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

NOTES
1. 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'.
2. 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, KNICK ARM, COOK INLET, ALASKA" PUBLISHED 10/24/2011 HOLDING "NO 15 RESET 1966" (PID TT0711 / VM# 1332) AS 37.14', "B75 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, "5290 D 1980" (VM# 1337) AS 44.69', AND "5920 THERMO 1 1988 (vm# 1339) AS 37.32'.
4. BASE MAP FEATURES INCLUDING BUT NOT LIMITED TO DOCK FACES, BUILDINGS, PILINGS, AND ROADS ARE PROVIDED BY USACE AND ARE NOT VERIFIED BY ETRAC ENGINEERING.
5. THIS SURVEY WAS PERFORMED BY ETRAC ENGINEERING ON 01 NOVEMBER, 2013.
6. SOUNDINGS WERE COLLECTED USING A R2SONIC 2024 MULTIBLEM ECHO SOUNDER OPERATING AT 200kHz. SURFACE VELOCITY WAS MEASURED USING A VALEPORT SV-PLUS MOUNTED TO THE SONAR HEAD.
7. SOUND VELOCITY PROFILES WERE COLLECTED USING A TELEDYNE ODOM DIGIBAR-PRO SVP UNIT.
8. VESSEL POSITION, HEADING, ATTITUDE, AND RTK TIDES WERE ACQUIRED USING AN APPLANIX POSMV WAVEMASTER GPS/INERTIAL POSITIONING SYSTEM RECEIVING RTK CORRECTIONS FROM A TRIMBLE SPS855 GPS RECEIVER SET AT CONTROL STATION "TERRA 11", LOCATED ATOP THE PORT OFFICE BUILDING.
9. SURVEY NAVIGATION AND DATA COLLECTION WERE PERFORMED USING QPS QINSY (V8.0). DATA PROCESSING WAS PERFORMED IN QPS QLOUD (V2.2.0.0)
10. SOUNDING MINUS AND IN FEET UNLESS OTHERWISE INDICATED.
11. SURVEY DATA IS VALID ONLY WITHIN THE TIMEFRAME IN WHICH THE SURVEY WAS CONDUCTED.

(Lewis J. Epps)
No. 3510
This hydrographic survey was completed under the oversight of an ACSM/THOSOA certified hydrographer.

Notes:
1. 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'.
2. 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, KNICK 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, "5290 D 1980" (VM# 1337) as 44.69', and "5920 THERMO 1 (vm# 1339) AS 37.32'.
3. Base map and project limits were transformed using existing baseline ("N END 1978" to "S END 1978") provided by USACE translated, rotated, and scaled to 2012 baseline ("N END 1978" to "S END 1978").
4. Base map features including but not limited to dock faces, buildings, pilings, and roads are provided by USACE and are not verified by ETRAC Engineering.
5. This survey was performed by ETRAC Engineering on 01 November, 2013.
6. Soundings were collected using a R2Sonic 2024 multibeam echo sounder operating at 200kHz. Surface velocity was measured using a Valeport SV-PLUS mounted to the sonar head.
7. Sound velocity profiles were collected using a Teledyne Odom Digibar-Pro SVP unit.
8. Vessel position, heading, attitude, and RTK tides were acquired using an Applanix PosMV Wavemaster GPS/Inertial positioning system receiving RTK corrections from a Trimble SPS855 GPS receiver set at control station "TERRA 11", located atop the port office building.
9. Survey navigation and data collection were performed using QPS QINSY (V8.0). Data processing was performed in QPS QLOUD (V2.2.0.0)
10. Soundings minus and in feet unless otherwise indicated.
11. Survey data is valid only within the timeframe in which the survey was conducted.
THIS HYDROGRAPHIC SURVEY WAS COMPLETED UNDER THE OVERSIGHT OF AN ACSM/THOSOA CERTIFIED HYDROGRAPHER.

NOTES

1. 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'.

2. 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, KNICK ARM, COOK INLET, ALASKA" PUBLISHED 10/24/2011 HOLDING "NO 15 RESET 1966" (PID TT0711 / VM# 1332) AS 37.14', "B75 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, "5290 D 1980" (VM# 1337) AS 44.69', AND "5920 THERMO 1 1988 (vm# 1339) AS 37.32'.

3. BASE MAP AND PROJECT LIMITS WERE TRANSFORMED USING EXISTING BASELINE ("N END 1978" TO "S END 1978") PROVIDED BY USACE TRANSLATED, ROTATED, AND SCALPED TO 2012 BASELINE ("N END 1978" TO "S END 1978").

4. BASE MAP FEATURES INCLUDING BUT NOT LIMITED TO DOCK FACES, BUILDINGS, PILINGS, AND ROADS ARE PROVIDED BY USACE AND ARE NOT VERIFIED BY ETRAC ENGINEERING.

5. THIS SURVEY WAS PERFORMED BY ETRAC ENGINEERING ON 01 NOVEMBER, 2013.

6. SOUNDINGS WERE COLLECTED USING A R2SONIC 2024 MULTIBEAM ECHO SOUNDER OPERATING AT 200kHz. SURFACE VELOCITY WAS MEASURED USING A VALEPORT SV-PLUS MOUNTED TO THE SONAR HEAD.

7. SOUND VELOCITY PROFILES WERE COLLECTED USING A TELEDYNE ODOM DIGIBAR-PRO SVP UNIT.

8. VESSEL POSITION, HEADING, ATTITUDE, AND RTK TIDES WERE ACQUIRED USING AN APPLANIX POSMV WAVEMASTER GPS/INERTIAL POSITIONING SYSTEM RECEIVING RTK CORRECTIONS FROM A TRIMBLE SPS855 GPS RECEIVER SET AT CONTROL STATION "TERRA 11", LOCATED ATOP THE PORT OFFICE BUILDING.

9. SURVEY NAVIGATION AND DATA COLLECTION WERE PERFORMED USING QPS QINSY (V8.0). DATA PROCESSING WAS PERFORMED IN QPS QLOUD (V2.2.0.0)

10. SOUNDING MINUS AND IN FEET UNLESS OTHERWISE INDICATED.

11. SURVEY DATA IS VALID ONLY WITHIN THE TIMEFRAME IN WHICH THE SURVEY WAS CONDUCTED.
THIS HYDROGRAPHIC SURVEY WAS COMPLETED UNDER THE OVERSIGHT OF AN ACSM/THOSOA CERTIFIED HYDROGRAPHER.

NOTES

1. 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'.

2. 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, KNICK 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, "5290 D 1980" (VM# 1337) AS 44.69', AND "5920 THERMO 1 1988 (VM# 1339) AS 37.32'.


4. BASE MAP FEATURES INCLUDING BUT NOT LIMITED TO DOCK FACES, BUILDINGS, PILINGS, AND ROADS ARE PROVIDED BY USACE AND ARE NOT VERIFIED BY ETRAC ENGINEERING.

5. THIS SURVEY WAS PERFORMED BY ETRAC ENGINEERING ON 01 NOVEMBER, 2013.

6. SOUNDINGS WERE COLLECTED USING A R2SONIC 2024 MULTIBEAM ECHO SOUNDER OPERATING AT 200kHz. SURFACE VELOCITY WAS MEASURED USING A VALEPORT SV-PLUS MOUNTED TO THE SONAR HEAD.

7. SOUND VELOCITY PROFILES WERE COLLECTED USING A TELEDYNE ODOM DIGIBAR-PRO SVP UNIT.

8. VESSEL POSITION, HEADING, ATTITUDE, AND RTK TIDES WERE ACQUIRED USING AN APPLANIX POSMV WAVEMASTER GPS/INERTIAL POSITIONING SYSTEM RECEIVING RTK CORRECTIONS FROM A TRIMBLE SPS855 GPS RECEIVER SET AT CONTROL STATION "TERRA 11", LOCATED ATOP THE PORT OFFICE BUILDING.

9. SURVEY NAVIGATION AND DATA COLLECTION WERE PERFORMED USING QPS QINSY (V8.0). DATA PROCESSING WAS PERFORMED IN QPS QLOUD (V2.2.0.0)

10. SOUNDING MINUS AND IN FEET UNLESS OTHERWISE INDICATED.

11. SURVEY DATA IS VALID ONLY WITHIN THE TIMEFRAME IN WHICH THE SURVEY WAS CONDUCTED.

(Leonard E. Epps)
POSTDREDGE SURVEY

NOTES

1. 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'.

2. 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, KNICK ARM, COOK INLET, ALASKA" PUBLISHED 10/24/2011 HOLDING "NO 15 RESET 1966" (PID TT0711 / VM# 1332) AS 37.14', "B75 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, "5290 D 1980" (VM# 1337) AS 44.69', AND "5920 THERMO 1 1988 (vm# 1339) AS 37.32'.


4. BASE MAP FEATURES INCLUDING BUT NOT LIMITED TO DOCK FACES, BUILDINGS, PILINGS, AND ROADS ARE PROVIDED BY USACE AND ARE NOT VERIFIED BY ETRAC ENGINEERING.

5. THIS SURVEY WAS PERFORMED BY ETRAC ENGINEERING ON 01 NOVEMBER, 2013.

6. SOUNDINGS WERE COLLECTED USING A R2SONIC 2024 MULTIBEAM ECHO SOUNDER OPERATING AT 200kHz. SURFACE VELOCITY WAS MEASURED USING A VALEPORT SV-PLUS MOUNTED TO THE SONAR HEAD.

7. SOUND VELOCITY PROFILES WERE COLLECTED USING A TELEDYNE ODOM DIGIBAR-PRO SVP UNIT.

8. VESSEL POSITION, HEADING, ATTITUDE, AND RTK TIDES WERE ACQUIRED USING AN APPLANIX POSMV WAVEMASTER GPS/INERTIAL POSITIONING SYSTEM RECEIVING RTK CORRECTIONS FROM A TRIMBLE SPS855 GPS RECEIVER SET AT CONTROL STATION "TERRA 11", LOCATED ATOP THE PORT OFFICE BUILDING.

9. SURVEY NAVIGATION AND DATA COLLECTION WERE PERFORMED USING QPS QINSY (V8.0). DATA PROCESSING WAS PERFORMED IN QPS QLOUD (V2.2.0.0)

10. SOUNDING HEIGHTS IN FEET UNLESS OTHERWISE INDICATED.

11. SURVEY DATA IS VALID ONLY WITHIN THE TIMEFRAME IN WHICH THE SURVEY WAS CONDUCTED.
NOTES

1. 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'.

2. VERTICAL CONTROL: ELEVATIONS ARE MEAN LOWER LOW WATER (MLLW) BASED ON THE 1983-2001 TIDAL EPOCH EXPRESSED IN US FEET.  ... "ANCHORAGE, KNICK 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, "5290 D 1980" (VM# 1337) AS 44.69', AND "5920 THERMO 1 1988 (vm# 1339) AS 37.32'.


4. BASE MAP FEATURES INCLUDING BUILDINGS REFERENCED TO BASE MAP FEATURES POLICIES AND ARE NOT VERIFIED BY ETRO ENGINEERING.

5. THIS SURVEY WAS PERFORMED BY ETRO ENGINEERING ON NOVEMBER 1, 2013.

6. SURVEY NAVIGATION AND DATA COLLECTION WERE PERFORMED USING A TRIMBLE SPS855 GPS RECEIVER INTEGRATED WITH A GPS/INS NAVIGATION SYSTEM AND GLONASS/GPS RTK TIDE GENETICS FROM A TRIMBLE TX 90 DUAL FREQUENCY GPS RECEIVER SET AT CONTROL STATION "TERRA 11" LOCATED AT THE PORT OFFICE BUILDING.

7. SURVEY NAVIGATION AND DATA COLLECTION WERE PERFORMED USING QPS QINSY (V8.0).  DATA PROCESSING WAS PERFORMED USING QPS QLOUD (V2.2.0.0).

8. SOUNDINGS WERE COLLECTED USING A R2SONIC 2024 MULTIBEAM ECHO SOUNDER OPERATING AT 200kHz.  SURFACE VELOCITY WAS MEASURED USING A VALEPORT SV-PLUS MOUNTED TO THE SONAR HEAD.

9. SOUNDING MINUS AND IN FEET UNLESS OTHERWISE INDICATED.

10. SURVEY DATA IS VALID ONLY WITHIN THE TIMEFRAME IN WHICH THE SURVEY WAS CONDUCTED.

(Signature)
Lewis J. Epps
No. 3510
David R. Neff C.H.(275)