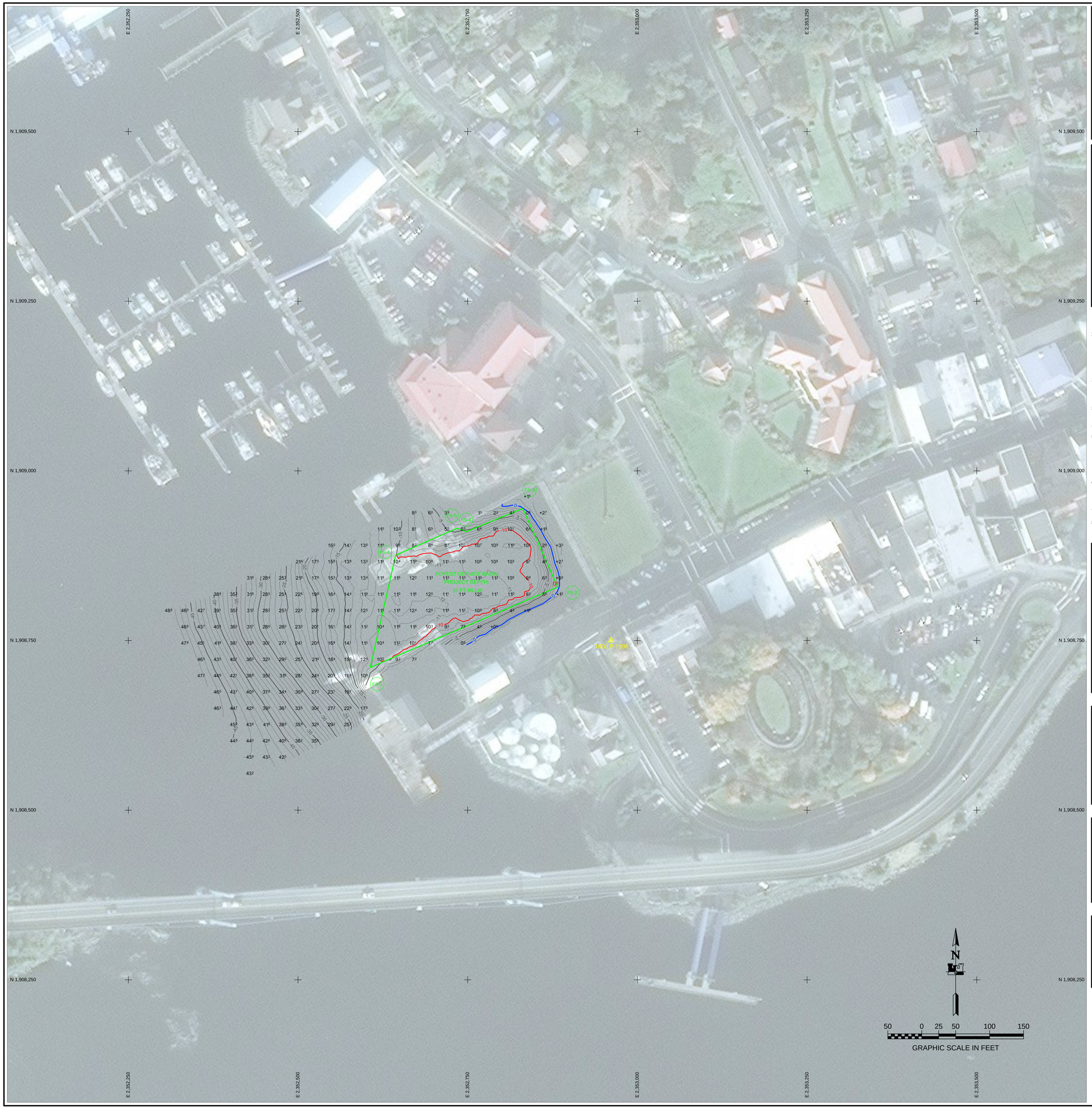
SURVEYED BY: Jessica Gibson
DRAWN BY: Gregory W. Gibson
PROOFREAD BY: Michael E. Mueller
CHECKED BY: TA/SER/HJ/BG/DW/G
DATE: 03/08/2016
UPC: 015840
CONTRACT NO. W912EB-14-D-0013
SCALE: 1:50
SIZE: ANSI E
PLOT DATE: 03/08/2016
FILE NAME: 015840-VR01.DWG
JOB NO. 1436

U.S. ARMY CORPS OF ENGINEERS
ALASKA DISTRICT
P.O. BOX 6898
JBER, ALASKA 99506-0898

eTrac Inc.
617 S Kink-Goose Bay Rd, Suite C
Wasilla, AK 99654

SITKA, ALASKA
CRESCENT BAY HARBOR
PROJECT CONDITION SURVEY
03/18-29/2016

SHEET IDENTIFICATION
1-SIT-92-07-14
Sheet 2 of 6



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24975	1,908,568	2,354,721	CRESCENT HARBOR WEST BREAKWATER LIGHT 3, FL. G.

PROJECT LIMITS FOREST SERVICE

CORNER#	NORTHING	EASTING
FS-1	1,908,710.38	2,352,606.47
FS-2	1,908,828.94	2,352,882.68
FS-3	1,908,944.56	2,352,831.29

PROJECT LIMITS FOREST SERVICE

CORNER#	NORTHING	EASTING
FS-4	1,908,910.38	2,352,747.89
FS-5	1,908,915.53	2,352,734.62
FS-6	1,908,875.69	2,352,643.81

VOLUME COMPUTATIONS

AREA A: FOREST SERVICE BASIN	MLLW=0	CU. YD.
AVAILABLE TO PROJECT DEPTH (PD)	-10.0	512
AVAILABLE TO MAX PAY DEPTH (MP)	-11.0	901
AVAILABLE SIDE SLOPES (SS) AT 3:1 (H:V) & 25' WIDE	VARIES	1,484
TOTAL MAXIMUM VOLUME AVAILABLE (MP + SS)		2,385

STATE OF ALASKA 49TH GREGORY W. GIBSON No. LS14824 REGISTERED PROFESSIONAL LAND SURVEYOR

THIS HYDROGRAPHIC SURVEY WAS COMPLETED UNDER THE OVERSIGHT OF AN ACSM/THSOA CERTIFIED HYDROGRAPHER

David R. Neff C.H. (275)

US Army Corps of Engineers
ALASKA DISTRICT

CONTRACT NO. W912JB-14-D-0013
CONTRACTOR ETRAC INC.
CITY WASILLA STATE ALASKA
Project Manager MICHAEL E. MUELLER
Chief Hydrographic Section THOMAS A. SLOAN
Date 05/06/2016

REVISION	DATE	DESCRIPTION	BY	APPROV

REVISION	DATE	DESCRIPTION	BY	APPROV

DATE: 03-24-2016
UPC: 01B840
CHECKED BY: TA/EB/MJ/JB/GW/GJ
VOU/PS-14-D-0013
DRAWN BY: Gregory W. Gibson
JOB NO.: 1430
REVIEWED BY: Thomas A. Sloan, Chief Cartometric Section
PLOT DATE: 06/06/2016
SCALE: 1" = 50'
FILE NAME: 01B840-VH01.DWG

U.S. ARMY CORPS OF ENGINEERS
ALASKA DISTRICT
P.O. BOX 6898
JBER, ALASKA 99506-0898

eTrac Inc.
617 S Knik-Goose Bay Rd, Suite C
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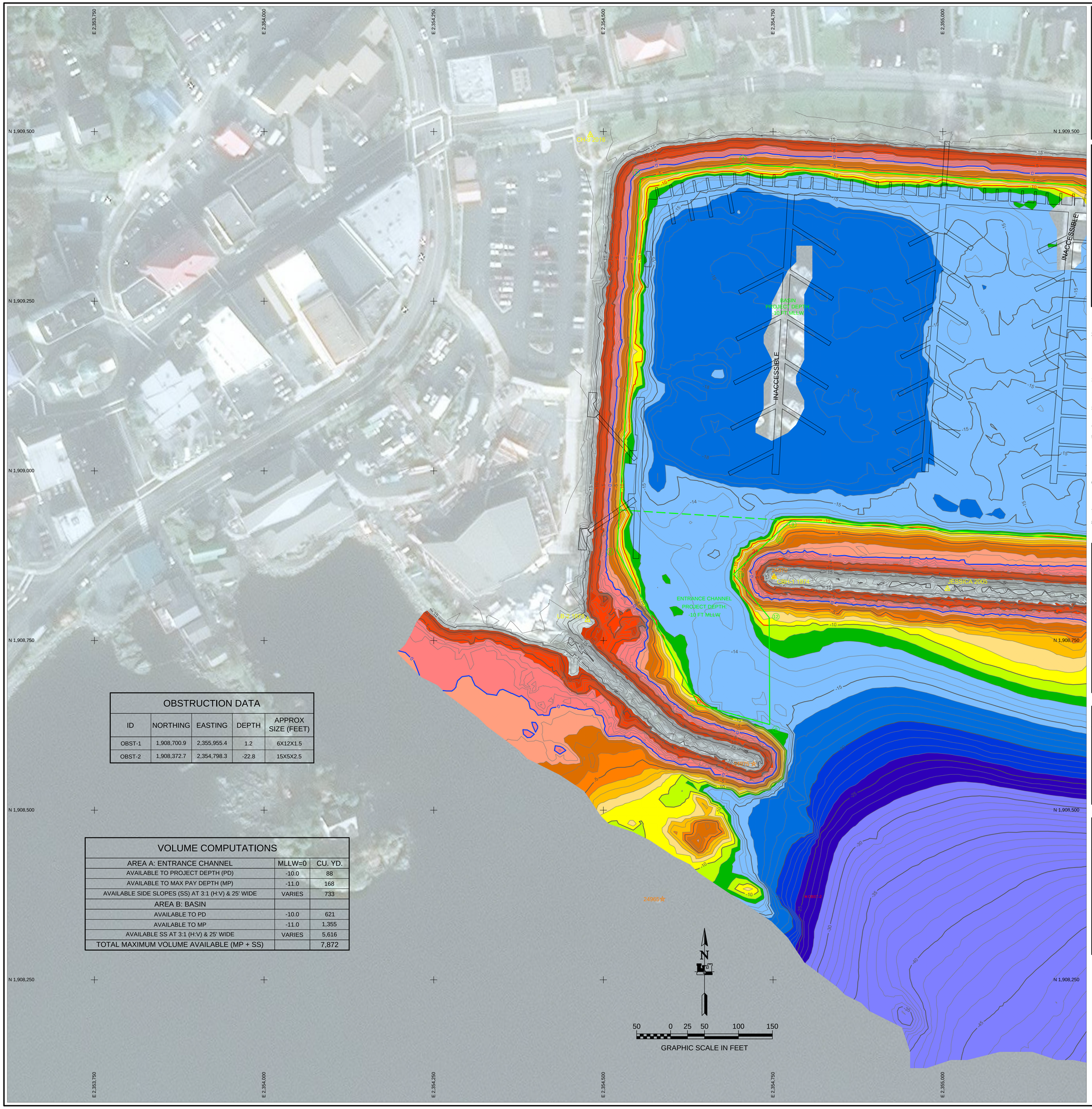
SITKA, ALASKA
FOREST SERVICE BASIN
PROJECT CONDITION SURVEY
03/18-29/2016

SHEET IDENTIFICATION

1-SIT-92-07-14

Sheet 3 of 6



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SURVEY CONTROL DATA

STATION	NORTHING	EASTING	MLLW	DESCRIPTION
1600 P 1998	1,908,750.35	2,352,961.21	22.83	3.5" DOMED NOS BC
CBH-1 1974	1,908,843.60	2,354,751.50	20.74	3.5" DOMED USACE BC
CH-9 2016	1,909,495.16	2,354,480.57	19.62	3.5" DOMED USACE BC
CH-10 2016	1,909,305.43	2,355,776.39	18.09	3.5" DOMED USACE BC
CH-11 2016	1,908,762.66	2,355,883.14	18.69	3.5" DOMED USACE BC
FORD 2005	1,908,796.05	2,355,567.34	21.48	3"" DOMED SBC
JESSICA 2005	1,908,826.21	2,355,006.80	21.39	3" DOMED SBC
LB-2 1978	1,908,780.34	2,354,476.60	14.61	3.5" DOMED NOS BC

NAVIGATION AIDS

USCG NO.	NORTHING	EASTING	DESCRIPTION
24965	1,908,369	2,354,587	CRESCENT BOAT HARBOR DAYBEACON 1
24970	1,908,844	2,354,752	CRESCENT HARBOR WEST BREAKWATER LIGHT 4, FL. G.
24975	1,908,568	2,354,721	CRESCENT HARBOR WEST BREAKWATER LIGHT 3, FL. G.

OBSTRUCTION DATA

ID	NORTHING	EASTING	DEPTH	APPROX SIZE (FEET)
OBST-1	1,908,700.9	2,355,955.4	1.2	6X12X1.5
OBST-2	1,908,372.7	2,354,798.3	-22.8	15X5X2.5

VOLUME COMPUTATIONS

AREA A: ENTRANCE CHANNEL	MLLW=0	CU. YD.
AVAILABLE TO PROJECT DEPTH (PD)	-10.0	88
AVAILABLE TO MAX PAY DEPTH (MP)	-11.0	168
AVAILABLE SIDE SLOPES (SS) AT 3:1 (H:V) & 25' WIDE	VARIES	733
AREA B: BASIN		
AVAILABLE TO PD	-10.0	621
AVAILABLE TO MP	-11.0	1,355
AVAILABLE SS AT 3:1 (H:V) & 25' WIDE	VARIES	5,616
TOTAL MAXIMUM VOLUME AVAILABLE (MP + SS)		7,872

PROJECT LIMITS CRESCENT HARBOR

CORNER#	NORTHING	EASTING
0	1,908,626.17	2,354,745.04
1	1,908,655.80	2,354,639.41
2	1,908,882.60	2,354,519.94
3	1,909,431.52	2,354,554.53
4	1,909,452.03	2,354,706.12
5	1,909,414.61	2,355,299.94
6	1,909,267.81	2,355,721.54

PROJECT LIMITS CRESCENT HARBOR

CORNER#	NORTHING	EASTING
7	1,909,058.26	2,355,866.65
8	1,908,858.66	2,355,854.07
9	1,908,926.54	2,354,776.72
10	1,908,904.57	2,354,751.78
11	1,908,847.73	2,354,691.83
12	1,908,783.81	2,354,744.17

STATE OF ALASKA 49TH GREGORY W. GIBSON No. LS14824 REGISTERED PROFESSIONAL LAND SURVEYOR

THIS HYDROGRAPHIC SURVEY WAS COMPLETED UNDER THE OVERSIGHT OF AN ACSM/THSOA CERTIFIED HYDROGRAPHER

David R. Neff C.H. (275)

US Army Corps of Engineers
ALASKA DISTRICT

CONTRACT NO. W912ER-14-D-0013
CONTRACTOR ETRAC INC.
CITY WASILLA STATE ALASKA
Project Manager MICHAEL E. MUELLER
Chief, Survey Section THOMAS A. SLOAN
Date 05/06/2016

REVISION	DATE	DESCRIPTION	BY	APPROVED	REVISION	DATE	DESCRIPTION	BY	APPROVED

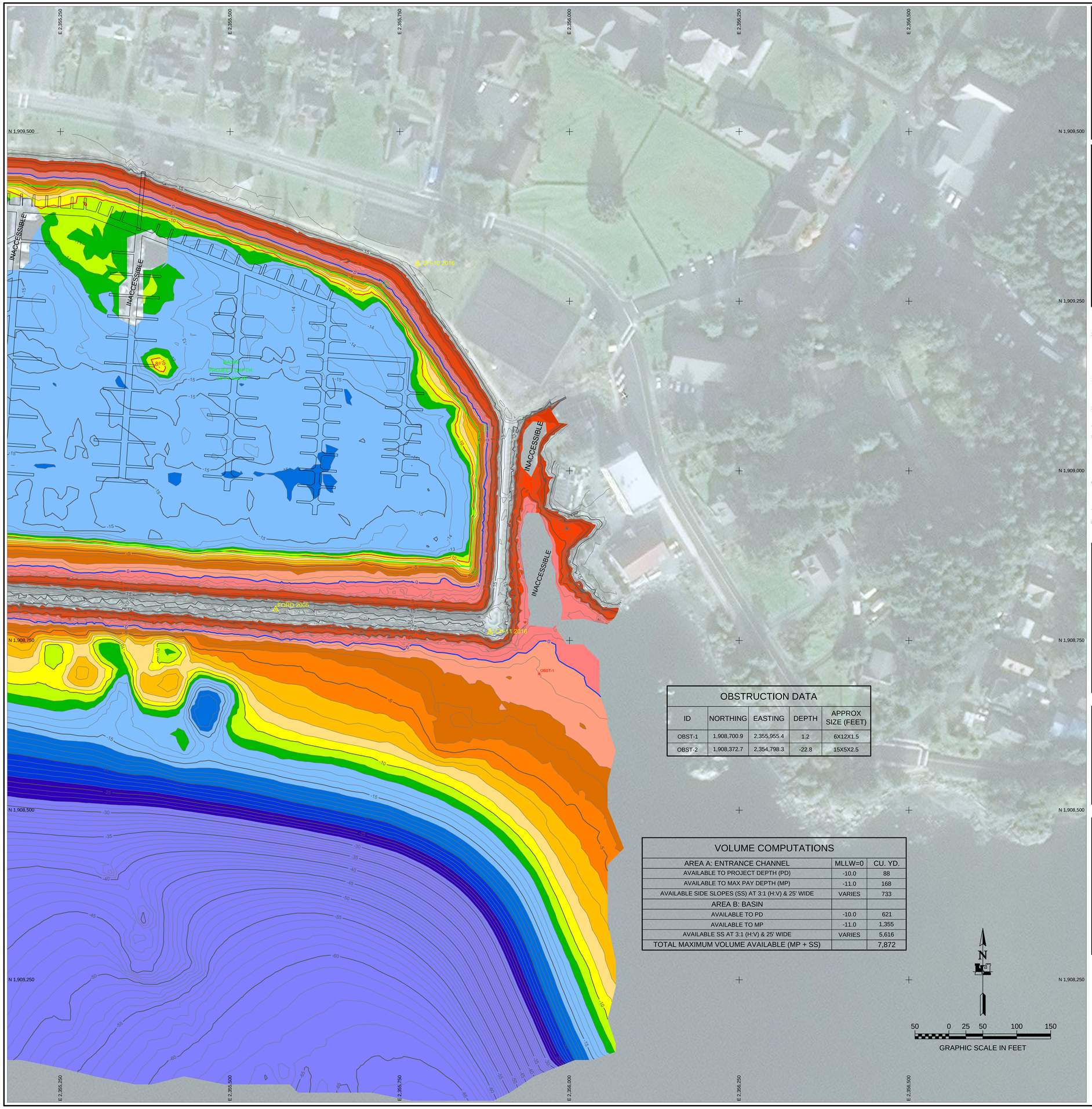
DATE: April 2016
UPC: 016840
CHECKED BY: TASTEHAJI/BGO/WG
VERIFICATION NO. V2016-14-D-0013
DRAWN BY: Gregory W. Gibson
APPROVED BY: Thomas A. Sloan, Chief Geomatics Section
PLOT DATE: 06/08/2016
JOB NO. 1430
SCALE: 1" = 50'
FILE NAME: 016840-VRD.DWG

U.S. ARMY CORPS OF ENGINEERS
ALASKA DISTRICT
P.O. BOX 6898
JBER, ALASKA 99506-0898

eTrac Inc.
617 S KIMKA-Choose Bay Rd, Suite C
Wasilla, AK 99654

SITKA, ALASKA
CRESCENT BAY HARBOR
PROJECT CONDITION SURVEY
03/18-29/2016

SHEET IDENTIFICATION
1-SIT-92-07-14



NOTES

1. PRIMARY PROJECT HORIZONTAL CONTROL IS ALASKA STATE PLANE, ZONE 1, NAD83 2011 (2010.00), IN US SURVEY FEET BASED ON A FULLY CONSTRAINED STATIC GPS NETWORK HOLDING THE PUBLISHED NAD83 2011 EPOCH 2010.00 VALUES OF NGS CORS STATIONS:"LEVEL ISLAND 5 CORS ARP" (PID DJ3033); "BIORKA ISLAND 6 CORS ARP" (PID DK6554); "PORTALEXANDERAK2005 CORS ARP" (PID DL6695).

   LOCAL PROJECT HORIZONTAL CONTROL IS ALASKA STATE PLANE, ZONE 1, NAD83, IN US SURVEY FEET HOLDING "LB-2 1978" AS N 1,908,780.34', E 2,354,476.60'.

2. VERTICAL CONTROL IS MEAN LOWER LOW WATER (MLLW=0.0'), BASED ON THE NOAA/NOS TIDAL BENCH MARK LIST "9451600 SITKA, BARANOF ISLAND, SITKA SOUND ALASKA", PUBLISHED 10/06/2011. THIS TIDAL DATUM IS BASED ON THE 1983-2001 TIDAL EPOCH AND IS REFERENCED BY HOLDING NOAA/NOS TIDAL BENCH MARK "945 1600 L 1982" (VM#1186) AS 40.32'.

3. VERTICAL TIES TO THE NATIONAL SPATIAL REFERENCE SYSTEM ARE BASED ON PUBLISHED NAVD88 (GEOID 12B) ELEVATIONS HOLDING NOAA/USACE TIDAL BENCHMARK "1600 P 1998" (PID BBFF16/VM#14007) AS 22.37'.

4. SOUNDINGS ARE IN US SURVEY FEET AND ARE MINUS UNLESS OTHERWISE INDICATED.

5. BATHYMETRY WAS COLLECTED MARCH 24 - 28, 2016. SOUNDINGS WERE COLLECTED USING AN R2SONIC 2022 MULTIBEAM ECHOSOUNDER OPERATING AT 200 KHZ. SOUND VELOCITY THROUGH THE WATER COLUMN WAS DETERMINED WITH AN AML BASE X SOUND VELOCITY PROBE. POSITIONING AND VESSEL ORIENTATION WERE MEASURED USING AN APPLANIX POS OCEANMASTER V5 SYSTEM. DATA WAS COLLECTED AND PROCESSED USING QINSY 8.1 SOFTWARE. HORIZONTAL CONTROL WAS SURVEYED USING RTK GNSS EQUIPMENT AND TECHNIQUES. VERTICAL CONTROL WAS SURVEYED USING DIFFERENTIAL LEVELING TECHINQUES.

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VOLUME COMPUTATIONS

AREA A: ENTRANCE CHANNEL	MLLW=0	CU. YD.
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STATE OF ALASKA 49TH GREGORY W. GIBSON No. LS14824 REGISTERED PROFESSIONAL LAND SURVEYOR

THIS HYDROGRAPHIC SURVEY WAS COMPLETED UNDER THE OVERSIGHT OF AN ACSM/THSOA CERTIFIED HYDROGRAPHER

David R. Neff C.H. (275)

US Army Corps of Engineers
ALASKA DISTRICT

CONTRACT NO. W912JB-14-D-0013
CONTRACTOR ETRAC INC.
CITY MADELIA STATE ALASKA
QUADRANGLE Port Wrangell
MICHAEL E. MUELLER, PRIME CONTRACTOR
THOMAS A. SLOAN, CHIEF GEOMATICS SECTION
Date 05/05/2016

REVISION	DATE	DESCRIPTION	BY	APPROD

REVISION	DATE	DESCRIPTION	BY	APPROD

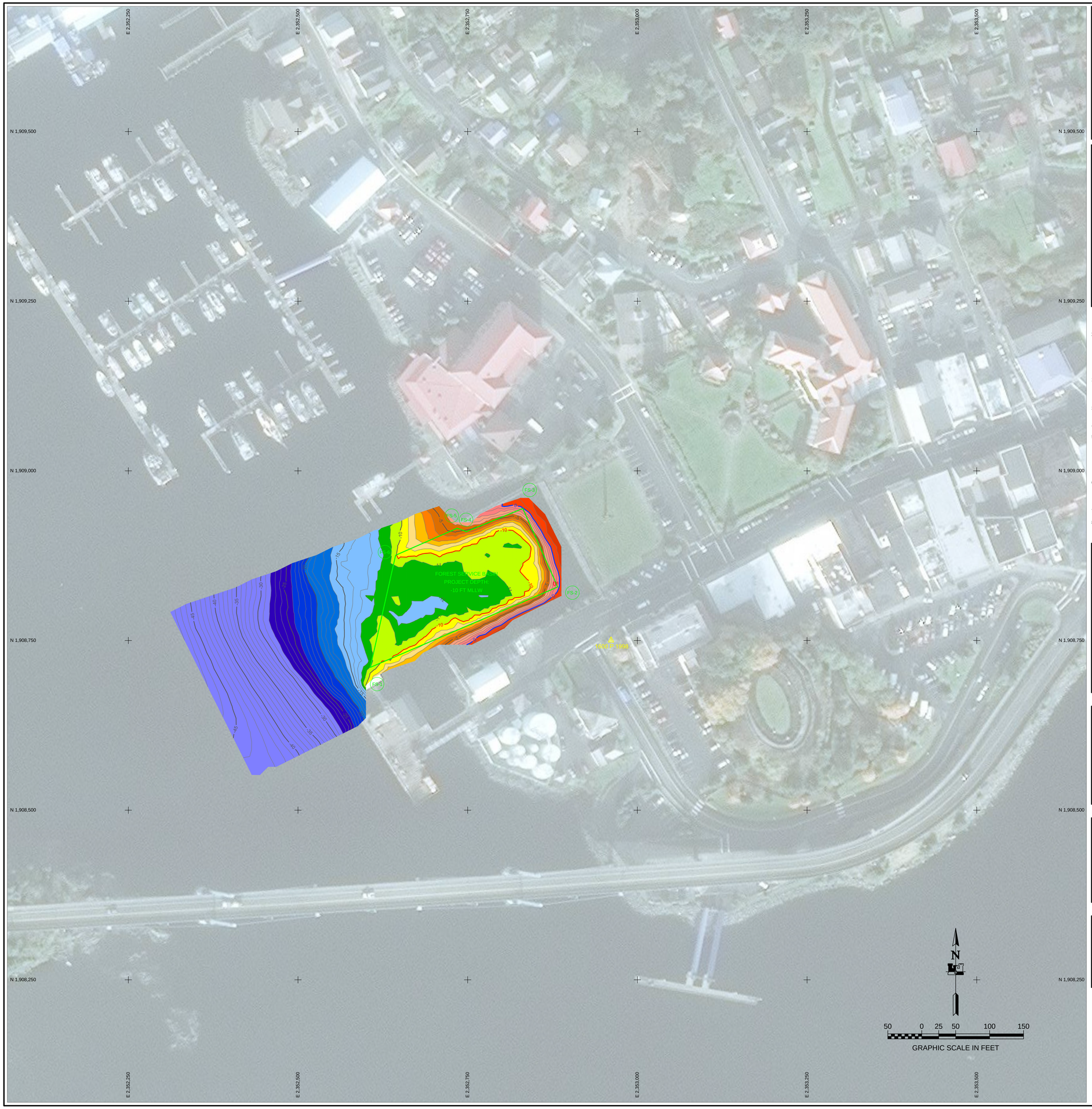
DATE: 11-14-2016
UPC: GI08A0
CHECKED BY: FAS/DEN/JB/GJ/VG
SURVEYED BY: Gregory W. Gibson
DRAWN BY: Gregory W. Gibson
PLOT DATE: 05/06/2016
APPROVED BY: Chief Geomatics Section
SCALE: 1" = 50'
FILE NAME: G1608A0-V001.DWG
JOB NO. 2438
SHEET NO. 1-SIT-92-07-14
ASD 6

U.S. ARMY CORPS OF ENGINEERS
ALASKA DISTRICT
P.O. BOX 6898
JBER, ALASKA 99506-0898

eTrac Inc.
617 S Kola Goose Bay Rd, Suite C
Wasilla, AK 99654

SITKA, ALASKA
CRESCENT BAY HARBOR
PROJECT CONDITION SURVEY
03/18-29/2016

SHEET IDENTIFICATION
1-SIT-92-07-14
Sheet 5 of 6



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24975	1,908,568	2,354,721	CRESCENT HARBOR WEST BREAKWATER LIGHT 3, FL. G.

PROJECT LIMITS FOREST SERVICE

CORNER#	NORTHING	EASTING
FS-1	1,908,710.38	2,352,606.47
FS-2	1,908,828.94	2,352,882.68
FS-3	1,908,944.56	2,352,831.29

PROJECT LIMITS FOREST SERVICE

CORNER#	NORTHING	EASTING
FS-4	1,908,910.38	2,352,747.89
FS-5	1,908,915.53	2,352,734.62
FS-6	1,908,875.69	2,352,643.81

VOLUME COMPUTATIONS

AREA A: FOREST SERVICE BASIN	MLLW=0	CU. YD.
AVAILABLE TO PROJECT DEPTH (PD)	-10.0	512
AVAILABLE TO MAX PAY DEPTH (MP)	-11.0	901
AVAILABLE SIDE SLOPES (SS) AT 3:1 (H:V) & 25' WIDE	VARIES	1,484
TOTAL MAXIMUM VOLUME AVAILABLE (MP + SS)		2,385

STATE OF ALASKA 49TH GREGORY W. GIBSON No. LS14824 PROFESSIONAL LAND SURVEYOR

THIS HYDROGRAPHIC SURVEY WAS COMPLETED UNDER THE OVERSIGHT OF AN ACSM/THSOA CERTIFIED HYDROGRAPHER

David R. Neff C.H. (275)

US Army Corps of Engineers
ALASKA DISTRICT

CONTRACT NO. W912JB-14-D-0013
CONTRACTOR ETRAC INC.
CITY WASILLA STATE ALASKA
Date 03/08/2016
Project Manager MICHAEL E. MUELLER
PRIME CONTRACTOR
THOMAS A. SLOAN
CHIEF GEOMATICS SECTION

REVISION	DATE	DESCRIPTION	BY	APPROV

REVISION	DATE	DESCRIPTION	BY	APPROV

DATE: 03/08/2016
UPC: 010840
CHECKED BY: FAC/ETRAC/JB/GOWG
CONTRACT NO: W912JB-14-D-0013
SURVEYED BY: Gregory W. Gibson
DRAWN BY: Gregory W. Gibson
APPROVED BY: Thomas A. Sloan, Chief Geomatics Section
PLOT DATE: 03/08/2016
JOB NO: 1438
SCALE: 1" = 50'
FILE NAME: 010840-VW01.DWG

U.S. ARMY CORPS OF ENGINEERS
ALASKA DISTRICT
P.O. BOX 6898
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eTrac Inc.
617 S Knik-Goose Bay Rd, Suite C
Wasilla, AK 99654

SITKA, ALASKA
FOREST SERVICE BASIN
PROJECT CONDITION SURVEY
03/18-29/2016

SHEET IDENTIFICATION
1-SIT-92-07-14
Sheet 6 of 6