

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: ODOM DIGIBAR S VELOCIMETER  
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 29, 2022  
INTERPOLATED WATER SURFACE ELEVATIONS

MILE	WSE @ 10:00	WSE @ 16:00	LWRP 2014	LWRP DIF @ 10:00	LWRP DIF @ 16:00
171	376.79	376.19	371.48	4.71	4.71
172	376.78	376.77	372.21	4.57	4.56
173	377.37	377.34	372.95	4.42	4.39
174	377.96	377.91	373.73	4.23	4.18
175	378.55	378.48	374.30	4.25	4.18
176	379.14	379.05	374.74	4.40	4.31
177	379.68	379.58	375.29	4.39	4.29
178	380.05	379.91	375.74	4.31	4.17
179	380.41	380.24	376.07	4.34	4.17
180	380.77	380.57	376.37	4.40	4.20
181	381.13	380.97	376.38	4.75	4.69
182	381.50	381.37	376.38	5.12	4.99
183	381.86	381.77	376.38	5.48	5.39
183.3	381.97	381.89	376.38	5.59	5.51
184	381.97	381.89	376.38	5.59	5.51
185.1	381.97	381.89	376.38	5.59	5.51

GAGE RECORD

River Mile	River Gage	Zero NAVD88	Time 1	Stage 1	Time 2	Stage 2
151.9	Herculanum, MO	365.23	10:00	-1.51	16:00	-1.44
168.7	Jefferson Barracks, MO	377.34	10:00	-2.50	16:00	-2.46
176.8	Engineers Depot, MO	378.98	10:00	0.63	16:00	0.53
180.0	St. Louis, MO	379.58	10:00	1.19	16:00	0.99
183.3	L&D27 Lower transferred to 183.3	349.49	10:00	32.48	16:00	32.40
185.1	Lock and Dam 27 Lower, IL	349.49	10:00	32.48	16:00	32.40



St. Louis District

DATES OF SURVEY:  
AUGUST 26, 2022

FILE NO. 186\_15542922  
REQUEST NO. W912P2CF0051

SCALE:  
1" = 800' (ANSI B)

FIELD BOOKS:

Approved:

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

Approved:

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

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ST. LOUIS DISTRICT  
ST. LOUIS, MISSOURI

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

Date:

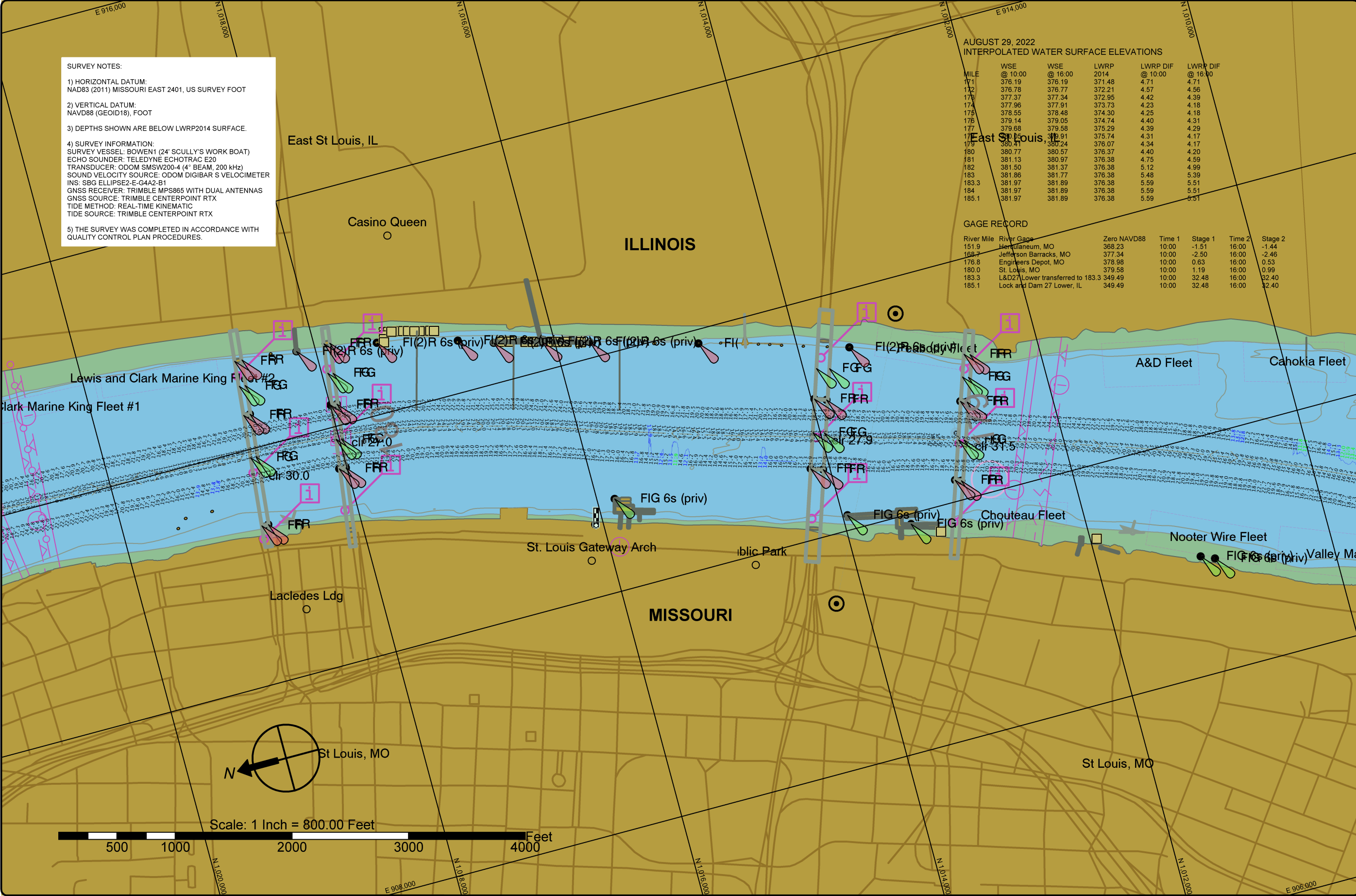
UPPER MISSISSIPPI RIVER  
BASIN  
MISSISSIPPI RIVER  
CHANNEL PATROL 182.2 - 184.5

SHEET NO.

1 OF 1







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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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QUALITY CONTROL PLAN PROCEDURES.

AUGUST 29, 2022  
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172	376.78	376.77	372.21	4.57	4.56
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179	380.41	380.24	376.07	4.34	4.17
180	380.77	380.57	376.37	4.40	4.20
181	381.13	380.97	376.38	4.75	4.59
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GAGE RECORD

River Mile	River Gage	Zero NAVD88	Time 1	Stage 1	Time 2	Stage 2
151.9	Herculaneum, MO	369.23	10:00	-1.51	16:00	-1.44
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176.8	Engineers Depot, MO	378.98	10:00	0.63	16:00	0.53
180.0	St. Louis, MO	379.58	10:00	1.19	16:00	0.99
183.3	L&D27 Lower transferred to 183.3	349.49	10:00	32.48	16:00	32.40
185.1	Lock and Dam 27 Lower, IL	349.49	10:00	32.48	16:00	32.40



St. Louis District

DATES OF SURVEY:  
AUGUST 29, 2022

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

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

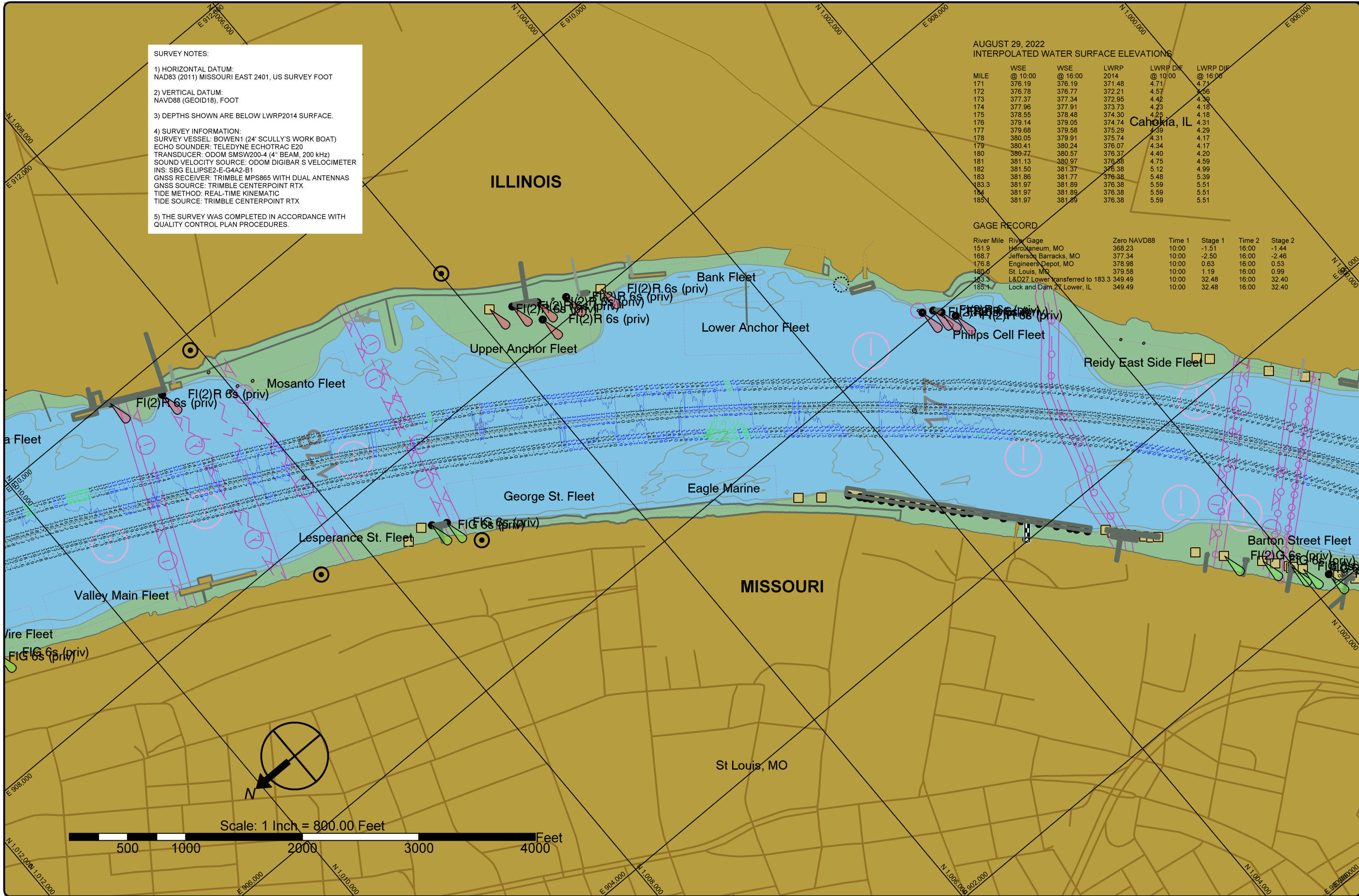
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ST. LOUIS DISTRICT  
ST. LOUIS, MISSOURI

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ST. LOUIS DISTRICT  
ST. LOUIS, MISSOURI

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

SHEET NO.

1 OF 1



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SOUND VELOCITY SOURCE: ODOM DIGIBAR S VELOCIMETER  
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 29, 2022  
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172	376.78	376.77	372.21	4.57	4.56
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GAGE RECORD

River Mile	River Gage	Zero NAVD88	Time 1	Stage 1	Time 2	Stage 2
151.9	Herculeum, MO	368.23	10:00	-1.51	16:00	-1.44
168.7	Jefferson Barracks, MO	377.34	10:00	-2.50	16:00	-2.46
176.8	Engineers Depot, MO	378.98	10:00	0.63	16:00	0.53
180.0	St. Louis, MO	379.58	10:00	1.19	16:00	0.99
183.3	L&D27 Lower, transferred to 183.3	349.49	10:00	32.48	16:00	32.40
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St. Louis District

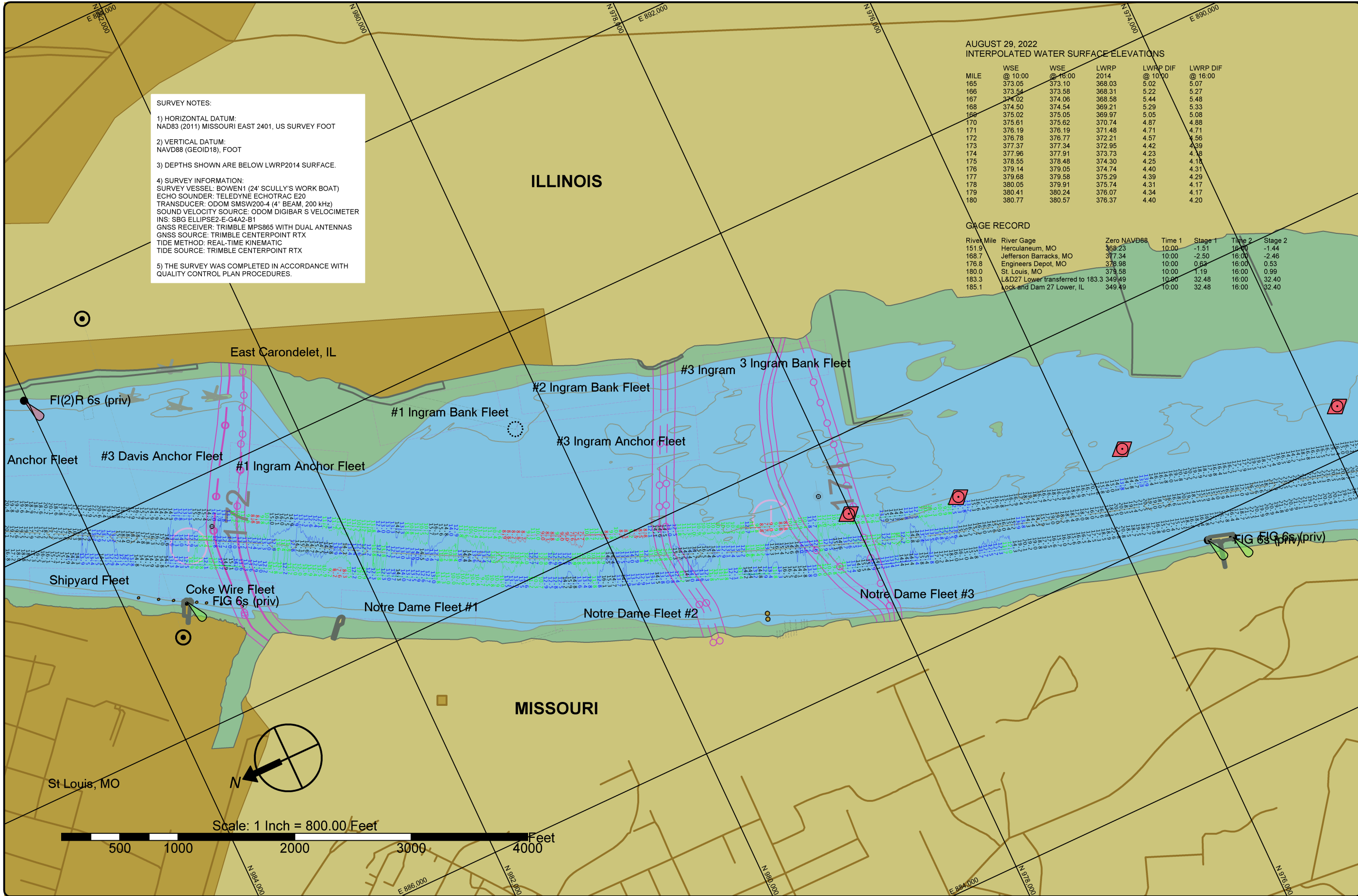
DATES OF SURVEY: AUGUST 29, 2022		FILE NO. 186_15542922 REQUEST NO. W912P292F0051
SCALE: 1" = 800' (ANSI B)	FIELD BOOKS: _____ _____	
Approved: _____ FIELD CARTOGRAPHER	Approved: _____ CIVIL ENGINEERING TECHNICIAN	Approved: _____ ASST. CHIEF OF SURVEY
Approved: _____ U.S. ARMY CORPS OF ENGINEERS ST. LOUIS DISTRICT ST. LOUIS, MISSOURI	Approved: _____ SURVEYED BY: BOWEN ENGINEERING AND SURVEYING, P.C. 2121 MEGAN DRIVE CAPE GIRARDEAU, MO 63701	Date: _____ CHIEF OF SURVEY
UPPER MISSISSIPPI RIVER BASIN MISSISSIPPI RIVER CHANNEL PATROL RIVER MILES 176.2 - 178.2		
SHEET NO. _____ 1 OF 1		











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AUGUST 29, 2022  
INTERPOLATED WATER SURFACE ELEVATIONS

MILE	WSE @ 10:00	WSE @ 16:00	LWRP 2014	LWRP DIF @ 10:00	LWRP DIF @ 16:00
165	373.05	373.10	368.03	5.02	5.07
166	373.54	373.58	368.31	5.22	5.27
167	374.02	374.06	368.58	5.44	5.48
168	374.50	374.54	369.21	5.29	5.33
169	375.02	375.05	369.97	5.05	5.08
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GAGE RECORD

River Mile	River Gage	Zero NAVD88	Time 1	Stage 1	Time 2	Stage 2
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176.8	Engineers Depot, MO	378.98	10:00	0.64	16:00	0.53
180.0	St. Louis, MO	379.58	10:00	1.19	16:00	0.99
183.3	L&D27 Lower transferred to 183.3	349.49	10:00	32.48	16:00	32.40
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St. Louis District

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ST. LOUIS, MISSOURI

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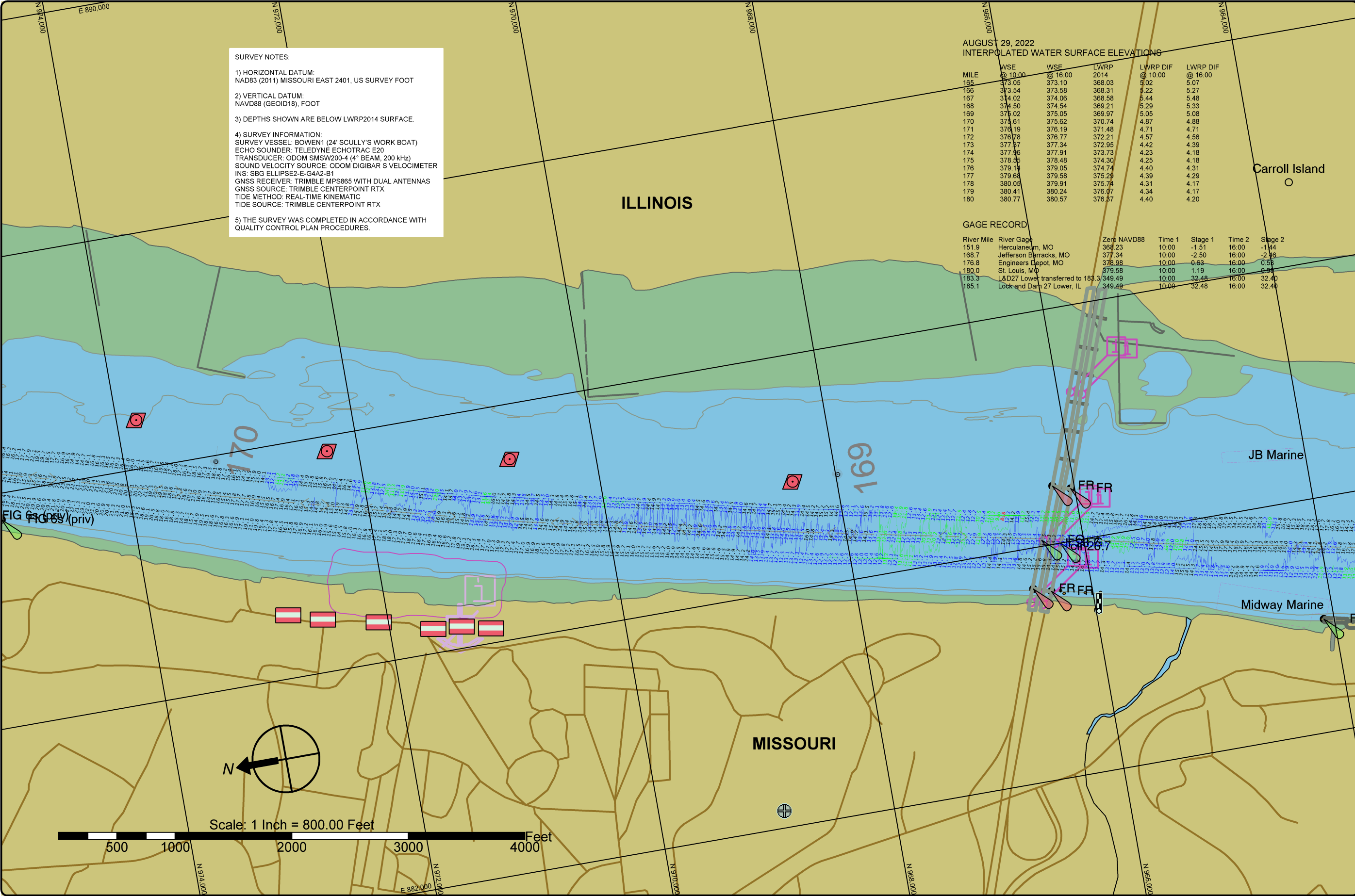
Date:

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

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

SHEET NO.

1 OF 1



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GNSS RECEIVER: TRIMBLE MPS865 WITH DUAL ANTENNAS  
TIDE METHOD: REAL-TIME KINEMATIC  
TIDE SOURCE: TRIMBLE CENTERPOINT RTX

5) THE SURVEY WAS COMPLETED IN ACCORDANCE WITH  
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AUGUST 29, 2022  
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167	374.02	374.06	368.58	5.44	5.48
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St. Louis District

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FILE NO. 186\_15542922

REQUEST NO. W912P922F0051

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

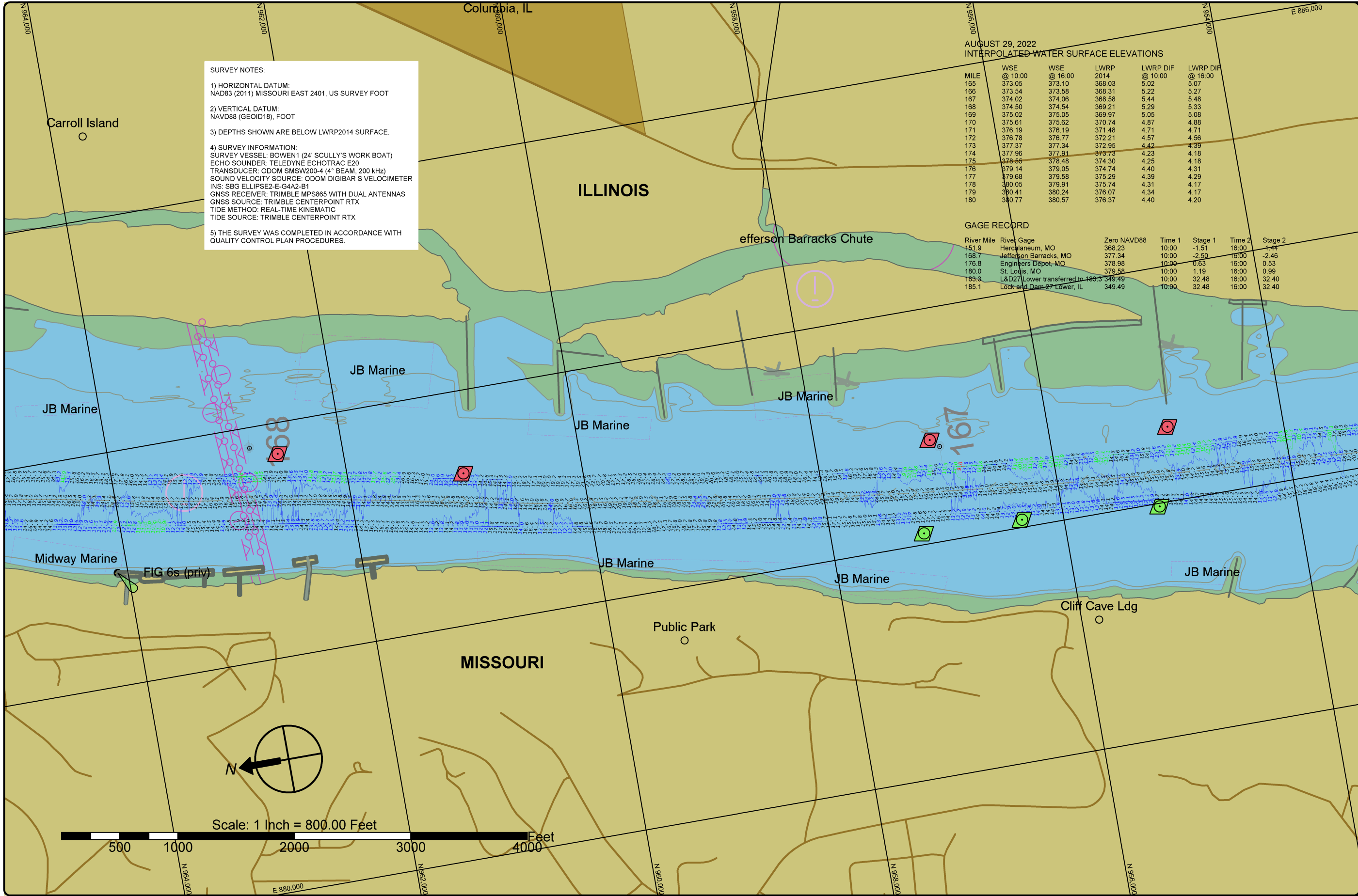
SURVEYED BY:  
BOWEN ENGINEERING AND SURVEYING, P.C.  
2121 MEGAN DRIVE  
CAPE GIRARDEAU, MO 63701

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

SHEET NO.

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CHIEF OF SURVEY

Date: \_\_\_\_\_

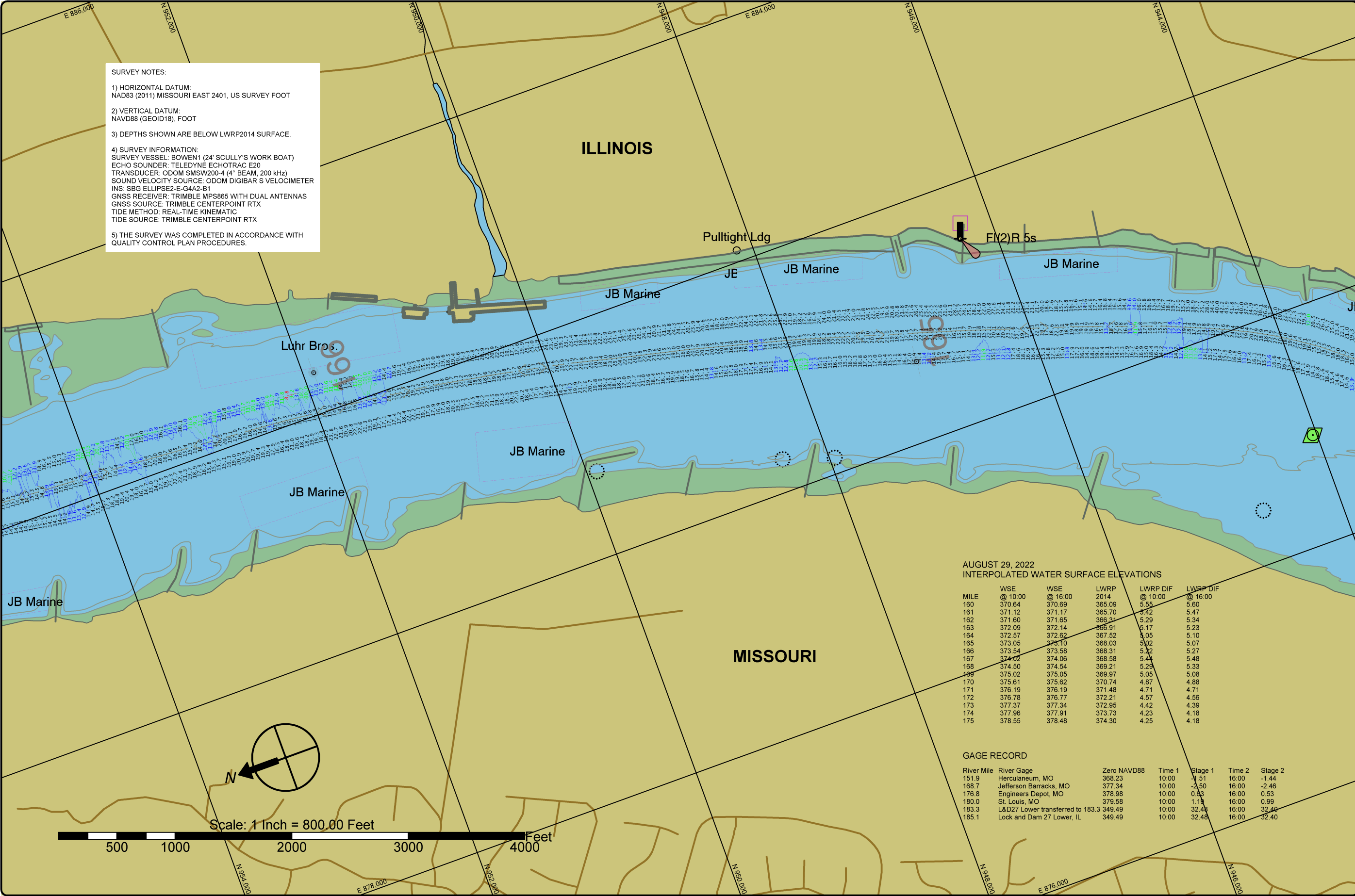
U.S. ARMY CORPS OF ENGINEERS  
ST. LOUIS DISTRICT  
ST. LOUIS, MISSOURI

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: ODOM DIGIBAR S VELOCIMETER  
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 29, 2022  
INTERPOLATED WATER SURFACE ELEVATIONS

MILE	WSE @ 10:00	WSE @ 16:00	LWRP 2014	LWRP DIF @ 10:00	LWRP DIF @ 16:00
160	370.64	370.69	365.09	5.55	5.60
161	371.12	371.17	365.70	5.42	5.47
162	371.60	371.65	366.31	5.29	5.34
163	372.09	372.14	366.91	5.17	5.23
164	372.57	372.62	367.52	5.05	5.10
165	373.05	373.10	368.03	5.02	5.07
166	373.54	373.58	368.31	5.22	5.27
167	374.02	374.06	368.58	5.44	5.48
168	374.50	374.54	369.21	5.29	5.33
169	375.02	375.05	369.97	5.05	5.08
170	375.61	375.62	370.74	4.87	4.88
171	376.19	376.19	371.48	4.71	4.71
172	376.78	376.77	372.21	4.57	4.56
173	377.37	377.34	372.95	4.42	4.39
174	377.96	377.91	373.73	4.23	4.18
175	378.55	378.48	374.30	4.25	4.18

GAGE RECORD

River Mile	River Gage	Zero NAVD88	Time 1	Stage 1	Time 2	Stage 2
151.9	Herculeaneum, MO	368.23	10:00	-1.51	16:00	-1.44
168.7	Jefferson Barracks, MO	377.34	10:00	-2.50	16:00	-2.46
176.8	Engineers Depot, MO	378.98	10:00	0.63	16:00	0.53
180.0	St. Louis, MO	379.58	10:00	1.18	16:00	0.99
183.3	L&D27 Lower transferred to 183.3	349.49	10:00	32.48	16:00	32.40
185.1	Lock and Dam 27 Lower, IL	349.49	10:00	32.48	16:00	32.40



St. Louis District

DATES OF SURVEY:  
AUGUST 29, 2022

FILE NO. 186\_15542922  
REQUEST NO. W912P92F0051

SCALE:  
1" = 800' (ANSI B)

FIELD BOOKS:  
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\_\_\_\_\_  
\_\_\_\_\_

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.

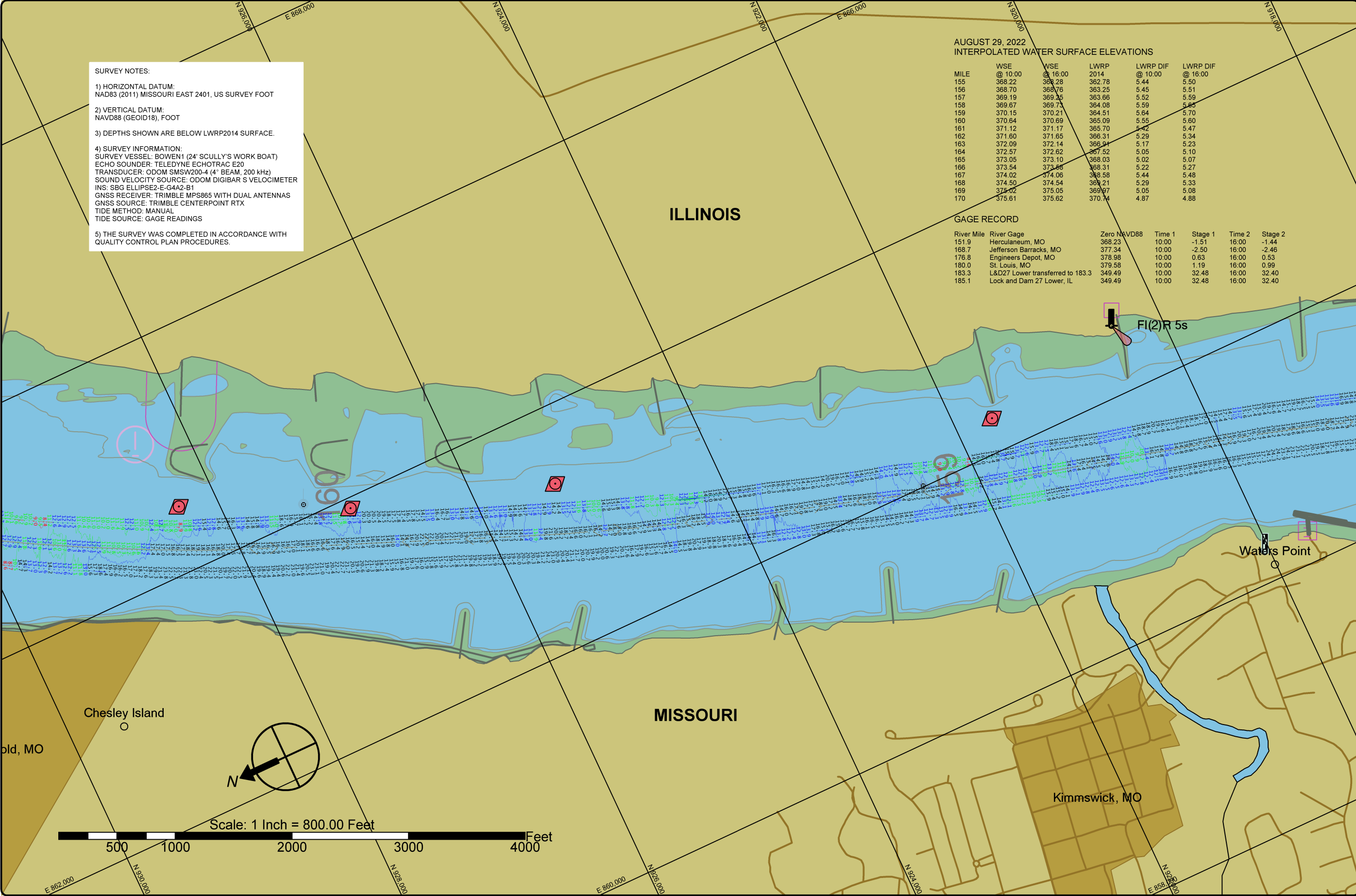
1 OF 1











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: ODOM DIGIBAR S VELOCIMETER  
INS: SBG ELLIPSE2-E-G4A2-B1  
GNSS RECEIVER: TRIMBLE MPS865 WITH DUAL ANTENNAS  
GNSS SOURCE: TRIMBLE CENTERPOINT RTX  
TIDE METHOD: MANUAL  
TIDE SOURCE: GAGE READINGS

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

AUGUST 29, 2022  
INTERPOLATED WATER SURFACE ELEVATIONS

MILE	WSE @ 10:00	WSE @ 16:00	LWRP 2014	LWRP DIF @ 10:00	LWRP DIF @ 16:00
155	368.22	368.28	362.78	5.44	5.50
156	368.70	368.76	363.25	5.45	5.51
157	369.19	369.25	363.66	5.52	5.59
158	369.67	369.73	364.08	5.59	5.65
159	370.15	370.21	364.51	5.64	5.70
160	370.64	370.69	365.09	5.55	5.60
161	371.12	371.17	365.70	5.42	5.47
162	371.60	371.65	366.31	5.29	5.34
163	372.09	372.14	366.91	5.17	5.23
164	372.57	372.62	367.52	5.05	5.10
165	373.05	373.10	368.03	5.02	5.07
166	373.54	373.58	368.31	5.22	5.27
167	374.02	374.06	368.58	5.44	5.48
168	374.50	374.54	368.21	5.29	5.33
169	375.02	375.05	369.97	5.05	5.08
170	375.61	375.62	370.74	4.87	4.88

GAGE RECORD

River Mile	River Gage	Zero NAVD88	Time 1	Stage 1	Time 2	Stage 2
151.9	Herculaneum, MO	368.23	10:00	-1.51	16:00	-1.44
168.7	Jefferson Barracks, MO	377.34	10:00	-2.50	16:00	-2.46
176.8	Engineers Depot, MO	378.98	10:00	0.63	16:00	0.53
180.0	St. Louis, MO	379.58	10:00	1.19	16:00	0.99
183.3	L&D27 Lower transferred to 183.3	349.49	10:00	32.48	16:00	32.40
185.1	Lock and Dam 27 Lower, IL	349.49	10:00	32.48	16:00	32.40



St. Louis District

DATES OF SURVEY:

AUGUST 29, 2022

SCALE:

1" = 800' (ANSI B)

FIELD BOOKS:

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Approved:

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Approved:

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Approved:

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Approved:

\_\_\_\_\_

Date:

\_\_\_\_\_

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

FIELD CARTOGRAPHER

CIVIL ENGINEERING TECHNICIAN

ASST. CHIEF OF SURVEY

CHIEF OF SURVEY

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UPPER MISSISSIPPI RIVER  
BASIN

MISSISSIPPI RIVER

CHANNEL PATROL

RIVER MILES 158.3 - 160.3

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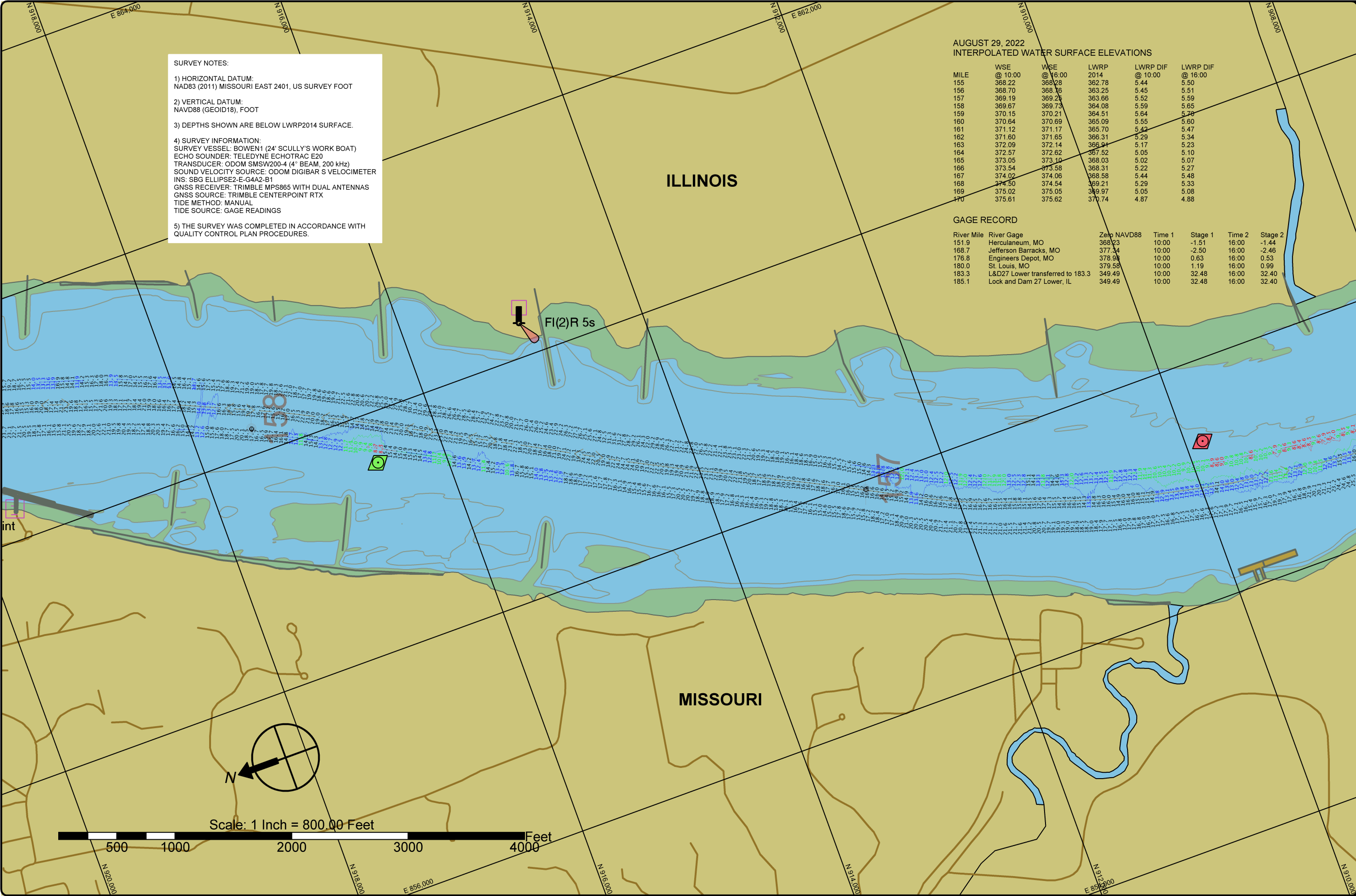
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\_\_\_\_\_

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.

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TRANSDUCER: ODOM SMSW200-4 (4" BEAM, 200 kHz)  
SOUND VELOCITY SOURCE: ODOM DIGIBAR S VELOCIMETER  
INS: SBG ELLIPSE2-E-G4A2-B1  
GNSS RECEIVER: TRIMBLE MPS865 WITH DUAL ANTENNAS  
GNSS SOURCE: TRIMBLE CENTERPOINT RTX  
TIDE METHOD: MANUAL  
TIDE SOURCE: GAGE READINGS

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

AUGUST 29, 2022  
INTERPOLATED WATER SURFACE ELEVATIONS

MILE	WSE @ 10:00	WSE @ 16:00	LWRP 2014	LWRP DIF @ 10:00	LWRP DIF @ 16:00
155	368.22	368.28	362.78	5.44	5.50
156	368.70	368.16	363.25	5.45	5.51
157	369.19	369.25	363.66	5.52	5.59
158	369.67	369.73	364.08	5.59	5.65
159	370.15	370.21	364.51	5.64	5.76
160	370.64	370.69	365.09	5.55	5.60
161	371.12	371.17	365.70	5.42	5.47
162	371.60	371.65	366.31	5.29	5.34
163	372.09	372.14	366.94	5.17	5.23
164	372.57	372.62	367.52	5.05	5.10
165	373.05	373.10	368.03	5.02	5.07
166	373.54	373.58	368.31	5.22	5.27
167	374.02	374.06	368.58	5.44	5.48
168	374.50	374.54	369.21	5.29	5.33
169	375.02	375.05	369.97	5.05	5.08
170	375.61	375.62	370.74	4.87	4.88

GAGE RECORD

River Mile	River Gage	Zero NAVD88	Time 1	Stage 1	Time 2	Stage 2
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168.7	Jefferson Barracks, MO	377.34	10:00	-2.50	16:00	-2.46
176.8	Engineers Depot, MO	378.98	10:00	0.63	16:00	0.53
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St. Louis District

DATES OF SURVEY:

AUGUST 29, 2022

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

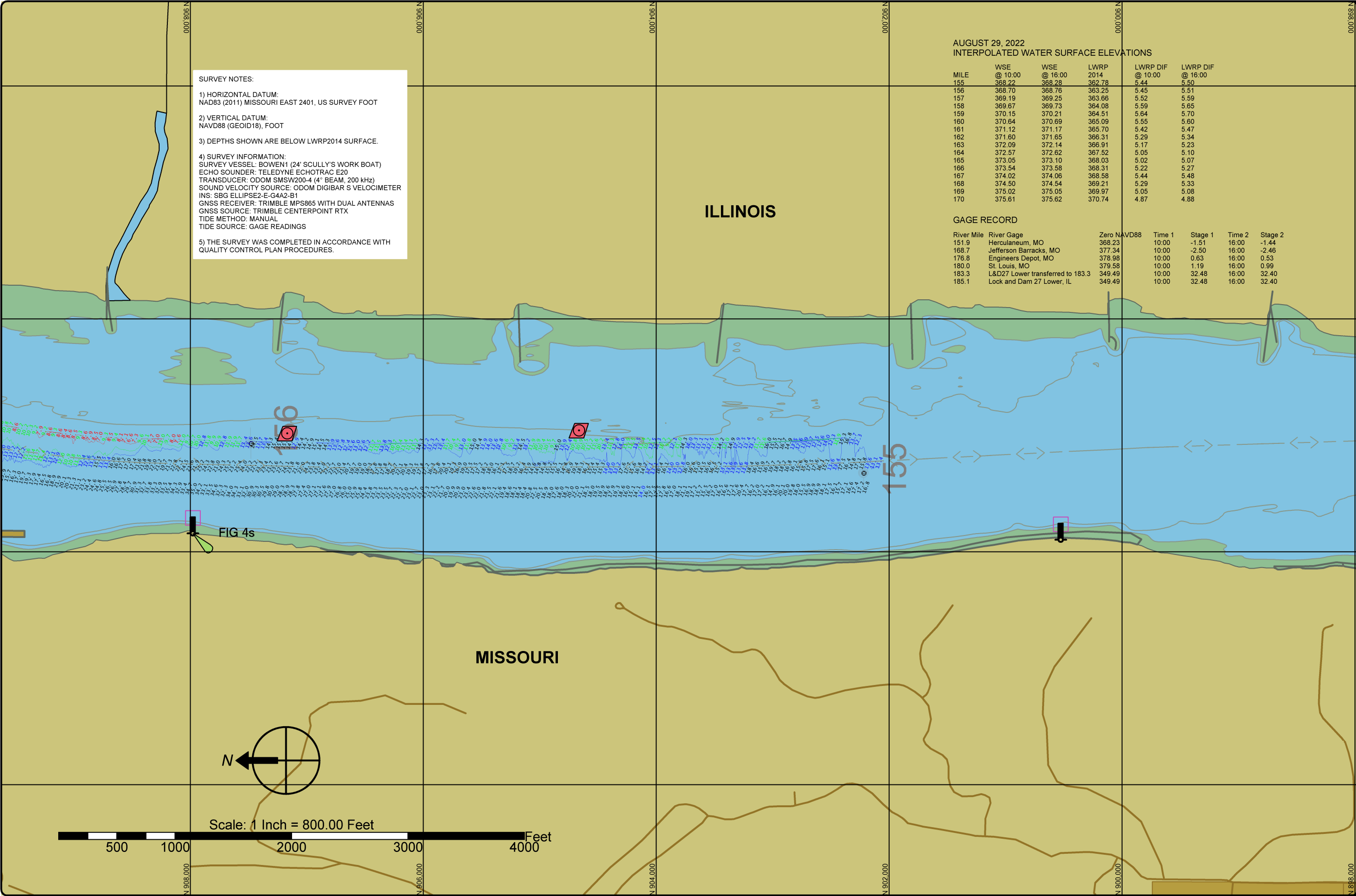
MISSISSIPPI RIVER

CHANNEL PATROL  
RIVER MILES 156.2 - 158.3

SHEET NO.

1 OF 1





SURVEY NOTES:

1) HORIZONTAL DATUM:  
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163	372.09	372.14	366.91	5.17	5.23
164	372.57	372.62	367.52	5.05	5.10
165	373.05	373.10	368.03	5.02	5.07
166	373.54	373.58	368.31	5.22	5.27
167	374.02	374.06	368.58	5.44	5.48
168	374.50	374.54	369.21	5.29	5.33
169	375.02	375.05	369.97	5.05	5.08
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St. Louis District

DATES OF SURVEY:

AUGUST 29, 2022

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 154.3 - 156.2

SHEET NO.

1 OF 1