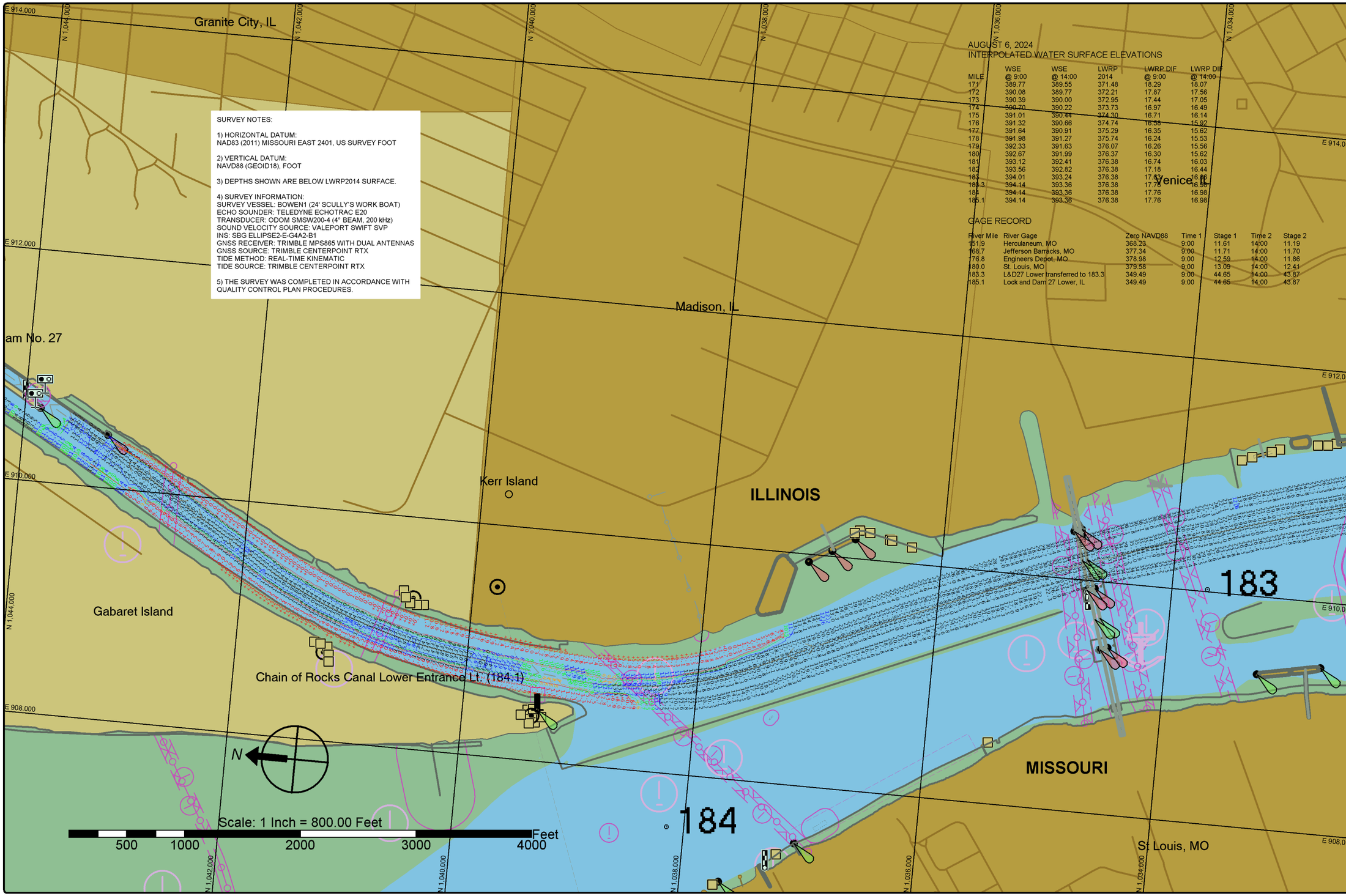



SURVEY NOTES:

1) HORIZONTAL DATUM:
NAD83 (2011) MISSOURI EAST 2401, US SURVEY FOOT

2) VERTICAL DATUM:
NAVD88 (GEOID18), FOOT

3) DEPTHS SHOWN ARE BELOW LWRP2014 SURFACE.

4) SURVEY INFORMATION:
SURVEY VESSEL: BOWEN1 (24' SCULLY'S WORK BOAT)
ECHO SOUNDER: TELEDYNE ECHOTRAC E20
TRANSDUCER: ODOM SMSW200-4 (4° BEAM, 200 kHz)
SOUND VELOCITY SOURCE: VALEPORT SWIFT SVP
INS: SBG ELLIPSE2-E-G4A2-B1
GNSS RECEIVER: TRIMBLE MPS865 WITH DUAL ANTENNAS
GNSS SOURCE: TRIMBLE CENTERPOINT RTX
TIDE METHOD: REAL-TIME KINEMATIC
TIDE SOURCE: TRIMBLE CENTERPOINT RTX

5) THE SURVEY WAS COMPLETED IN ACCORDANCE WITH QUALITY CONTROL PLAN PROCEDURES.

AUGUST 6, 2024
INTERPOLATED WATER SURFACE ELEVATIONS

| MILE | WSE @ 9:00 | WSE @ 14:00 | LWRP 2014 | LWRP DIF @ 9:00 | LWRP DIF @ 14:00 |
|---|---|---|---|---|---|
| 171 | 389.77 | 389.55 | 371.48 | 18.29 | 18.07 |
| 172 | 390.08 | 389.77 | 372.21 | 17.87 | 17.56 |
| 173 | 390.39 | 390.00 | 372.95 | 17.44 | 17.05 |
| 174 | 390.70 | 390.22 | 373.73 | 16.97 | 16.49 |
| 175 | 391.01 | 390.44 | 374.30 | 16.71 | 16.14 |
| 176 | 391.32 | 390.66 | 374.74 | 16.58 | 15.92 |
| 177 | 391.64 | 390.91 | 375.29 | 16.35 | 15.62 |
| 178 | 391.98 | 391.27 | 375.74 | 16.24 | 15.53 |
| 179 | 392.33 | 391.63 | 376.07 | 16.26 | 15.56 |
| 180 | 392.67 | 391.99 | 376.37 | 16.30 | 15.62 |
| 181 | 393.12 | 392.41 | 376.38 | 16.74 | 16.03 |
| 182 | 393.56 | 392.82 | 376.38 | 17.18 | 16.44 |
| 183 | 394.01 | 393.24 | 376.38 | 17.63 | 16.86 |
| 183.3 | 394.14 | 393.36 | 376.38 | 17.76 | 16.98 |
| 184 | 394.14 | 393.36 | 376.38 | 17.76 | 16.98 |
| 185.1 | 394.14 | 393.36 | 376.38 | 17.76 | 16.98 |

GAGE RECORD

| River Mile | River Gage | Zero NAVD88 | Time 1 | Stage 1 | Time 2 | Stage 2 |
|---|---|---|---|---|---|---|
| 151.9 | Herculaneum, MO | 368.23 | 9:00 | 11.61 | 14:00 | 11.19 |
| 168.7 | Jefferson Barracks, MO | 377.34 | 9:00 | 11.71 | 14:00 | 11.70 |
| 176.8 | Engineers Depot, MO | 378.98 | 9:00 | 12.59 | 14:00 | 11.86 |
| 180.0 | St. Louis, MO | 379.58 | 9:00 | 13.09 | 14:00 | 12.41 |
| 183.3 | L&D27 Lower transferred to 183.3 | 349.49 | 9:00 | 44.65 | 14:00 | 43.87 |
| 185.1 | Lock and Dam 27 Lower, IL | 349.49 | 9:00 | 44.65 | 14:00 | 43.87 |

St. Louis District

DATES OF SURVEY:
AUGUST 6, 2024

FILE NO.: 185_160K0624
REQUEST NO.: W912P924F0029

SCALE:
1" = 800' (ANSI B)

FIELD BOOKS:

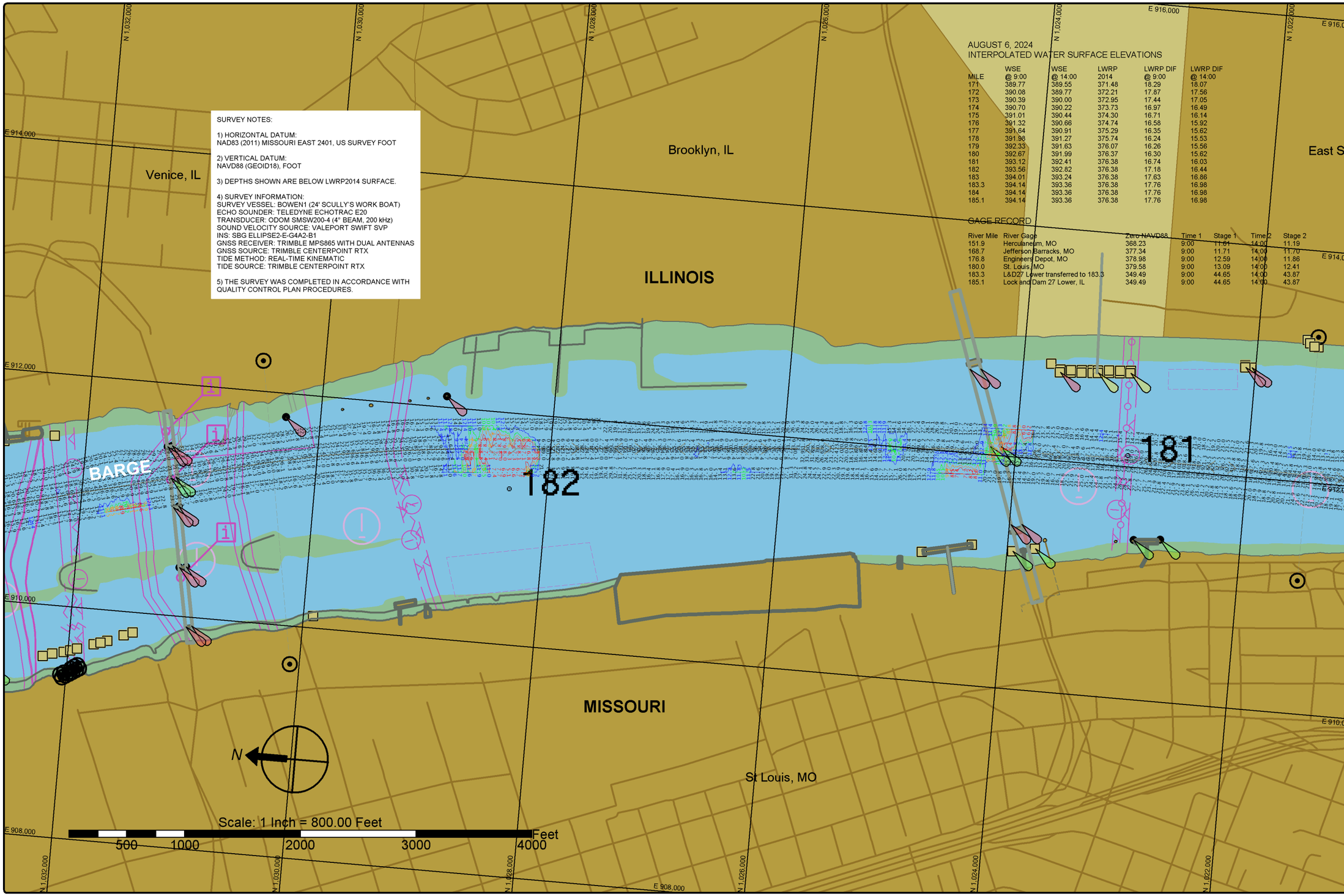
Approved: FIELD CARTOGRAPHER
Approved: CIVIL ENGINEERING TECHNICIAN
Approved: ASST CHIEF OF SURVEY
Approved: CHIEF OF SURVEY
Date:

U.S. ARMY CORPS OF ENGINEERS
ST. LOUIS DISTRICT
ST. LOUIS, MISSOURI

SURVEYED BY:
BOWEN ENGINEERING AND SURVEYING, P.C.
2121 MEGAN DRIVE
CAPE GIRARDEAU, MO 63701

UPPER MISSISSIPPI RIVER BASIN
MISSISSIPPI RIVER
CHANNEL PATROL
RIVER MILES 182.7 - 184.2

SHEET NO.
1 OF 1




SURVEY NOTES:

1) HORIZONTAL DATUM:
NAD83 (2011) MISSOURI EAST 2401, US SURVEY FOOT

2) VERTICAL DATUM:
NAVD88 (GEOID18), FOOT

3) DEPTHS SHOWN ARE BELOW LWRP2014 SURFACE.

4) SURVEY INFORMATION:
SURVEY VESSEL: BOWEN1 (24' SCULLY'S WORK BOAT)
ECHO SOUNDER: TELEDYNE ECHOTRAC E20
TRANSDUCER: ODOM SMSW200-4 (4° BEAM, 200 kHz)
SOUND VELOCITY SOURCE: VALEPORT SWIFT SVP
INS: SBG ELLIPSE2-E-G4A2-B1
GNSS RECEIVER: TRIMBLE MPS865 WITH DUAL ANTENNAS
GNSS SOURCE: TRIMBLE CENTERPOINT RTX
TIDE METHOD: REAL-TIME KINEMATIC
TIDE SOURCE: TRIMBLE CENTERPOINT RTX

5) THE SURVEY WAS COMPLETED IN ACCORDANCE WITH QUALITY CONTROL PLAN PROCEDURES.

AUGUST 6, 2024
INTERPOLATED WATER SURFACE ELEVATIONS

| MILE | WSE @ 9:00 | WSE @ 14:00 | LWRP 2014 | LWRP DIF @ 9:00 | LWRP DIF @ 14:00 |
|---|---|---|---|---|---|
| 171 | 389.77 | 389.55 | 371.48 | 18.29 | 18.07 |
| 172 | 390.08 | 389.77 | 372.21 | 17.87 | 17.56 |
| 173 | 390.39 | 390.00 | 372.95 | 17.44 | 17.05 |
| 174 | 390.70 | 390.22 | 373.73 | 16.97 | 16.49 |
| 175 | 391.01 | 390.44 | 374.30 | 16.71 | 16.14 |
| 176 | 391.32 | 390.66 | 374.74 | 16.58 | 15.92 |
| 177 | 391.64 | 390.91 | 375.29 | 16.35 | 15.62 |
| 178 | 391.98 | 391.27 | 375.74 | 16.24 | 15.53 |
| 179 | 392.33 | 391.63 | 376.07 | 16.26 | 15.56 |
| 180 | 392.67 | 391.99 | 376.37 | 16.30 | 15.62 |
| 181 | 393.12 | 392.41 | 376.38 | 16.74 | 16.03 |
| 182 | 393.56 | 392.82 | 376.38 | 17.18 | 16.44 |
| 183 | 394.01 | 393.24 | 376.38 | 17.63 | 16.86 |
| 183.3 | 394.14 | 393.36 | 376.38 | 17.76 | 16.98 |
| 184 | 394.14 | 393.36 | 376.38 | 17.76 | 16.98 |
| 185.1 | 394.14 | 393.36 | 376.38 | 17.76 | 16.98 |

GAGE RECORD

| River Mile | River Gage | Zero NAVD88 | Time 1 | Stage 1 | Time 2 | Stage 2 |
|---|---|---|---|---|---|---|
| 151.9 | Herculaneum, MO | 368.23 | 9:00 | 11.61 | 14:00 | 11.19 |
| 168.7 | Jefferson Barracks, MO | 377.34 | 9:00 | 11.71 | 14:00 | 11.70 |
| 176.8 | Engineers Depot, MO | 378.98 | 9:00 | 12.59 | 14:00 | 11.86 |
| 180.0 | St. Louis, MO | 379.58 | 9:00 | 13.09 | 14:00 | 12.41 |
| 183.3 | L&D27 Lower transferred to 183.3 | 349.49 | 9:00 | 44.65 | 14:00 | 43.87 |
| 185.1 | Lock and Dam 27 Lower, IL | 349.49 | 9:00 | 44.65 | 14:00 | 43.87 |

St. Louis District

DATES OF SURVEY:
AUGUST 6, 2024

FILE NO.: 189_160k0624
REQUEST NO.: W912P924F0029

SCALE:
1" = 800' (ANSI B)

FIELD BOOKS:

Approved: FIELD CARTOGRAPHER
Approved: CIVIL ENGINEERING TECHNICIAN
Approved: ASST CHIEF OF SURVEY
Approved: CHIEF OF SURVEY
Date:

U.S. ARMY CORPS OF ENGINEERS
ST. LOUIS DISTRICT
ST. LOUIS, MISSOURI

SURVEYED BY:
BOWEN ENGINEERING AND SURVEYING, P.C.
2121 MEGAN DRIVE
CAPE GIRARDEAU, MO 63701

UPPER MISSISSIPPI RIVER BASIN
MISSISSIPPI RIVER
CHANNEL PATROL
RIVER MILES 180.3 - 182.7

SHEET NO.
1 OF 1

SURVEY NOTES:

1) HORIZONTAL DATUM:
NAD83 (2011) MISSOURI EAST 2401, US SURVEY FOOT

2) VERTICAL DATUM:
NAVD88 (GEOID18), FOOT

3) DEPTHS SHOWN ARE BELOW LWRP2014 SURFACE.

4) SURVEY INFORMATION:
SURVEY VESSEL: BOWEN1 (24' SCULLY'S WORK BOAT)
ECHO SOUNDER: TELEDYNE ECHOTRAC E20
TRANSDUCER: ODOM SMSW200-4 (4° BEAM, 200 kHz)
SOUND VELOCITY SOURCE: VALEPORT SWIFT SVP
INS: SBG ELLIPSE2-E-G4A2-B1
GNSS RECEIVER: TRIMBLE MPS865 WITH DUAL ANTENNAS
GNSS SOURCE: TRIMBLE CENTERPOINT RTX
TIDE METHOD: REAL-TIME KINEMATIC
TIDE SOURCE: TRIMBLE CENTERPOINT RTX

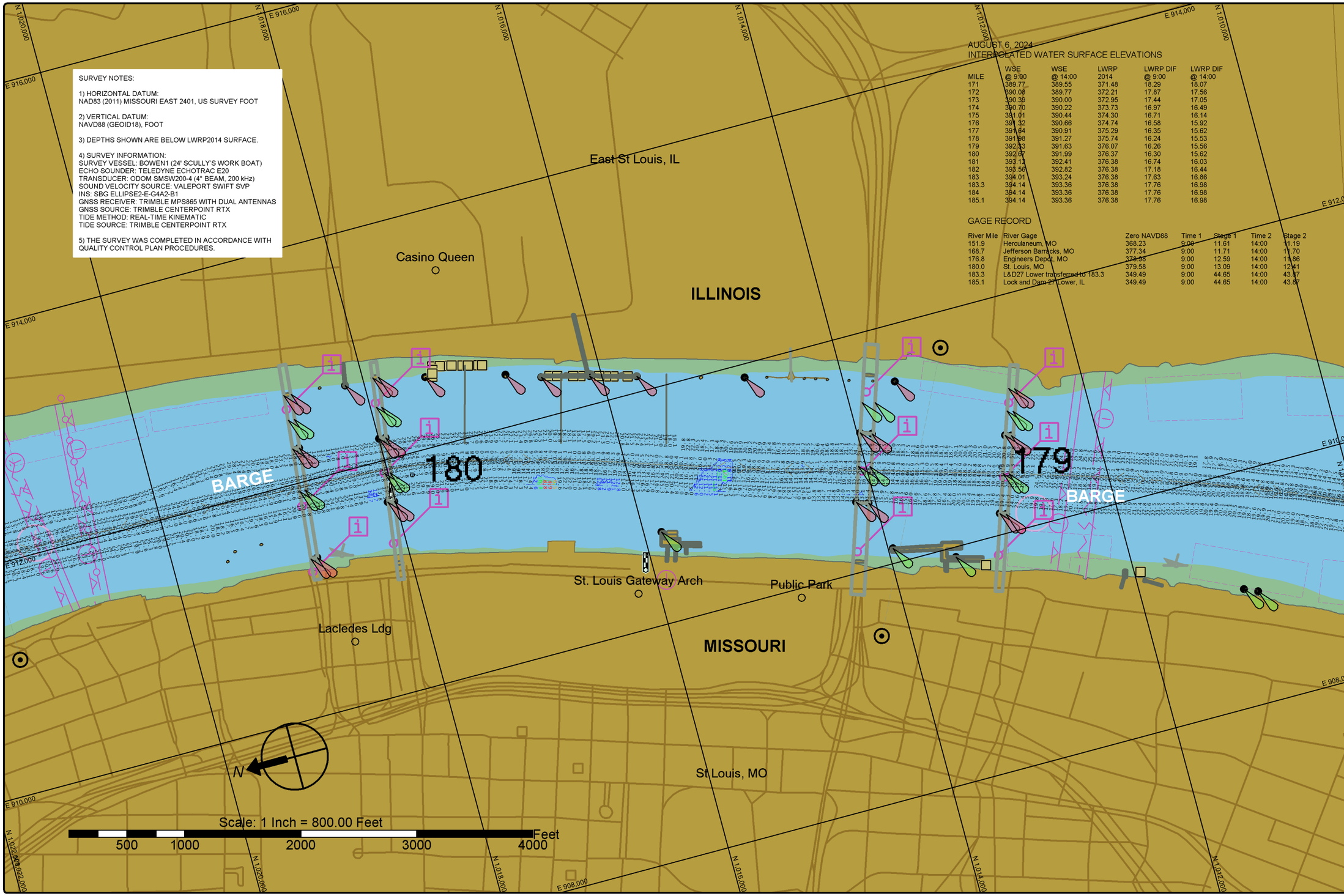
5) THE SURVEY WAS COMPLETED IN ACCORDANCE WITH QUALITY CONTROL PLAN PROCEDURES.

AUGUST 6, 2024
INTERPOLATED WATER SURFACE ELEVATIONS

| MILE | WSE @ 9:00 | WSE @ 14:00 | LWRP 2014 | LWRP DIF @ 9:00 | LWRP DIF @ 14:00 |
|---|---|---|---|---|---|
| 171 | 389.77 | 389.55 | 371.48 | 18.29 | 18.07 |
| 172 | 390.08 | 389.77 | 372.21 | 17.87 | 17.56 |
| 173 | 390.39 | 390.00 | 372.95 | 17.44 | 17.05 |
| 174 | 390.70 | 390.22 | 373.73 | 16.97 | 16.49 |
| 175 | 391.01 | 390.44 | 374.30 | 16.71 | 16.14 |
| 176 | 391.32 | 390.66 | 374.74 | 16.58 | 15.92 |
| 177 | 391.64 | 390.91 | 375.29 | 16.35 | 15.62 |
| 178 | 391.98 | 391.27 | 375.74 | 16.24 | 15.53 |
| 179 | 392.33 | 391.63 | 376.07 | 16.26 | 15.56 |
| 180 | 392.67 | 391.99 | 376.37 | 16.30 | 15.62 |
| 181 | 393.12 | 392.41 | 376.38 | 16.74 | 16.03 |
| 182 | 393.56 | 392.82 | 376.38 | 17.18 | 16.44 |
| 183 | 394.01 | 393.24 | 376.38 | 17.63 | 16.86 |
| 183.3 | 394.14 | 393.36 | 376.38 | 17.76 | 16.98 |
| 184 | 394.14 | 393.36 | 376.38 | 17.76 | 16.98 |
| 185.1 | 394.14 | 393.36 | 376.38 | 17.76 | 16.98 |

GAGE RECORD

| River Mile | River Gage | Zero NAVD88 | Time 1 | Stage 1 | Time 2 | Stage 2 |
|---|---|---|---|---|---|---|
| 151.9 | Herculaneum, MO | 368.23 | 9:00 | 11.61 | 14:00 | 11.19 |
| 168.7 | Jefferson Barracks, MO | 377.34 | 9:00 | 11.71 | 14:00 | 11.70 |
| 176.8 | Engineers Depot, MO | 378.98 | 9:00 | 12.59 | 14:00 | 11.86 |
| 180.0 | St. Louis, MO | 379.58 | 9:00 | 13.09 | 14:00 | 12.41 |
| 183.3 | L&D27 Lower transferred to 183.3 | 349.49 | 9:00 | 44.65 | 14:00 | 43.47 |
| 185.1 | Lock and Dam 27 Lower, IL | 349.49 | 9:00 | 44.65 | 14:00 | 43.87 |




St. Louis District

DATES OF SURVEY:
AUGUST 6, 2024

FILE NO.: 185_160k0624
REQUEST NO.: W912P924F0029

SCALE:
1" = 800' (ANSI B)

FIELD BOOKS:

Approved: FIELD CARTOGRAPHER
Approved: CIVIL ENGINEERING TECHNICIAN
Approved: ASST. CHIEF OF SURVEY
Approved: CHIEF OF SURVEY
Date:

U.S. ARMY CORPS OF ENGINEERS
ST. LOUIS DISTRICT
ST. LOUIS, MISSOURI

SURVEYED BY:
BOWEN ENGINEERING AND SURVEYING, P.C.
2121 MEGAN DRIVE
CAPE GIRARDEAU, MO 63701

UPPER MISSISSIPPI RIVER BASIN
MISSISSIPPI RIVER
CHANNEL PATROL
RIVER MILES 178.2 - 180.3

SHEET NO.
1 OF 1

SURVEY NOTES:

1) HORIZONTAL DATUM:
NAD83 (2011) MISSOURI EAST 2401, US SURVEY FOOT

2) VERTICAL DATUM:
NAVD88 (GEOID18), FOOT

3) DEPTHS SHOWN ARE BELOW LWRP2014 SURFACE.

4) SURVEY INFORMATION:
SURVEY VESSEL: BOWEN1 (24' SCULLY'S WORK BOAT)
ECHO SOUNDER: TELEDYNE ECHOTRAC E20
TRANSDUCER: ODOM SMSW200-4 (4° BEAM, 200 kHz)
SOUND VELOCITY SOURCE: VALEPORT SWIFT SVP
INS: SBG ELLIPSE2-E-G4A2-B1
GNSS RECEIVER: TRIMBLE MPS865 WITH DUAL ANTENNAS
GNSS SOURCE: TRIMBLE CENTERPOINT RTX
TIDE METHOD: REAL-TIME KINEMATIC
TIDE SOURCE: TRIMBLE CENTERPOINT RTX

5) THE SURVEY WAS COMPLETED IN ACCORDANCE WITH QUALITY CONTROL PLAN PROCEDURES.

AUGUST 6, 2024
INTERPOLATED WATER SURFACE ELEVATIONS

| MILE | WSE @ 9:00 | WSE @ 14:00 | LWRP 2014 | LWRP DIF @ 9:00 | LWRP DIF @ 14:00 |
|---|---|---|---|---|---|
| 171 | 389.77 | 389.55 | 371.48 | 18.29 | 18.07 |
| 172 | 390.08 | 389.77 | 372.21 | 17.87 | 17.56 |
| 173 | 390.39 | 390.00 | 372.95 | 17.44 | 17.05 |
| 174 | 390.70 | 390.22 | 373.73 | 16.97 | 16.49 |
| 175 | 391.01 | 390.44 | 374.30 | 16.71 | 16.14 |
| 176 | 391.32 | 390.66 | 374.74 | 16.58 | 15.92 |
| 177 | 391.64 | 390.91 | 375.29 | 16.35 | 15.62 |
| 178 | 391.98 | 391.27 | 375.74 | 16.24 | 15.53 |
| 179 | 392.33 | 391.63 | 376.07 | 16.26 | 15.56 |
| 180 | 392.67 | 391.99 | 376.37 | 16.30 | 15.62 |
| 181 | 393.12 | 392.41 | 376.38 | 16.74 | 16.03 |
| 182 | 393.56 | 392.82 | 376.38 | 17.18 | 16.44 |
| 183 | 394.01 | 393.24 | 376.38 | 17.63 | 16.86 |
| 183.3 | 394.14 | 393.36 | 376.38 | 17.76 | 16.98 |
| 184 | 394.14 | 393.36 | 376.38 | 17.76 | 16.98 |
| 185.1 | 394.14 | 393.36 | 376.38 | 17.76 | 16.98 |

GAGE RECORD

| River Mile | River Gage | Zero NAVD88 | Time 1 | Stage 1 | Time 2 | Stage 2 |
|---|---|---|---|---|---|---|
| 151.9 | Herculaneum, MO | 368.23 | 9:00 | 11.61 | 14:00 | 11.19 |
| 168.7 | Jefferson Barracks, MO | 377.34 | 9:00 | 11.71 | 14:00 | 11.70 |
| 176.8 | Engineers Depot, MO | 378.98 | 9:00 | 12.59 | 14:00 | 11.86 |
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| 183.3 | L&D27 Lower transferred to 183.3 | 349.49 | 9:00 | 44.65 | 14:00 | 43.87 |
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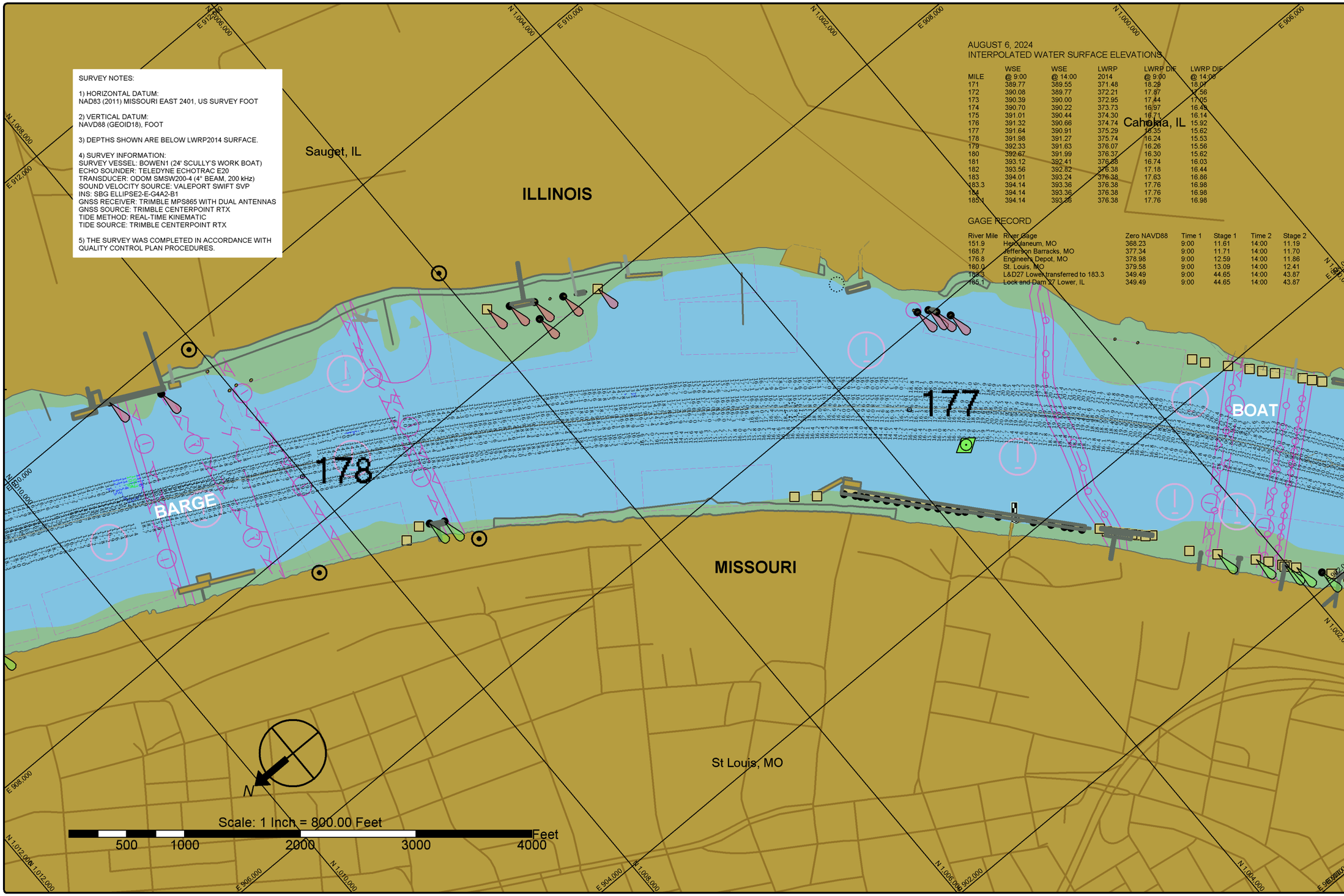



St. Louis District

DATES OF SURVEY:
AUGUST 6, 2024

FILE NO.: 185_160k0624
REQUEST NO.: W912P924F0029

SCALE:
1" = 800' (ANSI B)

FIELD BOOKS:

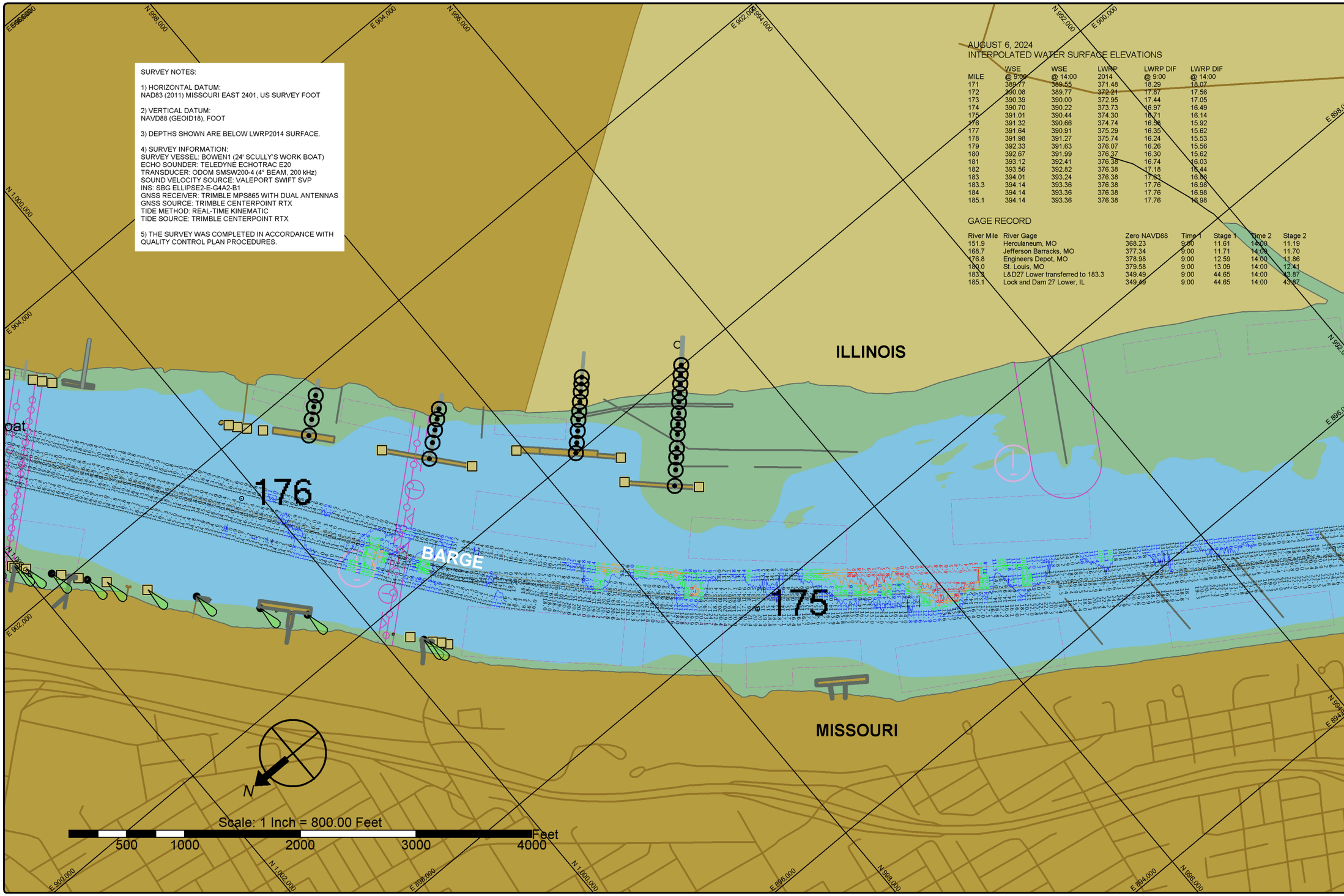
Approved: FIELD CARTOGRAPHER
Approved: CIVIL ENGINEERING TECHNICIAN
Approved: ASST. CHIEF OF SURVEY
Approved: CHIEF OF SURVEY
Date:

U.S. ARMY CORPS OF ENGINEERS
ST. LOUIS DISTRICT
ST. LOUIS, MISSOURI

SURVEYED BY:
BOWEN ENGINEERING AND SURVEYING, P.C.
2121 MEGAN DRIVE
CAPE GIRARDEAU, MO 63701

UPPER MISSISSIPPI RIVER BASIN
MISSISSIPPI RIVER
CHANNEL PATROL
RIVER MILES 176.2 - 178.2

SHEET NO.
1 OF 1




SURVEY NOTES:

1) HORIZONTAL DATUM:
NAD83 (2011) MISSOURI EAST 2401, US SURVEY FOOT

2) VERTICAL DATUM:
NAVD88 (GEOID18), FOOT

3) DEPTHS SHOWN ARE BELOW LWRP2014 SURFACE.

4) SURVEY INFORMATION:
SURVEY VESSEL: BOWEN1 (24' SCULLY'S WORK BOAT)
ECHO SOUNDER: TELEDYNE ECHOTRAC E20
TRANSDUCER: ODOM SMSW200-4 (4° BEAM, 200 kHz)
SOUND VELOCITY SOURCE: VALEPORT SWIFT SVP
INS: SBG ELLIPSE2-E-G4A2-B1
GNSS RECEIVER: TRIMBLE MPS865 WITH DUAL ANTENNAS
GNSS SOURCE: TRIMBLE CENTERPOINT RTX
TIDE METHOD: REAL-TIME KINEMATIC
TIDE SOURCE: TRIMBLE CENTERPOINT RTX

5) THE SURVEY WAS COMPLETED IN ACCORDANCE WITH QUALITY CONTROL PLAN PROCEDURES.

AUGUST 6, 2024
INTERPOLATED WATER SURFACE ELEVATIONS

| MILE | WSE @ 9:00 | WSE @ 14:00 | LWRP 2014 | LWRP DIF @ 9:00 | LWRP DIF @ 14:00 |
|---|---|---|---|---|---|
| 171 | 389.77 | 389.55 | 371.48 | 18.29 | 18.07 |
| 172 | 390.08 | 389.77 | 372.21 | 17.87 | 17.56 |
| 173 | 390.39 | 390.00 | 372.95 | 17.44 | 17.05 |
| 174 | 390.70 | 390.22 | 373.73 | 16.97 | 16.49 |
| 175 | 391.01 | 390.44 | 374.30 | 16.71 | 16.14 |
| 176 | 391.32 | 390.66 | 374.74 | 16.58 | 15.92 |
| 177 | 391.64 | 390.91 | 375.29 | 16.35 | 15.62 |
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| 179 | 392.33 | 391.63 | 376.07 | 16.26 | 15.56 |
| 180 | 392.67 | 391.99 | 376.37 | 16.30 | 15.62 |
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| 183.3 | 394.14 | 393.36 | 376.38 | 17.76 | 16.98 |
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| 185.1 | 394.14 | 393.36 | 376.38 | 17.76 | 16.98 |

GAGE RECORD

| River Mile | River Gage | Zero NAVD88 | Time 1 | Stage 1 | Time 2 | Stage 2 |
|---|---|---|---|---|---|---|
| 151.9 | Herculaneum, MO | 368.23 | 9:00 | 11.61 | 14:00 | 11.19 |
| 168.7 | Jefferson Barracks, MO | 377.34 | 9:00 | 11.71 | 14:00 | 11.70 |
| 176.8 | Engineers Depot, MO | 378.98 | 9:00 | 12.59 | 14:00 | 11.86 |
| 180.0 | St. Louis, MO | 379.58 | 9:00 | 13.09 | 14:00 | 12.41 |
| 183.3 | L&D27 Lower transferred to 183.3 | 349.49 | 9:00 | 44.65 | 14:00 | 43.87 |
| 185.1 | Lock and Dam 27 Lower, IL | 349.49 | 9:00 | 44.65 | 14:00 | 43.87 |

St. Louis District

DATES OF SURVEY:
AUGUST 6, 2024

FILE NO.: 185_160k0624
REQUEST NO.: W912P924F0029

SCALE:
1" = 800' (ANSI B)

FIELD BOOKS:

Approved: FIELD CARTOGRAPHER
Approved: CIVIL ENGINEERING TECHNICIAN
Approved: ASST CHIEF OF SURVEY
Approved: CHIEF OF SURVEY
Date:

U.S. ARMY CORPS OF ENGINEERS
ST. LOUIS DISTRICT
ST. LOUIS, MISSOURI

SURVEYED BY:
BOWEN ENGINEERING AND SURVEYING, P.C.
2121 MEDIAN DRIVE
CAPE GIRARDEAU, MO 63701

UPPER MISSISSIPPI RIVER BASIN
MISSISSIPPI RIVER
CHANNEL PATROL
RIVER MILES 174.1 - 176.2

SHEET NO.
1 OF 1

SURVEY NOTES:

1) HORIZONTAL DATUM:
NAD83 (2011) MISSOURI EAST 2401, US SURVEY FOOT

2) VERTICAL DATUM:
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3) DEPTHS SHOWN ARE BELOW LWRP2014 SURFACE.

4) SURVEY INFORMATION:
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ECHO SOUNDER: TELEDYNE ECHOTRAC E20
TRANSDUCER: ODOM SMSW200-4 (4° BEAM, 200 kHz)
SOUND VELOCITY SOURCE: VALEPORT SWIFT SVP
INS: SBG ELLIPSE2-E-G4A2-B1
GNSS RECEIVER: TRIMBLE MPS865 WITH DUAL ANTENNAS
GNSS SOURCE: TRIMBLE CENTERPOINT RTX
TIDE METHOD: REAL-TIME KINEMATIC
TIDE SOURCE: TRIMBLE CENTERPOINT RTX

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AUGUST 6, 2024
INTERPOLATED WATER SURFACE ELEVATIONS

| MILE | WSE @ 9:00 | WSE @ 14:00 | LWRP 2014 | LWRP DIF @ 9:00 | LWRP DIF @ 14:00 |
|---|---|---|---|---|---|
| 160 | 384.28 | 384.06 | 365.09 | 19.19 | 18.97 |
| 161 | 384.83 | 384.63 | 365.70 | 19.13 | 18.93 |
| 162 | 385.38 | 385.20 | 366.31 | 19.07 | 18.89 |
| 163 | 385.93 | 385.78 | 366.91 | 19.02 | 18.87 |
| 164 | 386.47 | 386.35 | 367.52 | 18.95 | 18.83 |
| 165 | 387.02 | 386.92 | 368.03 | 18.99 | 18.89 |
| 166 | 387.57 | 387.49 | 368.31 | 19.26 | 19.18 |
| 167 | 388.12 | 388.07 | 368.58 | 19.54 | 19.49 |
| 168 | 388.67 | 388.64 | 369.21 | 19.46 | 19.43 |
| 169 | 389.14 | 389.11 | 369.97 | 19.17 | 19.14 |
| 170 | 389.45 | 389.33 | 370.74 | 18.71 | 18.59 |
| 171 | 389.77 | 389.55 | 371.48 | 18.29 | 18.07 |
| 172 | 390.08 | 389.77 | 372.21 | 17.87 | 17.56 |
| 173 | 390.39 | 390.00 | 372.95 | 17.44 | 17.05 |
| 174 | 390.70 | 390.22 | 373.73 | 16.97 | 16.49 |
| 175 | 391.01 | 390.44 | 374.30 | 16.71 | 16.14 |

GAGE RECORD

| River Mile | River Gage | Zero NAVD88 | Time 1 | Stage 1 | Time 2 | Stage 2 |
|---|---|---|---|---|---|---|
| 151.9 | Herculaneum, MO | 368.23 | 9:00 | 11.61 | 14:00 | 11.19 |
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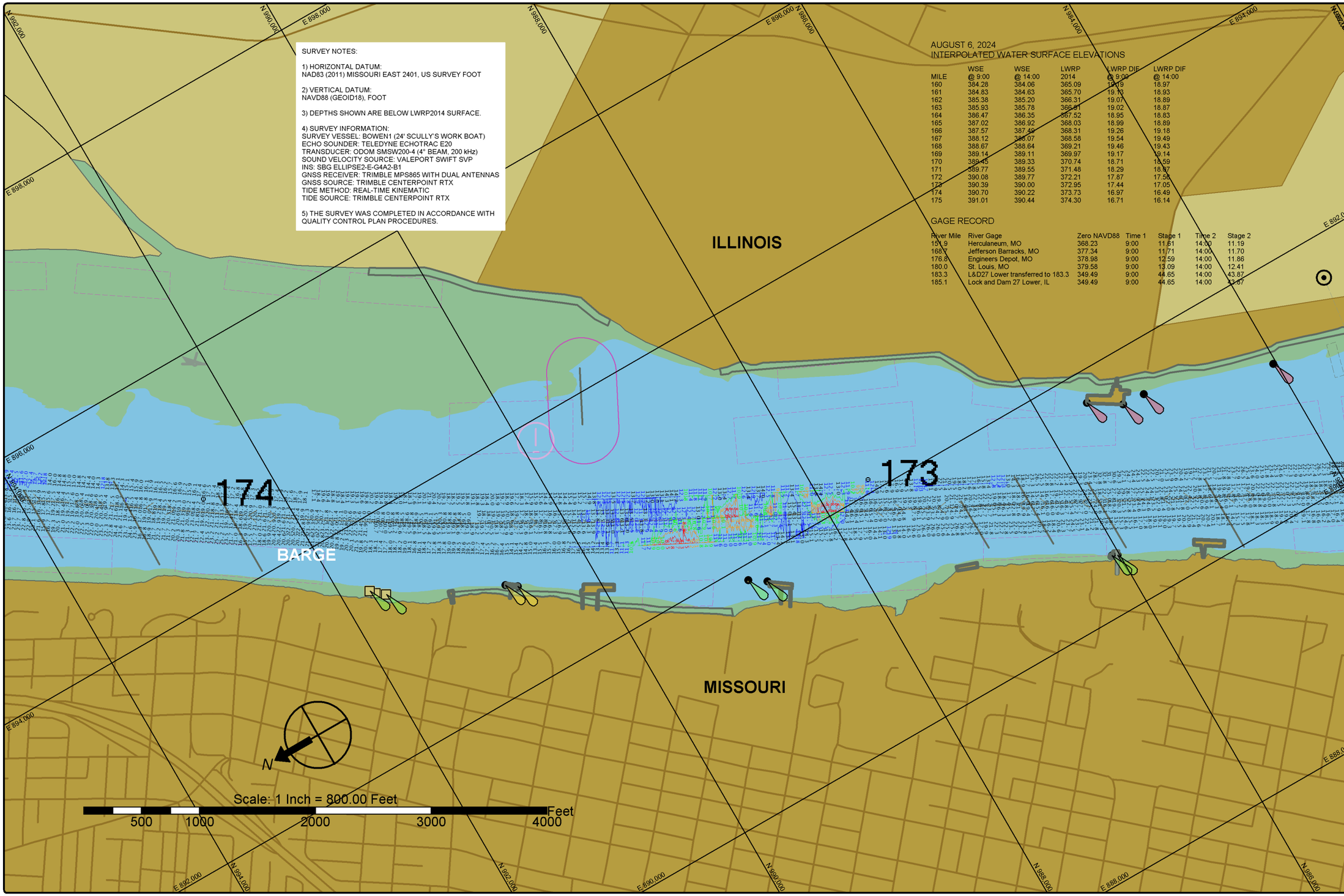
| 180.0 | St. Louis, MO | 379.58 | 9:00 | 13.09 | 14:00 | 12.41 |
| 183.3 | L&D27 Lower transferred to 183.3 | 349.49 | 9:00 | 44.65 | 14:00 | 43.87 |
| 185.1 | Lock and Dam 27 Lower, IL | 349.49 | 9:00 | 44.65 | 14:00 | 43.87 |




St. Louis District

DATES OF SURVEY:
AUGUST 6, 2024

FILE NO.: 185_160k0624
REQUEST NO.: W912P924F0029

SCALE:
1" = 800' (ANSI B)

FIELD BOOKS:

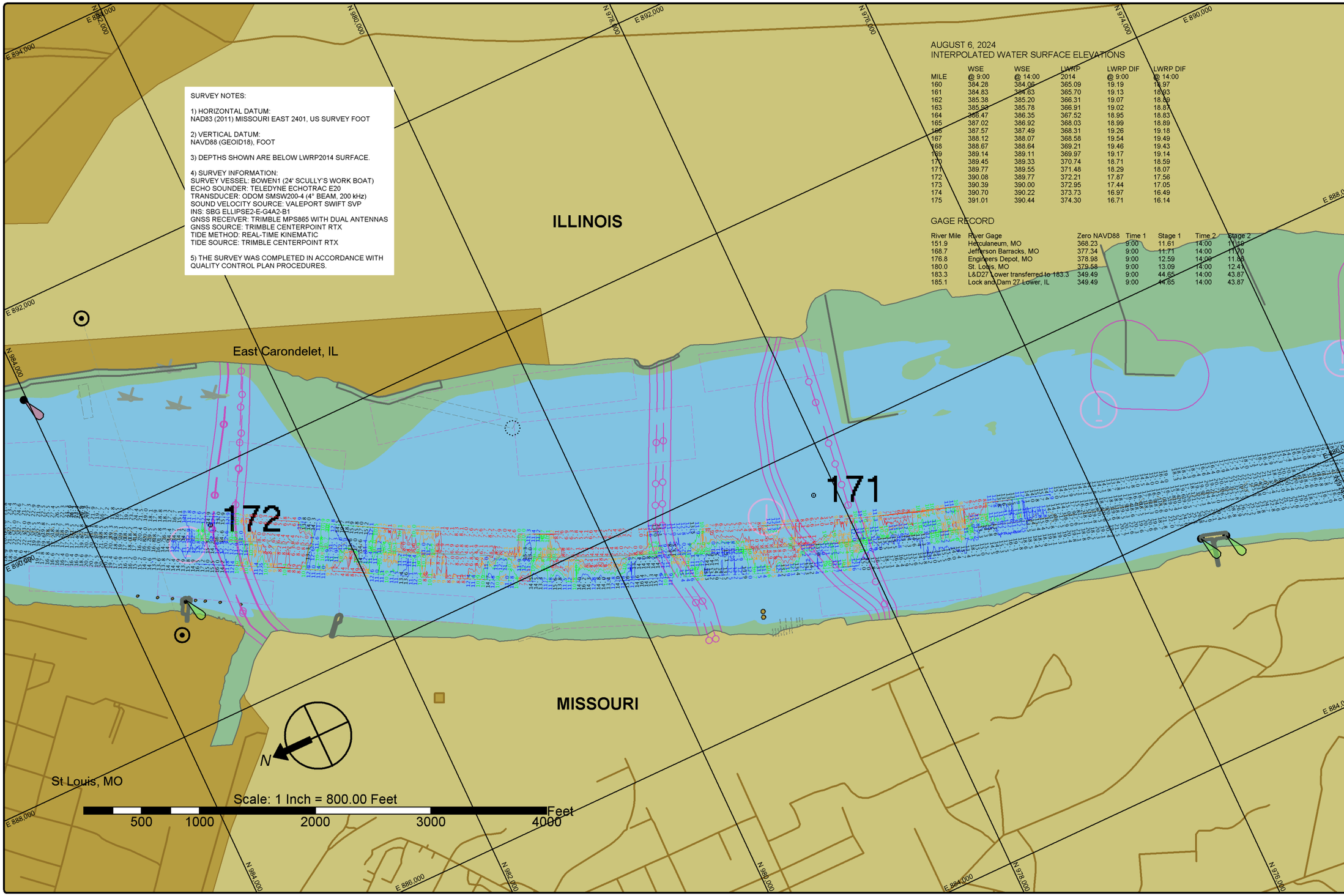
Approved: FIELD CARTOGRAPHER
Approved: CIVIL ENGINEERING TECHNICIAN
Approved: ASST. CHIEF OF SURVEY
Approved: CHIEF OF SURVEY
Date:

U.S. ARMY CORPS OF ENGINEERS
ST. LOUIS DISTRICT
ST. LOUIS, MISSOURI

SURVEYED BY:
BOWEN ENGINEERING AND SURVEYING, P.C.
2121 MEGAN DRIVE
CAPE GIRARDEAU, MO 63701

UPPER MISSISSIPPI RIVER BASIN
MISSISSIPPI RIVER
CHANNEL PATROL
RIVER MILES 172.2 - 174.1

SHEET NO.
1 OF 1




SURVEY NOTES:

1) HORIZONTAL DATUM:
NAD83 (2011) MISSOURI EAST 2401, US SURVEY FOOT

2) VERTICAL DATUM:
NAVD88 (GEOID18), FOOT

3) DEPTHS SHOWN ARE BELOW LWRP2014 SURFACE.

4) SURVEY INFORMATION:
SURVEY VESSEL: BOWEN1 (24' SCULLY'S WORK BOAT)
ECHO SOUNDER: TELEDYNE ECHOTRAC E20
TRANSDUCER: ODOM SMSW200-4 (4° BEAM, 200 kHz)
SOUND VELOCITY SOURCE: VALEPORT SWIFT SVP
INS: SBG ELLIPSE2-E-G4A2-B1
GNSS RECEIVER: TRIMBLE MPS865 WITH DUAL ANTENNAS
GNSS SOURCE: TRIMBLE CENTERPOINT RTX
TIDE METHOD: REAL-TIME KINEMATIC
TIDE SOURCE: TRIMBLE CENTERPOINT RTX

5) THE SURVEY WAS COMPLETED IN ACCORDANCE WITH QUALITY CONTROL PLAN PROCEDURES.

AUGUST 6, 2024
INTERPOLATED WATER SURFACE ELEVATIONS

| MILE | WSE @ 9:00 | WSE @ 14:00 | LWRP 2014 | LWRP DIF @ 9:00 | LWRP DIF @ 14:00 |
|---|---|---|---|---|---|
| 160 | 384.28 | 384.05 | 365.09 | 19.19 | 18.97 |
| 161 | 384.83 | 384.63 | 365.70 | 19.13 | 18.93 |
| 162 | 385.38 | 385.20 | 366.31 | 19.07 | 18.89 |
| 163 | 385.93 | 385.78 | 366.91 | 19.02 | 18.87 |
| 164 | 386.47 | 386.35 | 367.52 | 18.95 | 18.83 |
| 165 | 387.02 | 386.92 | 368.03 | 18.99 | 18.89 |
| 166 | 387.57 | 387.49 | 368.31 | 19.26 | 19.18 |
| 167 | 388.12 | 388.07 | 368.58 | 19.54 | 19.49 |
| 168 | 388.67 | 388.64 | 369.21 | 19.46 | 19.43 |
| 169 | 389.14 | 389.11 | 369.97 | 19.17 | 19.14 |
| 170 | 389.45 | 389.33 | 370.74 | 18.71 | 18.59 |
| 171 | 389.77 | 389.55 | 371.48 | 18.29 | 18.07 |
| 172 | 390.08 | 389.77 | 372.21 | 17.87 | 17.56 |
| 173 | 390.39 | 390.00 | 372.95 | 17.44 | 17.05 |
| 174 | 390.70 | 390.22 | 373.73 | 16.97 | 16.49 |
| 175 | 391.01 | 390.44 | 374.30 | 16.71 | 16.14 |

GAGE RECORD

| River Mile | River Gage | Zero NAVD88 | Time 1 | Stage 1 | Time 2 | Stage 2 |
|---|---|---|---|---|---|---|
| 151.9 | Herculaneum, MO | 368.23 | 9:00 | 11.61 | 14:00 | 11.19 |
| 168.7 | Jefferson Barracks, MO | 377.34 | 9:00 | 11.71 | 14:00 | 11.70 |
| 176.8 | Engineers Depot, MO | 378.98 | 9:00 | 12.59 | 14:00 | 11.86 |
| 180.0 | St. Louis, MO | 379.58 | 9:00 | 13.09 | 14:00 | 12.41 |
| 183.3 | L&D27 Lower transferred to 183.3 | 349.49 | 9:00 | 44.65 | 14:00 | 43.87 |
| 185.1 | Lock and Dam 27 Lower, IL | 349.49 | 9:00 | 44.65 | 14:00 | 43.87 |

St. Louis District

DATES OF SURVEY:
AUGUST 6, 2024

FILE NO.: 185_160k0624
REQUEST NO.: W912P924F0029

SCALE:
1" = 800' (ANSI B)

FIELD BOOKS:

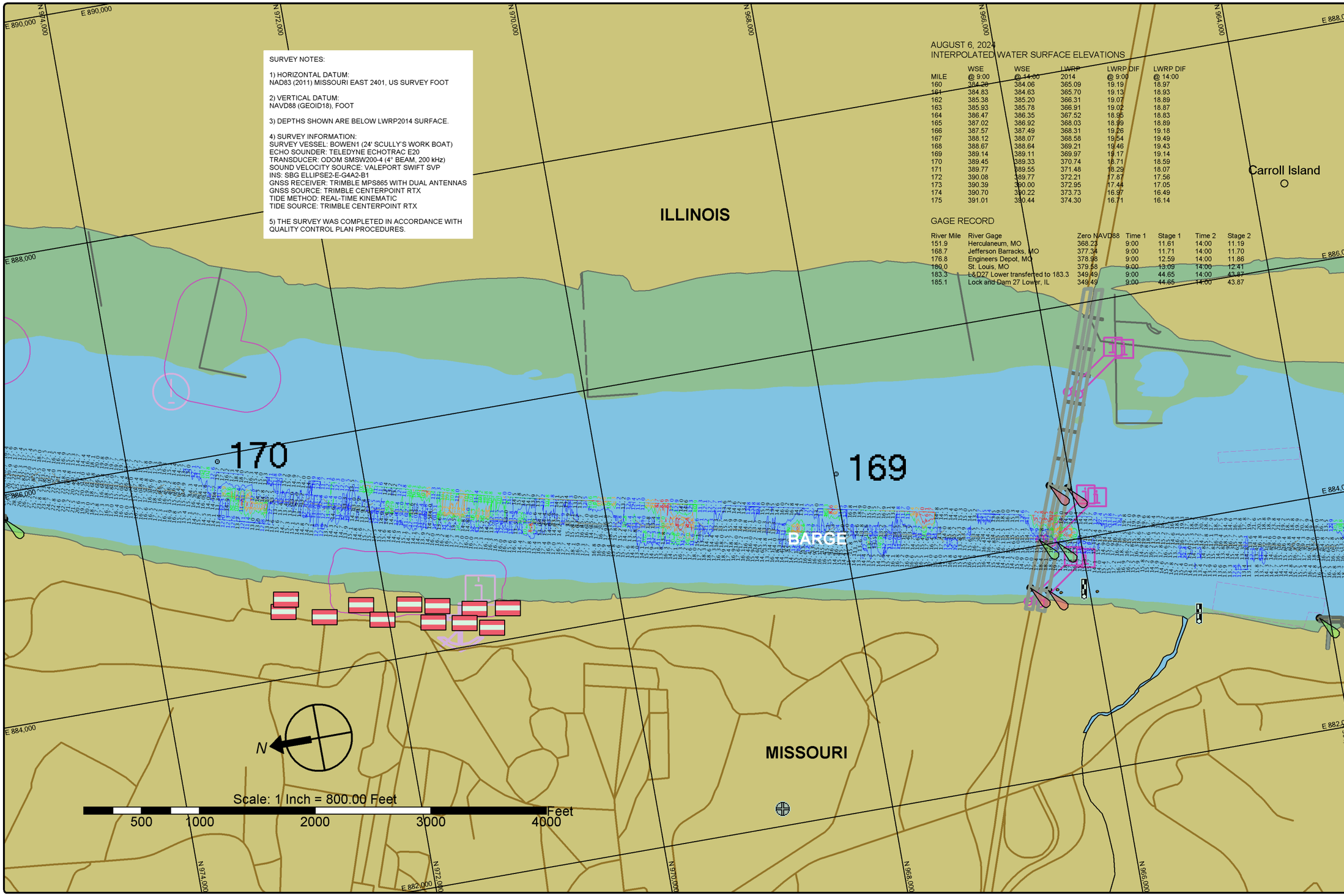
Approved: FIELD CARTOGRAPHER
Approved: CIVIL ENGINEERING TECHNICIAN
Approved: ASST. CHIEF OF SURVEY
Approved: CHIEF OF SURVEY
Date:

U.S. ARMY CORPS OF ENGINEERS
ST. LOUIS DISTRICT
ST. LOUIS, MISSOURI

SURVEYED BY:
BOWEN ENGINEERING AND SURVEYING, P.C.
2121 MEGAN DRIVE
CAPE GIRARDEAU, MO 63701

UPPER MISSISSIPPI RIVER BASIN
MISSISSIPPI RIVER
CHANNEL PATROL
RIVER MILES 170.1 - 172.2

SHEET NO.
1 OF 1




SURVEY NOTES:

1) HORIZONTAL DATUM:
NAD83 (2011) MISSOURI EAST 2401, US SURVEY FOOT

2) VERTICAL DATUM:
NAVD88 (GEOID18), FOOT

3) DEPTHS SHOWN ARE BELOW LWRP2014 SURFACE.

4) SURVEY INFORMATION:
SURVEY VESSEL: BOWEN1 (24' SCULLY'S WORK BOAT)
ECHO SOUNDER: TELEDYNE ECHOTRAC E20
TRANSDUCER: ODOM SMSW200-4 (4° BEAM, 200 kHz)
SOUND VELOCITY SOURCE: VALEPORT SWIFT SVP
INS: SBG ELLIPSE2-E-G4A2-B1
GNSS RECEIVER: TRIMBLE MPS865 WITH DUAL ANTENNAS
GNSS SOURCE: TRIMBLE CENTERPOINT RTX
TIDE METHOD: REAL-TIME KINEMATIC
TIDE SOURCE: TRIMBLE CENTERPOINT RTX

5) THE SURVEY WAS COMPLETED IN ACCORDANCE WITH QUALITY CONTROL PLAN PROCEDURES.

AUGUST 6, 2024
INTERPOLATED WATER SURFACE ELEVATIONS

| MILE | WSE @ 9:00 | WSE @ 14:00 | LWRP 2014 | LWRP DIF @ 9:00 | LWRP DIF @ 14:00 |
|---|---|---|---|---|---|
| 160 | 384.28 | 384.06 | 365.09 | 19.19 | 18.97 |
| 161 | 384.83 | 384.63 | 365.70 | 19.13 | 18.93 |
| 162 | 385.38 | 385.20 | 366.31 | 19.07 | 18.89 |
| 163 | 385.93 | 385.78 | 366.91 | 19.02 | 18.87 |
| 164 | 386.47 | 386.35 | 367.52 | 18.95 | 18.83 |
| 165 | 387.02 | 386.92 | 368.03 | 18.99 | 18.89 |
| 166 | 387.57 | 387.49 | 368.31 | 19.26 | 19.18 |
| 167 | 388.12 | 388.07 | 368.58 | 19.54 | 19.49 |
| 168 | 388.67 | 388.64 | 369.21 | 19.46 | 19.43 |
| 169 | 389.14 | 389.11 | 369.97 | 19.17 | 19.14 |
| 170 | 389.45 | 389.33 | 370.74 | 18.71 | 18.59 |
| 171 | 389.77 | 389.55 | 371.48 | 18.29 | 18.07 |
| 172 | 390.08 | 389.77 | 372.21 | 17.87 | 17.56 |
| 173 | 390.39 | 390.00 | 372.95 | 17.44 | 17.05 |
| 174 | 390.70 | 390.22 | 373.73 | 16.97 | 16.49 |
| 175 | 391.01 | 390.44 | 374.30 | 16.71 | 16.14 |

GAGE RECORD

| River Mile | River Gage | Zero NAVD88 | Time 1 | Stage 1 | Time 2 | Stage 2 |
|---|---|---|---|---|---|---|
| 151.9 | Herculaneum, MO | 368.23 | 9:00 | 11.61 | 14:00 | 11.19 |
| 168.7 | Jefferson Barracks, MO | 377.34 | 9:00 | 11.71 | 14:00 | 11.70 |
| 176.8 | Engineers Depot, MO | 378.98 | 9:00 | 12.59 | 14:00 | 11.86 |
| 180.0 | St. Louis, MO | 379.58 | 9:00 | 13.09 | 14:00 | 12.41 |
| 183.3 | L&D27 Lower transferred to 183.3 | 349.49 | 9:00 | 44.65 | 14:00 | 43.87 |
| 185.1 | Lock and Dam 27 Lower, IL | 349.49 | 9:00 | 44.65 | 14:00 | 43.87 |

St. Louis District

DATES OF SURVEY:
AUGUST 6, 2024

FILE NO.: 189_160k0624
REQUEST NO.: W912P924F0029

SCALE:
1" = 800' (ANSI B)

FIELD BOOKS:

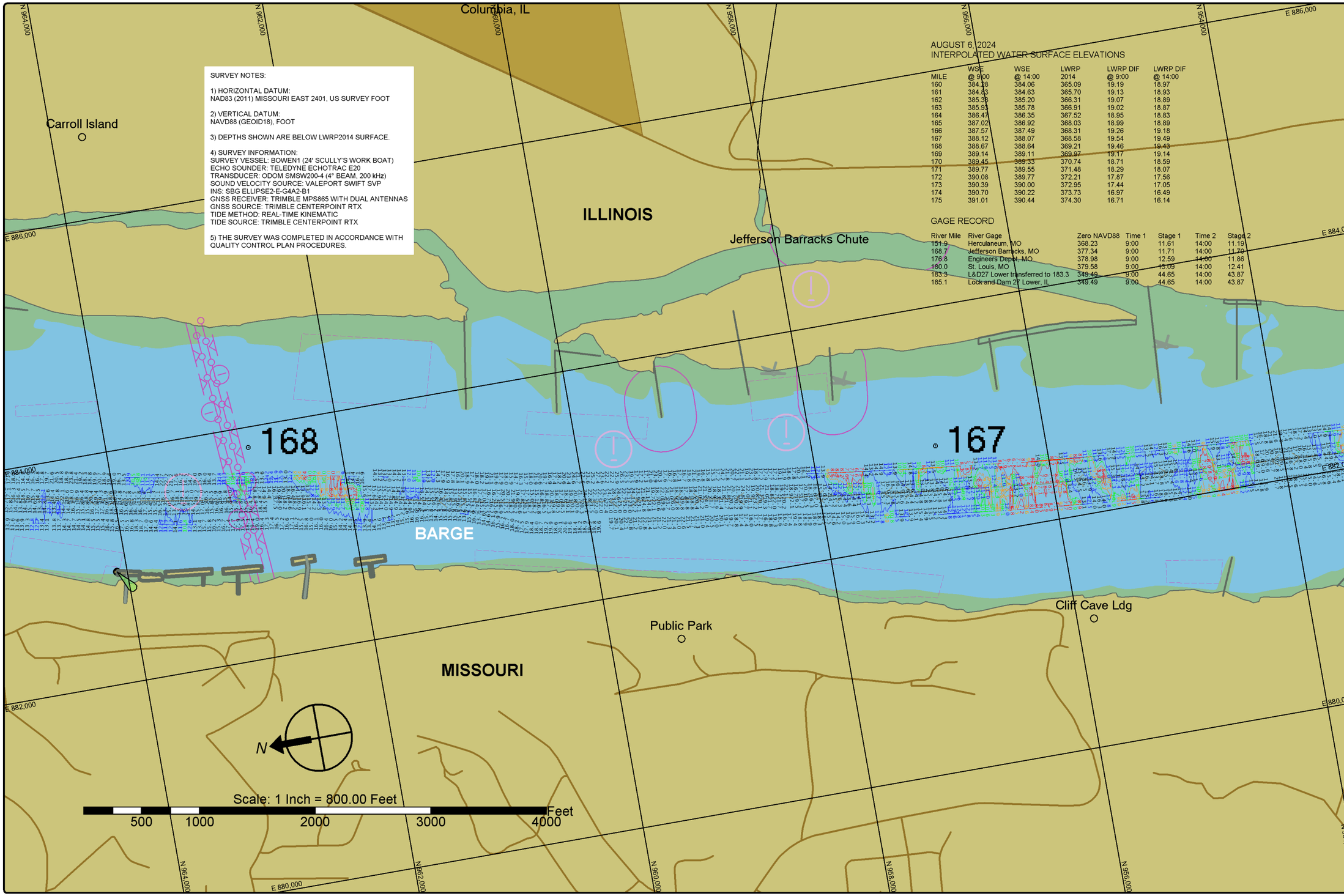
Approved: FIELD CARTOGRAPHER
Approved: CIVIL ENGINEERING TECHNICIAN
Approved: ASST. CHIEF OF SURVEY
Approved: CHIEF OF SURVEY
Date:

U.S. ARMY CORPS OF ENGINEERS
ST. LOUIS DISTRICT
ST. LOUIS, MISSOURI

SURVEYED BY:
BOWEN ENGINEERING AND SURVEYING, P.C.
2121 MEGAN DRIVE
CAPE GIRARDEAU, MO 63701

UPPER MISSISSIPPI RIVER BASIN
MISSISSIPPI RIVER
CHANNEL PATROL
RIVER MILES 168.2 - 170.1

SHEET NO.
1 OF 1




SURVEY NOTES:

1) HORIZONTAL DATUM:
NAD83 (2011) MISSOURI EAST 2401, US SURVEY FOOT

2) VERTICAL DATUM:
NAVD88 (GEOID18), FOOT

3) DEPTHS SHOWN ARE BELOW LWRP2014 SURFACE.

4) SURVEY INFORMATION:
SURVEY VESSEL: BOWEN1 (24' SCULLY'S WORK BOAT)
ECHO SOUNDER: TELEDYNE ECHOTRAC E20
TRANSDUCER: ODOM SMSW200-4 (4° BEAM, 200 kHz)
SOUND VELOCITY SOURCE: VALEPORT SWIFT SVP
INS: SBG ELLIPSE2-E-G4A2-B1
GNSS RECEIVER: TRIMBLE MPS865 WITH DUAL ANTENNAS
GNSS SOURCE: TRIMBLE CENTERPOINT RTX
TIDE METHOD: REAL-TIME KINEMATIC
TIDE SOURCE: TRIMBLE CENTERPOINT RTX

5) THE SURVEY WAS COMPLETED IN ACCORDANCE WITH QUALITY CONTROL PLAN PROCEDURES.

AUGUST 6, 2024
INTERPOLATED WATER SURFACE ELEVATIONS

| MILE | WSE @ 9:00 | WSE @ 14:00 | LWRP 2014 | LWRP DIF @ 9:00 | LWRP DIF @ 14:00 |
|---|---|---|---|---|---|
| 160 | 384.18 | 384.06 | 365.09 | 19.19 | 18.97 |
| 161 | 384.83 | 384.63 | 365.70 | 19.13 | 18.93 |
| 162 | 385.38 | 385.20 | 366.31 | 19.07 | 18.89 |
| 163 | 385.93 | 385.78 | 366.91 | 19.02 | 18.87 |
| 164 | 386.47 | 386.35 | 367.52 | 18.95 | 18.83 |
| 165 | 387.02 | 386.92 | 368.03 | 18.99 | 18.89 |
| 166 | 387.57 | 387.49 | 368.31 | 19.26 | 19.18 |
| 167 | 388.12 | 388.07 | 368.58 | 19.54 | 19.49 |
| 168 | 388.67 | 388.64 | 369.21 | 19.46 | 19.43 |
| 169 | 389.14 | 389.11 | 369.97 | 19.17 | 19.14 |
| 170 | 389.45 | 389.33 | 370.74 | 18.71 | 18.59 |
| 171 | 389.77 | 389.55 | 371.48 | 18.29 | 18.07 |
| 172 | 390.08 | 389.77 | 372.21 | 17.87 | 17.56 |
| 173 | 390.39 | 390.00 | 372.95 | 17.44 | 17.05 |
| 174 | 390.70 | 390.22 | 373.73 | 16.97 | 16.49 |
| 175 | 391.01 | 390.44 | 374.30 | 16.71 | 16.14 |

GAGE RECORD

| River Mile | River Gage | Zero NAVD88 | Time 1 | Stage 1 | Time 2 | Stage 2 |
|---|---|---|---|---|---|---|
| 151.9 | Herculaneum, MO | 368.23 | 9:00 | 11.61 | 14:00 | 11.19 |
| 168.7 | Jefferson Barracks, MO | 377.34 | 9:00 | 11.71 | 14:00 | 11.70 |
| 176.8 | Engineers Depot, MO | 378.98 | 9:00 | 12.59 | 14:00 | 11.86 |
| 180.0 | St. Louis, MO | 379.58 | 9:00 | 13.09 | 14:00 | 12.41 |
| 183.3 | L&D27 Lower transferred to 183.3 | 349.49 | 9:00 | 44.65 | 14:00 | 43.87 |
| 185.1 | Lock and Dam 27 Lower, IL | 349.49 | 9:00 | 44.65 | 14:00 | 43.87 |

St. Louis District

DATES OF SURVEY:
AUGUST 6, 2024

FILE NO.: 185_160k0624
REQUEST NO.: W912P924F0029

SCALE:
1" = 800' (ANSI B)

FIELD BOOKS:

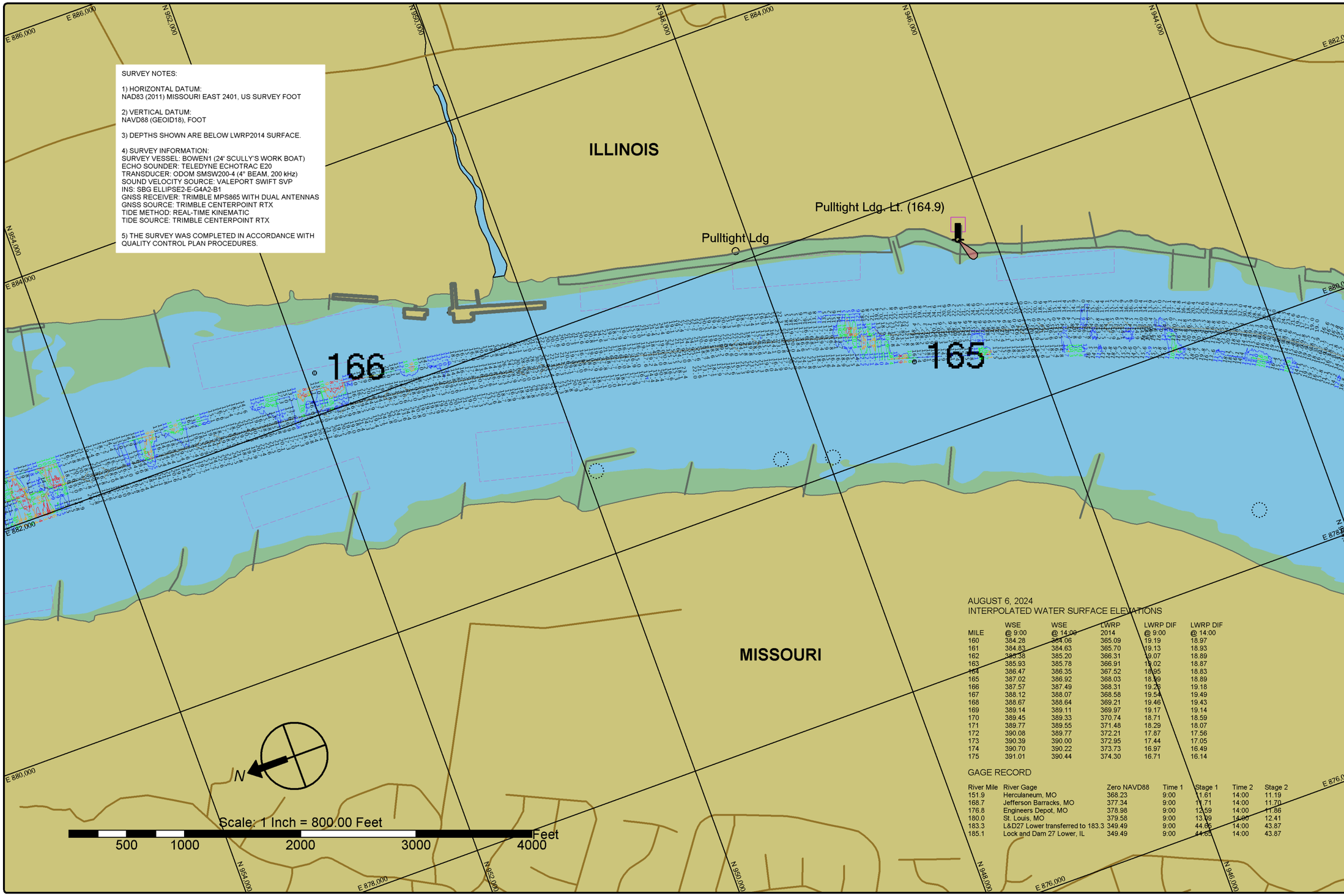
Approved: FIELD CARTOGRAPHER
Approved: CIVIL ENGINEERING TECHNICIAN
Approved: ASST. CHIEF OF SURVEY
Approved: CHIEF OF SURVEY
Date:

U.S. ARMY CORPS OF ENGINEERS
ST. LOUIS DISTRICT
ST. LOUIS, MISSOURI

SURVEYED BY:
BOWEN ENGINEERING AND SURVEYING, P.C.
2121 MEGAN DRIVE
CAPE GIRARDEAU, MO 63701

UPPER MISSISSIPPI RIVER BASIN
MISSISSIPPI RIVER
CHANNEL PATROL
RIVER MILES 166.3 - 168.2

SHEET NO.
1 OF 1




SURVEY NOTES:

1) HORIZONTAL DATUM:
NAD83 (2011) MISSOURI EAST 2401, US SURVEY FOOT

2) VERTICAL DATUM:
NAVD88 (GEOID18), FOOT

3) DEPTHS SHOWN ARE BELOW LWRP2014 SURFACE.

4) SURVEY INFORMATION:
SURVEY VESSEL: BOWEN1 (24' SCULLY'S WORK BOAT)
ECHO SOUNDER: TELEDYNE ECHOTRAC E20
TRANSDUCER: ODOM SMSW200-4 (4° BEAM, 200 kHz)
SOUND VELOCITY SOURCE: VALEPORT SWIFT SVP
INS: SBG ELLIPSE2-E-G4A2-B1
GNSS RECEIVER: TRIMBLE MPS865 WITH DUAL ANTENNAS
GNSS SOURCE: TRIMBLE CENTERPOINT RTX
TIDE METHOD: REAL-TIME KINEMATIC
TIDE SOURCE: TRIMBLE CENTERPOINT RTX

5) THE SURVEY WAS COMPLETED IN ACCORDANCE WITH QUALITY CONTROL PLAN PROCEDURES.

AUGUST 6, 2024
INTERPOLATED WATER SURFACE ELEVATIONS

| MILE | WSE @ 9:00 | WSE @ 14:00 | LWRP 2014 | LWRP DIF @ 9:00 | LWRP DIF @ 14:00 |
|---|---|---|---|---|---|
| 160 | 384.28 | 384.06 | 365.09 | 19.19 | 18.97 |
| 161 | 384.83 | 384.63 | 365.70 | 19.13 | 18.93 |
| 162 | 385.38 | 385.20 | 366.31 | 19.07 | 18.89 |
| 163 | 385.93 | 385.78 | 366.91 | 19.02 | 18.87 |
| 164 | 386.47 | 386.35 | 367.52 | 18.95 | 18.83 |
| 165 | 387.02 | 386.92 | 368.03 | 18.99 | 18.89 |
| 166 | 387.57 | 387.49 | 368.31 | 19.26 | 19.18 |
| 167 | 388.12 | 388.07 | 368.58 | 19.54 | 19.49 |
| 168 | 388.67 | 388.64 | 369.21 | 19.46 | 19.43 |
| 169 | 389.14 | 389.11 | 369.97 | 19.17 | 19.14 |
| 170 | 389.45 | 389.33 | 370.74 | 18.71 | 18.59 |
| 171 | 389.77 | 389.55 | 371.48 | 18.29 | 18.07 |
| 172 | 390.08 | 389.77 | 372.21 | 17.87 | 17.56 |
| 173 | 390.39 | 390.00 | 372.95 | 17.44 | 17.05 |
| 174 | 390.70 | 390.22 | 373.73 | 16.97 | 16.49 |
| 175 | 391.01 | 390.44 | 374.30 | 16.71 | 16.14 |

GAGE RECORD

| River Mile | River Gage | Zero NAVD88 | Time 1 | Stage 1 | Time 2 | Stage 2 |
|---|---|---|---|---|---|---|
| 151.9 | Herculaneum, MO | 368.23 | 9:00 | 11.61 | 14:00 | 11.19 |
| 168.7 | Jefferson Barracks, MO | 377.34 | 9:00 | 11.71 | 14:00 | 11.70 |
| 176.8 | Engineers Depot, MO | 378.98 | 9:00 | 12.59 | 14:00 | 11.86 |
| 180.0 | St. Louis, MO | 379.58 | 9:00 | 13.09 | 14:00 | 12.41 |
| 183.3 | L&D27 Lower transferred to 183.3 | 349.49 | 9:00 | 44.66 | 14:00 | 43.87 |
| 185.1 | Lock and Dam 27 Lower, IL | 349.49 | 9:00 | 44.65 | 14:00 | 43.87 |

St. Louis District

DATES OF SURVEY:
AUGUST 6, 2024

FILE NO.: 185_160k0624
REQUEST NO.: W912P924F0029

SCALE:
1" = 800' (ANSI B)

FIELD BOOKS:

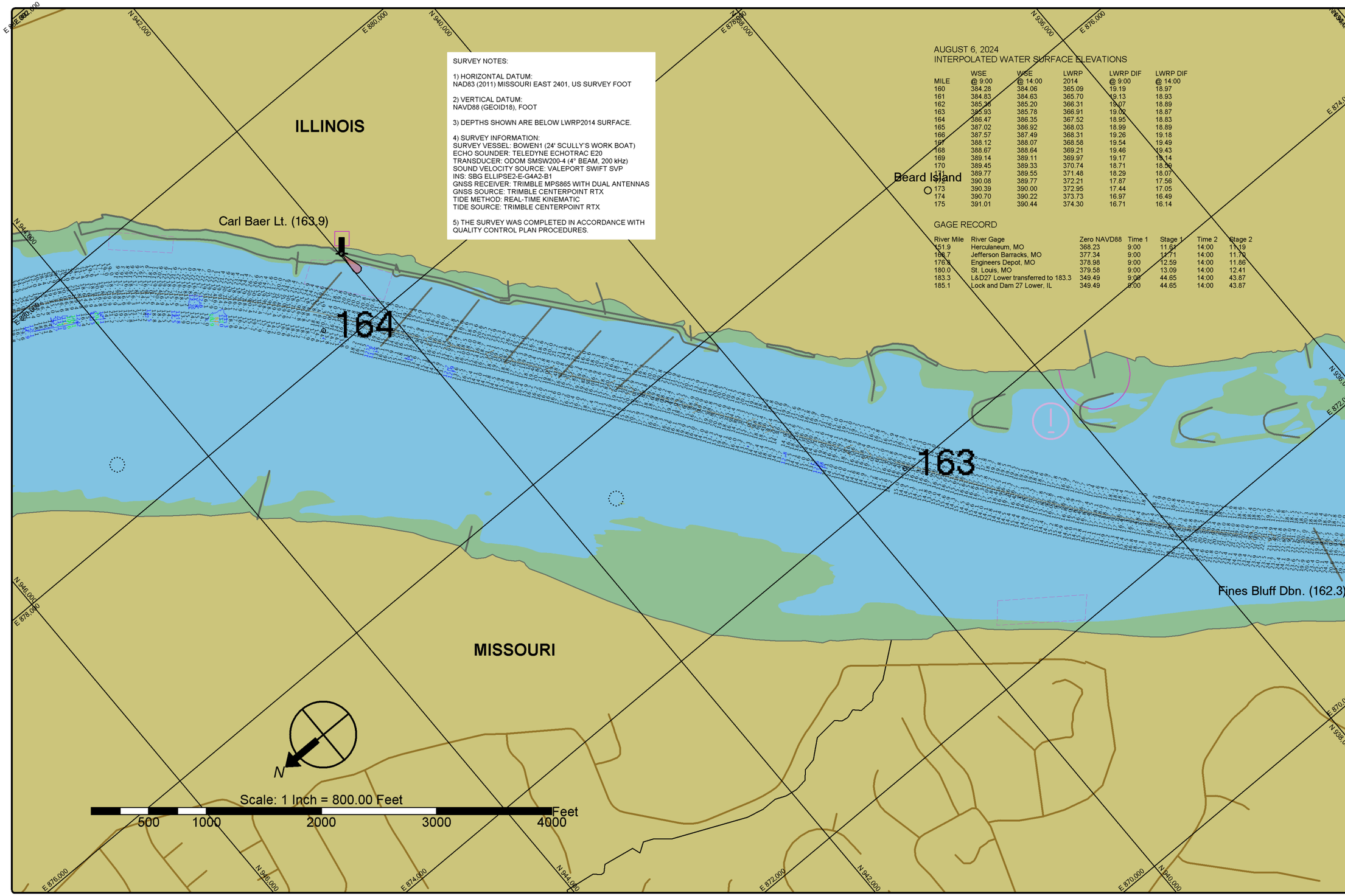
Approved: FIELD CARTOGRAPHER
Approved: CIVIL ENGINEERING TECHNICIAN
Approved: ASST. CHIEF OF SURVEY
Approved: CHIEF OF SURVEY
Date:

U.S. ARMY CORPS OF ENGINEERS
ST. LOUIS DISTRICT
ST. LOUIS, MISSOURI

SURVEYED BY:
BOWEN ENGINEERING AND SURVEYING, P.C.
2121 MEGAN DRIVE
CAPE GIRARDEAU, MO 63701

UPPER MISSISSIPPI RIVER BASIN
MISSISSIPPI RIVER
CHANNEL PATROL
RIVER MILES 164.3 - 166.3

SHEET NO.
1 OF 1




SURVEY NOTES:

1) HORIZONTAL DATUM:
NAD83 (2011) MISSOURI EAST 2401, US SURVEY FOOT

2) VERTICAL DATUM:
NAVD88 (GEOID18), FOOT

3) DEPTHS SHOWN ARE BELOW LWRP2014 SURFACE.

4) SURVEY INFORMATION:
SURVEY VESSEL: BOWEN1 (24' SCULLY'S WORK BOAT)
ECHO SOUNDER: TELEDYNE ECHOTRAC E20
TRANSDUCER: ODOM SMSW200-4 (4° BEAM, 200 kHz)
SOUND VELOCITY SOURCE: VALEPORT SWIFT SVP
INS: SBG ELLIPSE2-E-G4A2-B1
GNSS RECEIVER: TRIMBLE MPS865 WITH DUAL ANTENNAS
GNSS SOURCE: TRIMBLE CENTERPOINT RTX
TIDE METHOD: REAL-TIME KINEMATIC
TIDE SOURCE: TRIMBLE CENTERPOINT RTX

5) THE SURVEY WAS COMPLETED IN ACCORDANCE WITH QUALITY CONTROL PLAN PROCEDURES.

AUGUST 6, 2024
INTERPOLATED WATER SURFACE ELEVATIONS

| MILE | WSE @ 9:00 | WSE @ 14:00 | LWRP 2014 | LWRP DIF @ 9:00 | LWRP DIF @ 14:00 |
|---|---|---|---|---|---|
| 160 | 384.28 | 384.06 | 365.09 | 19.19 | 18.97 |
| 161 | 384.83 | 384.63 | 365.70 | 19.13 | 18.93 |
| 162 | 385.36 | 385.20 | 366.31 | 19.07 | 18.89 |
| 163 | 385.93 | 385.78 | 366.91 | 19.02 | 18.87 |
| 164 | 386.47 | 386.35 | 367.52 | 18.95 | 18.83 |
| 165 | 387.02 | 386.92 | 368.03 | 18.99 | 18.89 |
| 166 | 387.57 | 387.49 | 368.31 | 19.26 | 19.18 |
| 167 | 388.12 | 388.07 | 368.58 | 19.54 | 19.49 |
| 168 | 388.67 | 388.64 | 369.21 | 19.46 | 19.43 |
| 169 | 389.14 | 389.11 | 369.97 | 19.17 | 19.14 |
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| 173 | 390.39 | 390.00 | 372.95 | 17.44 | 17.05 |
| 174 | 390.70 | 390.22 | 373.73 | 16.97 | 16.49 |
| 175 | 391.01 | 390.44 | 374.30 | 16.71 | 16.14 |

GAGE RECORD

| River Mile | River Gage | Zero NAVD88 | Time 1 | Stage 1 | Time 2 | Stage 2 |
|---|---|---|---|---|---|---|
| 151.9 | Herculaneum, MO | 368.23 | 9:00 | 11.61 | 14:00 | 11.19 |
| 166.7 | Jefferson Barracks, MO | 377.34 | 9:00 | 11.71 | 14:00 | 11.70 |
| 176.8 | Engineers Depot, MO | 378.98 | 9:00 | 12.59 | 14:00 | 11.86 |
| 180.0 | St. Louis, MO | 379.58 | 9:00 | 13.09 | 14:00 | 12.41 |
| 183.3 | L&D27 Lower transferred to 183.3 | 349.49 | 9:00 | 44.65 | 14:00 | 43.87 |
| 185.1 | Lock and Dam 27 Lower, IL | 349.49 | 9:00 | 44.65 | 14:00 | 43.87 |

St. Louis District

DATES OF SURVEY:
AUGUST 6, 2024

FILE NO.: 185_160k-0624
REQUEST NO.: W912P924F0029

SCALE:
1" = 800' (ANSI B)

FIELD BOOKS:

Approved: FIELD CARTOGRAPHER
Approved: CIVIL ENGINEERING TECHNICIAN
Approved: ASST CHIEF OF SURVEY
Approved: CHIEF OF SURVEY
Date:

U.S. ARMY CORPS OF ENGINEERS
ST. LOUIS DISTRICT
ST. LOUIS, MISSOURI

SURVEYED BY:
BOWEN ENGINEERING AND SURVEYING, P.C.
2121 MEGAN DRIVE
CAPE GIRARDEAU, MO 63701

UPPER MISSISSIPPI RIVER BASIN
MISSISSIPPI RIVER
CHANNEL PATROL
RIVER MILES 162.3 - 164.3

SHEET NO.
1 OF 1

SURVEY NOTES:

1) HORIZONTAL DATUM:
NAD83 (2011) MISSOURI EAST 2401, US SURVEY FOOT

2) VERTICAL DATUM:
NAVD88 (GEOID18), FOOT

3) DEPTHS SHOWN ARE BELOW LWRP2014 SURFACE.

4) SURVEY INFORMATION:
SURVEY VESSEL: BOWEN1 (24' SCULLY'S WORK BOAT)
ECHO SOUNDER: TELEDYNE ECHOTRAC E20
TRANSDUCER: ODOM SMSW200-4 (4° BEAM, 200 kHz)
SOUND VELOCITY SOURCE: VALEPORT SWIFT SVP
INS: SBG ELLIPSE2-E-G4A2-B1
GNSS RECEIVER: TRIMBLE MPS865 WITH DUAL ANTENNAS
GNSS SOURCE: TRIMBLE CENTERPOINT RTX
TIDE METHOD: REAL-TIME KINEMATIC
TIDE SOURCE: TRIMBLE CENTERPOINT RTX

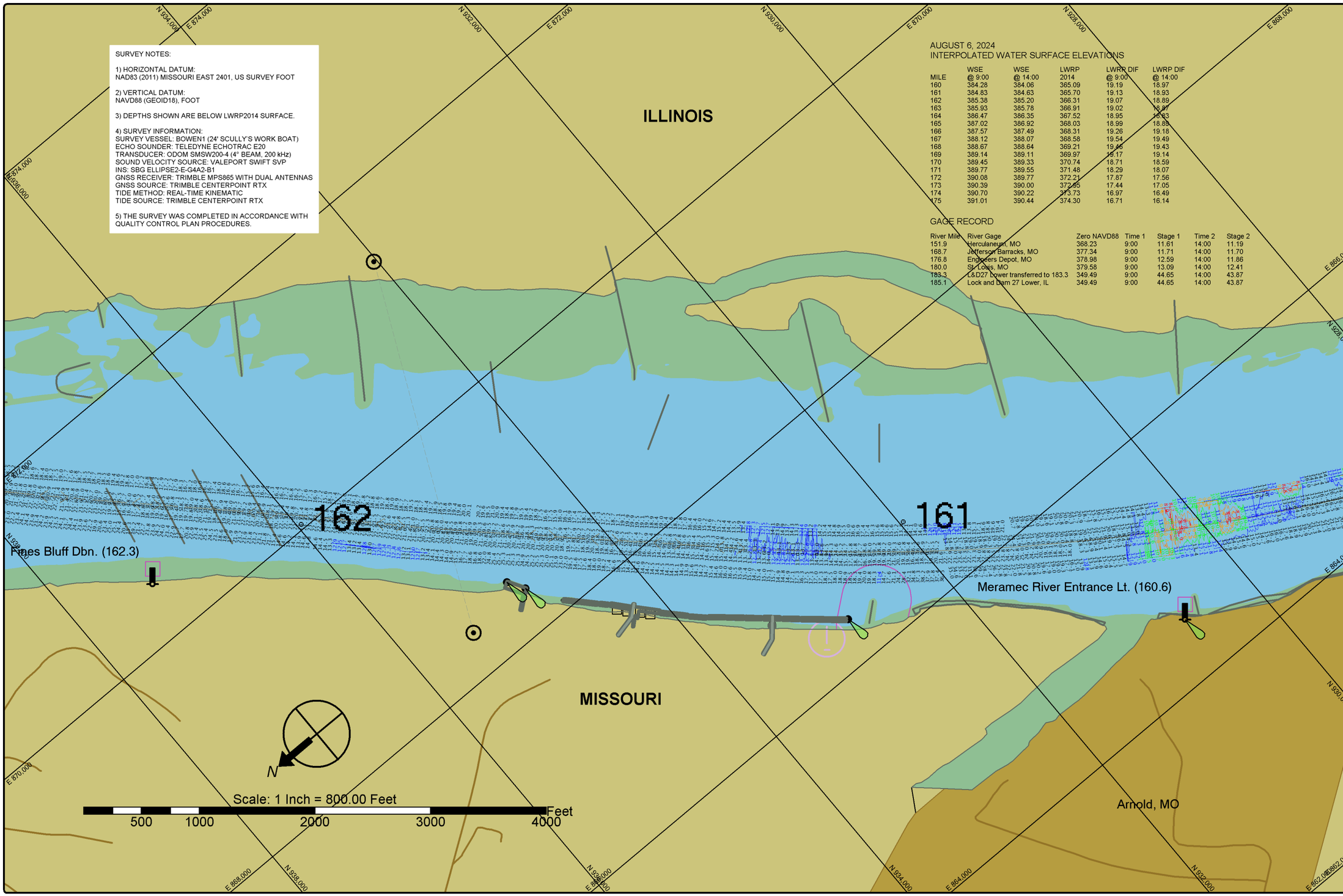
5) THE SURVEY WAS COMPLETED IN ACCORDANCE WITH QUALITY CONTROL PLAN PROCEDURES.

AUGUST 6, 2024
INTERPOLATED WATER SURFACE ELEVATIONS

| MILE | WSE @ 9:00 | WSE @ 14:00 | LWRP 2014 | LWRP DIF @ 9:00 | LWRP DIF @ 14:00 |
|---|---|---|---|---|---|
| 160 | 384.28 | 384.06 | 365.09 | 19.19 | 18.97 |
| 161 | 384.83 | 384.63 | 365.70 | 19.13 | 18.93 |
| 162 | 385.38 | 385.20 | 366.31 | 19.07 | 18.89 |
| 163 | 385.93 | 385.78 | 366.91 | 19.02 | 18.87 |
| 164 | 386.47 | 386.35 | 367.52 | 18.95 | 18.83 |
| 165 | 387.02 | 386.92 | 368.03 | 18.99 | 18.89 |
| 166 | 387.57 | 387.49 | 368.31 | 19.26 | 19.18 |
| 167 | 388.12 | 388.07 | 368.58 | 19.54 | 19.49 |
| 168 | 388.67 | 388.64 | 369.21 | 19.46 | 19.43 |
| 169 | 389.14 | 389.11 | 369.97 | 19.17 | 19.14 |
| 170 | 389.45 | 389.33 | 370.74 | 18.71 | 18.59 |
| 171 | 389.77 | 389.55 | 371.48 | 18.29 | 18.07 |
| 172 | 390.08 | 389.77 | 372.21 | 17.87 | 17.56 |
| 173 | 390.39 | 390.00 | 372.95 | 17.44 | 17.05 |
| 174 | 390.70 | 390.22 | 373.73 | 16.97 | 16.49 |
| 175 | 391.01 | 390.44 | 374.30 | 16.71 | 16.14 |

GAGE RECORD

| River Mile | River Gage | Zero NAVD88 | Time 1 | Stage 1 | Time 2 | Stage 2 |
|---|---|---|---|---|---|---|
| 151.9 | Herculaneum, MO | 368.23 | 9:00 | 11.61 | 14:00 | 11.19 |
| 168.7 | Jefferson Barracks, MO | 377.34 | 9:00 | 11.71 | 14:00 | 11.70 |
| 176.8 | Engineers Depot, MO | 378.98 | 9:00 | 12.59 | 14:00 | 11.86 |
| 180.0 | St. Louis, MO | 379.58 | 9:00 | 13.09 | 14:00 | 12.41 |
| 183.3 | L&D27 lower transferred to 183.3 | 349.49 | 9:00 | 44.65 | 14:00 | 43.87 |
| 185.1 | Lock and Dam 27 Lower, IL | 349.49 | 9:00 | 44.65 | 14:00 | 43.87 |




St. Louis District

DATES OF SURVEY:
AUGUST 6, 2024

FILE NO.: 185_160k0624
REQUEST NO.: W912P924F0029

SCALE:
1" = 800' (ANSI B)

FIELD BOOKS:

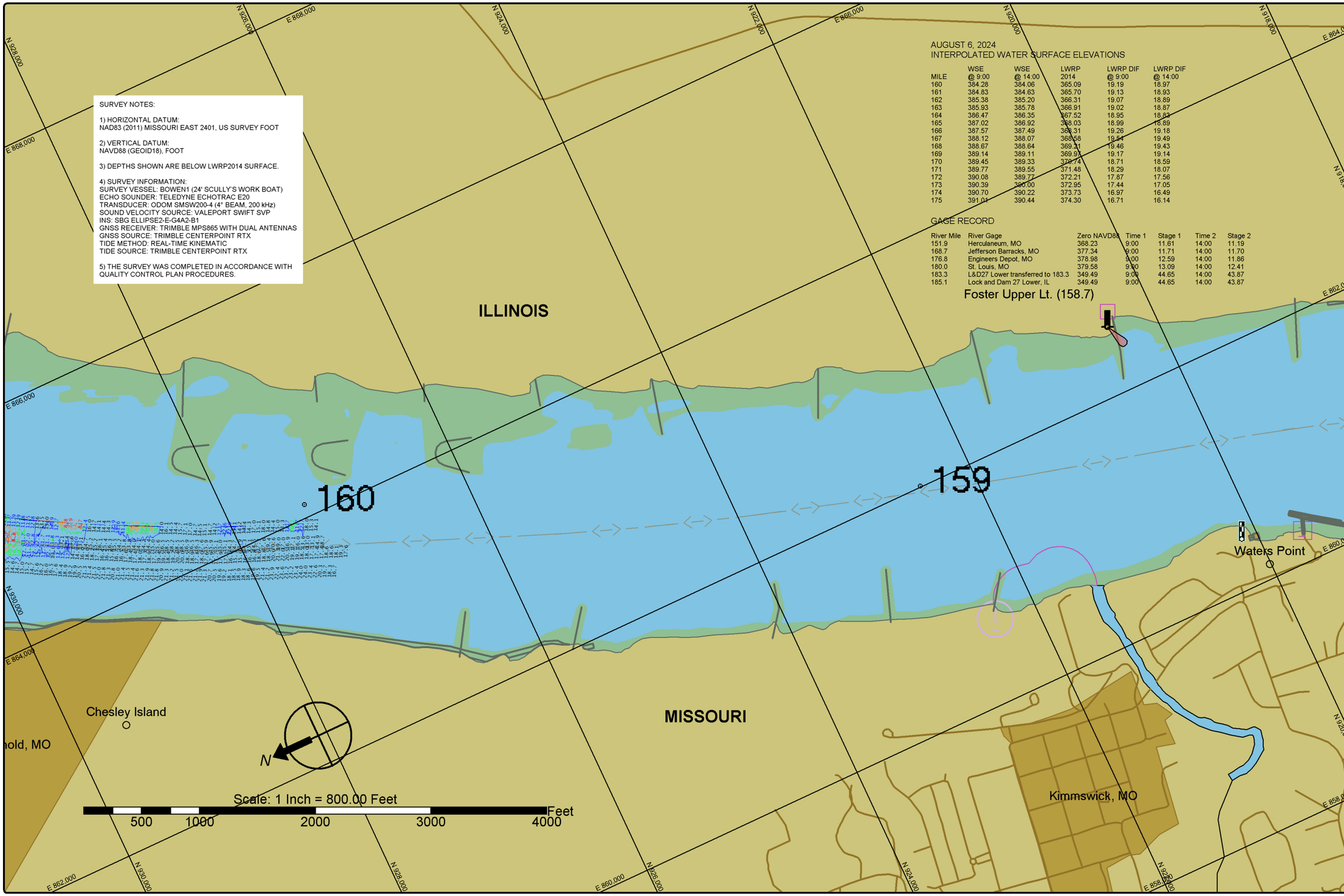
Approved: FIELD CARTOGRAPHER
Approved: CIVIL ENGINEERING TECHNICIAN
Approved: ASST CHIEF OF SURVEY
Approved: CHIEF OF SURVEY
Date:

U.S. ARMY CORPS OF ENGINEERS
ST. LOUIS DISTRICT
ST. LOUIS, MISSOURI

SURVEYED BY:
BOWEN ENGINEERING AND SURVEYING, P.C.
2121 MEGAN DRIVE
CAPE GIRARDEAU, MO 63701

UPPER MISSISSIPPI RIVER BASIN
MISSISSIPPI RIVER
CHANNEL PATROL
RIVER MILES 160.3 - 162.3

SHEET NO.
1 OF 1




SURVEY NOTES:

1) HORIZONTAL DATUM:
NAD83 (2011) MISSOURI EAST 2401, US SURVEY FOOT

2) VERTICAL DATUM:
NAVD88 (GEOID18), FOOT

3) DEPTHS SHOWN ARE BELOW LWRP2014 SURFACE.

4) SURVEY INFORMATION:
SURVEY VESSEL: BOWEN1 (24' SCULLY'S WORK BOAT)
ECHO SOUNDER: TELEDYNE ECHOTRAC E20
TRANSDUCER: ODOM SMSW200-4 (4° BEAM, 200 kHz)
SOUND VELOCITY SOURCE: VALEPORT SWIFT SVP
INS: SBG ELLIPSE2-E-G4A2-B1
GNSS RECEIVER: TRIMBLE MPS865 WITH DUAL ANTENNAS
GNSS SOURCE: TRIMBLE CENTERPOINT RTX
TIDE METHOD: REAL-TIME KINEMATIC
TIDE SOURCE: TRIMBLE CENTERPOINT RTX

5) THE SURVEY WAS COMPLETED IN ACCORDANCE WITH QUALITY CONTROL PLAN PROCEDURES.

AUGUST 6, 2024
INTERPOLATED WATER SURFACE ELEVATIONS

| MILE | WSE @ 9:00 | WSE @ 14:00 | LWRP 2014 | LWRP DIF @ 9:00 | LWRP DIF @ 14:00 |
|---|---|---|---|---|---|
| 160 | 384.28 | 384.06 | 365.09 | 19.19 | 18.97 |
| 161 | 384.83 | 384.63 | 365.70 | 19.13 | 18.93 |
| 162 | 385.38 | 385.20 | 366.31 | 19.07 | 18.89 |
| 163 | 385.93 | 385.78 | 366.91 | 19.02 | 18.87 |
| 164 | 386.47 | 386.35 | 367.52 | 18.95 | 18.83 |
| 165 | 387.02 | 386.92 | 368.03 | 18.99 | 18.89 |
| 166 | 387.57 | 387.49 | 368.31 | 19.26 | 19.18 |
| 167 | 388.12 | 388.07 | 368.58 | 19.54 | 19.49 |
| 168 | 388.67 | 388.64 | 369.21 | 19.46 | 19.43 |
| 169 | 389.14 | 389.11 | 369.97 | 19.17 | 19.14 |
| 170 | 389.45 | 389.33 | 370.74 | 18.71 | 18.59 |
| 171 | 389.77 | 389.55 | 371.48 | 18.29 | 18.07 |
| 172 | 390.08 | 389.77 | 372.21 | 17.87 | 17.56 |
| 173 | 390.39 | 390.00 | 372.95 | 17.44 | 17.05 |
| 174 | 390.70 | 390.22 | 373.73 | 16.97 | 16.49 |
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St. Louis District

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U.S. ARMY CORPS OF ENGINEERS
ST. LOUIS DISTRICT
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SURVEYED BY:
BOWEN ENGINEERING AND SURVEYING, P.C.
2121 MEGAN DRIVE
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UPPER MISSISSIPPI RIVER BASIN
MISSISSIPPI RIVER
CHANNEL PATROL
RIVER MILES 158.3 - 160.3

SHEET NO.
1 OF 1