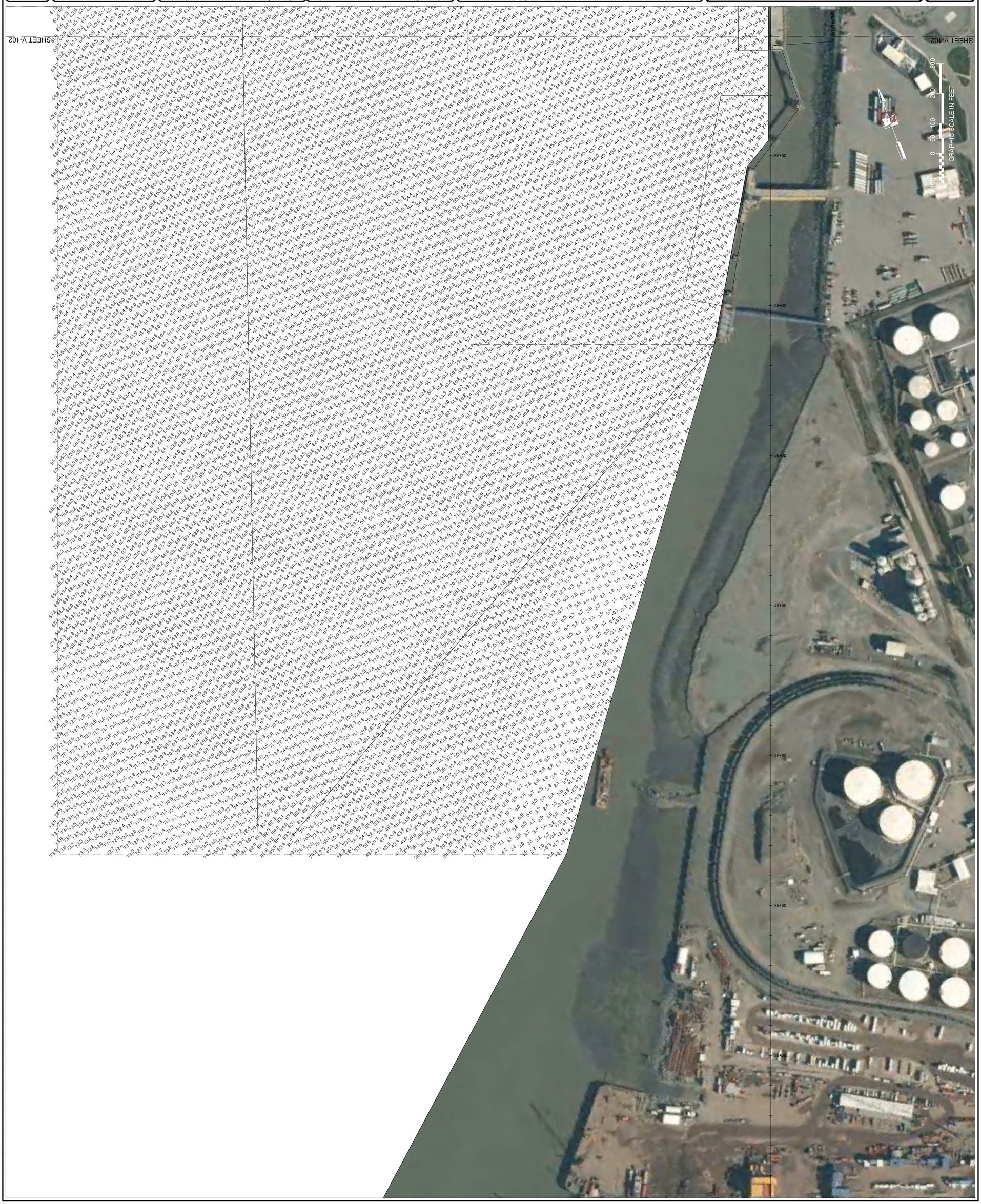


US Army Corps of Engineers
ALASKA DISTRICT

CONTRACT NO. W91-1KB-15-C-0006
CONTRACTOR MANSON CONSTRUCTION CO.
CITY SEATTLE STATE WASHINGTON
Recommended Approved Date:
KTR ENGINEER
PRIME CONTRACTOR CHIEF GEOMATICS SECTION 04/27/16

REVISION	DATE	DESCRIPTION	BY	APP'D

REVISION	DATE	DESCRIPTION	BY	APP'D

SURVEYED BY: DWG	CHECKED BY:	DATE: 27 Apr 2016
DRAWN BY: ENG/DWG	CHECKED BY: GWG/ENG/MT/JA	UPC: ANCEXP11
APPROVED BY: J. ANDERSON	PLOT DATE: 4/27/2016	CONTRACT NO.: W91-1KB-15-C-0006
SCALE: AS SHOWN		JOB NO.: 3303-16
SIZE: ANSI E	FILE NAME: PRE_20160418_POA_FINAL.DWG	

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

ANCHORAGE, ALASKA
2015 - 2017 MAINTENANCE DREDGING, PORT OF ANCHORAGE
HYDROGRAPHIC SURVEY
PRE_20160418_POA

SHEET IDENTIFICATION
V-101
Sheet 1 of 5

US Army Corps of Engineers
ALASKA DISTRICT

CONTRACT NO. W911KB-15-C-0006
CONTRACTOR MANSON CONSTRUCTION CO.
CITY SEATTLE STATE WASHINGTON
Recommended: Approved: Date:
KTR ENGINEER PRIME CONTRACTOR CHIEF, GEOMATICS SECTION 04/27/16

REVISION	DATE	DESCRIPTION	BY	APP'D

REVISION	DATE	DESCRIPTION	BY	APP'D

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

SURVEYED BY: GWG
DRAWN BY: ENH/GWG
CHECKED BY: GWG/ENH/JMT/JA
DATE: 27 April 2016
APPROVED BY: J. ANDERSON
UPC: ANCEXP11
CONTRACT NO.: W911KB-15-C-0006
SCALE: AS SHOWN
PLOT DATE: 4/27/2016
JOB NO.: 3303-16
SIZE: ANSI E
FILE NAME: PRE_20160418_POA_FINAL.DWG

ANCHORAGE, ALASKA
2015 - 2017 MAINTENANCE DREDGING, PORT OF ANCHORAGE
HYDROGRAPHIC SURVEY
PRE_20160418_POA

SHEET IDENTIFICATION
V-102
Sheet 2 of 5

US Army Corps of Engineers
ALASKA DISTRICT

CONTRACT NO. W911KB-15-C-0006
CONTRACTOR MANSON CONSTRUCTION CO.
CITY SEATTLE STATE WASHINGTON
Recommended: Approved: Date:
PRIME CONTRACTOR CHIEF GEOMATICS SECTION 04/27/16

REVISION	DATE	DESCRIPTION	BY	APP'D

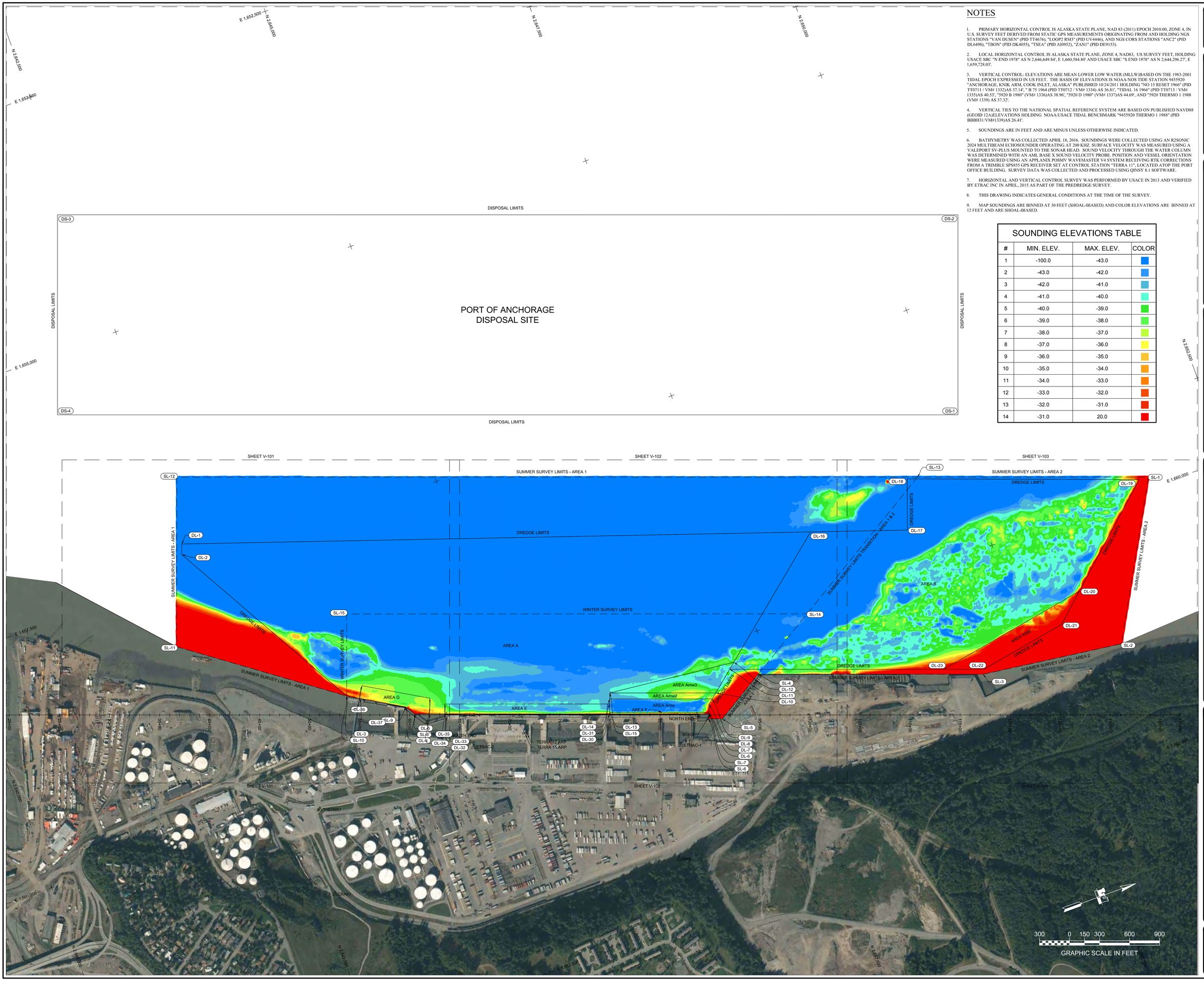
REVISION	DATE	DESCRIPTION	BY	APP'D

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

SURVEYED BY: GWG
DRAWN BY: ENH/GWG
APPROVED BY: J. ANDERSON
CHECKED BY: GWG/ENH/MT/JA
SCALE: AS SHOWN
PLOT DATE: 4/27/2016
SIZE: ANSI E
FILE NAME: PRE_20160418_POA_FINAL.DWG
DATE: 27 April 2016
UPC: ANCEXP11
CONTRACT NO.: W911KB-15-C-0006
JOB NO.: 3303-16

ANCHORAGE, ALASKA
2015 - 2017 MAINTENANCE DREDGING, PORT OF ANCHORAGE
HYDROGRAPHIC SURVEY
PRE_20160418_POA

SHEET IDENTIFICATION
V-103
Sheet 3 of 5



NOTES

1. PRIMARY HORIZONTAL CONTROL IS ALASKA STATE PLANE, NAD 83 (2011) EPOCH 2010.00, ZONE 4, IN U.S. SURVEY FEET DERIVED FROM STATIC GPS MEASUREMENTS ORIGINATING FROM AND HOLDING NGS STATIONS "VAN DUSEN" (PID TT4676), "LOOP2 RM3" (PID UV4446), AND NGS CORS STATIONS "ANC2" (PID DL6498), "TBON" (PID DK4055), "TSEA" (PID AI0952), "ZAN1" (PID DE9153).

2. LOCAL HORIZONTAL CONTROL IS ALASKA STATE PLANE, ZONE 4, NAD83, US SURVEY FEET, HOLDING USACE SBC "N END 1978" AS N 2,646,649.84', E 1,660,584.80' AND USACE SBC "S END 1978" AS N 2,644,296.27', E 1,659,728.03'.

3. VERTICAL CONTROL: ELEVATIONS ARE MEAN LOWER LOW WATER (MLLW)BASED ON THE 1983-2001 TIDAL EPOCH EXPRESSED IN US FEET. THE BASIS OF ELEVATIONS IS NOAA/NOS TIDE STATION 9455920 "ANCHORAGE, KNIK ARM, COOK INLET, ALASKA" PUBLISHED 10/24/2011 HOLDING "NO 15 RESET 1966" (PID TT0711 / VM# 1332)AS 37.14', " B 75 1964 (PID TT0712 / VM# 1334) AS 36.81', "TIDAL 16 1966" (PID TT0713 / VM# 1335)AS 40.53', "5920 B 1980" (VM# 1336)AS 38.96', "5920 D 1980" (VM# 1337)AS 44.69', AND "5920 THERMO 1 1988 (VM# 1339) AS 37.32'.

4. VERTICAL TIES TO THE NATIONAL SPATIAL REFERENCE SYSTEM ARE BASED ON PUBLISHED NAVD88 (GEOID 12A)ELEVATIONS HOLDING NOAA/USACE TIDAL BENCHMARK "9455920 THERMO 1 1988" (PID BBBH31/VM#1339)AS 26.41'.

5. SOUNDINGS ARE IN FEET AND ARE MINUS UNLESS OTHERWISE INDICATED.

6. BATHYMETRY WAS COLLECTED APRIL 18, 2016. SOUNDINGS WERE COLLECTED USING AN R2SONIC 2024 MULTIBEAM ECHOSOUNDER OPERATING AT 200 KHZ. SURFACE VELOCITY WAS MEASURED USING A VALEPORT SV-PLUS MOUNTED TO THE SONAR HEAD. SOUND VELOCITY THROUGH THE WATER COLUMN WAS DETERMINED WITH AN AML BASE X SOUND VELOCITY PROBE. POSITION AND VESSEL ORIENTATION WERE MEASURED USING AN APPLANIX POSMV WAVEMASTER V4 SYSTEM RECEIVING RTK CORRECTIONS FROM A TRIMBLE SPS855 GPS RECEIVER SET AT CONTROL STATION "TERRA 11", LOCATED ATOP THE PORT OFFICE BUILDING. SURVEY DATA WAS COLLECTED AND PROCESSED USING QINSY 8.1 SOFTWARE.

7. HORIZONTAL AND VERTICAL CONTROL SURVEY WAS PERFORMED BY USACE IN 2013 AND VERIFIED BY ETRAC INC IN APRIL, 2015 AS PART OF THE PREDREDGE SURVEY.

8. THIS DRAWING INDICATES GENERAL CONDITIONS AT THE TIME OF THE SURVEY.

9. MAP SOUNDINGS ARE BINNED AT 30 FEET (SHOAL-BIASED) AND COLOR ELEVATIONS ARE BINNED AT 12 FEET AND ARE SHOAL-BIASED.

SOUNDING ELEVATIONS TABLE

#	MIN. ELEV.	MAX. ELEV.	COLOR
1	-100.0	-43.0	
2	-43.0	-42.0	
3	-42.0	-41.0	
4	-41.0	-40.0	
5	-40.0	-39.0	
6	-39.0	-38.0	
7	-38.0	-37.0	
8	-37.0	-36.0	
9	-36.0	-35.0	
10	-35.0	-34.0	
11	-34.0	-33.0	
12	-33.0	-32.0	
13	-32.0	-31.0	
14	-31.0	20.0	

US Army Corps of Engineers
ALASKA DISTRICT

CONTRACT NO. W911KB-15-C-0006
CONTRACTOR MARSON CONSTRUCTION CO.
CITY SEATTLE STATE WASHINGTON
Recommended: KTR ENGINEER
Approved: RESIDENT ENGINEER
Date: 04/27/16
PRIME CONTRACTOR
SECTION

REVISION	DATE	DESCRIPTION	BY	APPROV
REVISION	DATE	DESCRIPTION	BY	APPROV

SURVEYED BY: CWO
DRAWN BY: CWO/DRB/TJ
APPROVED BY: J. ANDERSON
SCALE: N/A
SIZE: ANSI E
DATE: 27 April 2016
UFC: MIL-STD-1911
CONTRACT NO.: W911KB-15-C-0006
PLOT DATE: 4/27/2016
FILE NAME: PRE_20160418_EPOA_FINAL.DWG

U.S. ARMY CORPS OF ENGINEERS
ALASKA DISTRICT
CONTRACT NO. W911KB-15-C-0006
JBER, ALASKA 99506-0898

ANCHORAGE, ALASKA
2015 - 2017 MAINTENANCE DREDGING, PORT OF ANCHORAGE
HYDROGRAPHIC SURVEY
PRE_20160418_POA

SHEET IDENTIFICATION
V-104
Sheet 4 of 5

DREDGE LIMITS-AREA A

CORNER#	NORTHING	EASTING
DL-1	2,642,395.68	1,657,218.16
DL-2	2,642,359.80	1,657,316.67
DL-3	2,643,424.51	1,659,210.27
DL-4	2,643,944.48	1,659,516.63
DL-5	2,644,001.92	1,659,611.67
DL-12	2,647,175.03	1,660,215.92
DL-13	2,645,904.59	1,660,079.90
DL-14	2,645,884.06	1,660,136.28
DL-16	2,648,342.16	1,659,254.03
DL-31	2,645,866.95	1,660,183.26
DL-32	2,644,317.98	1,659,620.16
DL-33	2,644,283.82	1,659,714.15

DREDGE LIMITS-AREA Amw

CORNER#	NORTHING	EASTING
DL-7	2,646,768.74	1,660,601.52
DL-8	2,646,798.05	1,660,526.57
DL-9	2,646,846.91	1,660,486.30
DL-14	2,645,884.06	1,660,136.28
DL-15	2,645,837.86	1,660,263.13
DL-31	2,645,866.95	1,660,183.26

DREDGE LIMITS-AREA Amw2

CORNER#	NORTHING	EASTING
DL-9	2,646,846.91	1,660,486.30
DL-10	2,646,900.67	1,660,442.00
DL-13	2,645,904.59	1,660,079.90
DL-14	2,645,884.06	1,660,136.28

DREDGE LIMITS-AREA Amw3

CORNER#	NORTHING	EASTING
DL-10	2,646,900.67	1,660,442.00
DL-11	2,647,112.20	1,660,267.74
DL-12	2,647,175.03	1,660,215.92
DL-13	2,645,904.59	1,660,079.90

DREDGE LIMITS-AREA E

CORNER#	NORTHING	EASTING
DL-30	2,645,832.73	1,660,277.22
DL-31	2,645,866.95	1,660,183.26
DL-32	2,644,317.98	1,659,620.16
DL-33	2,644,283.82	1,659,714.15

DREDGE LIMITS-AREA F

CORNER#	NORTHING	EASTING
DL-6	2,646,763.28	1,660,615.50
DL-7	2,646,768.74	1,660,601.52
DL-15	2,645,837.86	1,660,263.13
DL-30	2,645,832.73	1,660,277.22

DREDGE LIMITS-AREA B

CORNER#	NORTHING	EASTING
DL-11	2,647,112.20	1,660,267.74
DL-12	2,647,175.03	1,660,215.92
DL-16	2,648,342.16	1,659,254.03
DL-17	2,649,256.22	1,659,566.97
DL-18	2,649,430.26	1,659,086.40
DL-19	2,651,604.46	1,659,885.47
DL-20	2,650,663.91	1,660,728.64
DL-23	2,649,122.65	1,661,000.03

DREDGE LIMITS-AREA WBB

CORNER#	NORTHING	EASTING
DL-20	2,650,663.91	1,660,728.64
DL-21	2,650,382.05	1,660,981.32
DL-22	2,649,498.45	1,661,136.91
DL-23	2,649,122.65	1,661,000.03

PORT OF ANCHORAGE DISPOSAL SITE

CORNER#	NORTHING	EASTING
DS-1	2,650,125.73	1,658,658.25
DS-2	2,650,809.80	1,656,779.24
DS-3	2,642,354.11	1,653,700.90
DS-4	2,641,670.05	1,655,579.94

SUMMER SURVEY LIMITS-AREA 1

CORNER#	NORTHING	EASTING
SL-4	2,647,364.95	1,660,411.54
SL-5	2,646,872.99	1,660,708.20
SL-6	2,646,746.32	1,660,662.07
SL-7	2,646,763.28	1,660,615.50
SL-8	2,644,001.92	1,659,611.67
SL-9	2,643,944.48	1,659,516.63
SL-10	2,643,424.51	1,659,210.27
SL-11	2,641,997.05	1,658,166.50
SL-12	2,642,577.54	1,656,572.75
SL-13	2,649,533.11	1,659,104.10
SL-14	2,648,028.49	1,660,011.41

SUMMER SURVEY LIMITS-AREA 2

CORNER#	NORTHING	EASTING
SL-1	2,651,701.73	1,659,893.33
SL-2	2,650,876.85	1,661,368.09
SL-3	2,649,474.08	1,661,181.24
SL-4	2,647,364.95	1,660,411.54
SL-13	2,649,533.11	1,659,104.10
SL-14	2,648,028.49	1,660,011.41

WINTER SURVEY LIMITS

CORNER#	NORTHING	EASTING
SL-4	2,647,364.95	1,660,411.54
SL-5	2,646,872.99	1,660,708.20
SL-6	2,646,746.32	1,660,662.07
SL-7	2,646,763.28	1,660,615.50
SL-8	2,644,001.92	1,659,611.67
SL-9	2,643,944.48	1,659,516.63
SL-10	2,643,424.51	1,659,210.27
SL-14	2,648,028.49	1,660,011.41
SL-15	2,643,704.68	1,658,439.59

SOUNDING ELEVATIONS TABLE

#	MIN. ELEV.	MAX. ELEV.	COLOR
1	-100.0	-43.0	
2	-43.0	-42.0	
3	-42.0	-41.0	
4	-41.0	-40.0	
5	-40.0	-39.0	
6	-39.0	-38.0	
7	-38.0	-37.0	
8	-37.0	-36.0	
9	-36.0	-35.0	
10	-35.0	-34.0	
11	-34.0	-33.0	
12	-33.0	-32.0	
13	-32.0	-31.0	
14	-31.0	20.0	

SURVEY CONTROL DATA

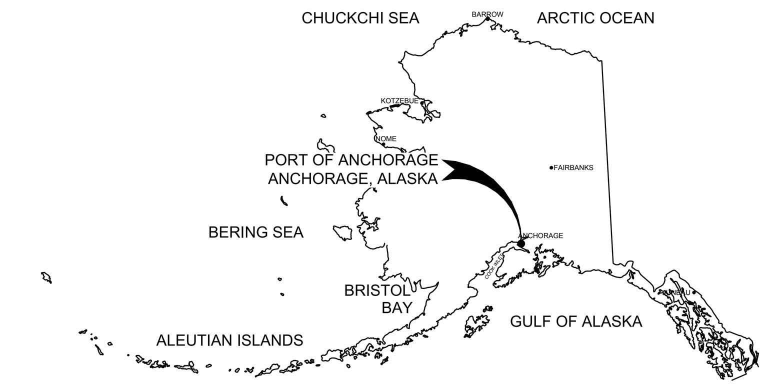
STATION	NORTHING	EASTING	MLLW	DESCRIPTION
ANC2 ARP	2,621,462.11	1,643,344.06		ARP
AWWU 1984	2,629,311.02	1,635,837.37		ALMON
BM 12 1974	2,620,563.82	1,604,566.35	27.63	BRASS CAP
BM 5934 F	2,655,203.73	1,655,049.51	36.48	BRASS CAP
CRAIG	2,642,635.95	1,661,029.47	44.95	BRASS CAP
ETRAC-1	2,646,395.57	1,660,814.72	38.34	BRASS CAP
ETRAC-2	2,644,443.04	1,660,120.66	36.38	BRASS CAP
JHZ-1 ARP	2,629,233.88	1,636,558.78		ARP
LOOP 2 RM 3	2,649,985.32	1,667,186.91		BRASS CAP
MIKE	2,645,987.73	1,661,875.48	48.67	BRASS CAP
NORTH END	2,646,649.84	1,660,584.80	41.56	BRASS CAP
PMAC ARP	2,713,356.44	1,626,542.67		ARP
PORT 1989	2,639,934.29	1,656,925.43	39.55	ALMON
PORT MAC	2,655,563.46	1,654,968.22	41.51	BRASS CAP
RIFE 1960	2,620,502.19	1,604,162.70	29.99	BRASS CAP
SOUTH END	2,644,296.27	1,659,728.03	40.58	BRASS CAP
TBON ARP	2,623,165.72	1,678,342.84		ARP
TERRA 11 ARP	2,644,969.84	1,660,159.24	80.48	ARP
TERRA 12 ARP	2,644,990.65	1,660,166.56	81.21	ARP
THERMO	2,642,784.70	1,660,183.87	37.32	ALMON
TSEA ARP	2,625,900.12	1,658,953.00		ARP
VAN DUSEN	2,621,199.16	1,648,753.44		BRASS CAP
ZAN1 ARP	2,641,258.45	1,679,145.42		ARP

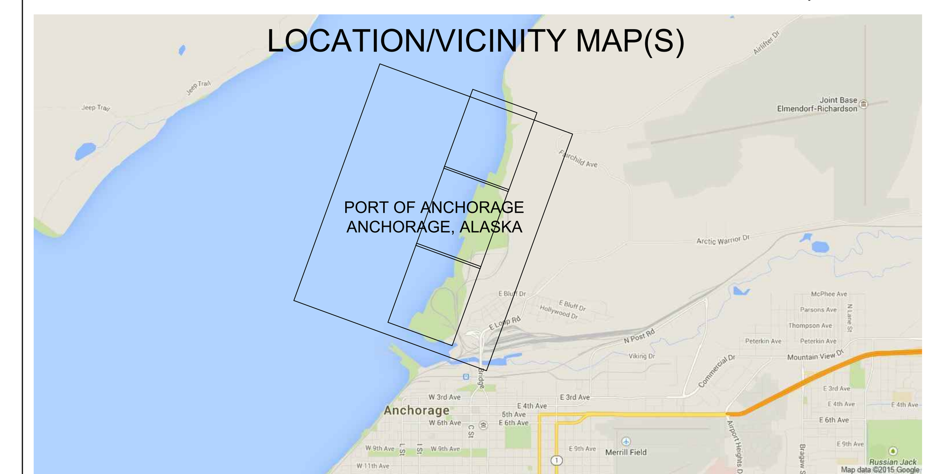
NAVIGATION AIDS

USCG NO.	NORTHING	EASTING	DESCRIPTION
26410	2,620,482.01	1,605,132.29	FIRE ISLAND RANGE FRONT LIGHT
26415	2,619,767.91	1,603,779.36	FIRE ISLAND RANGE REAR LIGHT
26420	2,631,850.53	1,624,593.18	KNIK ARM SHOAL LIGHTED BUOY 7
26435	2,631,161.57	1,636,356.21	POINT WORONZOF RANGE FRONT LIGHT
26440	2,631,320.13	1,637,173.61	POINT WORONZOF RANGE REAR LIGHT

DREDGE LIMITS-AREA G

CORNER#	NORTHING	EASTING
DL-4	2,643,944.48	1,659,516.63
DL-5	2,644,001.92	1,659,611.67
DL-34	2,644,142.84	1,659,662.90
DL-35	2,644,196.82	1,659,514.42
DL-36	2,643,604.20	1,659,165.26
DL-37	2,643,538.21	1,659,277.26





NOTES

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STATE OF ALASKA
49 TH
(Lewis J. Epps)
04/27/2016
No. 3510
REGISTERED PROFESSIONAL LAND SURVEYOR

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

David R. Neff C.H. (275)

US Army Corps of Engineers®
ALASKA DISTRICT

CONTRACT NO. W911KB-15-C-0006
CONTRACTOR MANSON CONSTRUCTION CO.
CITY SEATTLE STATE WASHINGTON
Recommended: KTR ENGINEER PRIME CONTRACTOR
Approved: CHIEF GEOMATICS SECTION
Date: 04/27/16

REVISION	DATE	DESCRIPTION	BY	APPVD

REVISION	DATE	DESCRIPTION	BY	APPVD

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

SURVEYED BY: GWG
DRAWN BY: ENHJ/GWG
CHECKED BY: GWG/ENHJ/MT/JA
APPROVED BY: J. ANDERSON
SCALE: 1" = 50'
PLOT DATE: 4/27/2016
SIZE: ANSI E
FILE NAME: PRE_20160418_POA_FINAL.DWG
DATE: 27 April 2016
UPC: ANCEXP11
CONTRACT NO.: W911KB-15-C-0006
JOB NO.: 3353-16

ANCHORAGE, ALASKA
2015 - 2017 MAINTENANCE DREDGING, PORT OF ANCHORAGE
HYDROGRAPHIC SURVEY
PRE_20160418_POA

SHEET IDENTIFICATION
V-105
Sheet 5 of 5