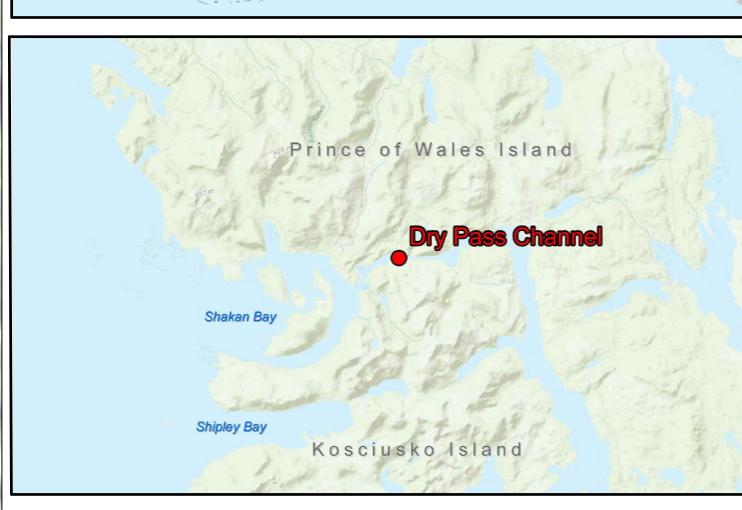




US Army Corps of Engineers ® ALASKA DISTRIC



NOTES

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 2010.00 EPOCH VALUES OF NGS CORS STATIONS: "KLAWOCKAIRAK2006 CORS ARP" (PID DM7451); "ATLIN CORS ARP" (PID DP5991); "JUNEAU WAAS 1 CORS ARP" (DF4367).

LOCAL PROJECT HORIZONTAL CONTROL IS ALASKA STATE PLANE, ZONE 1, NAD83, IN US SURVEY FEET HOLDING "945 0998 TIDAL 3" AS N 1,581,007.620', E 2,737,111.435', "945 0987 BM 1" AS N 1,575,471.975', E 2,727,634.500', AND "945 0997 LYN" AS N 1,581,415.916', E 2,754,466.054'.

VERTICAL CONTROL IS MEAN LOWER LOW WATER (MLLW=0.0 FT), BASED ON THE NOAA/NOS TIDAL BENCH MARK LISTS: "945 0987 SHAKAN STRAIT (NORTHEAST END), AK" PUBLISHED 04/26/2011, "945 0997 EL CAPITAN PASSAGE, ALASKA" PUBLISHED 07/14/2014, AND "945 0998 DRY PASS, EL CAPITAN PASSAGE, AK" PUBLISHED 07/14/2014. THIS TIDAL DATUM IS BASED ON THE 1983-2001 TIDAL EPOCH AND IS REFERENCED TO A TILTED-PLANE MLLW DATUM HOLDING NOAA/NOS TIDAL BENCH MARKS: "945 0987 BM 1" (VM#14026) AS 14.43 FT., "945 0997 LYN" (VM#20876) AS 10.59 FT., AND "945 0998 TIDAL 3" (VM#20878) AS

VERTICAL TIES TO THE NATIONAL SPATIAL REFERENCE SYSTEM ARE BASED ON PUBLISHED NAVD88 (GEOID 12B) ELEVATIONS HOLDING NOAA/USACE TIDAL BENCHMARKS: "945 0987 BM1" (VM#14026) AS 12.94 FT, "945 0997 LYN" (PID BBCV41/VM#20876) AS 9.43 FT, AND "945 0998 TIDAL 3" (PID BBCV62/VM#20878) AS

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

BATHYMETRY WAS COLLECTED MARCH 31 AND APRIL 1. SOUNDINGS WERE COLLECTED USING AN R2SONIC 2024 MULTIBEAM ECHOSOUNDER OPERATING AT 200KHZ. 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 POSMV OCEANMASTER V5 SYSTEM RECEIVING RTK CORRECTIONS FROM A TRIMBLE SPS855 GPS RECEIVER SET AT CONTROL STATION "TIDAL 3". SURVEY DATA WAS COLLECTED AND PROCESSED USING QINSY 8.1 SOFTWARE. HORIZONTAL CONTROL WAS SURVEYED USING STATIC GNSS EQUIPMENT AND TECHNIQUES. VERTICAL CONTROL WAS SURVEYED USING STATIC GNSS EQUIPMENT AND DIFFERENTIAL LEVELING.

MOBILE TERRESTRIAL LASER SCANNING DATA WAS COLLECTED USING A REIGL VZ400 LASER SCANNER. POSITION AND VESSEL ORIENTATION WERE MEASURED USING AN APPLANIX POSMV OCEANMASTER V5 RECEIVING RTK CORRECTIONS FROM A TRIMBLE SPS855 GPS RECEIVER SET AT CONTROL STATION "TIDAL 3". MOBILE SCANNING WAS COLLECTED AND PROCESSED USING QINSY 8.1 SOFTWARE.

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

SURVEY CONTROL DATA STATION NORTHING EASTING MLLW DESCRIPTION 0987 BM 1 | 1,575,471.98 | 2,727,634.50 | 14.43 3.5" USCS DOMED BC BETSY 1996 | 1,580,869.08 | 2,732,943.94 | 14.72 DOMED SBC 1,581,415.92 | 2,754,466.05 | 10.59 3.5" USACE DOMED BC 1,580,391.15 | 2,741,998.01 | 12.27 1" PIPE WITH TACK 1,578,763.46 | 2,729,012.51 | 14.34 3" DOMED SBC TIDAL 3 | 1,581,007.62 | 2,737,111.44 | 13.56 3.5" USCS DOMED BC

| PROJECT CENTERLINE | | | PROJECT CENTERLINE | | |
|--------------------|--------------|--------------|--------------------|--------------|--------------|
| CORNER# | NORTHING | EASTING | CORNER# | NORTHING | EASTING |
| 1 | 1,577,302.17 | 2,727,990.18 | 7 | 1,582,013.12 | 2,735,743.96 |
| 2 | 1,577,760.13 | 2,728,747.65 | 8 | 1,580,909.56 | 2,739,084.66 |
| 3 | 1,579,124.63 | 2,729,625.06 | 9 | 1,580,502.23 | 2,740,770.21 |
| 4 | 1,580,499.83 | 2,732,171.49 | 10 | 1,579,579.97 | 2,742,779.60 |
| 5 | 1,580,712.58 | 2,732,965.17 | 11 | 1,579,407.64 | 2,744,265.08 |
| _ | 4 504 700 04 | 0.704.505.70 | | | |

| VOLUME COMPUTATIONS | | | | |
|--|--------|---------|--|--|
| AREA A: CHANNEL | MLLW=0 | CU. YD. | | |
| AVAILABLE TO PROJECT DEPTH (PD) | -12.0 | 2,371 | | |
| AVAILABLE TO MAX PAY DEPTH (MP) | -13.0 | 4,949 | | |
| AVAILABLE SIDE SLOPES (SS) AT 3:1 (H:V) & 25' WIDE | VARIES | 10,592 | | |
| TOTAL MAXIMUM VOLUME AVAILABLE (MP + SS) | | 15,541 | | |

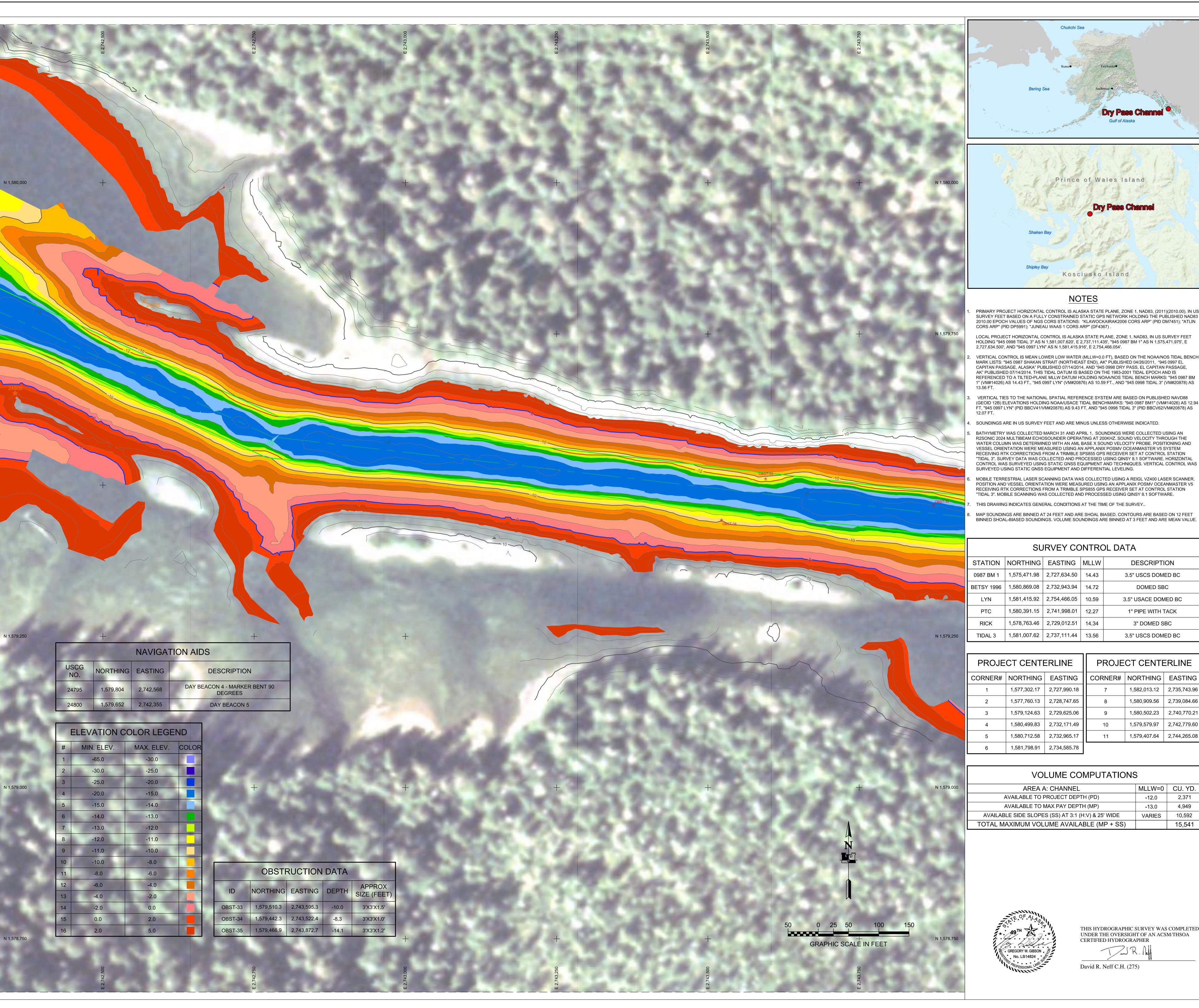


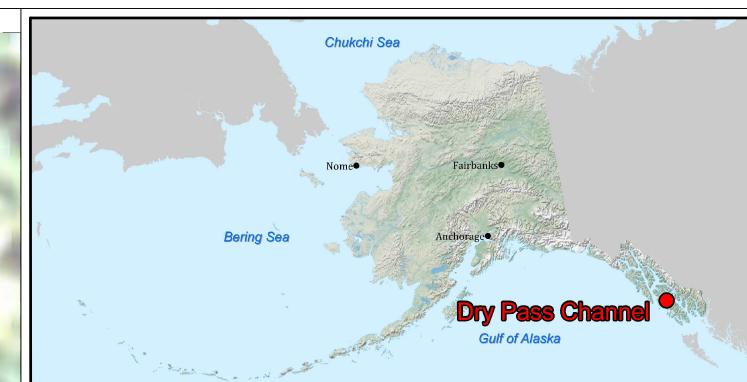
THIS HYDROGRAPHIC SURVEY WAS COMPLETED UNDER THE OVERSIGHT OF AN ACSM/THSOA CERTIFIED HYDROGRAPHER



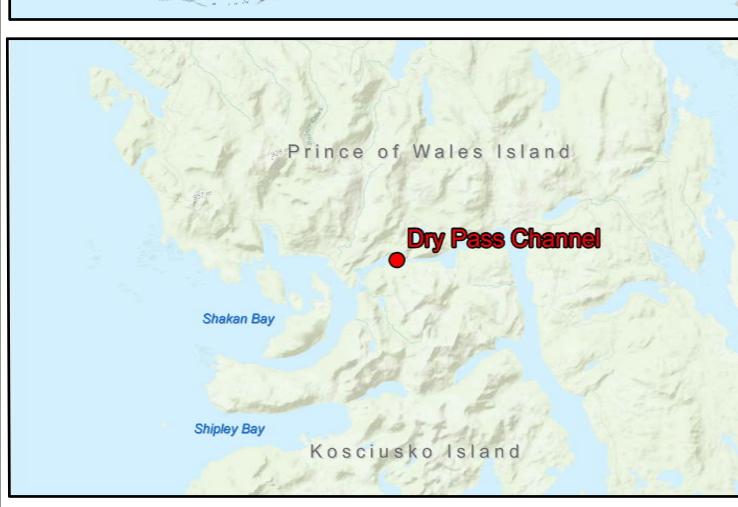
David R. Neff C.H. (275)

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US Army Corps of Engineers ® ALASKA DISTRIC



NOTES

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 2010.00 EPOCH VALUES OF NGS CORS STATIONS: "KLAWOCKAIRAK2006 CORS ARP" (PID DM7451); "ATLIN CORS ARP" (PID DP5991); "JUNEAU WAAS 1 CORS ARP" (DF4367) .

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VERTICAL CONTROL IS MEAN LOWER LOW WATER (MLLW=0.0 FT), BASED ON THE NOAA/NOS TIDAL BENCH MARK LISTS: "945 0987 SHAKAN STRAIT (NORTHEAST END), AK" PÜBLISHED 04/26/2011, "945 0997 EL CAPITAN PASSAGE, ALASKA" PUBLISHED 07/14/2014, AND "945 0998 DRY PASS, EL CAPITAN PASSAGE, AK" PUBLISHED 07/14/2014. THIS TIDAL DATUM IS BASED ON THE 1983-2001 TIDAL EPOCH AND IS REFERENCED TO A TILTED-PLANE MLLW DATUM HOLDING NOAA/NOS TIDAL BENCH MARKS: "945 0987 BM 1" (VM#14026) AS 14.43 FT., "945 0997 LYN" (VM#20876) AS 10.59 FT., AND "945 0998 TIDAL 3" (VM#20878) AS

VERTICAL TIES TO THE NATIONAL SPATIAL REFERENCE SYSTEM ARE BASED ON PUBLISHED NAVD88 (GEOID 12B) ELEVATIONS HOLDING NOAA/USACE TIDAL BENCHMARKS: "945 0987 BM1" (VM#14026) AS 12.94 FT, "945 0997 LYN" (PID BBCV41/VM#20876) AS 9.43 FT, AND "945 0998 TIDAL 3" (PID BBCV62/VM#20878) AS

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

BATHYMETRY WAS COLLECTED MARCH 31 AND APRIL 1. SOUNDINGS WERE COLLECTED USING AN R2SONIC 2024 MULTIBEAM ECHOSOUNDER OPERATING AT 200KHZ. 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 POSMV OCEANMASTER V5 SYSTEM RECEIVING RTK CORRECTIONS FROM A TRIMBLE SPS855 GPS RECEIVER SET AT CONTROL STATION "TIDAL 3". SURVEY DATA WAS COLLECTED AND PROCESSED USING QINSY 8.1 SOFTWARE. HORIZONTAL CONTROL WAS SURVEYED USING STATIC GNSS EQUIPMENT AND TECHNIQUES. VERTICAL CONTROL WAS SURVEYED USING STATIC GNSS EQUIPMENT AND DIFFERENTIAL LEVELING.

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

SURVEY CONTROL DATA STATION NORTHING EASTING MLLW DESCRIPTION 0987 BM 1 | 1,575,471.98 | 2,727,634.50 | 14.43 3.5" USCS DOMED BC BETSY 1996 | 1,580,869.08 | 2,732,943.94 | 14.72 DOMED SBC

1,581,415.92 | 2,754,466.05 | 10.59 3.5" USACE DOMED BC 1" PIPE WITH TACK 1,580,391.15 | 2,741,998.01 | 12.27 1,578,763.46 | 2,729,012.51 | 14.34 3" DOMED SBC TIDAL 3 | 1,581,007.62 | 2,737,111.44 | 13.56 3.5" USCS DOMED BC DDO IECT CENTEDLINE | DDO IECT CENTEDLINE

| PROJE | CT CENTE | ERLINE | PROJECT CENTERLINE | | |
|---------|--------------|--------------|--------------------|--------------|--------------|
| CORNER# | NORTHING | EASTING | CORNER# | NORTHING | EASTING |
| 1 | 1,577,302.17 | 2,727,990.18 | 7 | 1,582,013.12 | 2,735,743.96 |
| 2 | 1,577,760.13 | 2,728,747.65 | 8 | 1,580,909.56 | 2,739,084.66 |
| 3 | 1,579,124.63 | 2,729,625.06 | 9 | 1,580,502.23 | 2,740,770.21 |
| 4 | 1,580,499.83 | 2,732,171.49 | 10 | 1,579,579.97 | 2,742,779.60 |
| 5 | 1,580,712.58 | 2,732,965.17 | 11 | 1,579,407.64 | 2,744,265.08 |
| 6 | 1.581.798.91 | 2.734.585.78 | | | |

| VOLUME COMPUTATIONS | | | | | |
|--|--------|---------|--|--|--|
| AREA A: CHANNEL | MLLW=0 | CU. YD. | | | |
| AVAILABLE TO PROJECT DEPTH (PD) | -12.0 | 2,371 | | | |
| AVAILABLE TO MAX PAY DEPTH (MP) | -13.0 | 4,949 | | | |
| AVAILABLE SIDE SLOPES (SS) AT 3:1 (H:V) & 25' WIDE | VARIES | 10,592 | | | |
| TOTAL MAXIMUM VOLUME AVAILABLE (MP + SS) | | 15,541 | | | |

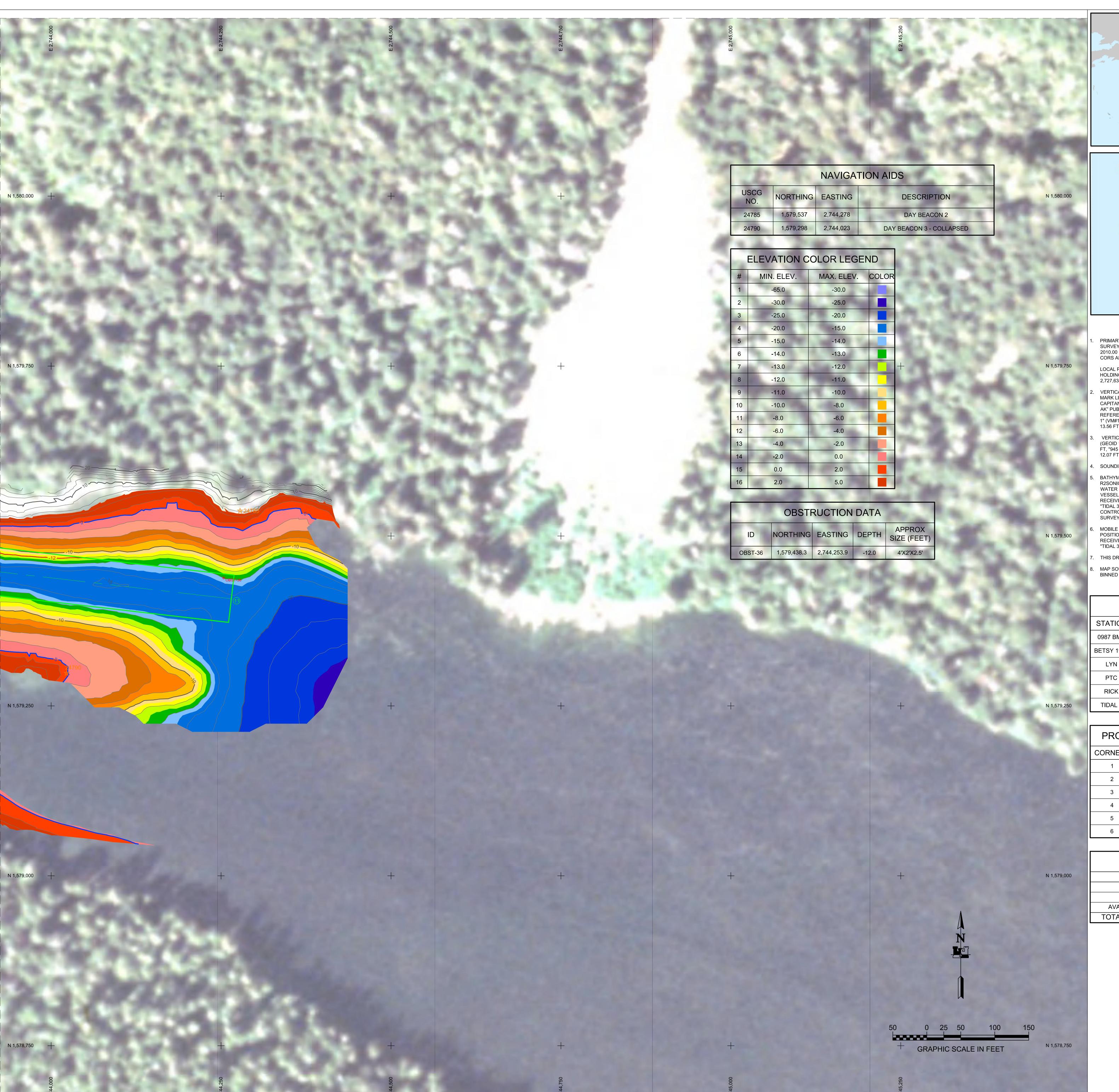


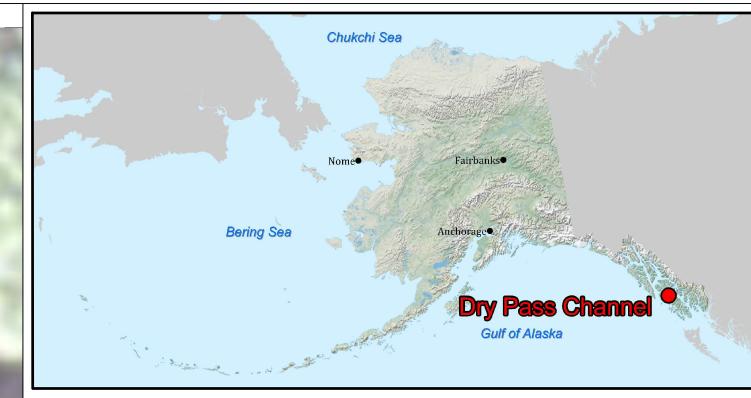
THIS HYDROGRAPHIC SURVEY WAS COMPLETED UNDER THE OVERSIGHT OF AN ACSM/THSOA CERTIFIED HYDROGRAPHER



IDENTIFICATION David R. Neff C.H. (275)

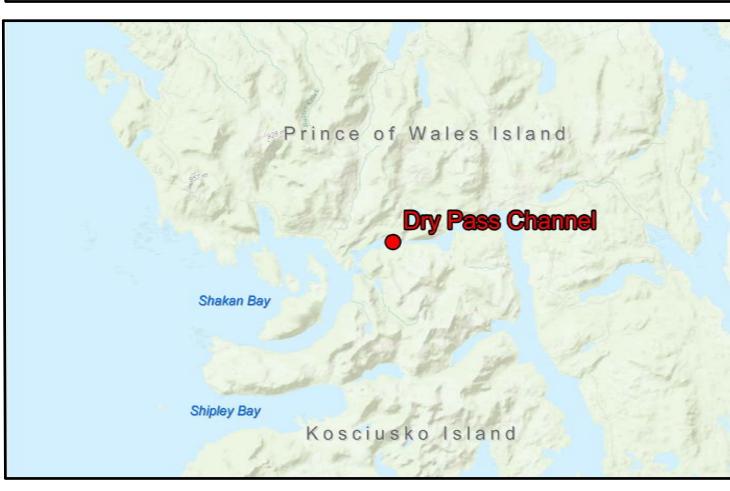
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US Army Corps

of Engineers ⊗
ALASKA DISTRICT



NOTES

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- THIS DRAWING INDICATES GENERAL CONDITIONS AT THE TIME OF THE SURVEY..
- MAP SOUNDINGS ARE BINNED AT 24 FEET AND ARE SHOAL BIASED. CONTOURS ARE BASED ON 12 FEET BINNED SHOAL-BIASED SOUNDINGS. VOLUME SOUNDINGS ARE BINNED AT 3 FEET AND ARE MEAN VALUE.

| SURVEY CONTROL DATA | | | | | | |
|---------------------|--|---|---|--|--|--|
| NORTHING | EASTING | MLLW | DESCRIPTION | | | |
| 1,575,471.98 | 2,727,634.50 | 14.43 | 3.5" USCS DOMED BC | | | |
| 1,580,869.08 | 2,732,943.94 | 14.72 | DOMED SBC | | | |
| 1,581,415.92 | 2,754,466.05 | 10.59 | 3.5" USACE DOMED BC | | | |
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| 1,578,763.46 | 2,729,012.51 | 14.34 | 3" DOMED SBC | | | |
| 1,581,007.62 | 2,737,111.44 | 13.56 | 3.5" USCS DOMED BC | | | |
| | NORTHING 1,575,471.98 1,580,869.08 1,581,415.92 1,580,391.15 1,578,763.46 | NORTHING EASTING 1,575,471.98 2,727,634.50 1,580,869.08 2,732,943.94 1,581,415.92 2,754,466.05 1,580,391.15 2,741,998.01 1,578,763.46 2,729,012.51 | NORTHING EASTING MLLW 1,575,471.98 2,727,634.50 14.43 1,580,869.08 2,732,943.94 14.72 1,581,415.92 2,754,466.05 10.59 1,580,391.15 2,741,998.01 12.27 1,578,763.46 2,729,012.51 14.34 | | | |

| į | PROJE | CT CENTE | ERLINE | PROJECT CENTERLINE | | |
|---|---------|--------------|--------------|--------------------|--------------|--------------|
| | CORNER# | NORTHING | EASTING | CORNER# | NORTHING | EASTING |
| | 1 | 1,577,302.17 | 2,727,990.18 | 7 | 1,582,013.12 | 2,735,743.96 |
| | 2 | 1,577,760.13 | 2,728,747.65 | 8 | 1,580,909.56 | 2,739,084.66 |
| | 3 | 1,579,124.63 | 2,729,625.06 | 9 | 1,580,502.23 | 2,740,770.21 |
| | 4 | 1,580,499.83 | 2,732,171.49 | 10 | 1,579,579.97 | 2,742,779.60 |
| | 5 | 1,580,712.58 | 2,732,965.17 | 11 | 1,579,407.64 | 2,744,265.08 |
| | 6 | 1,581,798.91 | 2,734,585.78 | | | |

| VOLUME COMPUTATIONS | | | | |
|--|--------|---------|--|--|
| AREA A: CHANNEL | MLLW=0 | CU. YD. | | |
| AVAILABLE TO PROJECT DEPTH (PD) | -12.0 | 2,371 | | |
| AVAILABLE TO MAX PAY DEPTH (MP) | -13.0 | 4,949 | | |
| AVAILABLE SIDE SLOPES (SS) AT 3:1 (H:V) & 25' WIDE | VARIES | 10,592 | | |
| TOTAL MAXIMUM VOLUME AVAILABLE (MP + SS) | | 15,541 | | |



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

David R. Neff C.H. (275)

SHEET IDENTIFICATION

1-DRP-92-07-02