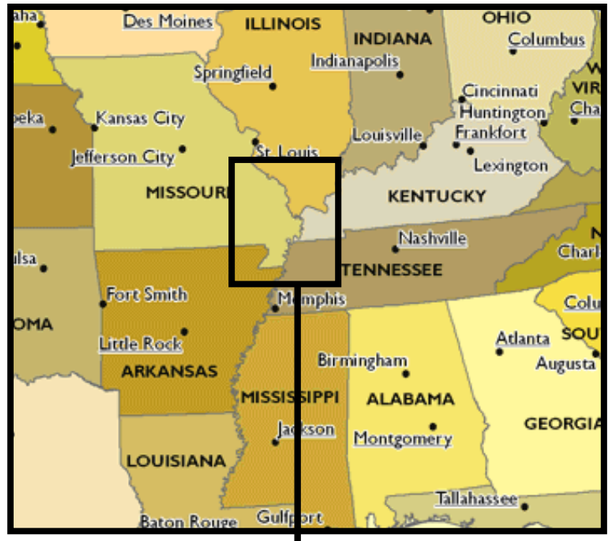

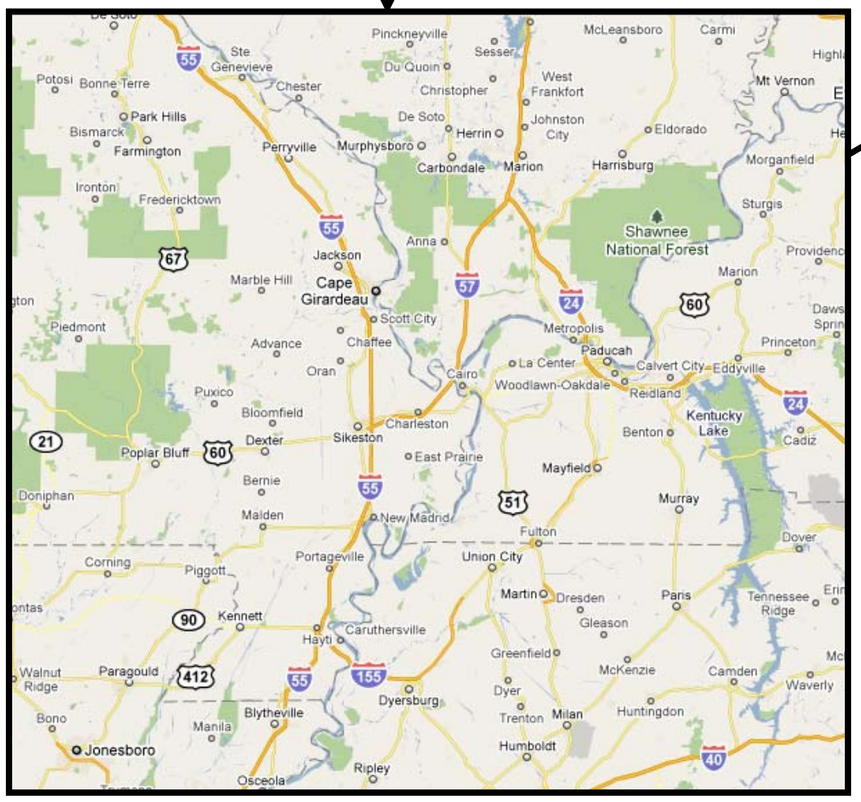

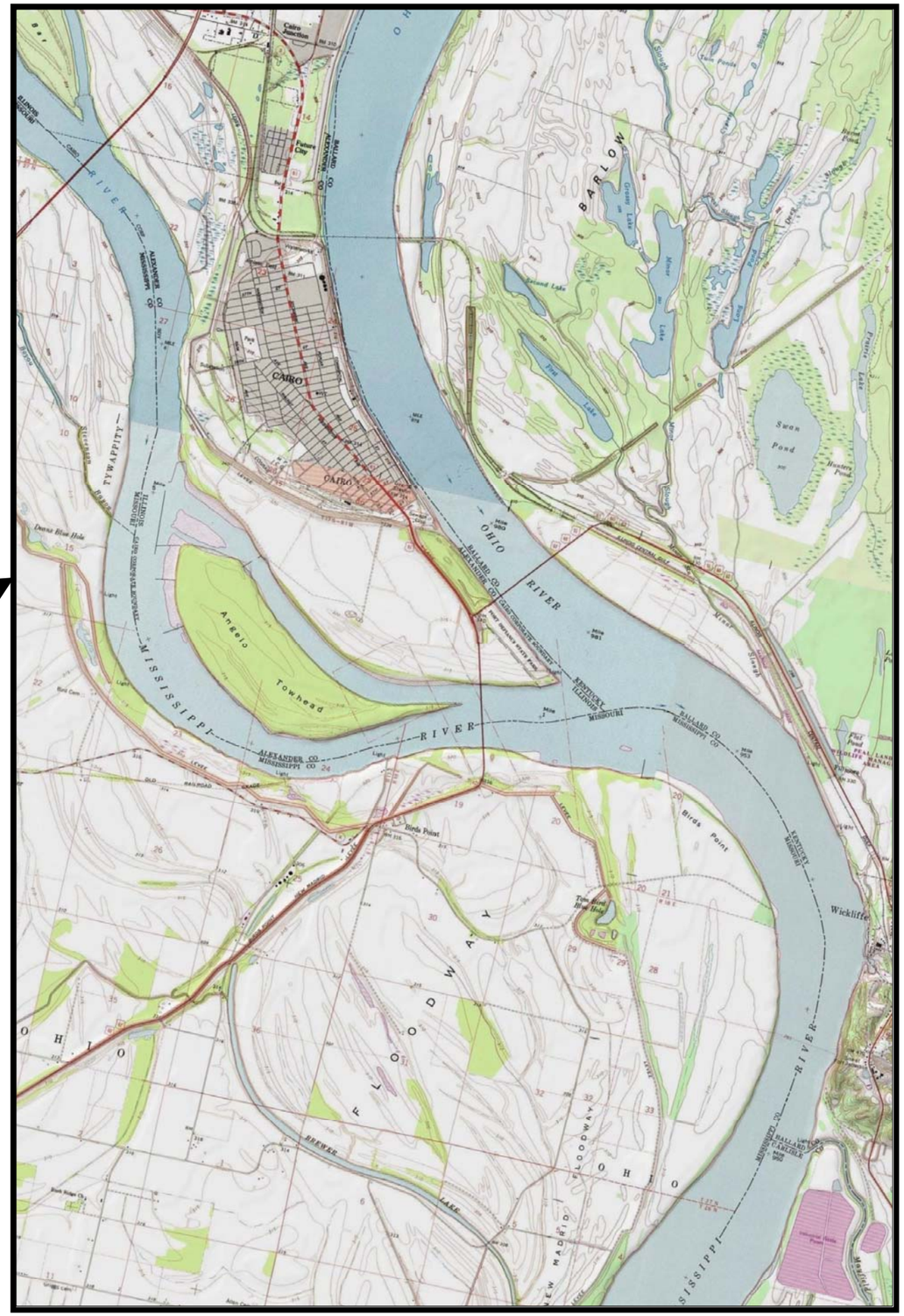

US Army Corps of Engineers
St. Louis District

APPLIED RIVER ENGINEERING CENTER

N W E S

DESIGNED BY: A COX	DRAWN BY: A COX	REVIEWED BY: E BRAUER, P.E.	SURVEY DATE:
SUBMITTED: A COX	APPROVED: R DAVINROY, P.E.	CHECKED BY: J BROWN, P.E.	PLOT DATE: 09/07/2011
FILE NAME: ...BirdsPoint/PLATES			

U.S. ARMY ENGINEER DIVISION
CORPS OF ENGINEERS
ST. LOUIS, MISSOURI

Confluence of the Ohio and Mississippi
St. Louis District
Bird's Point
HSR Model

Bird's Point
Location and Vicinity Map

PLATE NUMBER
1

PLATE NUMBER 2

0 700 1,400 2,800
Feet

2008 AERIAL PHOTOGRAPH

U.S. ARMY ENGINEER DIVISION
CORPS OF ENGINEERS
ST. LOUIS, MISSOURI

Confluence of the Ohio and Mississippi
St Louis District
Bird's Point
HSR Model

DESIGNED BY: A Cox		SURVEY DATE:	
DRAWN BY: A Rockwell	REVIEWED BY: E Brauer, P.E.	CHECKED BY: J Brown, P.E.	
SUBMITTED: A Cox		APPROVED: Rob Davinroy, P.E.	
FILE NAME: L:\Bird's Point\Plates		PLOT DATE: 09/02/2011	

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US Army Corps of Engineers
St. Louis District

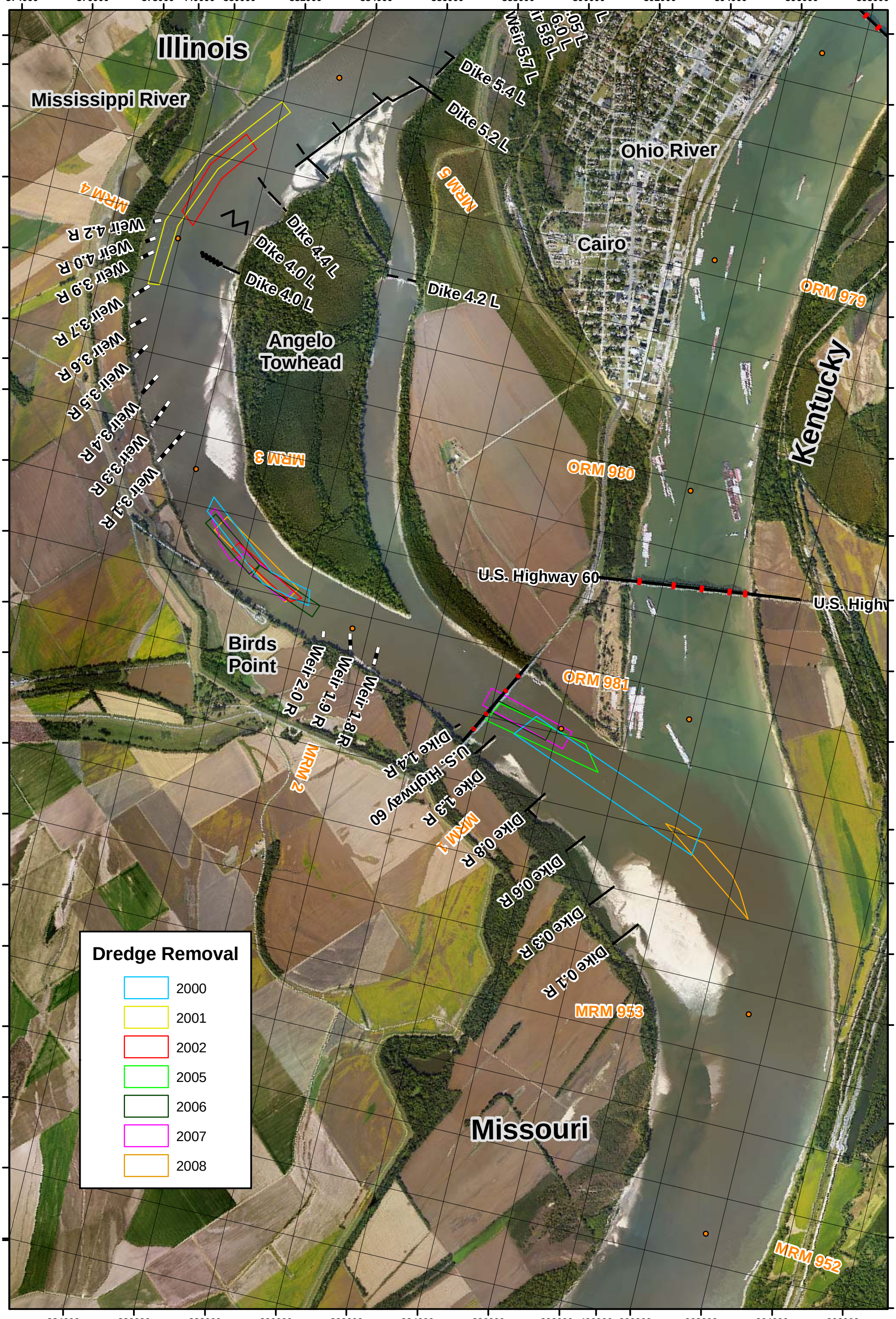

PLATE NUMBER 3

0 700 1,400 2,800
Feet

DREDGE REMOVAL
2008 AERIAL PHOTOGRAPH

U.S. ARMY ENGINEER DIVISION
CORPS OF ENGINEERS
ST. LOUIS, MISSOURI

Confluence of the Ohio and Mississippi
St Louis District
Bird's Point
HSR Model

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DRAWN BY: A Rockwell	REVIEWED BY: E Brauer, P.E.	CHECKED BY: J Brown, P.E.	
SUBMITTED: A Cox	APPROVED: Rob Davinroy, P.E.		
FILE NAME: L:\Bird's Point\Plates	PLOT DATE: 09/06/2011		

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US Army Corps of Engineers
St. Louis District

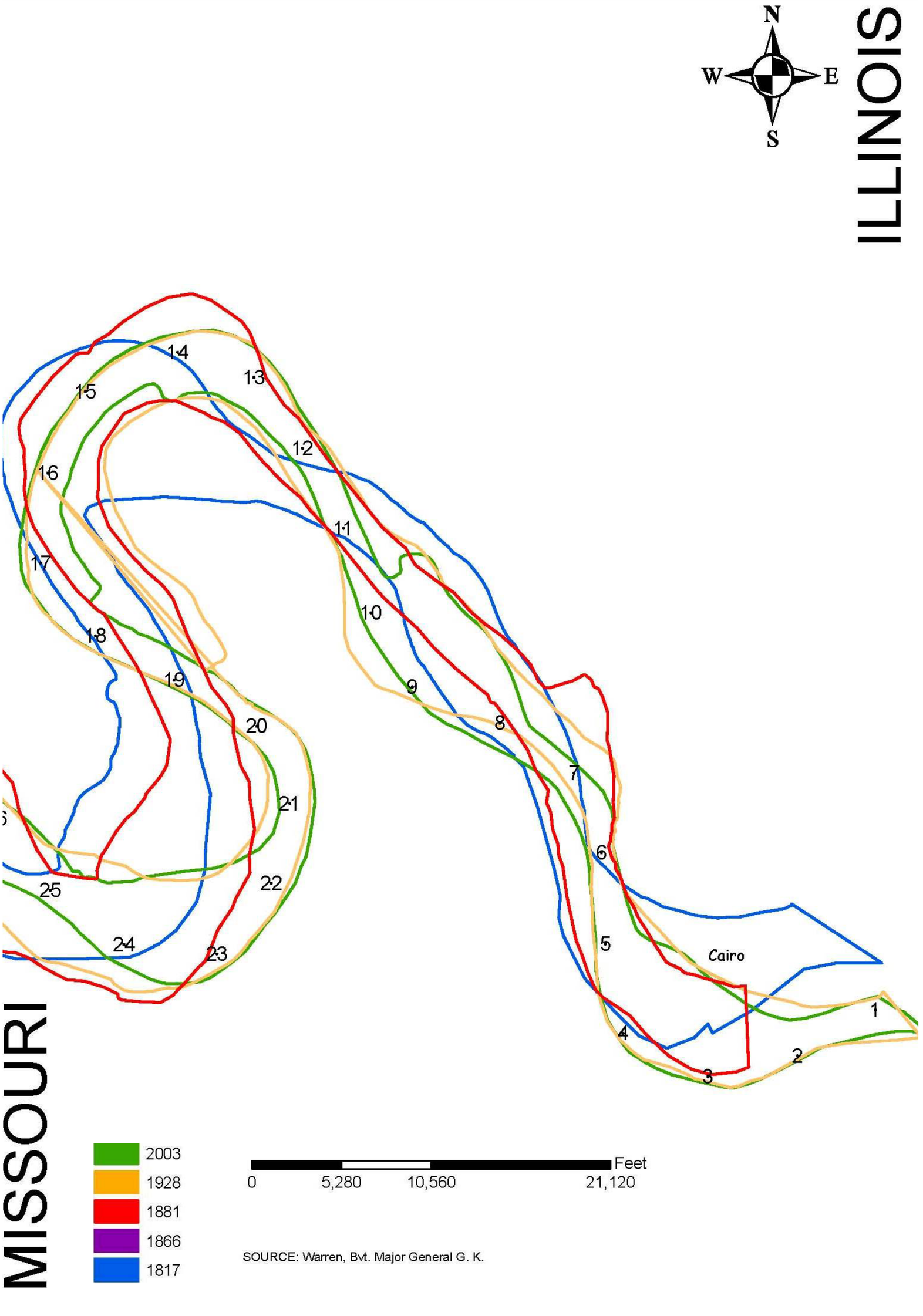

PLATE NUMBER 4

Bird's Point
Geomorphology Planform
1817 - 2003

U.S. ARMY ENGINEER DIVISION CORPS OF ENGINEERS ST. LOUIS, MISSOURI	DESIGNED BY: A COX		SURVEY DATE:
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Confluence of the Ohio and Mississippi St. Louis District Bird's Point HSR Model	SUBMITTED: A COX		APPROVED: R DAVINROY, P.E.
	FILE NAME: ...BirdsPoint/PLATES		PLOT DATE: 09/07/2011

APPLIED RIVER ENGINEERING CENTER

US Army Corps of Engineers
St. Louis District

Illinois

Mississippi River

Ohio River

Kentucky

Missouri

Cairo

Angelo Towhead

Birds Point

MRM 5

MRM 4

MRM 3

MRM 2

MRM 1

ORM 979

ORM 980

ORM 981

MRM 953

MRM 952

874000 876000 878000 440000 880000 882000 884000 886000 888000 890000 892000 894000 896000 898000

438000 444000 874000 442000 436000 440000 434000 900000 432000 436000 430000 876000 434000 428000 432000 426000 424000 902000 422000 428000 878000 426000 418000 424000 416000 904000 414000 420000 880000 418000 410000 416000 408000 906000 406000 412000 882000 410000 408000

884000 886000 888000 890000 892000 894000 896000 898000 406000 900000 902000 904000 906000

PLATE NUMBER 5

0 700 1,400 2,800
Feet

1928 AERIAL PHOTOGRAPH OVERLAY

2008 AERIAL PHOTOGRAPH

U.S. ARMY ENGINEER DIVISION
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ST. LOUIS, MISSOURI

Confluence of the Ohio and Mississippi
St Louis District
Bird's Point
HSR Model

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FILE NAME: L:\Bird's Point\Plates		PLOT DATE: 09/06/2011	

W N S E

APPLIED RIVER ENGINEERING CENTER

US Army Corps of Engineers
St. Louis District

Illinois

Mississippi River

Ohio River

Kentucky

Missouri

Cairo

Angelo Towhead

Birds Point

MRM 4

MRM 5

MRM 3

MRM 2

MRM 1

ORM 979

ORM 980

ORM 981

MRM 953

MRM 952

874000 876000 878000 440000 880000 882000 884000 886000 888000 890000 892000 894000 896000 898000

438000 444000
874000 442000
436000
434000 440000
432000 900000
430000 436000
876000
428000 434000
426000 432000
424000 902000
878000 428000
422000
426000
418000 424000
416000 904000
414000 420000
880000 418000
410000 416000
408000 906000
406000 412000
882000 410000
408000

884000 886000 888000 890000 892000 894000 896000 898000 406000 900000 902000 904000 906000

PLATE NUMBER 6

0 700 1,400 2,800
Feet

1942 PLANFORM MAP OVERLAY
2008 AERIAL PHOTOGRAPH

U.S. ARMY ENGINEER DIVISION
CORPS OF ENGINEERS
ST. LOUIS, MISSOURI

Confluence of the Ohio and Mississippi
St Louis District
Bird's Point
HSR Model

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US Army Corps of Engineers
St. Louis District

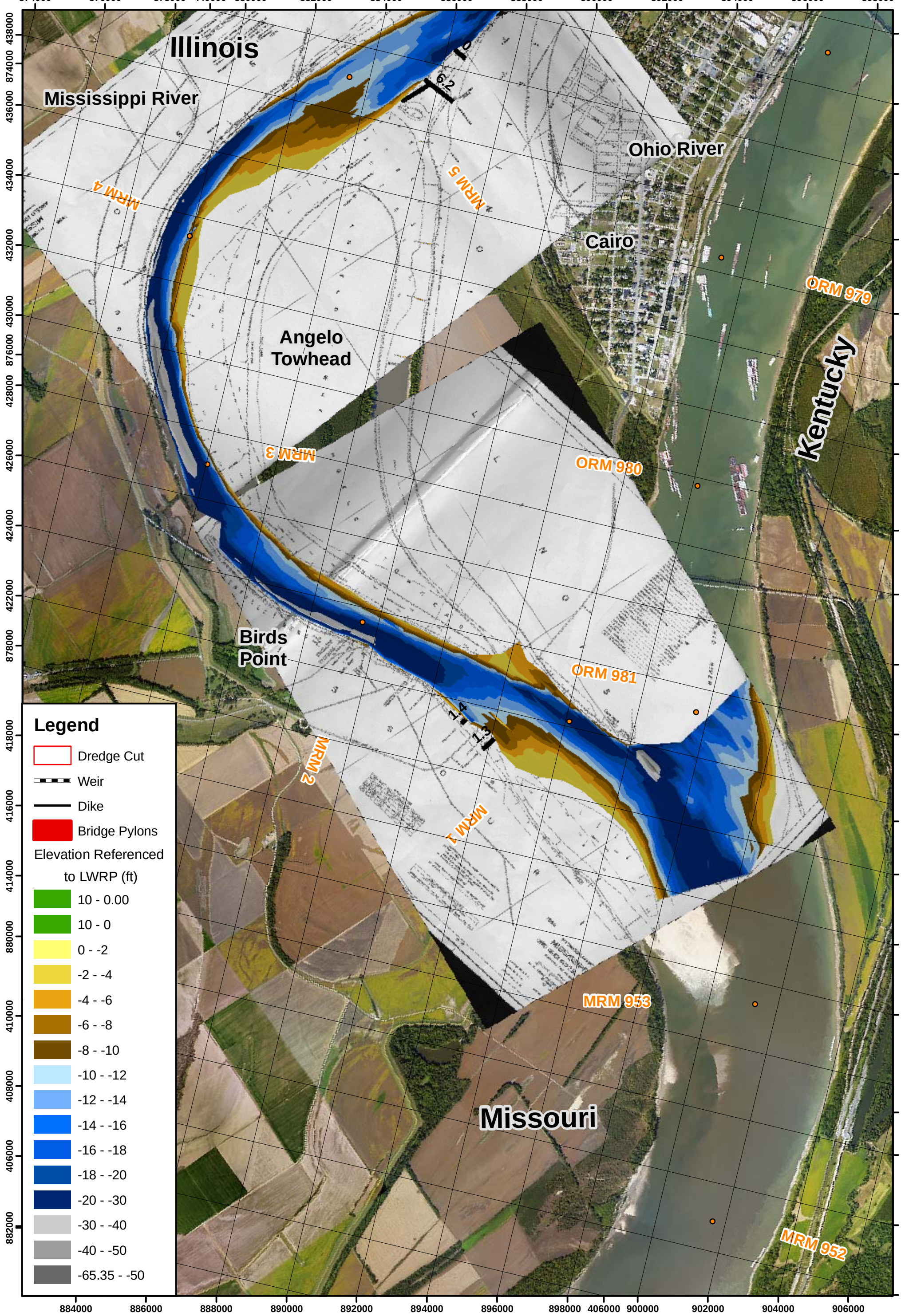

PLATE NUMBER 7

0 700 1,400 2,800
Feet

1939-1956 HYDROGRAPHIC SURVEY OVERLAY
2008 AERIAL PHOTOGRAPH

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Confluence of the Ohio and Mississippi St Louis District Bird's Point HSR Model	SUBMITTED: A Cox		APPROVED: Rob Davinroy, P.E.
	FILE NAME: L:\Bird's Point\Plates		PLOT DATE: 09/26/2011

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US Army Corps of Engineers St. Louis District

874000 876000 878000 440000 880000 882000 884000 886000 888000 890000 892000 894000 896000 898000

438000 874000 436000 434000 432000 430000 876000 428000 426000 424000 422000 878000 418000 416000 414000 880000 412000 410000 408000 406000 882000

444000 442000 440000 900000 436000 434000 432000 902000 428000 426000 904000 424000 422000 906000 418000 416000 412000 410000 408000

Illinois

Mississippi River

MRM 4

MRM 5

Ohio River

Cairo

ORM 979

Kentucky

Angelo Towhead

MRM 3

ORM 980

Birds Point

ORM 981

MRM 2

MRM 1

00.10R

MRM 953

Missouri

MRM 952

Legend

- Dredge Cut
- Weir
- Dike
- Bridge Pylons

Elevation Referenced to LWRP (ft)

- 10 - 0.00
- 10 - 0
- 0 - -2
- -2 - -4
- -4 - -6
- -6 - -8
- -8 - -10
- -10 - -12
- -12 - -14
- -14 - -16
- -16 - -18
- -18 - -20
- -20 - -30
- -30 - -40
- -40 - -50
- -65.35 - -50

884000 886000 888000 890000 892000 894000 896000 898000 406000 900000 902000 904000 906000

PLATE NUMBER 8

0 700 1,400 2,800
Feet

1968-1971 HYDROGRAPHIC SURVEY OVERLAY
2008 AERIAL PHOTOGRAPH

U.S. ARMY ENGINEER DIVISION
CORPS OF ENGINEERS
ST. LOUIS, MISSOURI

Confluence of the Ohio and Mississippi
St Louis District
Bird's Point
HSR Model

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SUBMITTED: A Cox	APPROVED: Rob Davinroy, P.E.		
FILE NAME: L:\Bird's Point\Plates	PLOT DATE: 09/26/2011		

W N S E

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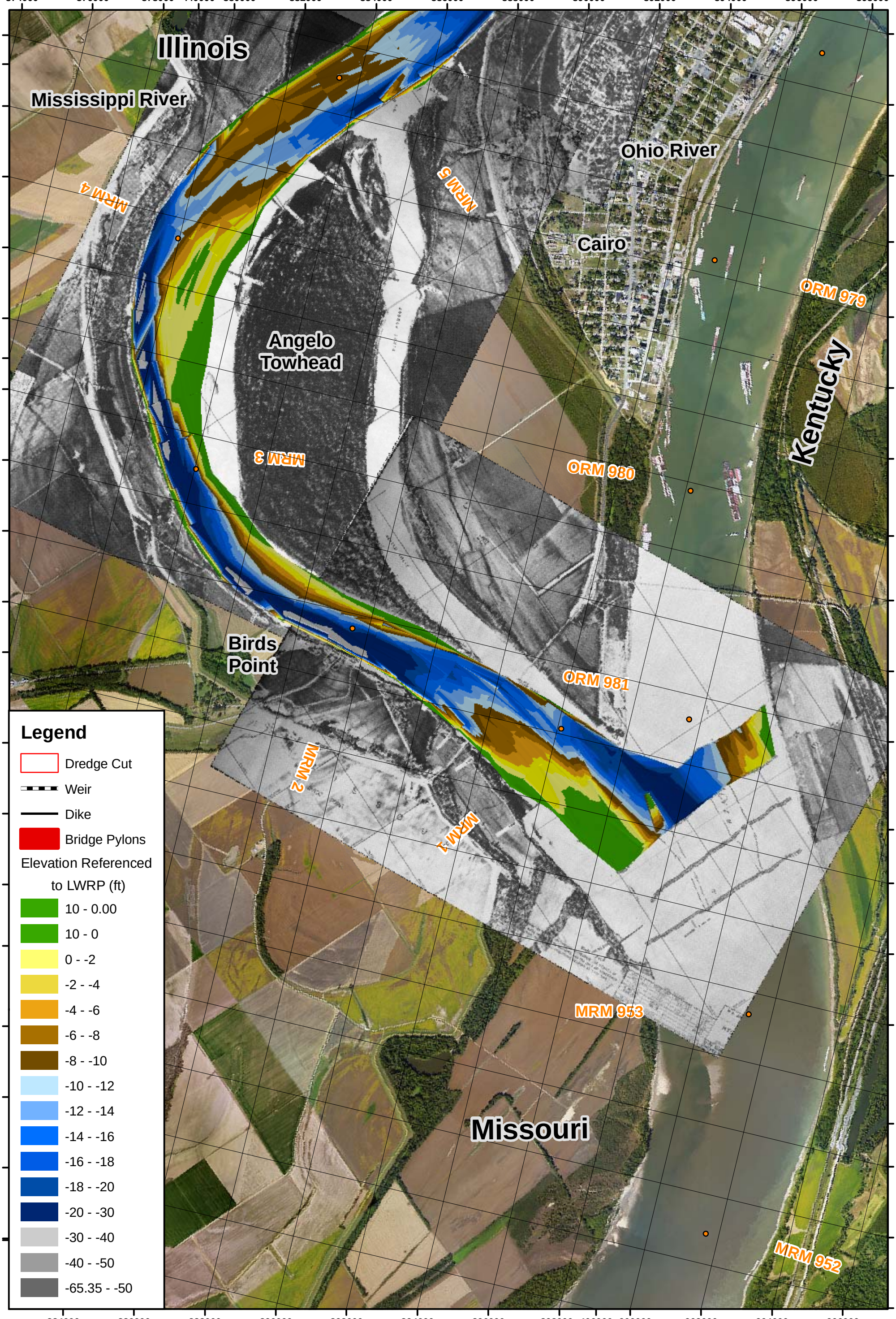
US Army Corps of Engineers
St. Louis District



Legend

- Dredge Cut
- Weir
- Dike
- Bridge Pylons

Elevation Referenced to LWRP (ft)

- 10 - 0.00
- 10 - 0
- 0 - -2
- -2 - -4
- -4 - -6
- -6 - -8
- -8 - -10
- -10 - -12
- -12 - -14
- -14 - -16
- -16 - -18
- -18 - -20
- -20 - -30
- -30 - -40
- -40 - -50
- -65.35 - -50

PLATE NUMBER 9

0 700 1,400 2,800
Feet

1967-1977 HYDROGRAPHIC SURVEY OVERLAY

2008 AERIAL PHOTOGRAPH

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ST. LOUIS, MISSOURI

Confluence of the Ohio and Mississippi
St Louis District
Bird's Point
HSR Model

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FILE NAME: L:\Bird's Point\Plates		PLOT DATE: 09/26/2011	

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US Army Corps of Engineers
St. Louis District

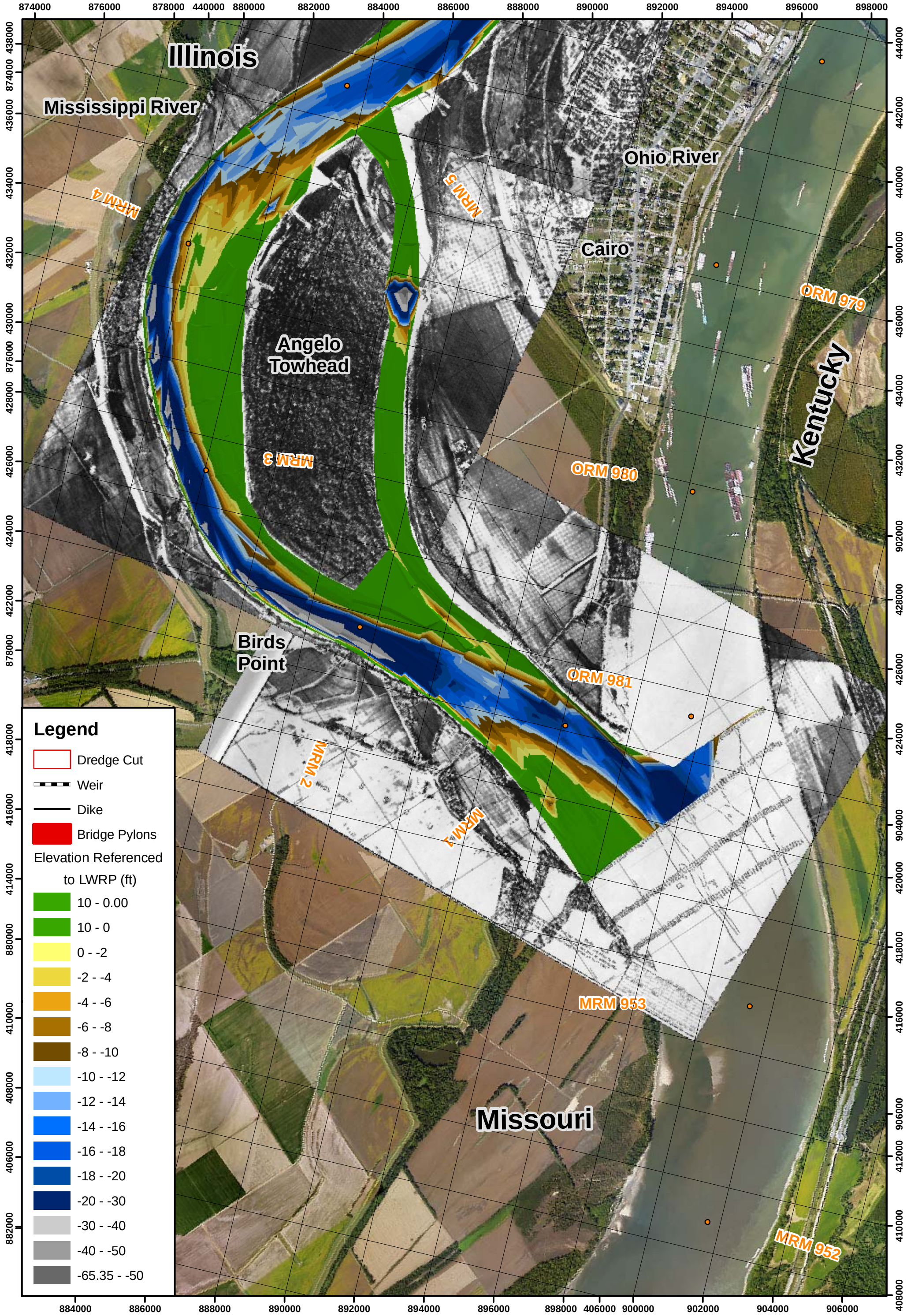

PLATE NUMBER 10

0 700 1,400 2,800
Feet

1982-1983 HYDROGRAPHIC SURVEY OVERLAY
2008 AERIAL PHOTOGRAPH

U.S. ARMY ENGINEER DIVISION
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ST. LOUIS, MISSOURI

Confluence of the Ohio and Mississippi
St Louis District
Bird's Point
HSR Model

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FILE NAME: L:\Bird's Point\Plates		PLOT DATE: 09/26/2011	

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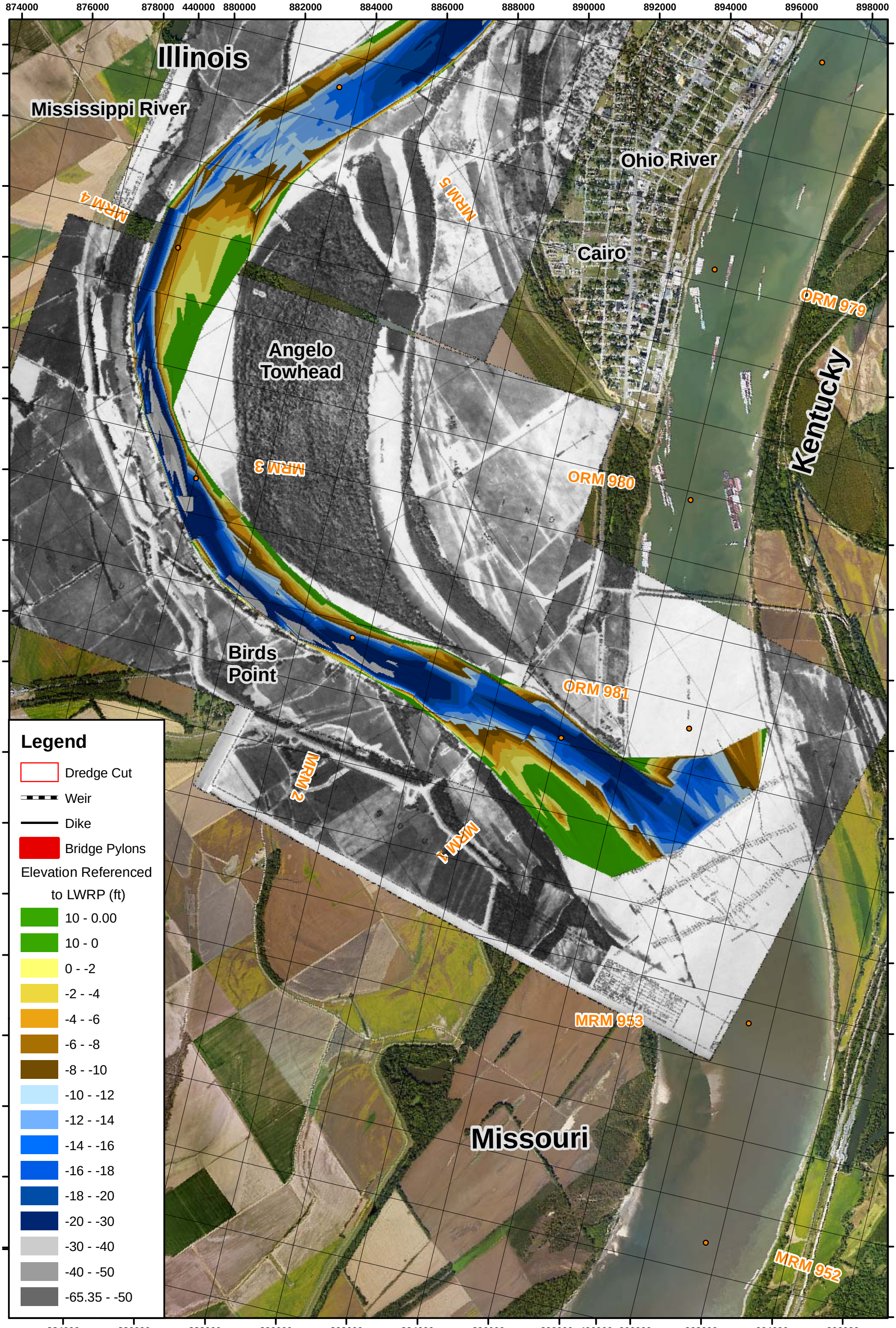
US Army Corps of Engineers
St. Louis District



Legend

- Dredge Cut
- Weir
- Dike
- Bridge Pylons

Elevation Referenced to LWRP (ft)

- 10 - 0.00
- 10 - 0
- 0 - -2
- -2 - -4
- -4 - -6
- -6 - -8
- -8 - -10
- -10 - -12
- -12 - -14
- -14 - -16
- -16 - -18
- -18 - -20
- -20 - -30
- -30 - -40
- -40 - -50
- -65.35 - -50

PLATE NUMBER 11

0 700 1,400 2,800
Feet

1986-1987 HYDROGRAPHIC SURVEY OVERLAY
2008 AERIAL PHOTOGRAPH

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ST. LOUIS, MISSOURI

Confluence of the Ohio and Mississippi
St Louis District
Bird's Point
HSR Model

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SUBMITTED: A Cox		APPROVED: Rob Davinroy, P.E.	
FILE NAME: L:\Bird's Point\Plates		PLOT DATE: 09/26/2011	

APPLIED RIVER ENGINEERING CENTER

US Army Corps of Engineers
St. Louis District

874000 876000 878000 440000 880000 882000 884000 886000 888000 890000 892000 894000 896000 898000

438000 874000 436000 434000 432000 430000 876000 428000 426000 424000 878000 422000 418000 416000 880000 414000 410000 408000 882000

444000 442000 900000 440000 436000 434000 902000 428000 426000 424000 904000 416000 418000 906000 412000 410000 420000 408000

Illinois

Mississippi River

Ohio River

Kentucky

Missouri

Cairo

Angelo Towhead

Birds Point

MRM 4

MRM 5

MRM 3

MRM 2

MRM 1

MRM 953

MRM 952

ORM 979

ORM 980

ORM 981

U.S. Highway 60

U.S. Highw

Weir 5.7 L

Dike 5.4 L

Dike 5.2 L

Weir 4.2 R

Weir 4.0 R

Weir 3.9 R

Weir 3.7 R

Weir 3.6 R

Weir 3.5 R

Weir 3.4 R

Weir 3.3 R

Weir 3.1 R

Dike 4.4 L

Dike 4.0 L

Dike 4.0 L

Dike 4.2 L

Weir 2.0 R

Weir 1.9 R

Weir 1.8 R

Dike 1.4 R

U.S. Highway 60

Dike 1.3 R

Dike 0.8 R

Dike 0.6 R

Dike 0.3 R

Dike 0.1 R

Legend

- Dredge Cut
- Weir
- Dike
- Bridge Pylons

Elevation Referenced to LWRP (ft)

- 10 - 0.00
- 10 - 0
- 0 - -2
- -2 - -4
- -4 - -6
- -6 - -8
- -8 - -10
- -10 - -12
- -12 - -14
- -14 - -16
- -16 - -18
- -18 - -20
- -20 - -30
- -30 - -40
- -40 - -50
- -65.35 - -50

884000 886000 888000 890000 892000 894000 896000 898000 406000 900000 902000 904000 906000

PLATE NUMBER 12

0 700 1,400 2,800

Feet

2001 HYDROGRAPHIC SURVEY

2008 AERIAL PHOTOGRAPH

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ST. LOUIS, MISSOURI

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SURVEY DATE:
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CHECKED BY: J Brown, P.E.

Confluence of the Ohio and Mississippi
St Louis District
Bird's Point
HSR Model

SUBMITTED: A Cox
APPROVED: Rob Davinroy, P.E.
FILE NAME: L:\Bird's Point\Plates
PLOT DATE: 09/27/2011

W N S E

APPLIED RIVER ENGINEERING CENTER

US Army Corps of Engineers
St. Louis District

Illinois

Mississippi River

Ohio River

Kentucky

Missouri

Cairo

Angelo Towhead

Birds Point

Dike 5.4 L

Dike 5.2 L

Weir 5.7 L

6.0 L

ir 5.8 L

.05 L

L

Dike 4.4 L

Dike 4.0 L

Dike 4.0 L

Dike 4.2 L

Weir 4.2 R

Weir 4.0 R

Weir 3.9 R

Weir 3.7 R

Weir 3.6 R

Weir 3.5 R

Weir 3.4 R

Weir 3.3 R

Weir 3.1 R

Weir 2.0 R

Weir 1.9 R

Weir 1.8 R

Dike 1.4 R

U.S. Highway 60

U.S. Highv

Dike 1.3 R

Dike 0.8 R

Dike 0.6 R

Dike 0.3 R

Dike 0.1 R

MRM 5

MRM 4

MRM 3

MRM 2

MRM 1

MRM 953

MRM 952

ORM 979

ORM 980

ORM 981

Legend

- Dredge Cut
- Weir
- Dike
- Bridge Pylons

Elevation Referenced to LWRP (ft)

- 10 - 0.00
- 10 - 0
- 0 - -2
- -2 - -4
- -4 - -6
- -6 - -8
- -8 - -10
- -10 - -12
- -12 - -14
- -14 - -16
- -16 - -18
- -18 - -20
- -20 - -30
- -30 - -40
- -40 - -50
- -65.35 - -50

PLATE NUMBER 13

0 700 1,400 2,800

Feet

2002 MULTI-BEAM HYDROGRAPHIC SURVEY

2008 AERIAL PHOTOGRAPH

U.S. ARMY ENGINEER DIVISION
CORPS OF ENGINEERS
ST. LOUIS, MISSOURI

Confluence of the Ohio and Mississippi
St Louis District
Bird's Point
HSR Model

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REVIEWED BY: E Brauer, P.E.
CHECKED BY: J Brown, P.E.
SUBMITTED: A Cox
APPROVED: Rob Davinroy, P.E.
FILE NAME: L:\Bird's Point\Plates
PLOT DATE: 09/27/2011

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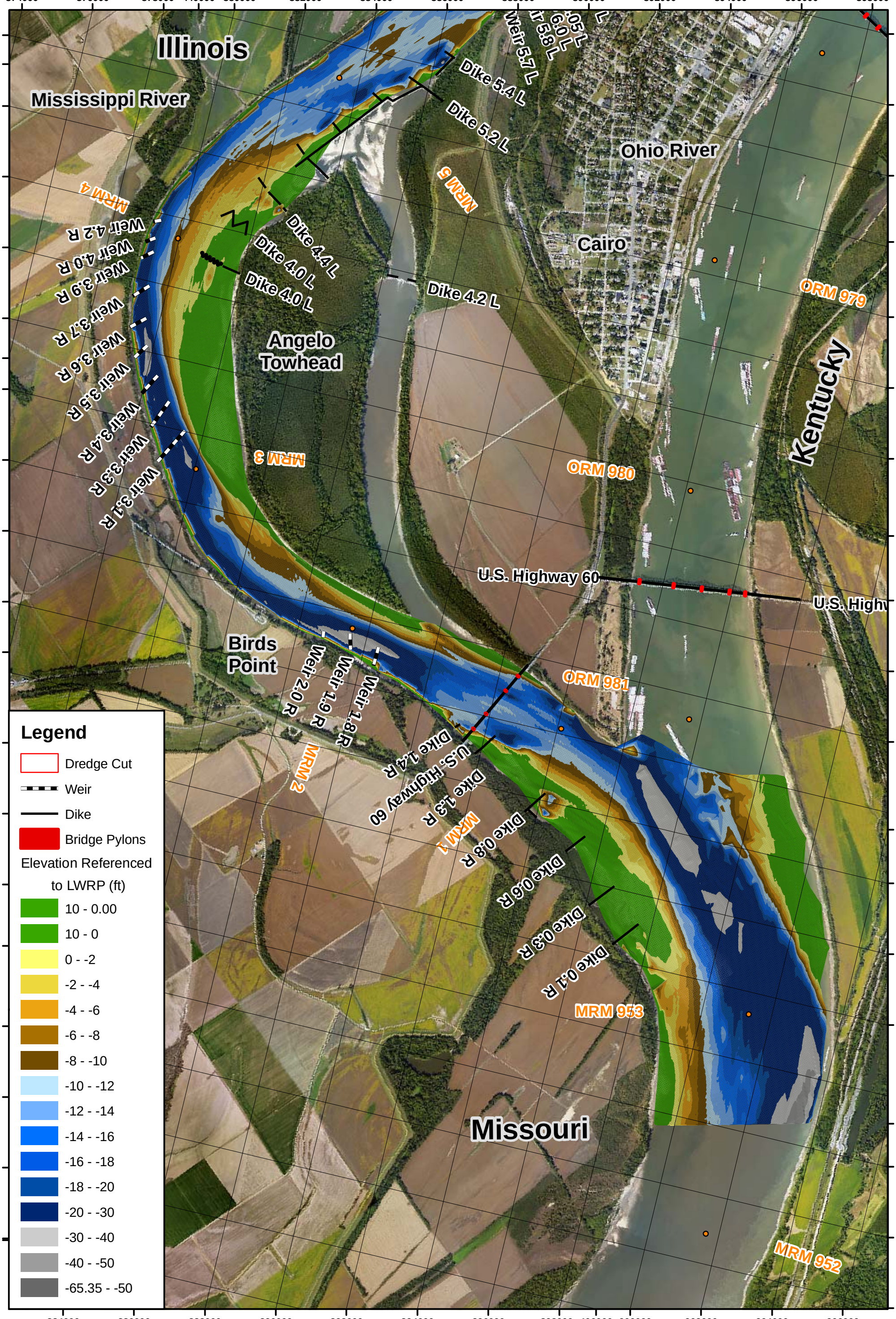
US Army Corps of Engineers
St. Louis District


Illinois
Mississippi River
Ohio River
Kentucky
Missouri
Cairo
Angelo Towhead
Birds Point
Dike 5.4 L
Dike 5.2 L
Dike 4.4 L
Dike 4.0 L
Dike 4.0 L
Dike 4.2 L
Weir 5.7 L
Weir 5.8 L
Weir 4.2 R
Weir 4.0 R
Weir 3.9 R
Weir 3.7 R
Weir 3.6 R
Weir 3.5 R
Weir 3.4 R
Weir 3.3 R
Weir 3.1 R
Weir 2.0 R
Weir 1.9 R
Weir 1.8 R
Dike 1.4 R
Dike 1.3 R
Dike 0.8 R
Dike 0.6 R
Dike 0.3 R
Dike 0.1 R
MRM 5
MRM 4
MRM 3
MRM 2
MRM 1
MRM 953
MRM 952
ORM 979
ORM 980
ORM 981
U.S. Highway 60
U.S. Highway 60
U.S. Highw
Legend
Dredge Cut
Weir
Dike
Bridge Pylons
Elevation Referenced to LWRP (ft)
10 - 0.00
10 - 0
0 - -2
-2 - -4
-4 - -6
-6 - -8
-8 - -10
-10 - -12
-12 - -14
-14 - -16
-16 - -18
-18 - -20
-20 - -30
-30 - -40
-40 - -50
-65.35 - -50
874000 876000 878000 440000 880000 882000 884000 886000 888000 890000 892000 894000 896000 898000
438000 874000 436000 434000 432000 430000 876000 428000 426000 424000 878000 422000 418000 416000 880000 414000 410000 408000 406000 882000
444000 442000 900000 440000 436000 434000 902000 428000 426000 424000 904000 418000 416000 906000 412000 410000 408000
884000 886000 888000 890000 892000 894000 896000 898000 406000 900000 902000 904000 906000
0 700 1,400 2,800
Feet
PLATE NUMBER 14
2005 HYDROGRAPHIC SURVEY
2008 AERIAL PHOTOGRAPH
U.S. ARMY ENGINEER DIVISION
CORPS OF ENGINEERS
ST. LOUIS, MISSOURI
Confluence of the Ohio and Mississippi
St Louis District
Bird's Point
HSR Model
DESIGNED BY: A Cox
SURVEY DATE:
DRAWN BY: A Rockwell
REVIEWED BY: E Brauer, P.E.
CHECKED BY: J Brown, P.E.
SUBMITTED: A Cox
APPROVED: Rob Davinroy, P.E.
FILE NAME: L:\Bird's Point\Plates
PLOT DATE: 09/27/2011
APPLIED RIVER ENGINEERING CENTER
US Army Corps of Engineers
St. Louis District

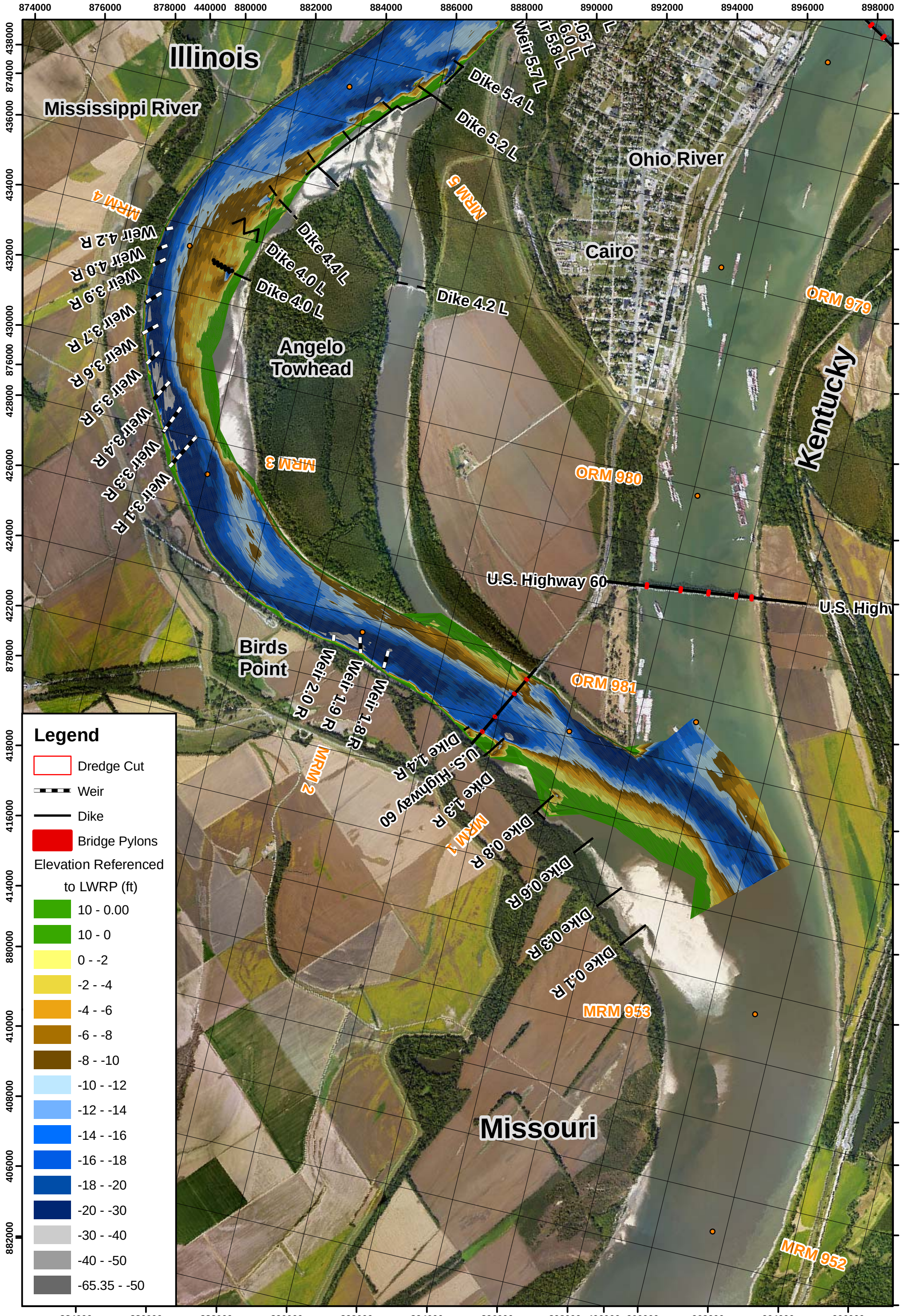


PLATE NUMBER 15

0 700 1,400 2,800
Feet

2007 HYDROGRAPHIC SURVEY
2008 AERIAL PHOTOGRAPH

U.S. ARMY ENGINEER DIVISION
CORPS OF ENGINEERS
ST. LOUIS, MISSOURI

Confluence of the Ohio and Mississippi
St Louis District
Bird's Point
HSR Model

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DRAWN BY: A Rockwell	REVIEWED BY: E Brauer, P.E.	CHECKED BY: J Brown, P.E.	
SUBMITTED: A Cox	APPROVED: Rob Davinroy, P.E.		
FILE NAME: L:\Bird's Point\Plates	PLOT DATE: 09/27/2011		

APPLIED RIVER ENGINEERING CENTER

US Army Corps of Engineers
St. Louis District

Illinois

Mississippi River

Ohio River

Kentucky

Missouri

Cairo

Angelo Towhead

Birds Point

Dike 5.4 L

Dike 5.2 L

Weir 5.7 L

Dike 4.4 L

Dike 4.0 L

Dike 4.0 L

Dike 4.2 L

Weir 4.2 R

Weir 4.0 R

Weir 3.9 R

Weir 3.7 R

Weir 3.6 R

Weir 3.5 R

Weir 3.4 R

Weir 3.3 R

Weir 3.1 R

Weir 2.0 R

Weir 1.9 R

Weir 1.8 R

Dike 1.4 R

U.S. Highway 60

Dike 1.3 R

Dike 0.8 R

Dike 0.6 R

Dike 0.3 R

Dike 0.1 R

MRM 4

MRM 3

MRM 2

MRM 1

MRM 5

ORM 979

ORM 980

ORM 981

MRM 953

MRM 952

Legend

- Dredge Cut
- Weir
- Dike
- Bridge Pylons

Elevation Referenced to LWRP (ft)

- 10 - 0.00
- 10 - 0
- 0 - -2
- -2 - -4
- -4 - -6
- -6 - -8
- -8 - -10
- -10 - -12
- -12 - -14
- -14 - -16
- -16 - -18
- -18 - -20
- -20 - -30
- -30 - -40
- -40 - -50
- -65.35 - -50

PLATE NUMBER 16

0 700 1,400 2,800

Feet

2007 MULTI-BEAM HYDROGRAPHIC SURVEY

2008 AERIAL PHOTOGRAPH

U.S. ARMY ENGINEER DIVISION
CORPS OF ENGINEERS
ST. LOUIS, MISSOURI

Confluence of the Ohio and Mississippi
St Louis District
Bird's Point
HSR Model

DESIGNED BY: A Cox		SURVEY DATE:	
DRAWN BY: A Rockwell	REVIEWED BY: E Brauer, P.E.	CHECKED BY: J Brown, P.E.	
SUBMITTED: A Cox	APPROVED: Rob Davinroy, P.E.		
FILE NAME: L:\Bird's Point\Plates	PLOT DATE: 09/27/2011		

APPLIED RIVER ENGINEERING CENTER

US Army Corps of Engineers
St. Louis District

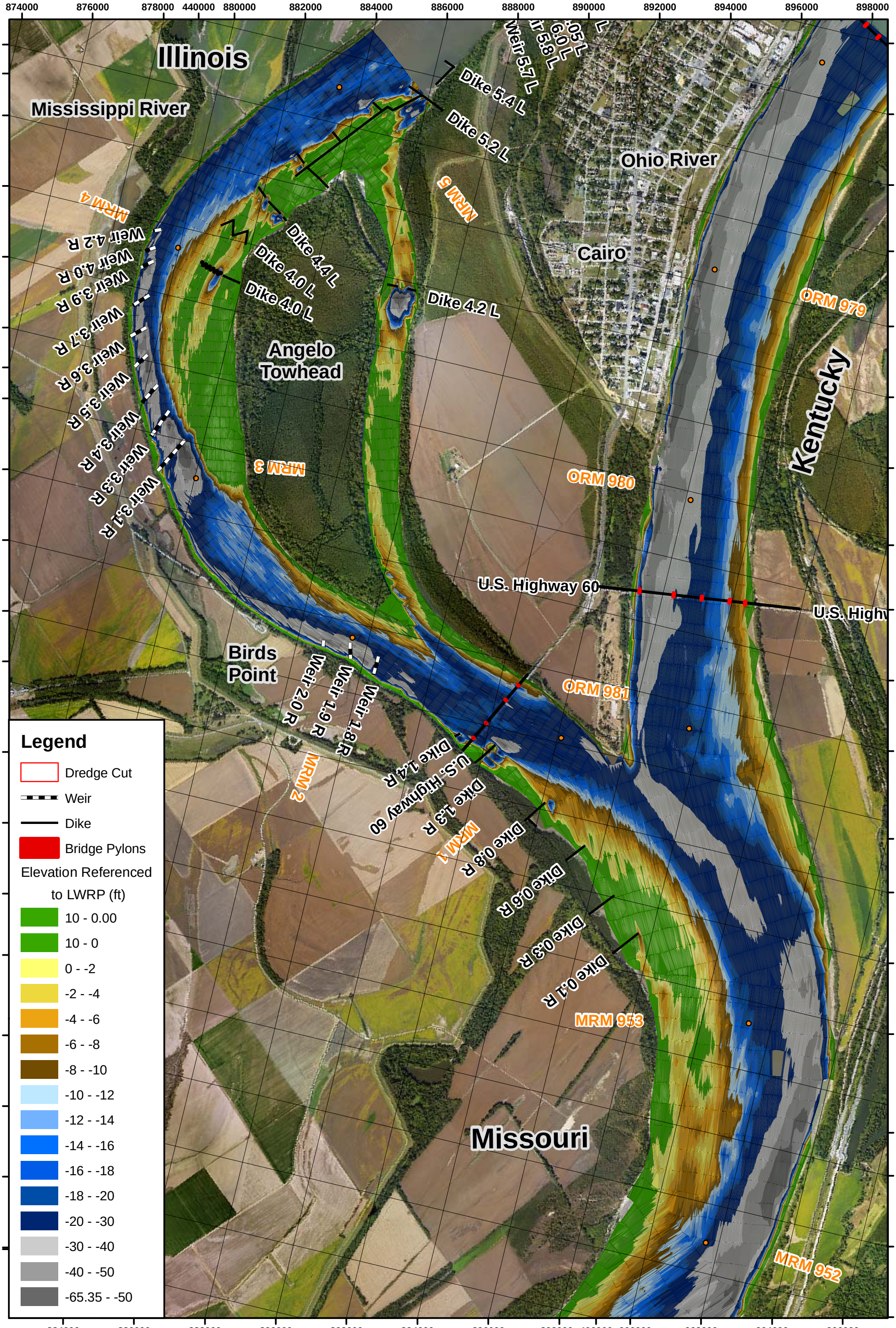

PLATE NUMBER 17

0 700 1,400 2,800
Feet

2010 HYDROGRAPHIC SURVEY
2008 AERIAL PHOTOGRAPH

U.S. ARMY ENGINEER DIVISION
CORPS OF ENGINEERS
ST. LOUIS, MISSOURI

Confluence of the Ohio and Mississippi
St Louis District
Bird's Point
HSR Model

DESIGNED BY: A Cox		SURVEY DATE:	
DRAWN BY: A Rockwell	REVIEWED BY: E Brauer, P.E.	CHECKED BY: J Brown, P.E.	
SUBMITTED: A Cox		APPROVED: Rob Davinroy, P.E.	
FILE NAME: L:\Bird's Point\Plates		PLOT DATE: 09/27/2011	

APPLIED RIVER ENGINEERING CENTER

US Army Corps of Engineers
St. Louis District

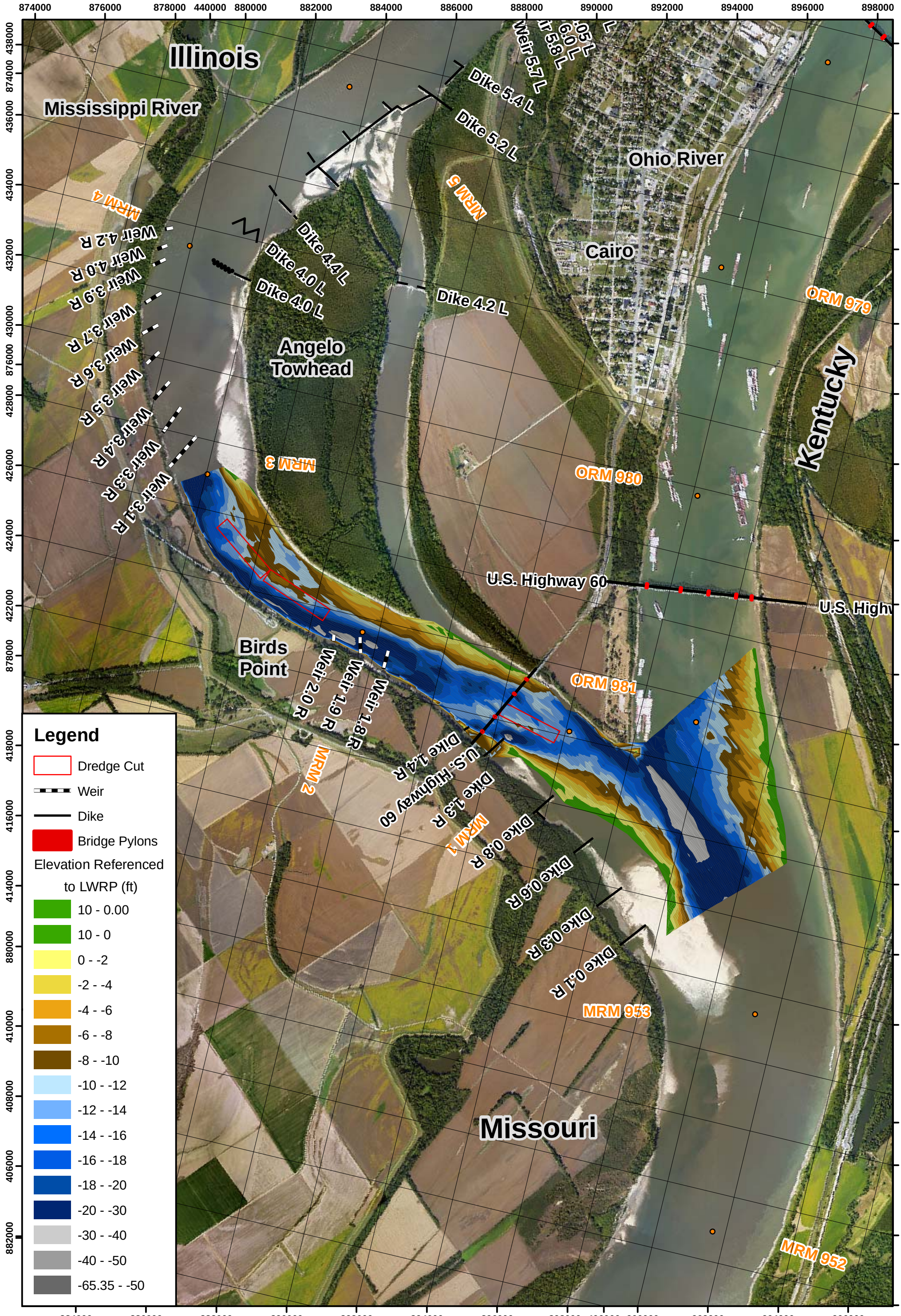

PLATE NUMBER 18

0 700 1,400 2,800 Feet

AUGUST 2006 PRE-DREDGE HYDROGRAPHIC SURVEY

2008 AERIAL PHOTOGRAPH

U.S. ARMY ENGINEER DIVISION CORPS OF ENGINEERS ST. LOUIS, MISSOURI	DESIGNED BY: A Cox		SURVEY DATE:
	DRAWN BY: A Rockwell	REVIEWED BY: E Brauer, P.E.	CHECKED BY: J Brown, P.E.
Confluence of the Ohio and Mississippi St Louis District Bird's Point HSR Model	SUBMITTED: A Cox	APPROVED: Rob Davinroy, P.E.	
	FILE NAME: L:\Bird's Point\Plates	PLOT DATE: 09/27/2011	

Applied River Engineering Center

US Army Corps of Engineers St. Louis District

Illinois
Mississippi River
Ohio River
Kentucky
Missouri
Cairo
Angelo Towhead
Birds Point
Dike 5.4 L
Dike 5.2 L
Weir 5.7 L
Dike 4.4 L
Dike 4.0 L
Dike 4.0 L
Dike 4.2 L
Weir 4.2 R
Weir 4.0 R
Weir 3.9 R
Weir 3.7 R
Weir 3.6 R
Weir 3.5 R
Weir 3.4 R
Weir 3.3 R
Weir 3.1 R
Weir 2.0 R
Weir 1.9 R
Weir 1.8 R
Dike 1.4 R
Dike 1.3 R
Dike 0.8 R
Dike 0.6 R
Dike 0.3 R
Dike 0.1 R
MRM 5
MRM 4
MRM 3
MRM 2
MRM 1
MRM 953
MRM 952
ORM 979
ORM 980
ORM 981
U.S. Highway 60
U.S. Highway 60
U.S. Highw
U.S. Highway 60

Legend

- Dredge Cut
- Weir
- Dike
- Bridge Pylons

Elevation Referenced to LWRP (ft)

- 10 - 0.00
- 10 - 0
- 0 - -2
- -2 - -4
- -4 - -6
- -6 - -8
- -8 - -10
- -10 - -12
- -12 - -14
- -14 - -16
- -16 - -18
- -18 - -20
- -20 - -30
- -30 - -40
- -40 - -50
- -65.35 - -50

PLATE NUMBER 19

0 700 1,400 2,800
Feet

NOVEMBER 2007 PRE-DREDGE HYDROGRAPHIC SURVEY

2008 AERIAL PHOTOGRAPH

U.S. ARMY ENGINEER DIVISION
CORPS OF ENGINEERS
ST. LOUIS, MISSOURI

Confluence of the Ohio and Mississippi
St Louis District
Bird's Point
HSR Model

DESIGNED BY: A Cox		SURVEY DATE:	
DRAWN BY: A Rockwell	REVIEWED BY: E Brauer, P.E.	CHECKED BY: J Brown, P.E.	
SUBMITTED: A Cox	APPROVED: Rob Davinroy, P.E.		
FILE NAME: L:\Bird's Point\Plates	PLOT DATE: 09/27/2011		

APPLIED RIVER ENGINEERING CENTER

US Army Corps of Engineers
St. Louis District

Illinois
Mississippi River
Ohio River
Kentucky
Missouri
Cairo
Angelo Towhead
Birds Point
Dike 5.4 L
Dike 5.2 L
Weir 5.7 L
Dike 4.4 L
Dike 4.0 L
Dike 4.0 L
Dike 4.2 L
Weir 4.2 R
Weir 4.0 R
Weir 3.9 R
Weir 3.7 R
Weir 3.6 R
Weir 3.5 R
Weir 3.4 R
Weir 3.3 R
Weir 3.1 R
Weir 2.0 R
Weir 1.9 R
Weir 1.8 R
Dike 1.4 R
Dike 1.3 R
Dike 0.8 R
Dike 0.6 R
Dike 0.3 R
Dike 0.1 R
U.S. Highway 60
U.S. Highw
MRM 5
MRM 4
MRM 3
MRM 2
MRM 1
ORM 979
ORM 980
ORM 981
MRM 953
MRM 952

Legend

- Dredge Cut
- Weir
- Dike
- Bridge Pylons

Elevation Referenced to LWRP (ft)

- 10 - 0.00
- 10 - 0
- 0 - -2
- -2 - -4
- -4 - -6
- -6 - -8
- -8 - -10
- -10 - -12
- -12 - -14
- -14 - -16
- -16 - -18
- -18 - -20
- -20 - -30
- -30 - -40
- -40 - -50
- -65.35 - -50

PLATE NUMBER 20

0 700 1,400 2,800
Feet

OCTOBER 2008 PRE-DREDGE HYDROGRAPHIC SURVEY

2008 AERIAL PHOTOGRAPH

U.S. ARMY ENGINEER DIVISION
CORPS OF ENGINEERS
ST. LOUIS, MISSOURI

DESIGNED BY: A Cox
SURVEY DATE:
DRAWN BY: A Rockwell
REVIEWED BY: E Brauer, P.E.
CHECKED BY: J Brown, P.E.

Confluence of the Ohio and Mississippi
St Louis District
Bird's Point
HSR Model

SUBMITTED: A Cox
APPROVED: Rob Davinroy, P.E.
FILE NAME: L:\Bird's Point\Plates
PLOT DATE: 09/27/2011

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US Army Corps of Engineers
St. Louis District

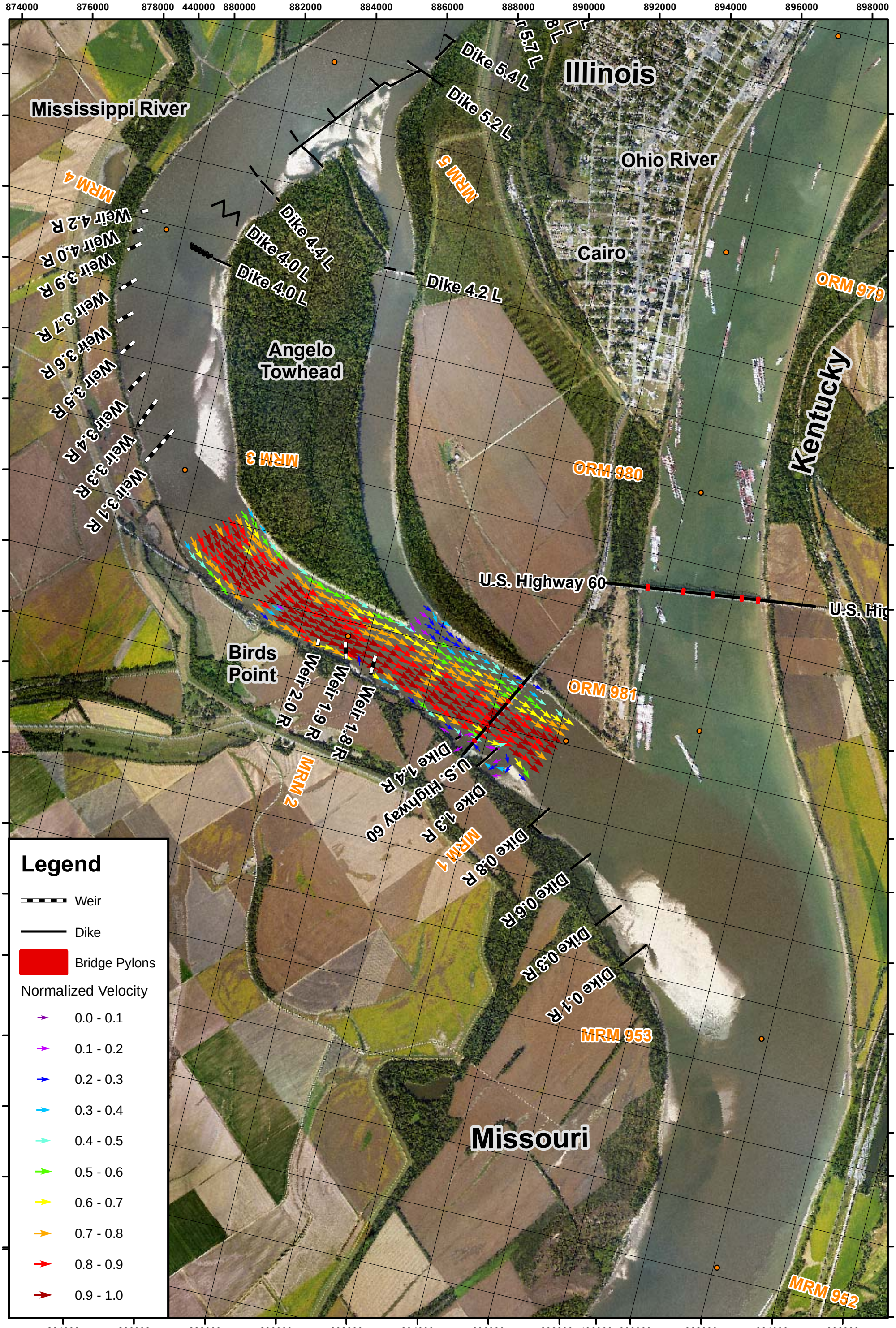

PLATE NUMBER 21

0 700 1,400 2,800
Feet

December 2007
Normalized ADCP

2008 AERIAL PHOTOGRAPH

U.S. ARMY ENGINEER DIVISION CORPS OF ENGINEERS ST. LOUIS, MISSOURI	DESIGNED BY: A Cox		SURVEY DATE: 12/2007
	DRAWN BY: A Rockwell	REVIEWED BY: E Brauer, P.E.	CHECKED BY: J Brown, P.E.
Confluence of the Ohio and Mississippi St Louis District Bird's Point HSR Model	SUBMITTED: A Cox		APPROVED: Rob Davinroy, P.E.
	FILE NAME: L:\Bird'sPoint\Plates		PLOT DATE: 09/14/2011

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St. Louis District

Looking towards LDB at submerged Dike 5.2L – Effects of Dike can be seen (turbulence in water)

Looking at RDB near RM 0.0

Looking downstream at submerged Dike 5.2L – Effects of Dike can be seen (turbulence in water)

US Army Corps of Engineers
St. Louis District®

APPLIED RIVER ENGINEERING CENTER

N W E S

DESIGNED BY: A COX	DRAWN BY: A COX	REVIEWED BY: E BRAUER, P.E.	CHECKED BY: J BROWN, P.E.
SUBMITTED: A COX	FILE NAME: ...BirdsPoint/PLATES		APPROVED: R DAVINROY, P.E.
			PLOT DATE: 09/07/2011

U.S. ARMY ENGINEER DIVISION
CORPS OF ENGINEERS
ST. LOUIS, MISSOURI

Confluence of the Ohio and Mississippi
St. Louis District
Bird's Point
HSR Model

Bird's Point
Field Photographs
Date Photographed: August 1, 2011

PLATE NUMBER
22

Erosion on the RDEB of Angelo Chute just upstream of revetment

Revetment on RDB of Angelo Chute just downstream of erosion

Closer view of erosion on the RDB of Angelo Chute just upstream of revetment

Looking upstream at Mississippi (left) – Ohio (right) Confluence – 60/62 Bridge

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St. Louis District®

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N W E S

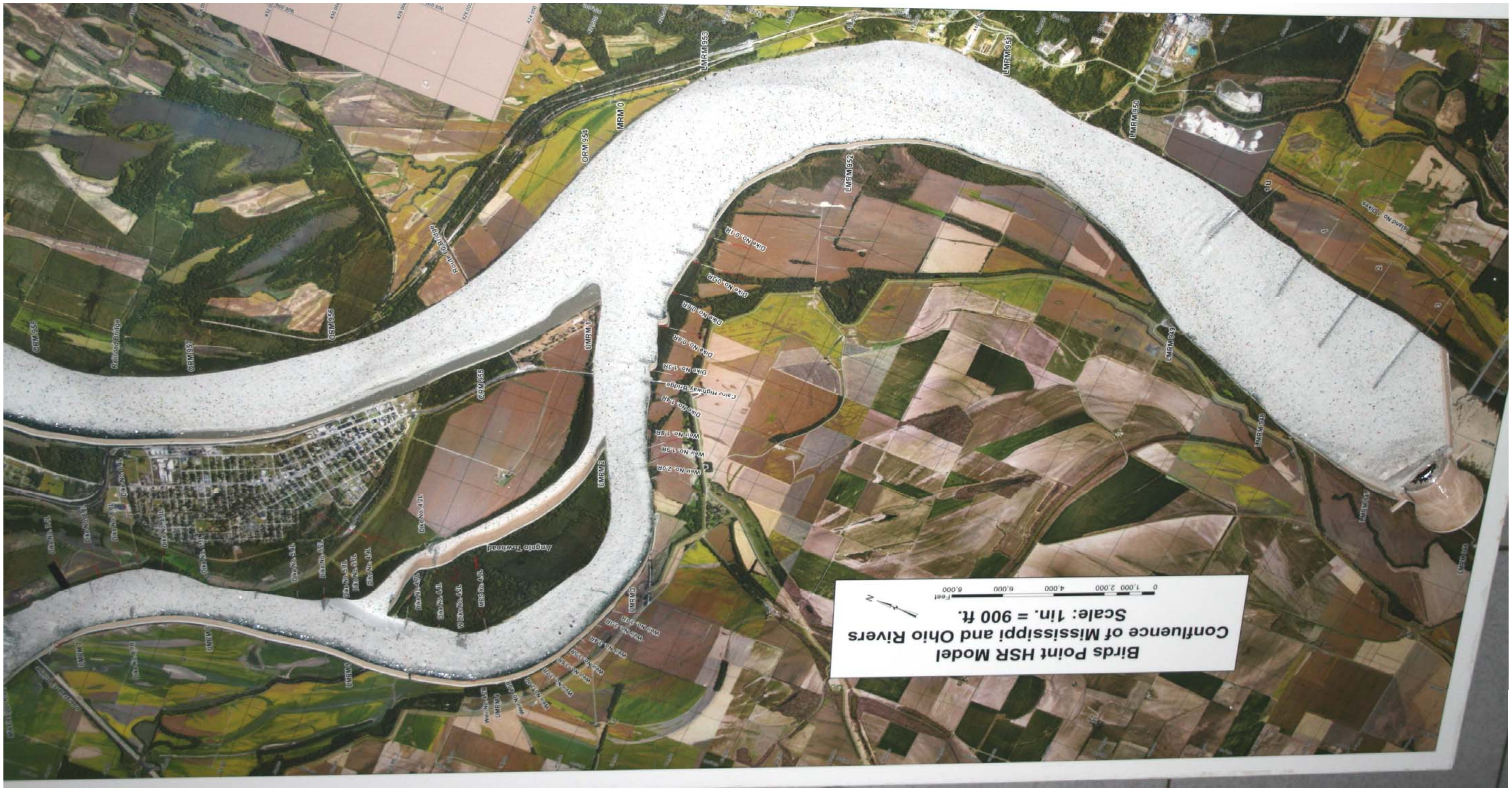
DESIGNED BY: A COX	DRAWN BY: A COX	REVIEWED BY: E BRAUER, P.E.	SURVEY DATE:
SUBMITTED: A COX		APPROVED: R DAVINROY, P.E.	CHECKED BY: J BROWN, P.E.
FILE NAME: ...BirdsPoint/PLATES		PLOT DATE: 09/07/2011	

U.S. ARMY ENGINEER DIVISION
CORPS OF ENGINEERS
ST. LOUIS, MISSOURI

Confluence of the Ohio and Mississippi
St. Louis District
Bird's Point
HSR Model

Bird's Point
Field Photographs
Date Photographed: August 1, 2011

PLATE NUMBER
23



Entrance is on left of picture, water flows to the right of the picture to the exit drain.

US Army Corps of Engineers
St. Louis District®

APPLIED RIVER ENGINEERING CENTER

N
W E
S

SURVEY DATE:	CHECKED BY: J BROWN, P.E.	APPROVED: R DAVINROY, P.E.	PLOT DATE: 09/07/2011
DESIGNED BY: A COX	REVIEWED BY: E BRAUER, P.E.		
	DRAWN BY: A COX	SUBMITTED: A COX	FILE NAME: ...BirdsPoint/PLATES

U.S. ARMY ENGINEER DIVISION
CORPS OF ENGINEERS
ST. LOUIS, MISSOURI

Confluence of the Ohio and Mississippi
St. Louis District
Bird's Point
HSR Model

Bird's Point
HSR Model Photograph

PLATE
NUMBER
24

Mississippi River
Illinois
Ohio River
Kentucky
Missouri
Cairo
Angelo Towhead
Birds Point
MRM 4
MRM 5
MRM 3
MRM 2
MRM 1
ORM 979
ORM 980
ORM 981
MRM 953
MRM 952
Weir 4.2 R
Weir 4.0 R
Weir 3.9 R
Weir 3.7 R
Weir 3.6 R
Weir 3.5 R
Weir 3.4 R
Weir 3.3 R
Weir 3.1 R
Weir 2.0 R
Weir 1.9 R
Weir 1.8 R
Dike 5.4 L
Dike 5.2 L
Dike 4.4 L
Dike 4.0 L
Dike 4.0 L
Dike 4.2 L
Dike 1.4 R
Dike 1.3 R
Dike 0.8 R
Dike 0.6 R
Dike 0.3 R
Dike 0.1 R
U.S. Highway 60
U.S. Highw
U.S. Highway 60

Legend

- Dredge Cut
- Weir
- Dike
- Bridge Pylons

Elevation Referenced to LWRP (ft)

- 10 - 0.00
- 10 - 0
- 0 - -2
- -2 - -4
- -4 - -6
- -6 - -8
- -8 - -10
- -10 - -12
- -12 - -14
- -14 - -16
- -16 - -18
- -18 - -20
- -20 - -30
- -30 - -40
- -40 - -50
- -65.35 - -50

PLATE NUMBER 25

0 700 1,400 2,800
Feet

Replication Test:
Bathymetry Results

2008 AERIAL PHOTOGRAPH

U.S. ARMY ENGINEER DIVISION CORPS OF ENGINEERS ST. LOUIS, MISSOURI	DESIGNED BY: A Cox		SURVEY DATE: 09/09/2011
	DRAWN BY: A Rockwell	REVIEWED BY: E Brauer, P.E.	CHECKED BY: J Brown, P.E.
Confluence of the Ohio and Mississippi St Louis District Bird's Point HSR Model	SUBMITTED: A Cox		APPROVED: Rob Davinroy, P.E.
	FILE NAME: L:\Bird'sPoint\Plates		PLOT DATE: 09/14/2011

APPLIED RIVER ENGINEERING CENTER

US Army Corps of Engineers
St. Louis District

874000 876000 878000 440000 880000 882000 884000 886000 888000 890000 892000 894000 896000 898000

438000 436000 434000 432000 430000 428000 426000 424000 422000 418000 416000 414000 880000 410000 408000 406000 882000

444000 442000 440000 900000 436000 434000 432000 902000 428000 426000 424000 904000 420000 418000 906000 416000 412000 410000 408000

Illinois

Mississippi River

Ohio River

Kentucky

Missouri

Weir 5.7 L

Dike 5.4 L

Dike 5.2 L

MRM 5

MRM 4

Weir 4.2 R

Weir 4.0 R

Weir 3.9 R

Weir 3.7 R

Weir 3.6 R

Weir 3.5 R

Weir 3.4 R

Weir 3.3 R

Weir 3.1 R

Dike 4.4 L

Dike 4.0 L

Dike 4.0 L

Dike 4.2 L

Cairo

ORM 979

Angelo Towhead

MRM 3

ORM 980

U.S. Highway 60

U.S. Highw

Birds Point

ORM 981

Weir 2.0 R

Weir 1.9 R

Weir 1.8 R

MRM 2

Dike 1.4 R

U.S. Highway 60

Dike 1.3 R

MRM 1

Dike 0.8 R

Dike 0.6 R

Dike 0.3 R

Dike 0.1 R

MRM 953

MRM 952

Legend

- Weir
- Dike
- Bridge Pylons

Normalized Velocity

- 0.0 - 0.1
- 0.1 - 0.2
- 0.2 - 0.3
- 0.3 - 0.4
- 0.4 - 0.5
- 0.5 - 0.6
- 0.6 - 0.7
- 0.7 - 0.8
- 0.8 - 0.9
- 0.9 - 1.0

884000 886000 888000 890000 892000 894000 896000 898000 406000 900000 902000 904000 906000

PLATE NUMBER 26

0 700 1,400 2,800
Feet

Replication Test:
Velocity Results

2008 AERIAL PHOTOGRAPH

U.S. ARMY ENGINEER DIVISION
CORPS OF ENGINEERS
ST. LOUIS, MISSOURI

DESIGNED BY: A Cox
SURVEY DATE: 09/09/2011
DRAWN BY: A Rockwell
REVIEWED BY: E Brauer, P.E.
CHECKED BY: J Brown, P.E.

Confluence of the Ohio and Mississippi
St Louis District
Bird's Point
HSR Model

SUBMITTED: A Cox
APPROVED: Rob Davinroy, P.E.
FILE NAME: L:\Bird'sPoint\Plates
PLOT DATE: 09/14/2011

APPLIED RIVER ENGINEERING CENTER

US Army Corps of Engineers
St. Louis District

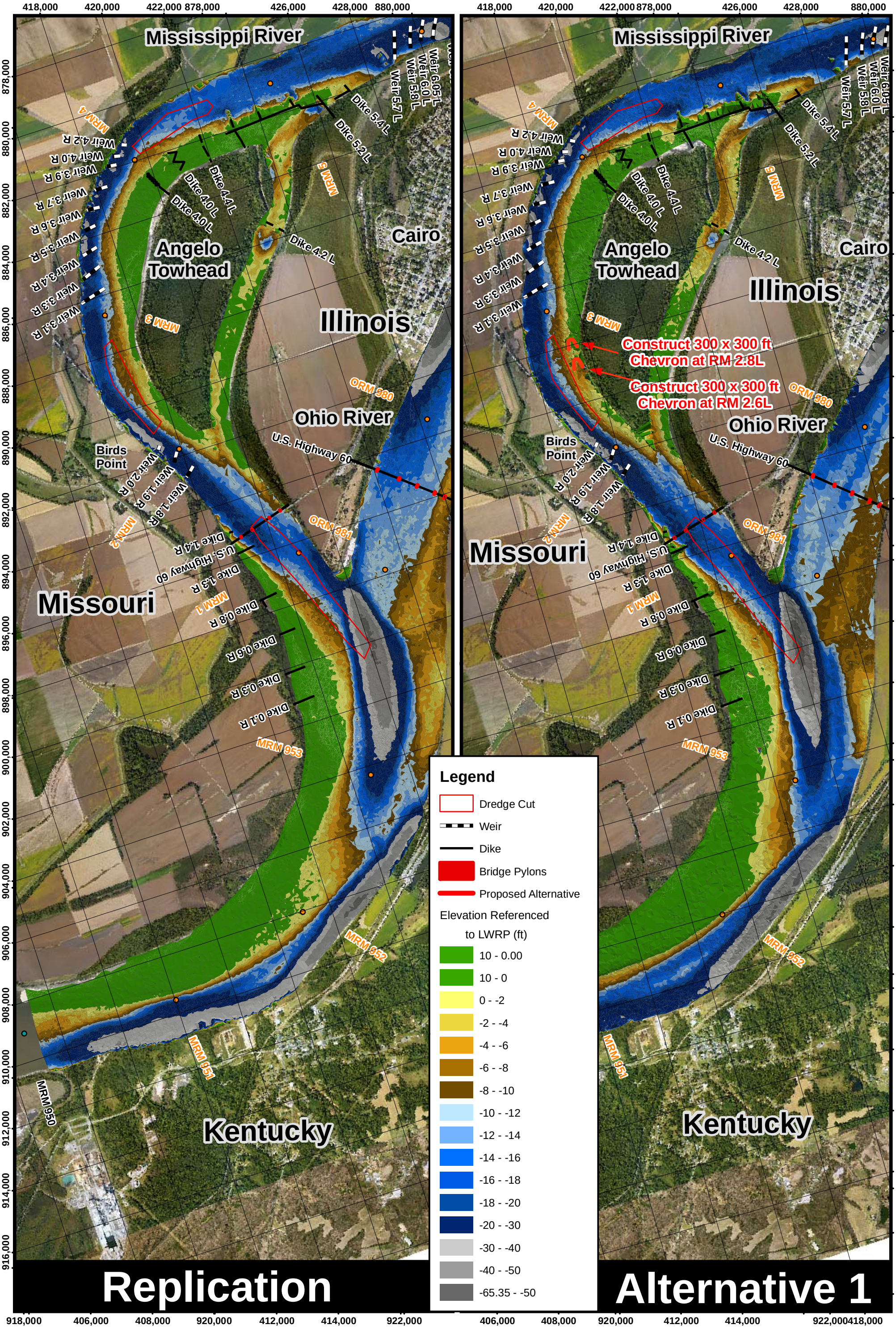


PLATE NUMBER 27

0 1,250 2,500 5,000 Feet

Replication Scan vs. Alternative 1 Bathymetry Results

2008 AERIAL PHOTOGRAPH

U.S. ARMY ENGINEER DIVISION CORPS OF ENGINEERS ST. LOUIS, MISSOURI	DESIGNED BY: A Cox		SURVEY DATE: 09/27/2011
	DRAWN BY: A Rockwell	REVIEWED BY: E Brauer, P.E.	CHECKED BY: J Brown, P.E.
Confluence of the Ohio and Mississippi St Louis District Bird's Point HSR Model	SUBMITTED: A Cox	APPROVED: Rob Davinroy, P.E.	
	FILE NAME: L:\Bird'sPoint\Plates	PLOT DATE: 09/28/2011	

APPLIED RIVER ENGINEERING CENTER

US Army Corps of Engineers St. Louis District

Replication

Alternative 1

Angelo Towhead

Birds Point

MRM 3

MRM 1

Dike 4.0 R

Weir 3.6 R

Weir 3.5 R

Weir 3.4 R

Weir 3.3 R

Weir 3.1 R

Weir 2.0 R

Weir 1.9 R

Weir 1.8 R

Dike 1.4 R

U.S. Highway 60

Dike 1.3 R

Dike 0.8 R

Dike 0.6 R

Dike 0.3 R

Dike 0.1 R

Construct 300 x 300 ft Chevron at RM 2.8L

Construct 300 x 300 ft Chevron at RM 2.8L

Legend

- Dike
- Weir
- Bridge Pylons
- Proposed Alternative

Normalized Velocity

- 0.0 - 0.1
- 0.1 - 0.2
- 0.2 - 0.3
- 0.3 - 0.4
- 0.4 - 0.5
- 0.5 - 0.6
- 0.6 - 0.7
- 0.7 - 0.8
- 0.8 - 0.9
- 0.9 - 1.0

416,000 418,000 420,000 422,000

884,000 886,000 888,000 890,000 892,000 894,000 896,000 898,000 900,000 902,000

PLATE NUMBER 28

0 500 1,000 2,000 Feet

Replication Scan vs. Alternative 1 Velocity Results

2008 AERIAL PHOTOGRAPH

U.S. ARMY ENGINEER DIVISION
CORPS OF ENGINEERS
ST. LOUIS, MISSOURI

Confluence of the Ohio and Mississippi
St Louis District
Bird's Point
HSR Model

DESIGNED BY: A Cox			SURVEY DATE: 09/14/2011
DRAWN BY: A Rockwell	REVIEWED BY: E Brauer, P.E.	CHECKED BY: J Brown, P.E.	
SUBMITTED: A Cox		APPROVED: Rob Davinroy, P.E.	
FILE NAME: L:\Bird'sPoint\Plates		PLOT DATE: 09/14/2011	

W S N E

Applied River Engineering Center

US Army Corps of Engineers St. Louis District

Mississippi River
Missouri
Kentucky
Illinois
Cairo
Angelo Towhead
Birds Point
Ohio River
U.S. Highway 60
MRM 4
MRM 3
MRM 2
MRM 1
MRM 953
MRM 952
MRM 951
MRM 950
ORM 980
ORM 981
Weir 6.05 L
Weir 6.0 L
Weir 5.8 L
Weir 5.7 L
Dike 5.4 L
Dike 5.2 L
Dike 4.4 L
Dike 4.2 L
Dike 4.0 L
Weir 4.2 R
Weir 4.0 R
Weir 3.9 R
Weir 3.7 R
Weir 3.6 R
Weir 3.5 R
Weir 3.4 R
Weir 3.3 R
Weir 3.1 R
Weir 2.0 R
Weir 1.9 R
Weir 1.8 R
Dike 1.4 R
U.S. Highway 60
Dike 1.3 R
Dike 0.8 R
Dike 0.6 R
Dike 0.3 R
Dike 0.1 R

Construct 300 x 300 ft Chevron at RM 2.8L

Construct 300 x 300 ft Chevron at RM 2.6L

Extend Dike 0.8R 370 ft

Extend Dike 0.6R 645 ft

Extend Dike 0.3R 930 ft

Legend

- Dredge Cut
- Weir
- Dike
- Bridge Pylons
- Proposed Alternative

Elevation Referenced to LWRP (ft)

- 10 - 0.00
- 10 - 0
- 0 - -2
- -2 - -4
- -4 - -6
- -6 - -8
- -8 - -10
- -10 - -12
- -12 - -14
- -14 - -16
- -16 - -18
- -18 - -20
- -20 - -30
- -30 - -40
- -40 - -50
- -65.35 - -50

Replication

Alternative 2

PLATE NUMBER 29

0 1,250 2,500 5,000 Feet

Replication Scan vs. Alternative 2
Bathymetry Results
2008 AERIAL PHOTOGRAPH

U.S. ARMY ENGINEER DIVISION
CORPS OF ENGINEERS
ST. LOUIS, MISSOURI

Confluence of the Ohio and Mississippi
St Louis District
Bird's Point
HSR Model

DESIGNED BY: A Cox		SURVEY DATE: 09/27/2011	
DRAWN BY: A Rockwell	REVIEWED BY: E Brauer, P.E.	CHECKED BY: J Brown, P.E.	
SUBMITTED: A Cox		APPROVED: Rob Davinroy, P.E.	
FILE NAME: L:\Bird'sPoint\Plates		PLOT DATE: 09/28/2011	

APPLIED RIVER ENGINEERING CENTER

US Army Corps of Engineers
St. Louis District

Replication

Alternative 2

Angelo Towhead

Birds Point

MRM 3

MRM 1

MRM 95

Dike 4.0 R

Weir 3.6 R

Weir 3.5 R

Weir 3.4 R

Weir 3.3 R

Weir 3.1 R

Weir 2.0 R

Weir 1.9 R

Weir 1.8 R

Dike 1.4 R

U.S. Highway 60

Dike 1.3 R

Dike 0.8 R

Dike 0.6 R

Dike 0.3 R

Dike 0.1 R

Construct 300 x 300 ft Chevron at RM 2.8L

Construct 300 x 300 ft Chevron at RM 2.6L

Extend Dike 0.8R 370 ft

Extend Dike 0.6R 645 ft

Extend Dike 0.3R 930 ft

Legend

- Dike
- Weir
- Bridge Pylons
- Proposed Alternative

Normalized Velocity

- 0.0 - 0.1
- 0.1 - 0.2
- 0.2 - 0.3
- 0.3 - 0.4
- 0.4 - 0.5
- 0.5 - 0.6
- 0.6 - 0.7
- 0.7 - 0.8
- 0.8 - 0.9
- 0.9 - 1.0

416,000 418,000 420,000 414,000 422,000

884,000 886,000 888,000 890,000 892,000 894,000 896,000 898,000 900,000 902,000

PLATE NUMBER 30

0 500 1,000 2,000 Feet

Replication Scan vs. Alternative 2 Velocity Results

2008 AERIAL PHOTOGRAPH

U.S. ARMY ENGINEER DIVISION CORPS OF ENGINEERS ST. LOUIS, MISSOURI	DESIGNED BY: A Cox	SURVEY DATE: 09/14/2011	
	DRAWN BY: A Rockwell	REVIEWED BY: E Brauer, P.E.	CHECKED BY: J Brown, P.E.
Confluence of the Ohio and Mississippi St Louis District Bird's Point HSR Model	SUBMITTED: A Cox	APPROVED: Rob Davinroy, P.E.	
	FILE NAME: L:\Bird'sPoint\Plates	PLOT DATE: 09/14/2011	

W S N E

APPLIED RIVER ENGINEERING CENTER

US Army Corps of Engineers St. Louis District

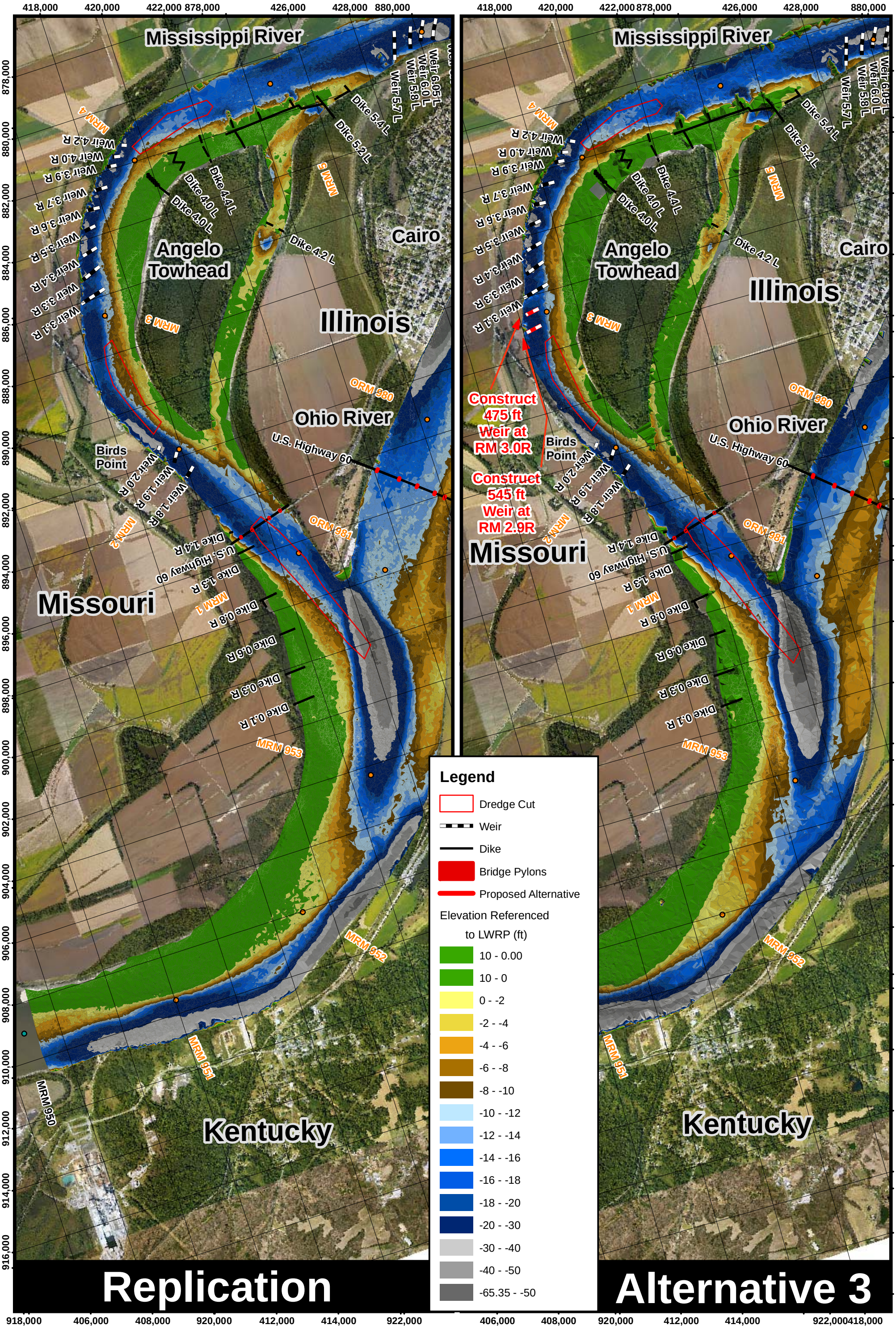


PLATE NUMBER 31

0 1,250 2,500 5,000 Feet

Replication Scan vs. Alternative 3 Bathymetry Results

2008 AERIAL PHOTOGRAPH

U.S. ARMY ENGINEER DIVISION CORPS OF ENGINEERS ST. LOUIS, MISSOURI	DESIGNED BY: A Cox		SURVEY DATE: 09/27/2011
	DRAWN BY: A Rockwell	REVIEWED BY: E Brauer, P.E.	CHECKED BY: J Brown, P.E.
Confluence of the Ohio and Mississippi St Louis District Bird's Point HSR Model	SUBMITTED: A Cox	APPROVED: Rob Davinroy, P.E.	
	FILE NAME: L:\Bird'sPoint\Plates	PLOT DATE: 09/28/2011	

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US Army Corps of Engineers St. Louis District

Replication

Alternative 3

Construct 475 ft Weir at RM 3.0R

Construct 545 ft Weir at RM 2.9R

Angelo Towhead

Birds Point

MRM 3

MRM 1

MRM 95

Weir 3.6 R
Weir 3.5 R
Weir 3.4 R
Weir 3.3 R
Weir 3.1 R
Dike 4.0 R
Weir 2.0 R
Weir 1.9 R
Weir 1.8 R
U.S. Highway 60
Dike 1.4 R
Dike 1.3 R
Dike 0.8 R
Dike 0.6 R
Dike 0.3 R
Dike 0.1 R

Legend

- Dike
- Weir
- Bridge Pylons
- Proposed Alternative

Normalized Velocity

F	0.0 - 0.1
F	0.1 - 0.2
F	0.2 - 0.3
F	0.3 - 0.4
F	0.4 - 0.5
F	0.5 - 0.6
F	0.6 - 0.7
F	0.7 - 0.8
F	0.8 - 0.9
F	0.9 - 1.0

416,000 418,000 420,000 422,000

884,000 886,000 888,000 890,000 892,000 894,000 896,000 898,000 900,000 902,000

PLATE NUMBER 32

0 500 1,000 2,000 Feet

Replication Scan vs. Alternative 3
Velocity Results
2008 AERIAL PHOTOGRAPH

U.S. ARMY ENGINEER DIVISION
CORPS OF ENGINEERS
ST. LOUIS, MISSOURI

Confluence of the Ohio and Mississippi
St Louis District
Bird's Point
HSR Model

DESIGNED BY: A Cox
SURVEY DATE: 09/15/2011
DRAWN BY: A Rockwell
REVIEWED BY: E Brauer, P.E.
CHECKED BY: J Brown, P.E.
SUBMITTED: A Cox
APPROVED: Rob Davinroy, P.E.
FILE NAME: L:\Bird'sPoint\Plates
PLOT DATE: 09/15/2011

APPLIED RIVER ENGINEERING CENTER

US Army Corps of Engineers
St. Louis District

Mississippi River
Missouri
Kentucky
Illinois
Angelo Towhead
Cairo
Ohio River
Birds Point
U.S. Highway 60
Shorten Existing Weir 3.1R 260 ft
Shorten Existing Weir 3.3R 120 ft
Weir 6.05 L
Weir 6.0 L
Weir 5.8 L
Weir 5.7 L
Dike 5.4 L
Dike 5.2 L
Dike 4.4 L
Dike 4.0 L
Dike 4.2 L
Weir 4.2 R
Weir 4.0 R
Weir 3.9 R
Weir 3.7 R
Weir 3.6 R
Weir 3.5 R
Weir 3.4 R
Weir 3.3 R
Weir 3.1 R
Weir 2.0 R
Weir 1.9 R
Weir 1.8 R
Dike 1.4 R
U.S. Highway 60
Dike 1.3 R
Dike 0.8 R
Dike 0.6 R
Dike 0.3 R
Dike 0.1 R
MRM 4
MRM 3
MRM 2
MRM 1
MRM 5
ORM 980
ORM 981
MRM 953
MRM 952
MRM 951
MRM 950
Legend
Dredge Cut
Weir
Dike
Bridge Pylons
Proposed Alternative
Elevation Referenced to LWRP (ft)
10 - 0.00
10 - 0
0 - -2
-2 - -4
-4 - -6
-6 - -8
-8 - -10
-10 - -12
-12 - -14
-14 - -16
-16 - -18
-18 - -20
-20 - -30
-30 - -40
-40 - -50
-65.35 - -50
Replication
Alternative 4
418,000 420,000 422,000 878,000 426,000 428,000 880,000
878,000 880,000 882,000 884,000 886,000 888,000 890,000 892,000 894,000 896,000 898,000 900,000 902,000 904,000 906,000 908,000 910,000 912,000 914,000 916,000
418,000 420,000 878,000 424,000 426,000 428,000 880,000
882,000 884,000 886,000 888,000 890,000 892,000 894,000 896,000 898,000 900,000 902,000 904,000 906,000 908,000 910,000 912,000 914,000 916,000 918,000 920,000 922,000
918,000 406,000 408,000 920,000 412,000 414,000 922,000 406,000 408,000 920,000 412,000 414,000 922,000 418,000

PLATE NUMBER 33

0 1,250 2,500 5,000
Feet

Replication Scan vs. Alternative 4 Bathymetry Results
2008 AERIAL PHOTOGRAPH

U.S. ARMY ENGINEER DIVISION
CORPS OF ENGINEERS
ST. LOUIS, MISSOURI

Confluence of the Ohio and Mississippi
St Louis District
Bird's Point
HSR Model

DESIGNED BY: A Cox
SURVEY DATE: 09/18/2011
DRAWN BY: A Rockwell
REVIEWED BY: E Brauer, P.E.
CHECKED BY: J Brown, P.E.
SUBMITTED: A Cox
APPROVED: Rob Davinroy, P.E.
FILE NAME: L:\Bird'sPoint\Plates
PLOT DATE: 10/07/2011

W N S E

Applied River Engineering Center

US Army Corps of Engineers
St. Louis District

Replication

Alternative 4

Shorten Existing Weir 3.3R 120 ft

Shorten Existing Weir 3.1R 260 ft

Angelo Towhead

Birds Point

Dike 4.0 R

Weir 3.6 R

Weir 3.5 R

Weir 3.4 R

Weir 3.3 R

Weir 3.1 R

MRM 3

Weir 2.0 R

Weir 1.9 R

Weir 1.8 R

MRM 2

U.S. Highway 60

Dike 1.4 R

Dike 1.3 R

MRM 1

Dike 0.8 R

Dike 0.6 R

Dike 0.3 R

Dike 0.1 R

MRM 95

ORM

U.S.

416,000 418,000 420,000 422,000

884,000 886,000 888,000 890,000 892,000 894,000 896,000 898,000 900,000 902,000

Legend

- Dike
- Weir
- Bridge Pylons
- Proposed Alternative

Normalized Velocity

- 0.0 - 0.1
- 0.1 - 0.2
- 0.2 - 0.3
- 0.3 - 0.4
- 0.4 - 0.5
- 0.5 - 0.6
- 0.6 - 0.7
- 0.7 - 0.8
- 0.8 - 0.9
- 0.9 - 1.0

PLATE NUMBER 34

0 500 1,000 2,000 Feet

Replication Scan vs. Alternative 4 Velocity Results

2008 AERIAL PHOTOGRAPH

U.S. ARMY ENGINEER DIVISION CORPS OF ENGINEERS ST. LOUIS, MISSOURI	DESIGNED BY: A Cox		SURVEY DATE: 09/18/2011
	DRAWN BY: A Rockwell	REVIEWED BY: E Brauer, P.E.	CHECKED BY: J Brown, P.E.
Confluence of the Ohio and Mississippi St Louis District Bird's Point HSR Model	SUBMITTED: A Cox	APPROVED: Rob Davinroy, P.E.	
	FILE NAME: L:\Bird'sPoint\Plates	PLOT DATE: 09/19/2011	

W S N E

APPLIED RIVER ENGINEERING CENTER

US Army Corps of Engineers St. Louis District

418,000 420,000 422,000 878,000 426,000 428,000 880,000

878,000 880,000 882,000 884,000 886,000 888,000 890,000 892,000 894,000 896,000 898,000 900,000 902,000 904,000 906,000 908,000 910,000 912,000 914,000 916,000

Mississippi River
Weir 6.05 L
Weir 6.0 L
Weir 5.8 L
Weir 5.7 L
Dike 5.4 L
Dike 5.2 L
MRM 4
Weir 4.2 R
Weir 4.0 R
Weir 3.9 R
Weir 3.7 R
Weir 3.6 R
Weir 3.5 R
Weir 3.4 R
Weir 3.3 R
Weir 3.1 R
Dike 4.4 L
Dike 4.0 L
Dike 4.0 L
MRM 5
Dike 4.2 L
Angelo Towhead
Cairo
Illinois
MRM 3
ORM 980
Ohio River
U.S. Highway 60
Birds Point
Weir 2.0 R
Weir 1.9 R
Weir 1.8 R
MRM 2
Dike 1.4 R
U.S. Highway 60
Dike 1.3 R
MRM 1
Dike 0.8 R
Dike 0.6 R
Dike 0.3 R
Dike 0.1 R
ORM 981
MRM 953
MRM 952
MRM 951
MRM 950
Missouri
Kentucky

Shorten Existing Weir 3.1R 260 ft

Shorten Existing Weir 3.3R 120 ft

Construct 475 ft Weir at RM 3.0R

Construct 545 ft Weir at RM 2.9R

Replication

Alternative 5

Legend

- Dredge Cut
- Weir
- Dike
- Bridge Pylons
- Proposed Alternative

Elevation Referenced to LWRP (ft)

- 10 - 0.00
- 10 - 0
- 0 - -2
- -2 - -4
- -4 - -6
- -6 - -8
- -8 - -10
- -10 - -12
- -12 - -14
- -14 - -16
- -16 - -18
- -18 - -20
- -20 - -30
- -30 - -40
- -40 - -50
- -65.35 - -50

918,000 406,000 408,000 920,000 412,000 414,000 922,000 406,000 408,000 920,000 412,000 414,000 922,000 418,000

PLATE NUMBER 35

0 1,250 2,500 5,000
Feet

Replication Scan vs. Alternative 5 Bathymetry Results

2008 AERIAL PHOTOGRAPH

U.S. ARMY ENGINEER DIVISION
CORPS OF ENGINEERS
ST. LOUIS, MISSOURI

Confluence of the Ohio and Mississippi
St Louis District
Bird's Point
HSR Model

DESIGNED BY: A Cox		SURVEY DATE: 09/18/2011	
DRAWN BY: A Rockwell	REVIEWED BY: E Brauer, P.E.	CHECKED BY: J Brown, P.E.	
SUBMITTED: A Cox	APPROVED: Rob Davinroy, P.E.		
FILE NAME: L:\Bird'sPoint\Plates	PLOT DATE: 10/07/2011		

APPLIED RIVER ENGINEERING CENTER

US Army Corps of Engineers
St. Louis District

Replication

Alternative 5

Shorten Existing Weir 3.3R 120 ft

Shorten Existing Weir 3.1R 260 ft

Construct 475 ft Wier at RM 3.0R

Construct 545 ft Wier at RM 2.9R

Angelo Towhead

Birds Point

MRM 3

MRM 1

Weir 3.6 R
Weir 3.5 R
Weir 3.4 R
Weir 3.3 R
Weir 3.1 R
Weir 2.0 R
Weir 1.9 R
Weir 1.8 R
Dike 1.4 R
U.S. Highway 60
Dike 1.3 R
Dike 0.8 R
Dike 0.6 R
Dike 0.3 R
Dike 0.1 R

Legend

- Dike
- Weir
- Bridge Pylons
- Proposed Alternative

Normalized Velocity

- 0.0 - 0.1
- 0.1 - 0.2
- 0.2 - 0.3
- 0.3 - 0.4
- 0.4 - 0.5
- 0.5 - 0.6
- 0.6 - 0.7
- 0.7 - 0.8
- 0.8 - 0.9
- 0.9 - 1.0

416,000 418,000 420,000 422,000

884,000 886,000 888,000 890,000 892,000 894,000 896,000 898,000 900,000 902,000

PLATE NUMBER 36

0 500 1,000 2,000 Feet

Replication Scan vs. Alternative 5 Velocity Results

2008 AERIAL PHOTOGRAPH

U.S. ARMY ENGINEER DIVISION CORPS OF ENGINEERS ST. LOUIS, MISSOURI	DESIGNED BY: A Cox		SURVEY DATE: 10/04/2011
	DRAWN BY: A Rockwell	REVIEWED BY: E Brauer, P.E.	CHECKED BY: J Brown, P.E.
Confluence of the Ohio and Mississippi St Louis District Bird's Point HSR Model	SUBMITTED: A Cox	APPROVED: Rob Davinroy, P.E.	
	FILE NAME: L:\Bird'sPoint\Plates	PLOT DATE: 10/03/2011	

W S N E

Applied River Engineering Center

US Army Corps of Engineers St. Louis District

418,000 420,000 422,000 878,000 426,000 428,000 880,000

878,000 880,000 882,000 884,000 886,000 888,000 890,000 892,000 894,000 896,000 898,000 900,000 902,000 904,000 906,000 908,000 910,000 912,000 914,000 916,000

Mississippi River

Weir 6.05 L
Weir 6.0 L
Weir 5.8 L
Weir 5.7 L
Dike 5.4 L
Dike 5.2 L
MRM 4
Weir 4.2 R
Weir 4.0 R
Weir 3.9 R
Weir 3.7 R
Weir 3.6 R
Weir 3.5 R
Weir 3.4 R
Weir 3.3 R
Weir 3.1 R
Dike 4.4 L
Dike 4.0 L
Dike 4.0 L
MRM 5
Dike 4.2 L
Angelo Towhead
Cairo
Illinois
MRM 3
ORM 980
Ohio River
U.S. Highway 60
Birds Point
Weir 2.0 R
Weir 1.9 R
Weir 1.8 R
MRM 2
ORM 981
Dike 1.4 R
U.S. Highway 60
Dike 1.3 R
MRM 1
Dike 0.8 R
Dike 0.6 R
Dike 0.3 R
Dike 0.1 R
MRM 953
Missouri
MRM 952
MRM 951
MRM 950
Kentucky

Replication

Shorten Existing Weir 3.1R 260 ft
Shorten Existing Weir 3.3R 120 ft
Construct 300 x 300 ft Chevron at RM 2.8L
Construct 300 x 300 ft Chevron at RM 2.6L
Construct 475 ft Weir at RM 3.0R
Construct 545 ft Weir at RM 2.9R
Extend Dike 0.8R 370 ft
Extend Dike 0.6R 645 ft
Extend Dike 0.3R 930 ft

Alternative 6

Legend

- Dredge Cut
- Weir
- Dike
- Bridge Pylons
- Proposed Alternative

Elevation Referenced to LWRP (ft)

- 10 - 0.00
- 10 - 0
- 0 - -2
- -2 - -4
- -4 - -6
- -6 - -8
- -8 - -10
- -10 - -12
- -12 - -14
- -14 - -16
- -16 - -18
- -18 - -20
- -20 - -30
- -30 - -40
- -40 - -50
- -65.35 - -50

918,000 406,000 408,000 920,000 412,000 414,000 922,000 406,000 408,000 920,000 412,000 414,000 922,000 418,000

PLATE NUMBER 37

0 1,250 2,500 5,000 Feet

Replication Scan vs. Alternative 6 Bathymetry Result

2008 AERIAL PHOTOGRAPH

U.S. ARMY ENGINEER DIVISION
CORPS OF ENGINEERS
ST. LOUIS, MISSOURI

Confluence of the Ohio and Mississippi
St Louis District
Bird's Point
HSR Model

DESIGNED BY: A Cox		SURVEY DATE: 09/19/2011	
DRAWN BY: A Rockwell	REVIEWED BY: E Brauer, P.E.	CHECKED BY: J Brown, P.E.	
SUBMITTED: A Cox		APPROVED: Rob Davinroy, P.E.	
FILE NAME: L:\Bird'sPoint\Plates		PLOT DATE: 10/07/2011	

APPLIED RIVER ENGINEERING CENTER

US Army Corps of Engineers
St. Louis District

Replication

Alternative 6

Angelo Towhead

Birds Point

MRM 3

MRM 1

MRM 95

Weir 3.6 R

Weir 3.5 R

Weir 3.4 R

Weir 3.3 R

Weir 3.1 R

Weir 2.0 R

Weir 1.9 R

Weir 1.8 R

Dike 4.0 L

U.S. H

Dike 1.4 R

U.S. Highway 60

Dike 1.3 R

ORM

Dike 0.8 R

Dike 0.6 R

Dike 0.3 R

Dike 0.1 R

Shorten Existing Weir 3.3R 120 ft

Shorten Existing Weir 3.1R 260 ft

Construct 475 ft Weir at RM 3.0R

Construct 545 ft Weir at RM 2.9R

Construct 300 x 300 ft Chevron at RM 2.8L

Construct 300 x 300 ft Chevron at RM 2.6L

Extend Dike 0.8R 370 ft

Extend Dike 0.6R 645 ft

Extend Dike 0.3R 930 ft

Legend

- Dike
- Weir
- Bridge Pylons
- Proposed Alternative

Normalized Velocity

- 0.0 - 0.1
- 0.1 - 0.2
- 0.2 - 0.3
- 0.3 - 0.4
- 0.4 - 0.5
- 0.5 - 0.6
- 0.6 - 0.7
- 0.7 - 0.8
- 0.8 - 0.9
- 0.9 - 1.0

416,000 418,000 420,000 422,000

884,000 886,000 888,000 890,000 892,000 894,000 896,000 898,000 900,000 902,000

PLATE NUMBER 38

0 500 1,000 2,000 Feet

Replication Scan vs. Alternative 6 Velocity Results

2008 AERIAL PHOTOGRAPH

U.S. ARMY ENGINEER DIVISION CORPS OF ENGINEERS ST. LOUIS, MISSOURI	DESIGNED BY: A Cox	SURVEY DATE: 10/04/2011	
	DRAWN BY: A Rockwell	REVIEWED BY: E Brauer, P.E.	CHECKED BY: J Brown, P.E.
Confluence of the Ohio and Mississippi St Louis District Bird's Point HSR Model	SUBMITTED: A Cox	APPROVED: Rob Davinroy, P.E.	
	FILE NAME: L:\Bird'sPoint\Plates	PLOT DATE: 10/03/2011	

W S N E

APPLIED RIVER ENGINEERING CENTER

US Army Corps of Engineers St. Louis District

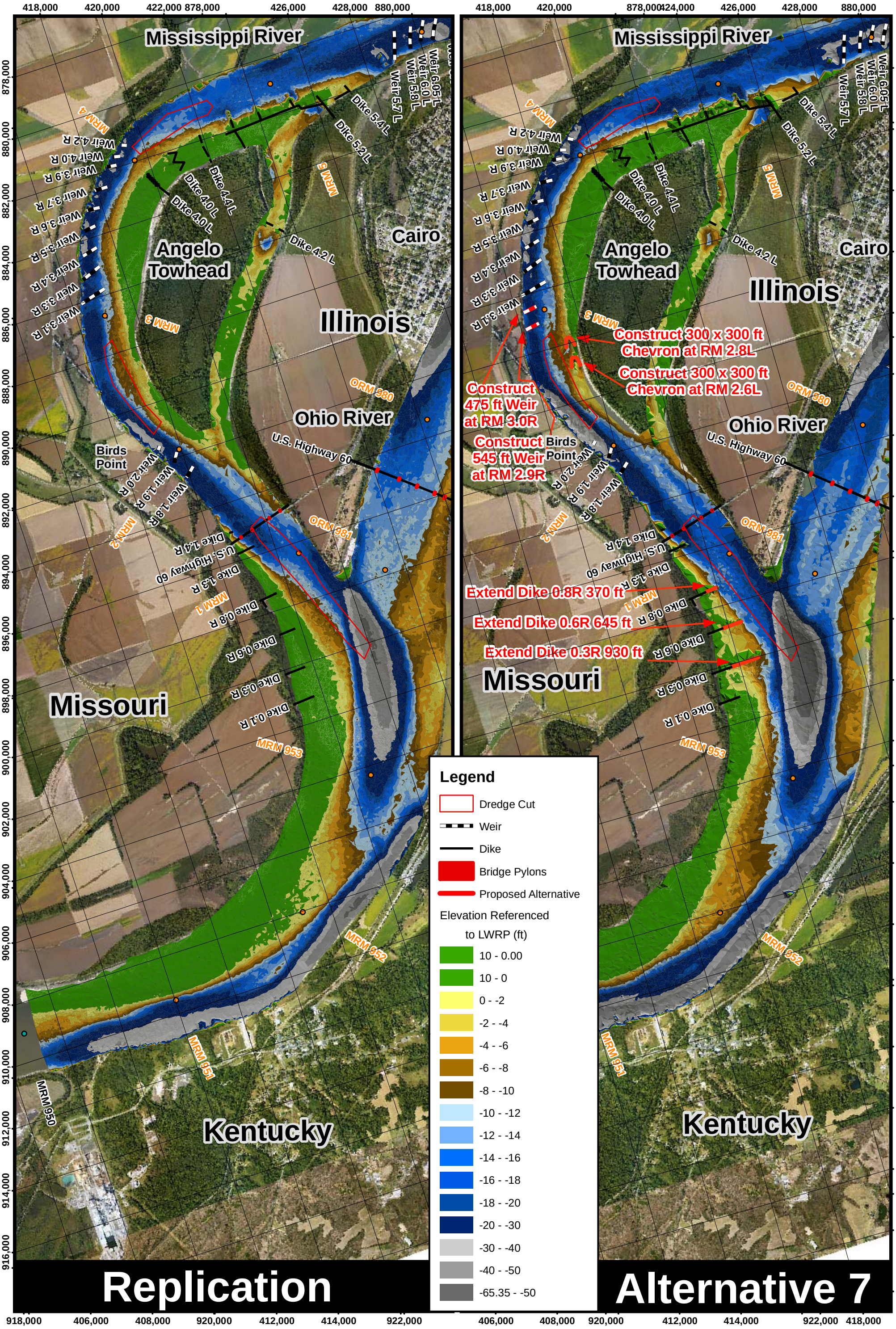

PLATE NUMBER 39

0 1,250 2,500 5,000 Feet

Replication Scan vs. Alternative 7 Bathymetry Results

2008 AERIAL PHOTOGRAPH

U.S. ARMY ENGINEER DIVISION CORPS OF ENGINEERS ST. LOUIS, MISSOURI	DESIGNED BY: A Cox		SURVEY DATE: 09/21/2011
	DRAWN BY: A Rockwell	REVIEWED BY: E Brauer, P.E.	CHECKED BY: J Brown, P.E.
Confluence of the Ohio and Mississippi St Louis District Bird's Point HSR Model	SUBMITTED: A Cox	APPROVED: Rob Davinroy, P.E.	
	FILE NAME: L:\Bird'sPoint\Plates	PLOT DATE: 10/07/2011	

Applied River Engineering Center

US Army Corps of Engineers St. Louis District

Replication

Alternative 7

Weir 3.6 R
Weir 3.5 R
Weir 3.4 R
Weir 3.3 R
Weir 3.1 R
Dike 4.0 R
Angelo Towhead
MRM 3
Construct 475 ft Weir at RM 3.0R
Construct 545 ft Weir at RM 2.9R
Construct 300 x 300 ft Chevron at RM 2.8L
Construct 300 x 300 ft Chevron at RM 2.6L
Birds Point
Weir 2.0 R
Weir 1.9 R
Weir 1.8 R
U.S. Highway 60
Dike 1.4 R
Dike 1.3 R
MRM 1
Dike 0.8 R
Extend Dike 0.8R 370 ft
Dike 0.6 R
Extend Dike 0.6R 645 ft
Dike 0.3 R
Extend Dike 0.3R 930 ft
Dike 0.1 R
MRM 95

416,000 418,000 420,000 414,000 416,000 418,000 420,000 422,000 418,000 420,000 422,000

884,000 886,000 888,000 890,000 892,000 894,000 896,000 898,000 900,000 902,000

Legend

- Dike
- Weir
- Bridge Pylons
- Proposed Alternative

Normalized Velocity

- 0.0 - 0.1
- 0.1 - 0.2
- 0.2 - 0.3
- 0.3 - 0.4
- 0.4 - 0.5
- 0.5 - 0.6
- 0.6 - 0.7
- 0.7 - 0.8
- 0.8 - 0.9
- 0.9 - 1.0

PLATE NUMBER 40

0 500 1,000 2,000 Feet

Replication Scan vs. Alternative 7 Velocity Results

2008 AERIAL PHOTOGRAPH

U.S. ARMY ENGINEER DIVISION CORPS OF ENGINEERS ST. LOUIS, MISSOURI	DESIGNED BY: A Cox		SURVEY DATE: 09/20/2011
	DRAWN BY: A Rockwell	REVIEWED BY: E Brauer, P.E.	CHECKED BY: J Brown, P.E.
Confluence of the Ohio and Mississippi St Louis District Bird's Point HSR Model	SUBMITTED: A Cox	APPROVED: Rob Davinroy, P.E.	
	FILE NAME: L:\Bird'sPoint\Plates	PLOT DATE: 09/20/2011	

W S N E

APPLIED RIVER ENGINEERING CENTER

US Army Corps of Engineers St. Louis District

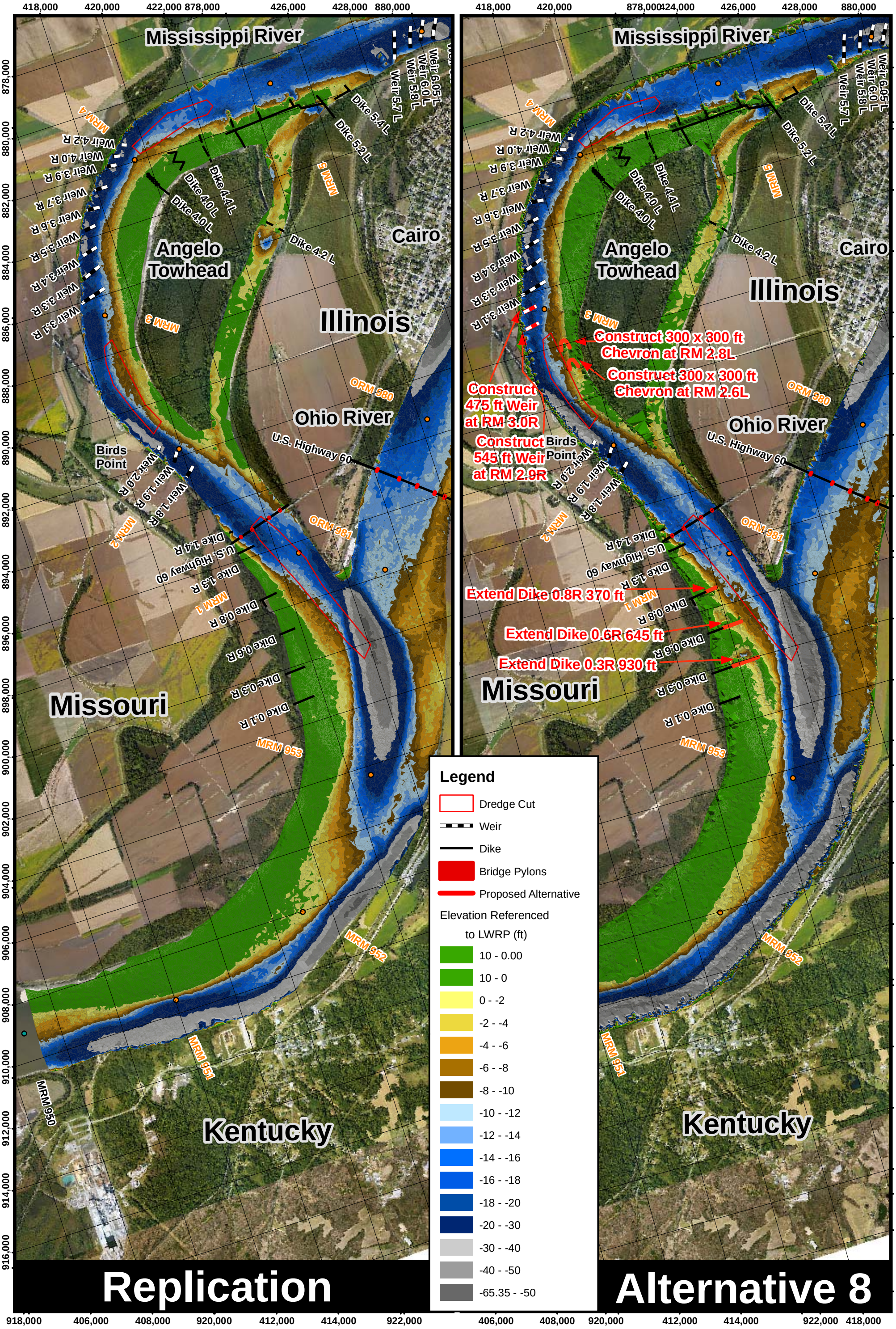

PLATE NUMBER 41

0 1,250 2,500 5,000 Feet

Replication Scan vs. Alternative 8 Bathymetry Results

2008 AERIAL PHOTOGRAPH

U.S. ARMY ENGINEER DIVISION
CORPS OF ENGINEERS
ST. LOUIS, MISSOURI

Confluence of the Ohio and Mississippi
St Louis District
Bird's Point
HSR Model

DESIGNED BY: A Cox		SURVEY DATE: 09/27/2011
DRAWN BY: A Rockwell	REVIEWED BY: E Brauer, P.E.	CHECKED BY: J Brown, P.E.
SUBMITTED: A Cox	APPROVED: Rob Davinroy, P.E.	
FILE NAME: L:\Bird'sPoint\Plates	PLOT DATE: 10/07/2011	

Applied River Engineering Center

US Army Corps of Engineers
St. Louis District

Replication

Alternative 8

Angelo Towhead

Birds Point

MRM 3

MRM 1

Dike 4.0 R

Weir 3.6 R

Weir 3.5 R

Weir 3.4 R

Weir 3.3 R

Weir 3.1 R

Weir 2.0 R

Weir 1.9 R

Weir 1.8 R

Dike 1.4 R

U.S. Highway 60

Dike 1.3 R

Dike 0.8 R

Dike 0.6 R

Dike 0.3 R

Dike 0.1 R

Construct 475 ft Weir at RM 3.0R

Construct 475 ft Weir at RM 3.0R

Construct 300 x 300 ft Chevron at RM 2.8L

Construct 300 x 300 ft Chevron at RM 2.6L

Extend Dike 0.8R 370 ft

Extend Dike 0.6R 645 ft

Extend Dike 0.3R 930 ft

Legend

- Dike
- Weir
- Bridge Pylons
- Proposed Alternative

Normalized Velocity

- 0.0 - 0.1
- 0.1 - 0.2
- 0.2 - 0.3
- 0.3 - 0.4
- 0.4 - 0.5
- 0.5 - 0.6
- 0.6 - 0.7
- 0.7 - 0.8
- 0.8 - 0.9
- 0.9 - 1.0

416,000 418,000 420,000 422,000

884,000 886,000 888,000 890,000 892,000 894,000 896,000 898,000 900,000 902,000

PLATE NUMBER 42

0 500 1,000 2,000 Feet

Replication Scan vs. Alternative 8 Velocity Results

2008 AERIAL PHOTOGRAPH

U.S. ARMY ENGINEER DIVISION
CORPS OF ENGINEERS
ST. LOUIS, MISSOURI

Confluence of the Ohio and Mississippi
St Louis District
Bird's Point
HSR Model

DESIGNED BY: A Cox			SURVEY DATE: 09/27/2011
DRAWN BY: A Rockwell	REVIEWED BY: E Brauer, P.E.	CHECKED BY: J Brown, P.E.	
SUBMITTED: A Cox		APPROVED: Rob Davinroy, P.E.	
FILE NAME: L:\Bird'sPoint\Plates		PLOT DATE: 09/27/2011	

W S N E

Applied River Engineering Center

US Army Corps of Engineers St. Louis District

Mississippi River
Missouri
Kentucky
Illinois
Angelo Towhead
Cairo
Ohio River
Birds Point
U.S. Highway 60
Weir 6.05 L
Weir 6.0 L
Weir 5.8 L
Weir 5.7 L
Dike 5.4 L
Dike 5.2 L
Dike 4.4 L
Dike 4.2 L
Dike 4.0 L
Weir 4.2 R
Weir 4.0 R
Weir 3.9 R
Weir 3.7 R
Weir 3.6 R
Weir 3.5 R
Weir 3.4 R
Weir 3.3 R
Weir 3.1 R
Weir 2.0 R
Weir 1.9 R
Weir 1.8 R
Dike 1.4 R
Dike 1.3 R
Dike 0.8 R
Dike 0.6 R
Dike 0.3 R
Dike 0.1 R
MRM 4
MRM 3
MRM 2
MRM 1
MRM 5
ORM 980
ORM 981
MRM 953
MRM 952
MRM 951
MRM 950
Construct 300 x 300 ft Chevron at RM 2.8L
Construct 300 x 300 ft Chevron at RM 2.6L

Legend

- Dredge Cut
- Weir
- Dike
- Bridge Pylons
- Proposed Alternative

Elevation Referenced to LWRP (ft)

- 10 - 0.00
- 10 - 0
- 0 - -2
- -2 - -4
- -4 - -6
- -6 - -8
- -8 - -10
- -10 - -12
- -12 - -14
- -14 - -16
- -16 - -18
- -18 - -20
- -20 - -30
- -30 - -40
- -40 - -50
- -65.35 - -50

Replication

Alternative 9

PLATE NUMBER 43

0 1,250 2,500 5,000 Feet

Replication Scan vs. Alternative 9
Bathymetry Results
2008 AERIAL PHOTOGRAPH

U.S. ARMY ENGINEER DIVISION
CORPS OF ENGINEERS
ST. LOUIS, MISSOURI

Confluence of the Ohio and Mississippi
St Louis District
Bird's Point
HSR Model

DESIGNED BY: A Cox		SURVEY DATE: 09/27/2011	
DRAWN BY: A Rockwell	REVIEWED BY: E Brauer, P.E.	CHECKED BY: J Brown, P.E.	
SUBMITTED: A Cox		APPROVED: Rob Davinroy, P.E.	
FILE NAME: L:\Bird'sPoint\Plates		PLOT DATE: 10/07/2011	

ENGINEERING WITH NATURE
APPLIED RIVER ENGINEERING CENTER
US Army Corps of Engineers
St. Louis District

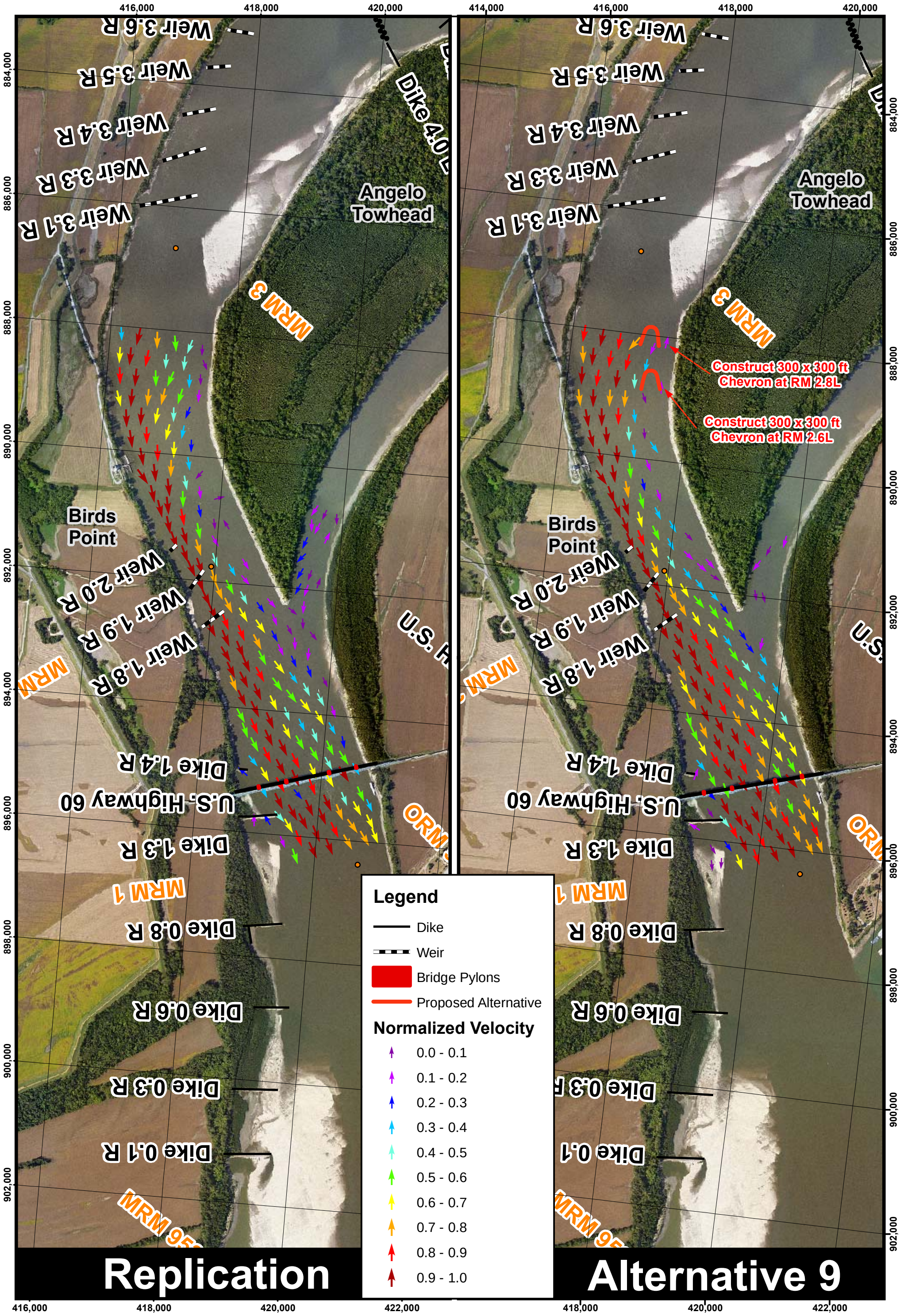

PLATE NUMBER 44

0 500 1,000 2,000 Feet

Replication Scan vs. Alternative 9 Velocity Results

2008 AERIAL PHOTOGRAPH

U.S. ARMY ENGINEER DIVISION CORPS OF ENGINEERS ST. LOUIS, MISSOURI	DESIGNED BY: A Cox		SURVEY DATE: 09/23/2011
	DRAWN BY: A Rockwell	REVIEWED BY: E Brauer, P.E.	CHECKED BY: J Brown, P.E.
Confluence of the Ohio and Mississippi St Louis District Bird's Point HSR Model	SUBMITTED: A Cox	APPROVED: Rob Davinroy, P.E.	
	FILE NAME: L:\Bird'sPoint\Plates	PLOT DATE: 09/26/2011	

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US Army Corps of Engineers St. Louis District

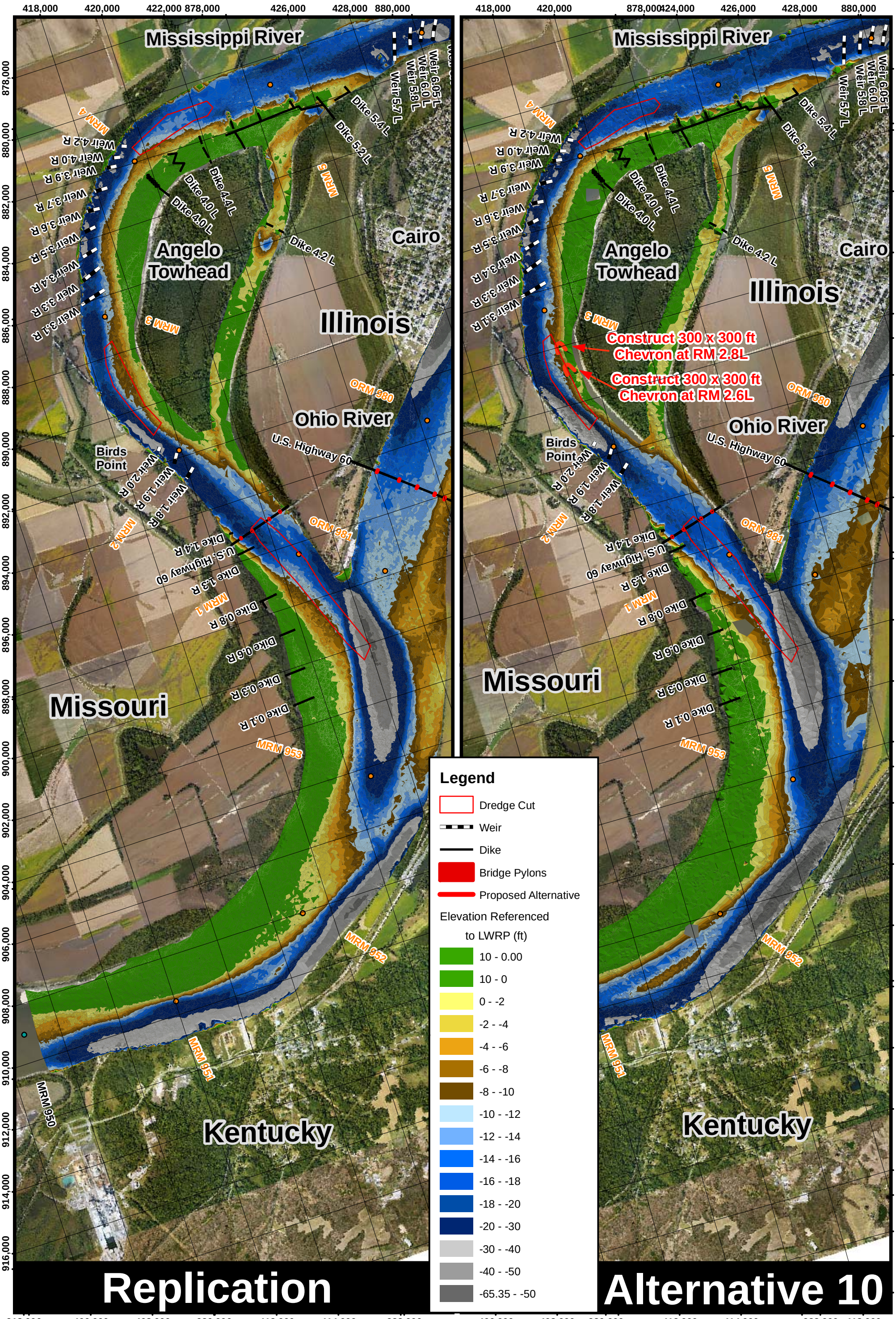

PLATE NUMBER 45

0 1,250 2,500 5,000 Feet

Replication Scan vs. Alternative 10 Bathymetry Results

2008 AERIAL PHOTOGRAPH

U.S. ARMY ENGINEER DIVISION CORPS OF ENGINEERS ST. LOUIS, MISSOURI	DESIGNED BY: A Cox		SURVEY DATE: 09/27/2011
	DRAWN BY: A Rockwell	REVIEWED BY: E Brauer, P.E.	CHECKED BY: J Brown, P.E.
Confluence of the Ohio and Mississippi St Louis District Bird's Point HSR Model	SUBMITTED: A Cox	APPROVED: Rob Davinroy, P.E.	
	FILE NAME: L:\Bird'sPoint\Plates	PLOT DATE: 10/07/2011	

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US Army Corps of Engineers St. Louis District

Replication

Alternative 10

Construct 300 x 300 ft Chevron at RM 2.8L

Construct 300 x 300 ft Chevron at RM 2.6L

Angelo Towhead

Birds Point

MRM 3

MRM 1

MRM 95

ORM

Dike 4.0 R

Weir 3.6 R

Weir 3.5 R

Weir 3.4 R

Weir 3.3 R

Weir 3.1 R

Weir 2.0 R

Weir 1.9 R

Weir 1.8 R

U.S. Highway 60

Dike 1.4 R

Dike 1.3 R

Dike 0.8 R

Dike 0.6 R

Dike 0.3 R

Dike 0.1 R

U.S.

Legend

- Dike
- Weir
- Bridge Pylons
- Proposed Alternative

Normalized Velocity

- 0.0 - 0.1
- 0.1 - 0.2
- 0.2 - 0.3
- 0.3 - 0.4
- 0.4 - 0.5
- 0.5 - 0.6
- 0.6 - 0.7
- 0.7 - 0.8
- 0.8 - 0.9
- 0.9 - 1.0

884,000 886,000 888,000 890,000 892,000 894,000 896,000 898,000 900,000 902,000

414,000 416,000 418,000 420,000 422,000

PLATE NUMBER 46

0 500 1,000 2,000 Feet

Replication Scan vs. Alternative 10 Velocity Results

2008 AERIAL PHOTOGRAPH

U.S. ARMY ENGINEER DIVISION CORPS OF ENGINEERS ST. LOUIS, MISSOURI	DESIGNED BY: A Cox		SURVEY DATE: 09/28/2011
	DRAWN BY: A Rockwell	REVIEWED BY: E Brauer, P.E.	CHECKED BY: J Brown, P.E.
Confluence of the Ohio and Mississippi St Louis District Bird's Point HSR Model	SUBMITTED: A Cox	APPROVED: Rob Davinroy, P.E.	
	FILE NAME: L:\Bird'sPoint\Plates	PLOT DATE: 09/28/2011	

W S N E

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US Army Corps of Engineers St. Louis District

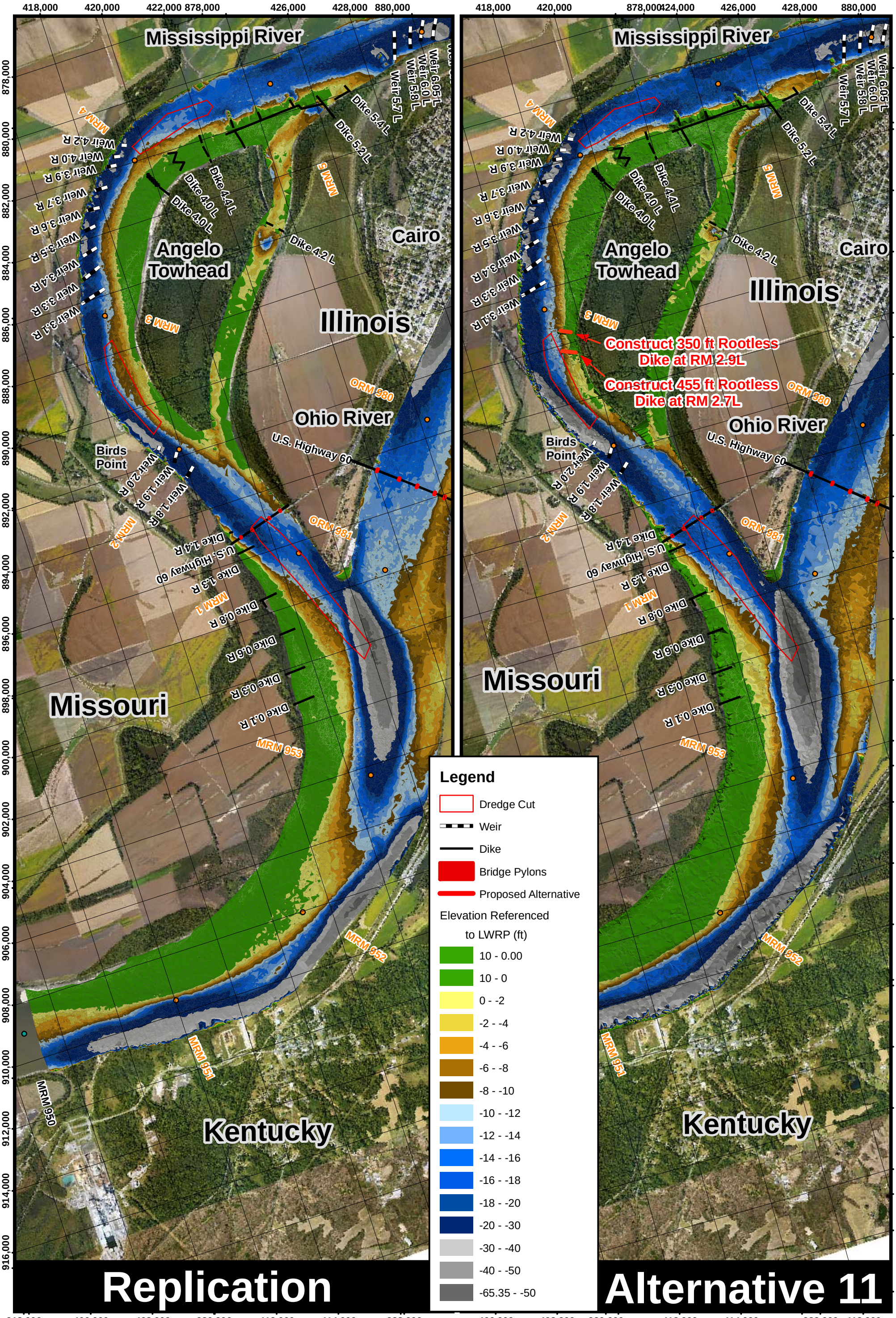

PLATE NUMBER 47

0 1,250 2,500 5,000 Feet

Replication Scan vs. Alternative 11 Bathymetry Results

2008 AERIAL PHOTOGRAPH

U.S. ARMY ENGINEER DIVISION CORPS OF ENGINEERS ST. LOUIS, MISSOURI	DESIGNED BY: A Cox		SURVEY DATE: 09/29/2011
	DRAWN BY: A Rockwell	REVIEWED BY: E Brauer, P.E.	CHECKED BY: J Brown, P.E.
Confluence of the Ohio and Mississippi St Louis District Bird's Point HSR Model	SUBMITTED: A Cox	APPROVED: Rob Davinroy, P.E.	
	FILE NAME: L:\Bird'sPoint\Plates	PLOT DATE: 10/07/2011	

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US Army Corps of Engineers St. Louis District

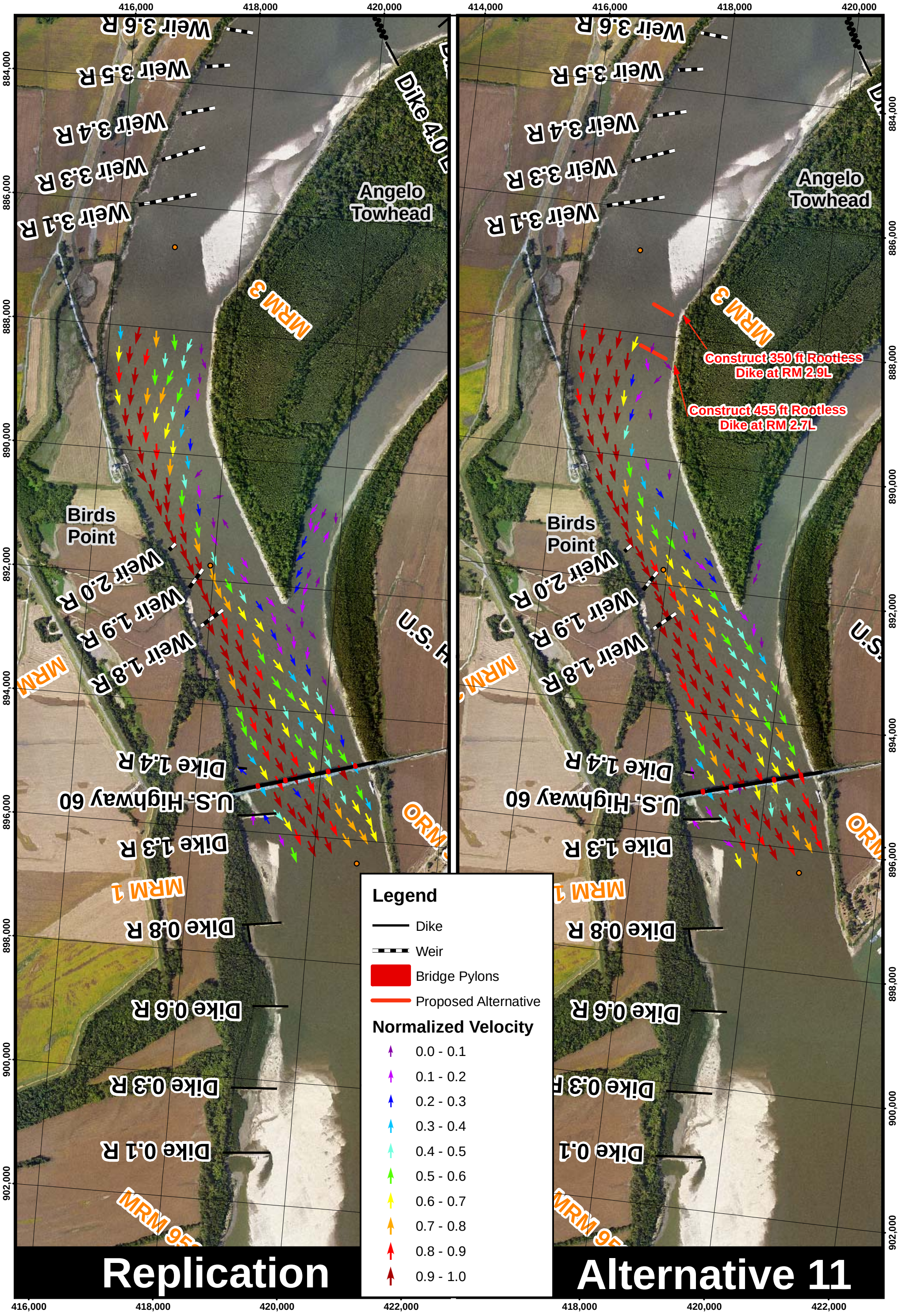

PLATE NUMBER 48

0 500 1,000 2,000 Feet

Replication Scan vs. Alternative 11 Velocity Results

2008 AERIAL PHOTOGRAPH

U.S. ARMY ENGINEER DIVISION
CORPS OF ENGINEERS
ST. LOUIS, MISSOURI

Confluence of the Ohio and Mississippi
St Louis District
Bird's Point
HSR Model

DESIGNED BY: A Cox		SURVEY DATE: 09/28/2011
DRAWN BY: A Rockwell	REVIEWED BY: E Brauer, P.E.	CHECKED BY: J Brown, P.E.
SUBMITTED: A Cox	APPROVED: Rob Davinroy, P.E.	
FILE NAME: L:\Bird'sPoint\Plates	PLOT DATE: 09/28/2011	

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US Army Corps of Engineers
St. Louis District

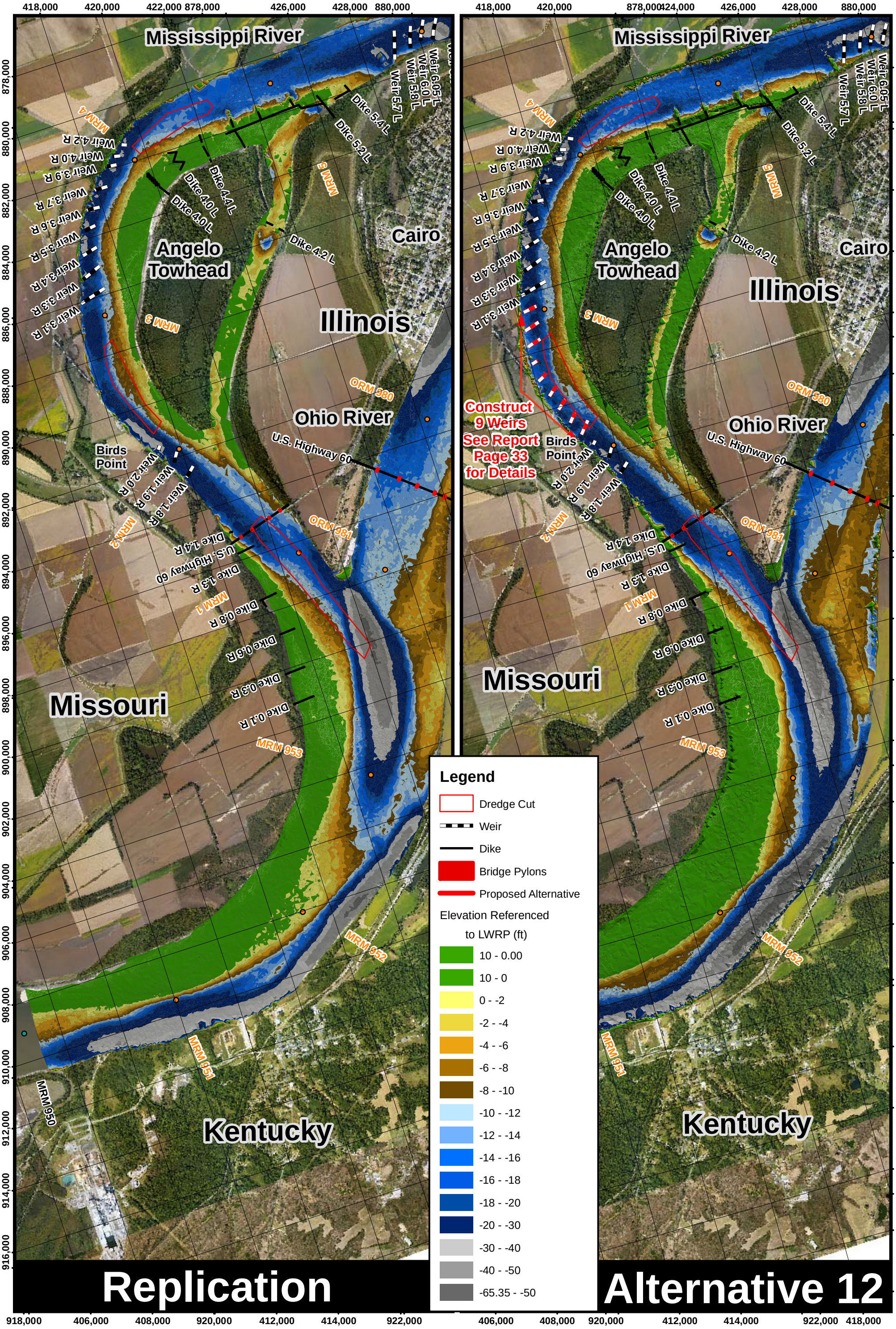

PLATE NUMBER 49

0 1,250 2,500 5,000 Feet

Replication Scan vs. Alternative 12 Bathymetry Results

2008 AERIAL PHOTOGRAPH

U.S. ARMY ENGINEER DIVISION
CORPS OF ENGINEERS
ST. LOUIS, MISSOURI

Confluence of the Ohio and Mississippi
St Louis District
Bird's Point
HSR Model

DESIGNED BY: A Cox		SURVEY DATE: 10/03/2011
DRAWN BY: A Rockwell	REVIEWED BY: E Brauer, P.E.	CHECKED BY: J Brown, P.E.
SUBMITTED: A Cox	APPROVED: Rob Davinroy, P.E.	
FILE NAME: L:\Bird'sPoint\Plates	PLOT DATE: 10/07/2011	

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US Army Corps of Engineers
St. Louis District

Replication

Alternative 12

Construct 9 Weirs See Report Page 33 for Details

Legend

- Dike
- Weir
- Bridge Pylons
- Proposed Alternative

Normalized Velocity

- 0.0 - 0.1
- 0.1 - 0.2
- 0.2 - 0.3
- 0.3 - 0.4
- 0.4 - 0.5
- 0.5 - 0.6
- 0.6 - 0.7
- 0.7 - 0.8
- 0.8 - 0.9
- 0.9 - 1.0

PLATE NUMBER 50

0 500 1,000 2,000 Feet

Replication Scan vs. Alternative 12 Velocity Results

2008 AERIAL PHOTOGRAPH

U.S. ARMY ENGINEER DIVISION
CORPS OF ENGINEERS
ST. LOUIS, MISSOURI

Confluence of the Ohio and Mississippi
St Louis District
Bird's Point
HSR Model

DESIGNED BY: A Cox			SURVEY DATE: 10/03/2011
DRAWN BY: A Rockwell	REVIEWED BY: E Brauer, P.E.	CHECKED BY: J Brown, P.E.	
SUBMITTED: A Cox		APPROVED: Rob Davinroy, P.E.	
FILE NAME: L:\Bird'sPoint\Plates		PLOT DATE: 10/03/2011	

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St. Louis District

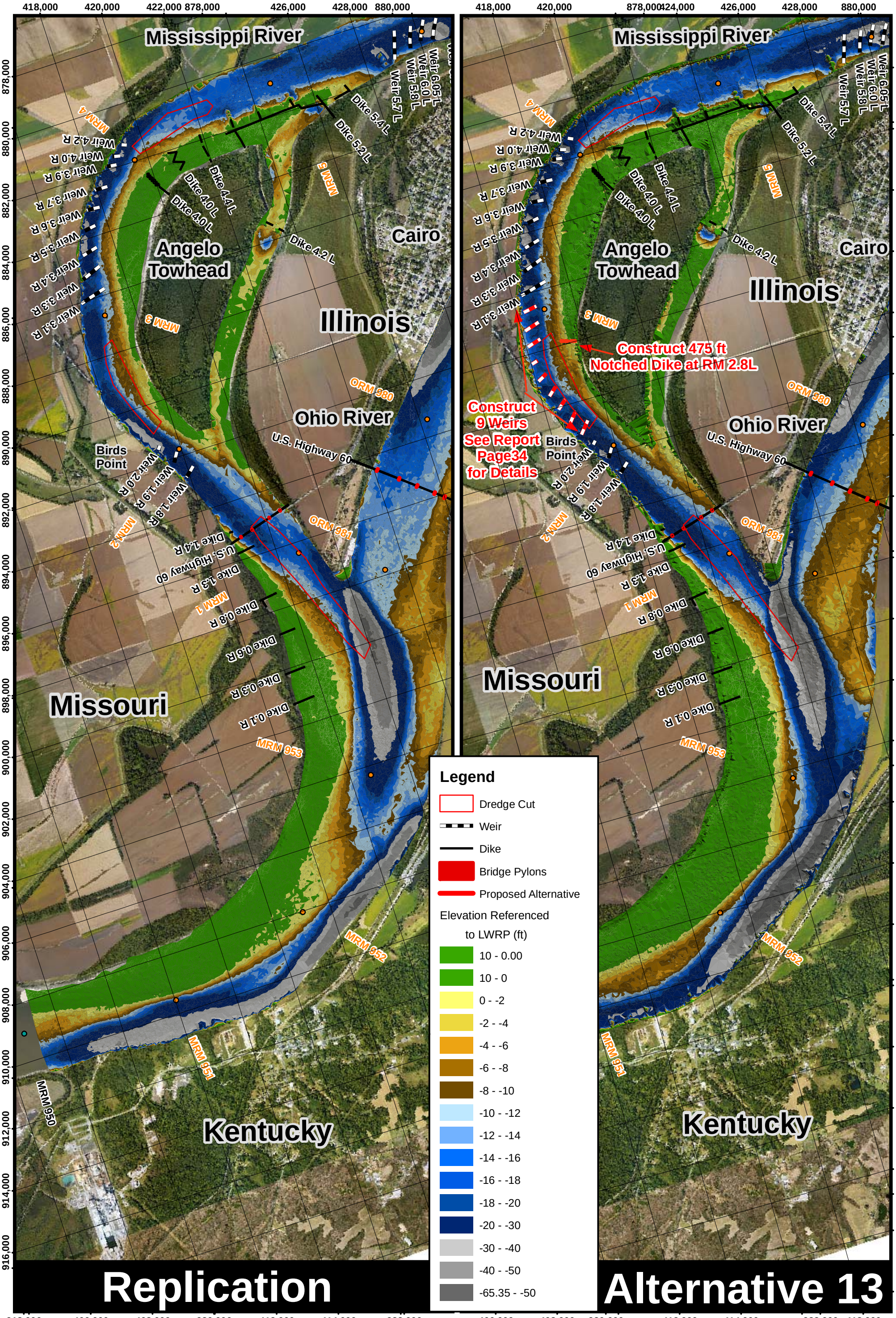

PLATE NUMBER 51

0 1,250 2,500 5,000
Feet

Replication Scan vs. Alternative 13
Bathymetry Results
2008 AERIAL PHOTOGRAPH

U.S. ARMY ENGINEER DIVISION CORPS OF ENGINEERS ST. LOUIS, MISSOURI	DESIGNED BY: A Cox	SURVEY DATE: 10/04/2011	
	DRAWN BY: A Rockwell	REVIEWED BY: E Brauer, P.E.	CHECKED BY: J Brown, P.E.
Confluence of the Ohio and Mississippi St Louis District Bird's Point HSR Model	SUBMITTED: A Cox	APPROVED: Rob Davinroy, P.E.	
	FILE NAME: L:\Bird'sPoint\Plates	PLOT DATE: 10/07/2011	

US Army Corps of Engineers
St. Louis District
APPLIED RIVER ENGINEERING CENTER

Replication

Alternative 13

Angelo Towhead

Birds Point

MRM 3

MRM 1

Weir 3.6 R
Weir 3.5 R
Weir 3.4 R
Weir 3.3 R
Weir 3.1 R
Dike 4.0 L
Weir 2.0 R
Weir 1.9 R
Weir 1.8 R
Dike 1.4 R
U.S. Highway 60
Dike 1.3 R
Dike 0.8 R
Dike 0.6 R
Dike 0.3 R
Dike 0.1 R

Construct 475 ft Notched Dike at RM 2.8L

Construct 9 Weirs See Report Page 34 For Details

Legend

- Dike
- Weir
- Bridge Pylons
- Proposed Alternative

Normalized Velocity

- 0.0 - 0.1
- 0.1 - 0.2
- 0.2 - 0.3
- 0.3 - 0.4
- 0.4 - 0.5
- 0.5 - 0.6
- 0.6 - 0.7
- 0.7 - 0.8
- 0.8 - 0.9
- 0.9 - 1.0

416,000 418,000 420,000 422,000

884,000 886,000 888,000 890,000 892,000 894,000 896,000 898,000 900,000 902,000

PLATE NUMBER 52

0 500 1,000 2,000 Feet

Replication Scan vs. Alternative 13 Velocity Results

2008 AERIAL PHOTOGRAPH

U.S. ARMY ENGINEER DIVISION
CORPS OF ENGINEERS
ST. LOUIS, MISSOURI

Confluence of the Ohio and Mississippi
St Louis District
Bird's Point
HSR Model

DESIGNED BY: A Cox			SURVEY DATE: 10/04/2011
DRAWN BY: A Rockwell	REVIEWED BY: E Brauer, P.E.	CHECKED BY: J Brown, P.E.	
SUBMITTED: A Cox		APPROVED: Rob Davinroy, P.E.	
FILE NAME: L:\Bird'sPoint\Plates		PLOT DATE: 10/05/2011	

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US Army Corps of Engineers St. Louis District

418,000 420,000 422,000 878,000 426,000 428,000 880,000

878,000 880,000 882,000 884,000 886,000 888,000 890,000 892,000 894,000 896,000 898,000 900,000 902,000 904,000 906,000 908,000 910,000 912,000 914,000 916,000

Mississippi River

Weir 6.05 L
Weir 6.0 L
Weir 5.8 L
Weir 5.7 L
Dike 5.4 L
Dike 5.2 L
MRM 4
Weir 4.2 R
Weir 4.0 R
Weir 3.9 R
Weir 3.7 R
Weir 3.6 R
Weir 3.5 R
Weir 3.4 R
Weir 3.3 R
Weir 3.1 R
Dike 4.4 L
Dike 4.0 L
Dike 4.0 L
MRM 5
Dike 4.2 L
Angelo Towhead
Cairo
Illinois
MRM 3
ORM 980
Ohio River
U.S. Highway 60
Birds Point
Weir 2.0 R
Weir 1.9 R
Weir 1.8 R
MRM 2
ORM 981
Dike 1.4 R
U.S. Highway 60
Dike 1.3 R
MRM 1
Dike 0.8 R
Dike 0.6 R
Dike 0.3 R
Dike 0.1 R
MRM 953
MRM 952
MRM 951
MRM 950
Missouri
Kentucky

Construct 350 ft Rootless Dike at RM 2.9L

Construct 455 ft Rootless Dike at RM 2.7L

Construct 9 Weirs See Report Page 35 for Details

Legend

- Dredge Cut
- Weir
- Dike
- Bridge Pylons
- Proposed Alternative

Elevation Referenced to LWRP (ft)

- 10 - 0.00
- 10 - 0
- 0 - -2
- -2 - -4
- -4 - -6
- -6 - -8
- -8 - -10
- -10 - -12
- -12 - -14
- -14 - -16
- -16 - -18
- -18 - -20
- -20 - -30
- -30 - -40
- -40 - -50
- -65.35 - -50

Replication

Alternative 14

918,000 406,000 408,000 920,000 412,000 414,000 922,000 406,000 408,000 920,000 412,000 414,000 922,000 418,000

PLATE NUMBER 53

0 1,250 2,500 5,000
Feet

Replication Scan vs. Alternative 14
Bathymetry Results
2008 AERIAL PHOTOGRAPH

U.S. ARMY ENGINEER DIVISION
CORPS OF ENGINEERS
ST. LOUIS, MISSOURI

Confluence of the Ohio and Mississippi
St Louis District
Bird's Point
HSR Model

DESIGNED BY: A Cox			SURVEY DATE: 10/05/2011
DRAWN BY: A Rockwell	REVIEWED BY: E Brauer, P.E.	CHECKED BY: J Brown, P.E.	
SUBMITTED: A Cox		APPROVED: Rob Davinroy, P.E.	
FILE NAME: L:\Bird'sPoint\Plates		PLOT DATE: 10/07/2011	

Applied River Engineering Center

US Army Corps of Engineers
St. Louis District

Replication

Alternative 14

Angelo Towhead

Birds Point

MRM 3

MRM 1

Weir 3.6 R
Weir 3.5 R
Weir 3.4 R
Weir 3.3 R
Weir 3.1 R
Weir 2.0 R
Weir 1.9 R
Weir 1.8 R
Dike 1.4 R
Dike 1.3 R
Dike 0.8 R
Dike 0.6 R
Dike 0.3 R
Dike 0.1 R
Dike 4.0 L
U.S. Highway 60

Construct 350 ft Rootless Dike at RM 2.9L

Construct 455 ft Rootless Dike at RM 2.9L

Construct 9 Weirs See Report Page 35 for Details

Legend

- Dike
- Weir
- Bridge Pylons
- Proposed Alternative

Normalized Velocity

- 0.0 - 0.1
- 0.1 - 0.2
- 0.2 - 0.3
- 0.3 - 0.4
- 0.4 - 0.5
- 0.5 - 0.6
- 0.6 - 0.7
- 0.7 - 0.8
- 0.8 - 0.9
- 0.9 - 1.0

416,000 418,000 420,000 422,000

884,000 886,000 888,000 890,000 892,000 894,000 896,000 898,000 900,000 902,000

PLATE NUMBER 54

0 500 1,000 2,000 Feet

Replication Scan vs. Alternative 14 Velocity Results

2008 AERIAL PHOTOGRAPH

U.S. ARMY ENGINEER DIVISION CORPS OF ENGINEERS ST. LOUIS, MISSOURI	DESIGNED BY: A Cox		SURVEY DATE: 10/05/2011
	DRAWN BY: A Rockwell	REVIEWED BY: E Brauer, P.E.	CHECKED BY: J Brown, P.E.
Confluence of the Ohio and Mississippi St Louis District Bird's Point HSR Model	SUBMITTED: A Cox	APPROVED: Rob Davinroy, P.E.	
	FILE NAME: L:\Bird'sPoint\Plates	PLOT DATE: 10/07/2011	

W S N E

Applied River Engineering Center

US Army Corps of Engineers St. Louis District

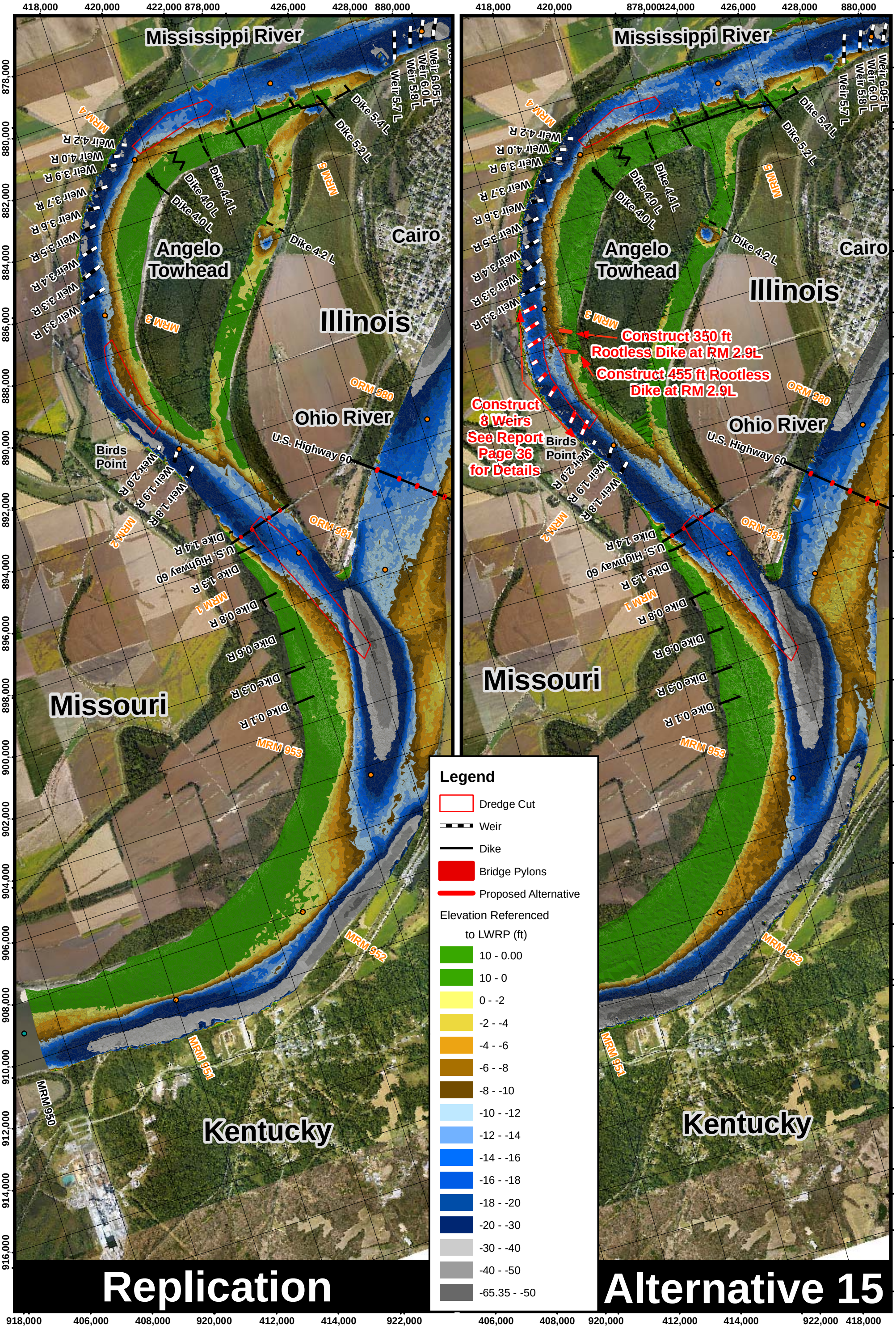

PLATE NUMBER 55

0 1,250 2,500 5,000
Feet

Replication Scan vs. Alternative 15 Bathymetry Results

2008 AERIAL PHOTOGRAPH

U.S. ARMY ENGINEER DIVISION
CORPS OF ENGINEERS
ST. LOUIS, MISSOURI

Confluence of the Ohio and Mississippi
St Louis District
Bird's Point
HSR Model

DESIGNED BY: A Cox		SURVEY DATE: 10/05/2011
DRAWN BY: A Rockwell	REVIEWED BY: E Brauer, P.E.	CHECKED BY: J Brown, P.E.
SUBMITTED: A Cox	APPROVED: Rob Davinroy, P.E.	
FILE NAME: L:\Bird'sPoint\Plates	PLOT DATE: 10/07/2011	

APPLIED RIVER ENGINEERING CENTER

US Army Corps of Engineers
St. Louis District

Replication

Alternative 15

Angelo Towhead

Birds Point

MRM 3

MRM 1

Weir 3.6 R
Weir 3.5 R
Weir 3.4 R
Weir 3.3 R
Weir 3.1 R
Dike 4.0 L
Weir 2.0 R
Weir 1.9 R
Weir 1.8 R
Dike 1.4 R
U.S. Highway 60
Dike 1.3 R
Dike 0.8 R
Dike 0.6 R
Dike 0.3 R
Dike 0.1 R

Construct 350 ft Rootless Dike at RM 2.9L

Construct 455 ft Rootless Dike at RM 2.7L

Construct 8 Weirs See Report Page 36 for Details

Legend

- Dike
- Weir
- Bridge Pylons
- Proposed Alternative

Normalized Velocity

- 0.0 - 0.1
- 0.1 - 0.2
- 0.2 - 0.3
- 0.3 - 0.4
- 0.4 - 0.5
- 0.5 - 0.6
- 0.6 - 0.7
- 0.7 - 0.8
- 0.8 - 0.9
- 0.9 - 1.0

416,000 418,000 420,000 422,000

884,000 886,000 888,000 890,000 892,000 894,000 896,000 898,000 900,000 902,000

PLATE NUMBER 56

0 500 1,000 2,000 Feet

Replication Scan vs. Alternative 15 Velocity Results

2008 AERIAL PHOTOGRAPH

U.S. ARMY ENGINEER DIVISION
CORPS OF ENGINEERS
ST. LOUIS, MISSOURI

Confluence of the Ohio and Mississippi
St Louis District
Bird's Point
HSR Model

DESIGNED BY: A Cox			SURVEY DATE: 10/05/2011
DRAWN BY: A Rockwell	REVIEWED BY: E Brauer, P.E.	CHECKED BY: J Brown, P.E.	
SUBMITTED: A Cox		APPROVED: Rob Davinroy, P.E.	
FILE NAME: L:\Bird'sPoint\Plates		PLOT DATE: 10/07/2011	

W S N E

Applied River Engineering Center

US Army Corps of Engineers St. Louis District

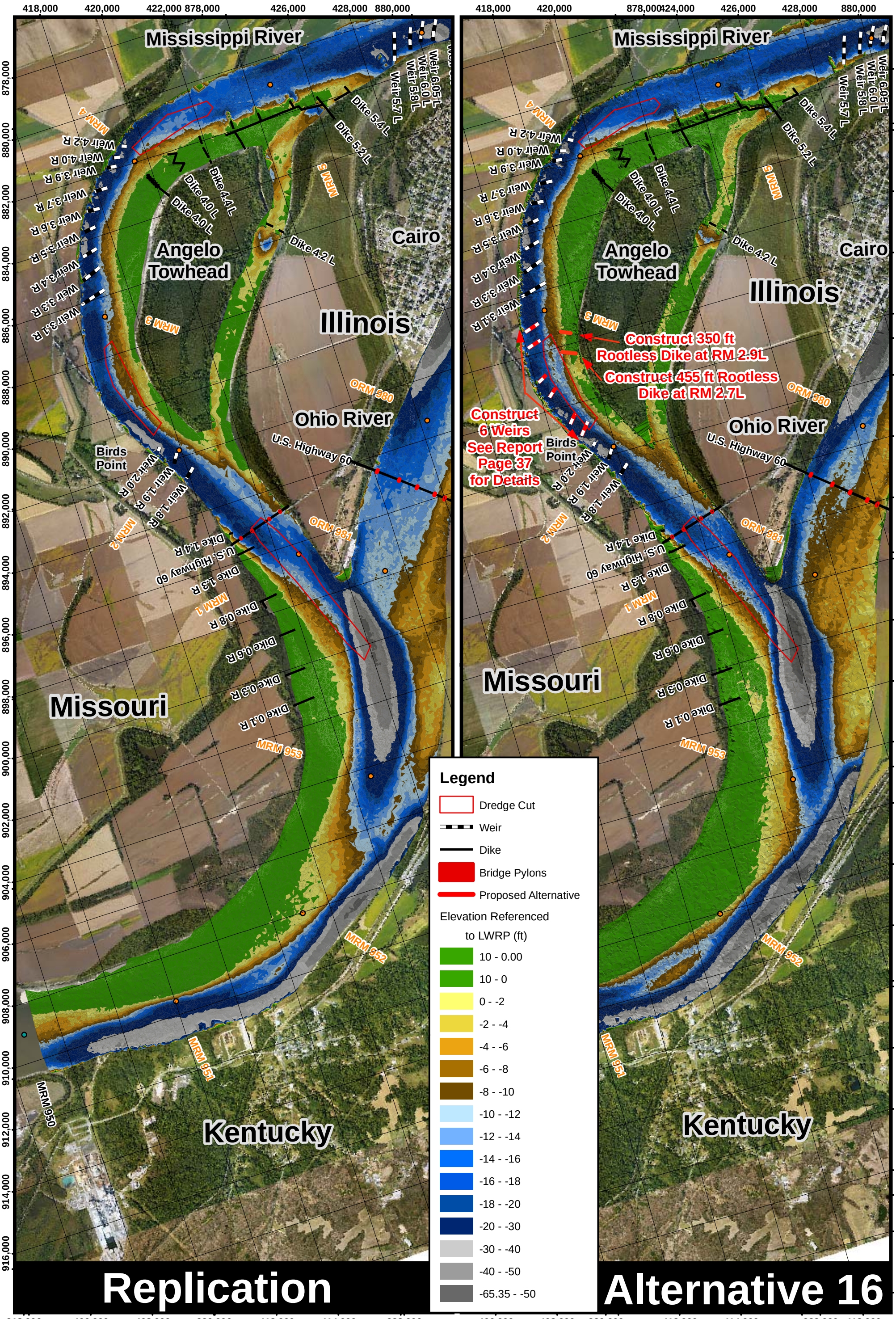

PLATE NUMBER 57

0 1,250 2,500 5,000 Feet

Replication Scan vs. Alternative 16 Bathymetry Results

2008 AERIAL PHOTOGRAPH

U.S. ARMY ENGINEER DIVISION CORPS OF ENGINEERS ST. LOUIS, MISSOURI	DESIGNED BY: A Cox		SURVEY DATE: 10/06/2011
	DRAWN BY: A Rockwell	REVIEWED BY: E Brauer, P.E.	CHECKED BY: J Brown, P.E.
Confluence of the Ohio and Mississippi St Louis District Bird's Point HSR Model	SUBMITTED: A Cox	APPROVED: Rob Davinroy, P.E.	
	FILE NAME: L:\Bird'sPoint\Plates	PLOT DATE: 10/07/2011	

Applied River Engineering Center

US Army Corps of Engineers St. Louis District

Replication

Alternative 16

Angelo Towhead

Birds Point

MRM 3

MRM 1

Weir 3.6 R
Weir 3.5 R
Weir 3.4 R
Weir 3.3 R
Weir 3.1 R
Weir 2.0 R
Weir 1.9 R
Weir 1.8 R
Dike 1.4 R
Dike 1.3 R
Dike 0.8 R
Dike 0.6 R
Dike 0.3 R
Dike 0.1 R
U.S. Highway 60

Construct 350 ft Rootless Dike at RM 2.9L

Construct 455 ft Rootless Dike at RM 2.7L

Construct 6 Weirs See Report Page 37 for Details

Legend

- Dike
- Weir
- Bridge Pylons
- Proposed Alternative

Normalized Velocity

- 0.0 - 0.1
- 0.1 - 0.2
- 0.2 - 0.3
- 0.3 - 0.4
- 0.4 - 0.5
- 0.5 - 0.6
- 0.6 - 0.7
- 0.7 - 0.8
- 0.8 - 0.9
- 0.9 - 1.0

416,000 418,000 420,000 422,000

884,000 886,000 888,000 890,000 892,000 894,000 896,000 898,000 900,000 902,000

PLATE NUMBER 58

0 500 1,000 2,000 Feet

Replication Scan vs. Alternative 16 Velocity Results

2008 AERIAL PHOTOGRAPH

U.S. ARMY ENGINEER DIVISION CORPS OF ENGINEERS ST. LOUIS, MISSOURI	DESIGNED BY: A Cox		SURVEY DATE: 10/06/2011
	DRAWN BY: A Rockwell	REVIEWED BY: E Brauer, P.E.	CHECKED BY: J Brown, P.E.
Confluence of the Ohio and Mississippi St Louis District Bird's Point HSR Model	SUBMITTED: A Cox	APPROVED: Rob Davinroy, P.E.	
	FILE NAME: L:\Bird'sPoint\Plates	PLOT DATE: 10/07/2011	

W S N E

APPLIED RIVER ENGINEERING CENTER

US Army Corps of Engineers St. Louis District

Mississippi River
Missouri
Illinois
Kentucky
Angelo Towhead
Cairo
Ohio River
Birds Point
U.S. Highway 60
Weir 6.05 L
Weir 6.0 L
Weir 5.8 L
Weir 5.7 L
Dike 5.4 L
Dike 5.2 L
Dike 4.4 L
Dike 4.0 L
Dike 4.2 L
Weir 4.2 R
Weir 4.0 R
Weir 3.9 R
Weir 3.7 R
Weir 3.6 R
Weir 3.5 R
Weir 3.4 R
Weir 3.3 R
Weir 3.1 R
Weir 2.0 R
Weir 1.9 R
Weir 1.8 R
Dike 1.4 R
Dike 1.3 R
Dike 0.8 R
Dike 0.6 R
Dike 0.3 R
Dike 0.1 R
MRM 4
MRM 3
MRM 2
MRM 1
MRM 5
ORM 980
ORM 981
MRM 953
MRM 952
MRM 951
MRM 950
Construct 670 ft Notched Dike at RM 3.0L
Construct 6 Weirs See Report Page 38 for Details

Legend

- Dredge Cut
- Weir
- Dike
- Bridge Pylons
- Proposed Alternative

Elevation Referenced to LWRP (ft)

- 10 - 0.00
- 10 - 0
- 0 - -2
- -2 - -4
- -4 - -6
- -6 - -8
- -8 - -10
- -10 - -12
- -12 - -14
- -14 - -16
- -16 - -18
- -18 - -20
- -20 - -30
- -30 - -40
- -40 - -50
- -65.35 - -50

Replication

Alternative 17

PLATE NUMBER 59

0 1,250 2,500 5,000 Feet

Replication Scan vs. Alternative 17 Bathymetry Results

2008 AERIAL PHOTOGRAPH

U.S. ARMY ENGINEER DIVISION
CORPS OF ENGINEERS
ST. LOUIS, MISSOURI

Confluence of the Ohio and Mississippi
St Louis District
Bird's Point
HSR Model

DESIGNED BY: A Cox		SURVEY DATE: 10/07/2011	
DRAWN BY: A Rockwell	REVIEWED BY: E Brauer, P.E.	CHECKED BY: J Brown, P.E.	
SUBMITTED: A Cox	APPROVED: Rob Davinroy, P.E.		
FILE NAME: L:\Bird'sPoint\Plates	PLOT DATE: 10/07/2011		

APPLIED RIVER ENGINEERING CENTER

US Army Corps of Engineers
St. Louis District

Replication

Alternative 17

Angelo Towhead

Birds Point

MRM 3

MRM 1

Weir 3.6 R
Weir 3.5 R
Weir 3.4 R
Weir 3.3 R
Weir 3.1 R
Weir 2.0 R
Weir 1.9 R
Weir 1.8 R
Dike 1.4 R
Dike 1.3 R
Dike 0.8 R
Dike 0.6 R
Dike 0.3 R
Dike 0.1 R
Dike 4.0 L
U.S. Highway 60

Construct 6 Weirs See Report Page 38 for Details

Construct 670 ft Rootless Dike at RM 3.0L

Legend

- Dike
- Weir
- Bridge Pylons
- Proposed Alternative

Normalized Velocity

- 0.0 - 0.1
- 0.1 - 0.2
- 0.2 - 0.3
- 0.3 - 0.4
- 0.4 - 0.5
- 0.5 - 0.6
- 0.6 - 0.7
- 0.7 - 0.8
- 0.8 - 0.9
- 0.9 - 1.0

416,000 418,000 420,000 422,000

884,000 886,000 888,000 890,000 892,000 894,000 896,000 898,000 900,000 902,000

PLATE NUMBER 60

0 500 1,000 2,000 Feet

Replication Scan vs. Alternative 17 Velocity Results

2008 AERIAL PHOTOGRAPH

U.S. ARMY ENGINEER DIVISION
CORPS OF ENGINEERS
ST. LOUIS, MISSOURI

Confluence of the Ohio and Mississippi
St Louis District
Bird's Point
HSR Model

DESIGNED BY: A Cox			SURVEY DATE: 10/07/2011
DRAWN BY: A Rockwell	REVIEWED BY: E Brauer, P.E.	CHECKED BY: J Brown, P.E.	
SUBMITTED: A Cox		APPROVED: Rob Davinroy, P.E.	
FILE NAME: L:\Bird'sPoint\Plates		PLOT DATE: 10/07/2011	

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US Army Corps of Engineers
St. Louis District

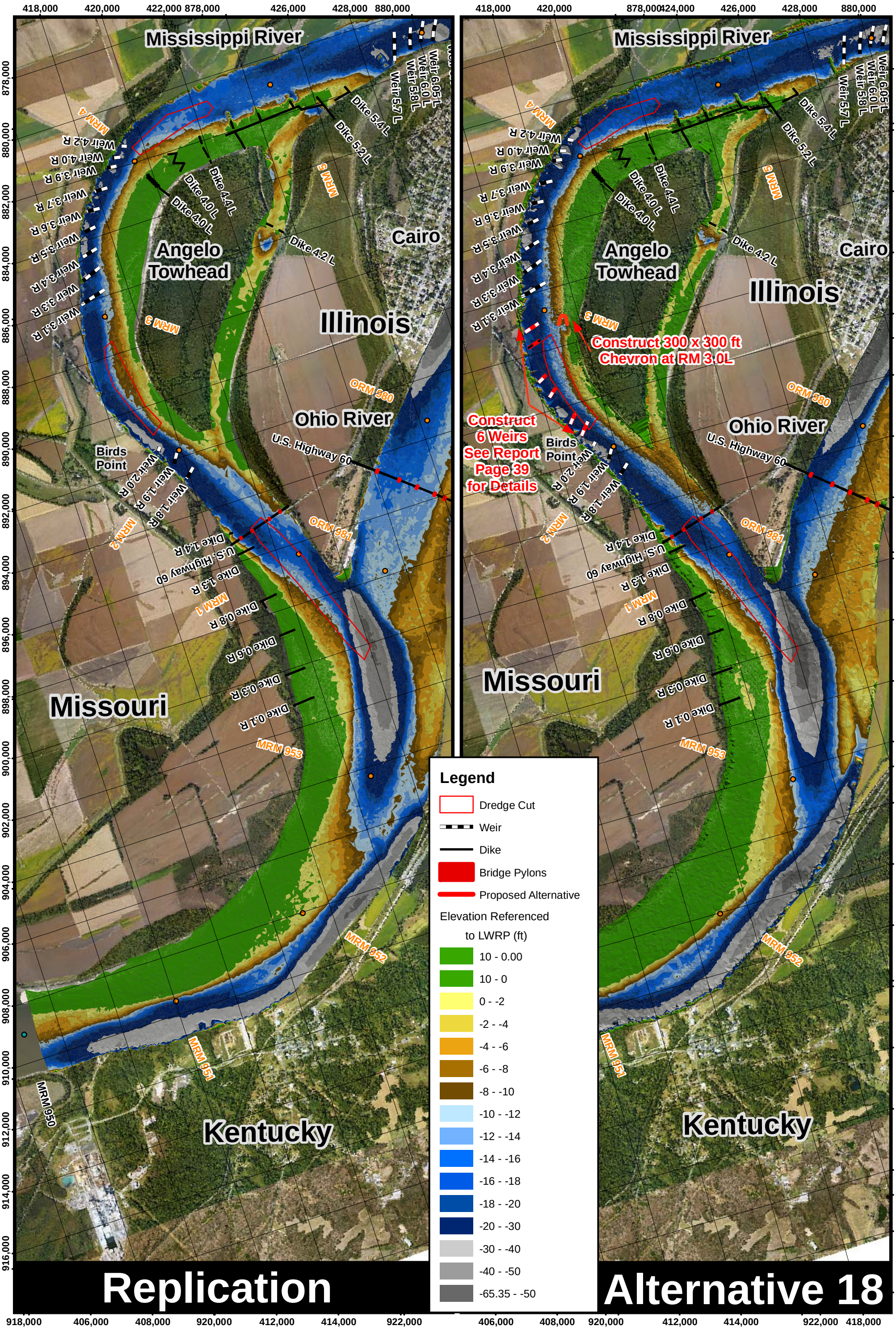

PLATE NUMBER 61

0 1,250 2,500 5,000 Feet

Replication Scan vs. Alternative 18 Bathymetry Results

2008 AERIAL PHOTOGRAPH

U.S. ARMY ENGINEER DIVISION CORPS OF ENGINEERS ST. LOUIS, MISSOURI	DESIGNED BY: A Cox		SURVEY DATE: 10/07/2011
	DRAWN BY: A Rockwell	REVIEWED BY: E Brauer, P.E.	CHECKED BY: J Brown, P.E.
Confluence of the Ohio and Mississippi St Louis District Bird's Point HSR Model	SUBMITTED: A Cox	APPROVED: Rob Davinroy, P.E.	
	FILE NAME: L:\Bird'sPoint\Plates	PLOT DATE: 10/11/2011	

Applied River Engineering Center

US Army Corps of Engineers St. Louis District

Replication

Alternative 18

Angelo Towhead

Birds Point

MRM 3

MRM 1

Weir 3.6 R
Weir 3.5 R
Weir 3.4 R
Weir 3.3 R
Weir 3.1 R
Weir 2.0 R
Weir 1.9 R
Weir 1.8 R
Dike 1.4 R
Dike 1.3 R
Dike 0.8 R
Dike 0.6 R
Dike 0.3 R
Dike 0.1 R
Dike 4.0 L
U.S. Highway 60

Construct 300 x 300 ft Chevron at RM 3.0L

Construct 6 Weirs See Report Page 39 for Details

Legend

- Dike
- Weir
- Bridge Pylons
- Proposed Alternative

Normalized Velocity

- 0.0 - 0.1
- 0.1 - 0.2
- 0.2 - 0.3
- 0.3 - 0.4
- 0.4 - 0.5
- 0.5 - 0.6
- 0.6 - 0.7
- 0.7 - 0.8
- 0.8 - 0.9
- 0.9 - 1.0

416,000 418,000 420,000 422,000

884,000 886,000 888,000 890,000 892,000 894,000 896,000 898,000 900,000 902,000

PLATE NUMBER 62

0 500 1,000 2,000 Feet

Replication Scan vs. Alternative 18 Velocity Results

2008 AERIAL PHOTOGRAPH

U.S. ARMY ENGINEER DIVISION
CORPS OF ENGINEERS
ST. LOUIS, MISSOURI

Confluence of the Ohio and Mississippi
St Louis District
Bird's Point
HSR Model

DESIGNED BY: A Cox			SURVEY DATE: 10/07/2011
DRAWN BY: A Rockwell	REVIEWED BY: E Brauer, P.E.	CHECKED BY: J Brown, P.E.	
SUBMITTED: A Cox		APPROVED: Rob Davinroy, P.E.	
FILE NAME: L:\Bird'sPoint\Plates		PLOT DATE: 10/11/2011	

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St. Louis District

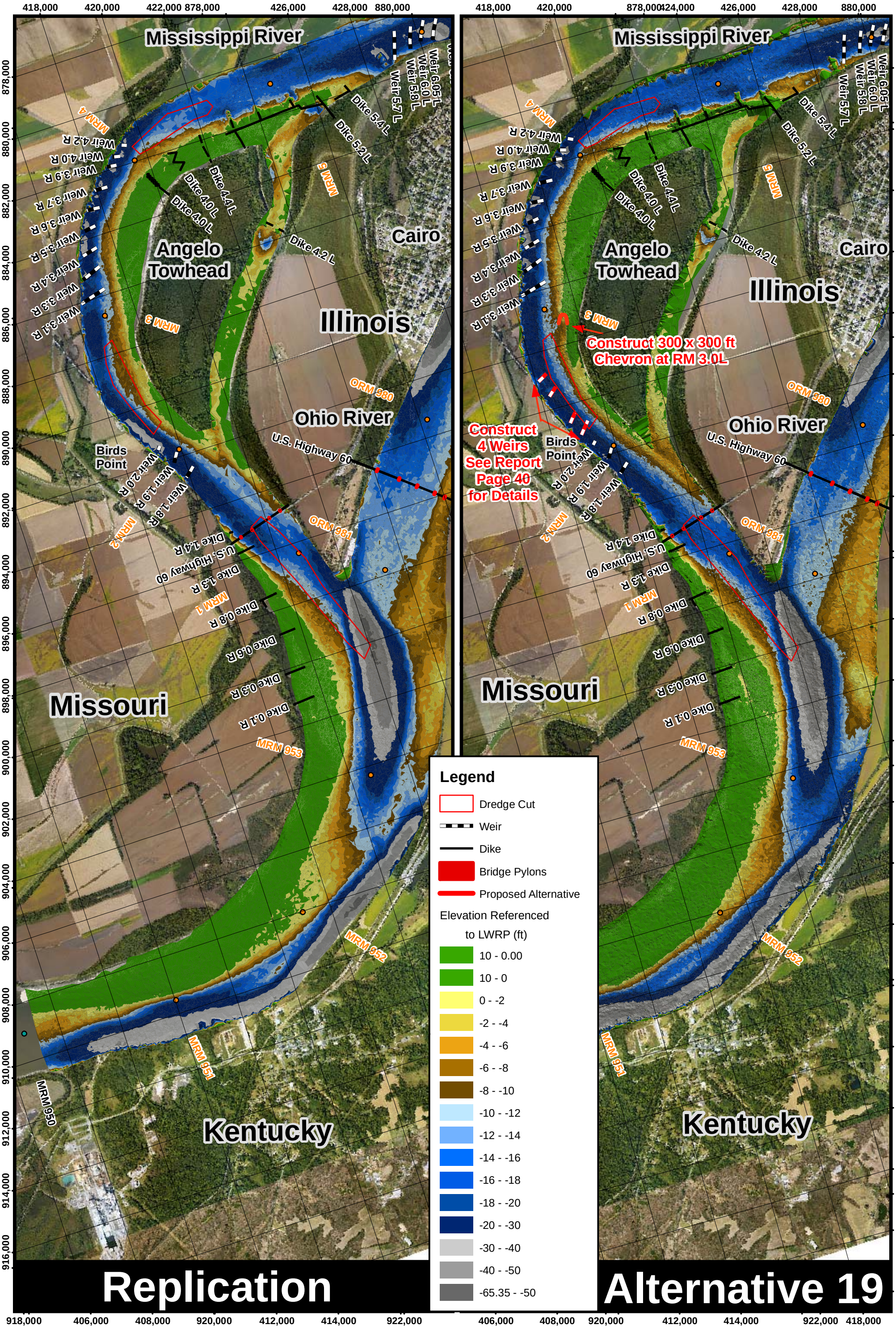

PLATE NUMBER 63

Replication Scan vs. Alternative 19 Bathymetry Results

2008 AERIAL PHOTOGRAPH

U.S. ARMY ENGINEER DIVISION
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ST. LOUIS, MISSOURI

Confluence of the Ohio and Mississippi
St Louis District
Bird's Point
HSR Model

DESIGNED BY: A Cox		SURVEY DATE: 10/11/2011	
DRAWN BY: A Rockwell	REVIEWED BY: E Brauer, P.E.	CHECKED BY: J Brown, P.E.	
SUBMITTED: A Cox	APPROVED: Rob Davinroy, P.E.		
FILE NAME: L:\Bird'sPoint\Plates	PLOT DATE: 10/11/2011		

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St. Louis District

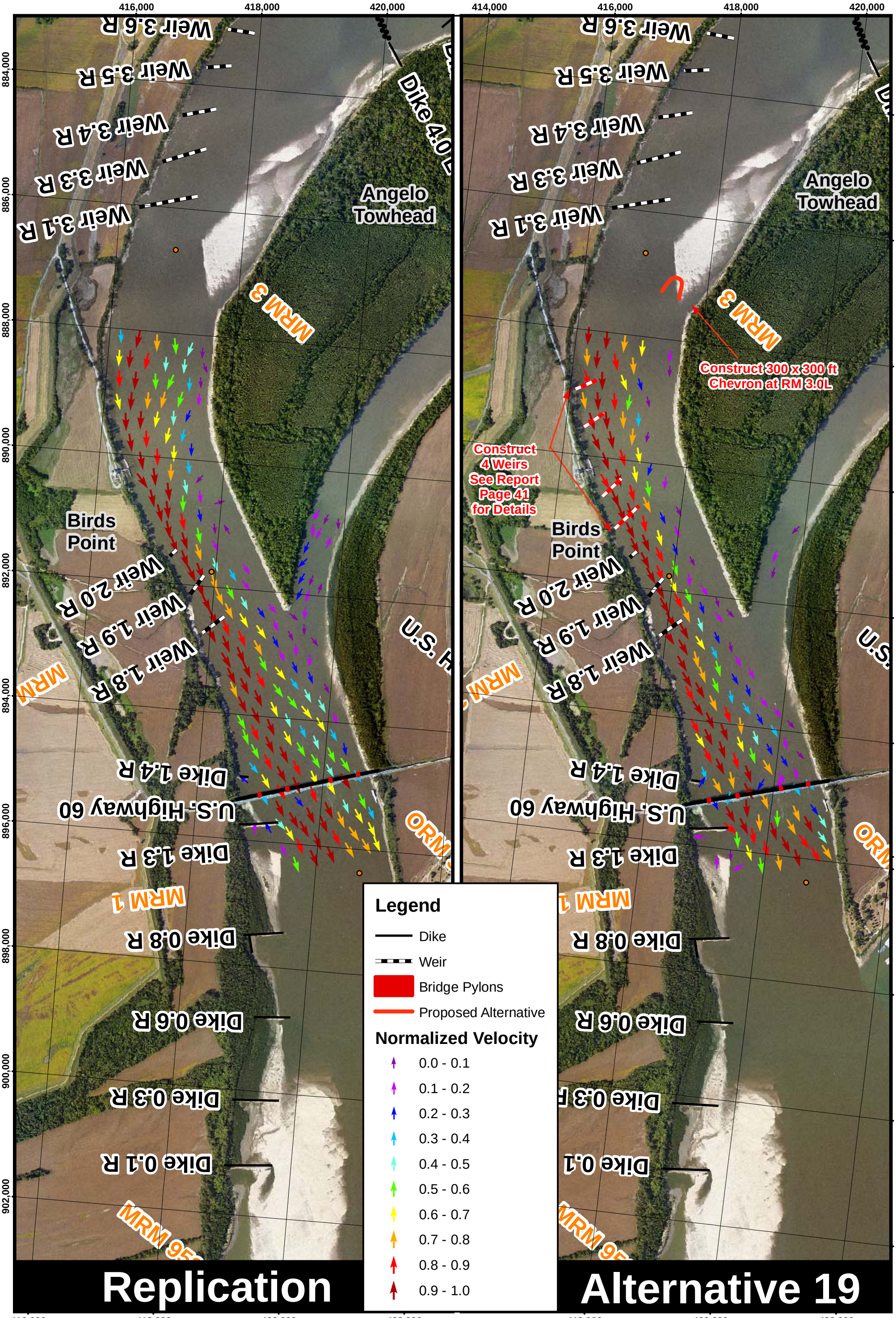

PLATE NUMBER 64

0 500 1,000 2,000 Feet

Replication Scan vs. Alternative 19 Velocity Results

2008 AERIAL PHOTOGRAPH

U.S. ARMY ENGINEER DIVISION
CORPS OF ENGINEERS
ST. LOUIS, MISSOURI

Confluence of the Ohio and Mississippi
St Louis District
Bird's Point
HSR Model

DESIGNED BY: A Cox			SURVEY DATE: 10/11/2011
DRAWN BY: A Rockwell	REVIEWED BY: E Brauer, P.E.	CHECKED BY: J Brown, P.E.	
SUBMITTED: A Cox		APPROVED: Rob Davinroy, P.E.	
FILE NAME: L:\Bird'sPoint\Plates		PLOT DATE: 10/11/2011	

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US Army Corps of Engineers
St. Louis District

Replication

Alternative 20

Mississippi River
Missouri
Kentucky
Illinois
Angelo Towhead
Cairo
Ohio River
Birds Point
U.S. Highway 60

Construct 615 ft Rootless Dike at RM 3.0L

Construct 4 Weirs See Report Page 41 for Details

Weir 6.05 L
Weir 6.0 L
Weir 5.8 L
Weir 5.7 L
Dike 5.4 L
Dike 5.2 L
Dike 4.4 L
Dike 4.0 L
Dike 4.2 L
Weir 4.2 R
Weir 4.0 R
Weir 3.9 R
Weir 3.7 R
Weir 3.6 R
Weir 3.5 R
Weir 3.4 R
Weir 3.3 R
Weir 3.1 R
Weir 2.0 R
Weir 1.9 R
Weir 1.8 R
Dike 1.4 R
Dike 1.3 R
Dike 0.8 R
Dike 0.6 R
Dike 0.3 R
Dike 0.1 R
MRM 4
MRM 3
MRM 2
MRM 1
MRM 5
ORM 980
ORM 981
MRM 953
MRM 952
MRM 951
MRM 950

Legend

- Dredge Cut
- Weir
- Dike
- Bridge Pylons
- Proposed Alternative

Elevation Referenced to LWRP (ft)

- 10 - 0.00
- 10 - 0
- 0 - -2
- -2 - -4
- -4 - -6
- -6 - -8
- -8 - -10
- -10 - -12
- -12 - -14
- -14 - -16
- -16 - -18
- -18 - -20
- -20 - -30
- -30 - -40
- -40 - -50
- -65.35 - -50

PLATE NUMBER 65

0 1,250 2,500 5,000 Feet

Replication Scan vs. Alternative 20 Bathymetry Results

2008 AERIAL PHOTOGRAPH

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ST. LOUIS, MISSOURI

Confluence of the Ohio and Mississippi
St Louis District
Bird's Point
HSR Model

DESIGNED BY: A Cox		SURVEY DATE: 10/12/2011
DRAWN BY: A Rockwell	REVIEWED BY: E Brauer, P.E.	CHECKED BY: J Brown, P.E.
SUBMITTED: A Cox	APPROVED: Rob Davinroy, P.E.	
FILE NAME: L:\Bird'sPoint\Plates	PLOT DATE: 10/12/2011	

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US Army Corps of Engineers
St. Louis District

Replication

Alternative 20

Angelo Towhead

Birds Point

MRM 3

MRM 1

MRM 95

Dike 4.0 L

U.S.

ORM

Weir 3.6 R

Weir 3.5 R

Weir 3.4 R

Weir 3.3 R

Weir 3.1 R

Weir 2.0 R

Weir 1.9 R

Weir 1.8 R

Dike 1.4 R

U.S. Highway 60

Dike 1.3 R

Dike 0.8 R

Dike 0.6 R

Dike 0.3 R

Dike 0.1 R

Construct 615 ft Rootless Dike at RM 3.0L

Construct 4 Weirs See Report Page 41 for Details

Legend

- Dike
- Weir
- Bridge Pylons
- Proposed Alternative

Normalized Velocity

- 0.0 - 0.1
- 0.1 - 0.2
- 0.2 - 0.3
- 0.3 - 0.4
- 0.4 - 0.5
- 0.5 - 0.6
- 0.6 - 0.7
- 0.7 - 0.8
- 0.8 - 0.9
- 0.9 - 1.0

884,000 886,000 888,000 890,000 892,000 894,000 896,000 898,000 900,000 902,000

416,000 418,000 420,000 422,000

PLATE NUMBER 66

0 500 1,000 2,000 Feet

Replication Scan vs. Alternative 20 Velocity Results

2008 AERIAL PHOTOGRAPH

U.S. ARMY ENGINEER DIVISION
CORPS OF ENGINEERS
ST. LOUIS, MISSOURI

Confluence of the Ohio and Mississippi
St Louis District
Bird's Point
HSR Model

DESIGNED BY: A Cox
SURVEY DATE: 10/12/2011
DRAWN BY: A Rockwell
REVIEWED BY: E Brauer, P.E.
CHECKED BY: J Brown, P.E.
SUBMITTED: A Cox
APPROVED: Rob Davinroy, P.E.
FILE NAME: L:\Bird'sPoint\Plates
PLOT DATE: 10/12/2011

W S N E

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US Army Corps of Engineers
St. Louis District

Replication

Alternative 21

Mississippi River
Illinois
Missouri
Kentucky
Angelo Towhead
Cairo
Ohio River
Birds Point
U.S. Highway 60
Dike 5.4 L
Dike 5.2 L
Weir 6.05 L
Weir 6.0 L
Weir 5.8 L
Weir 5.7 L
Dike 4.4 L
Dike 4.0 L
Dike 4.2 L
Weir 4.2 R
Weir 4.0 R
Weir 3.9 R
Weir 3.7 R
Weir 3.6 R
Weir 3.5 R
Weir 3.4 R
Weir 3.3 R
Weir 3.1 R
Weir 2.0 R
Weir 1.9 R
Weir 1.8 R
Dike 1.4 R
Dike 1.3 R
Dike 0.8 R
Dike 0.6 R
Dike 0.3 R
Dike 0.1 R
MRM 4
MRM 3
MRM 5
MRM 2
MRM 1
ORM 980
ORM 981
MRM 953
MRM 952
MRM 951
MRM 950
Construct 615 ft Rootless Dike at RM 3.0L
Construct 3 Weirs See Report Page 42 for Details

Legend

- Dredge Cut
- Weir
- Dike
- Bridge Pylons
- Proposed Alternative

Elevation Referenced to LWRP (ft)

- 10 - 0.00
- 10 - 0
- 0 - -2
- -2 - -4
- -4 - -6
- -6 - -8
- -8 - -10
- -10 - -12
- -12 - -14
- -14 - -16
- -16 - -18
- -18 - -20
- -20 - -30
- -30 - -40
- -40 - -50
- -65.35 - -50

PLATE NUMBER 67

0 1,250 2,500 5,000 Feet

Replication Scan vs. Alternative 21 Bathymetry Results

2008 AERIAL PHOTOGRAPH

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CORPS OF ENGINEERS
ST. LOUIS, MISSOURI

Confluence of the Ohio and Mississippi
St Louis District
Bird's Point
HSR Model

DESIGNED BY: A Cox
SURVEY DATE: 10/12/2011
DRAWN BY: A Rockwell
REVIEWED BY: E Brauer, P.E.
CHECKED BY: J Brown, P.E.
SUBMITTED: A Cox
APPROVED: Rob Davinroy, P.E.
FILE NAME: L:\Bird'sPoint\Plates
PLOT DATE: 10/12/2011

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St. Louis District

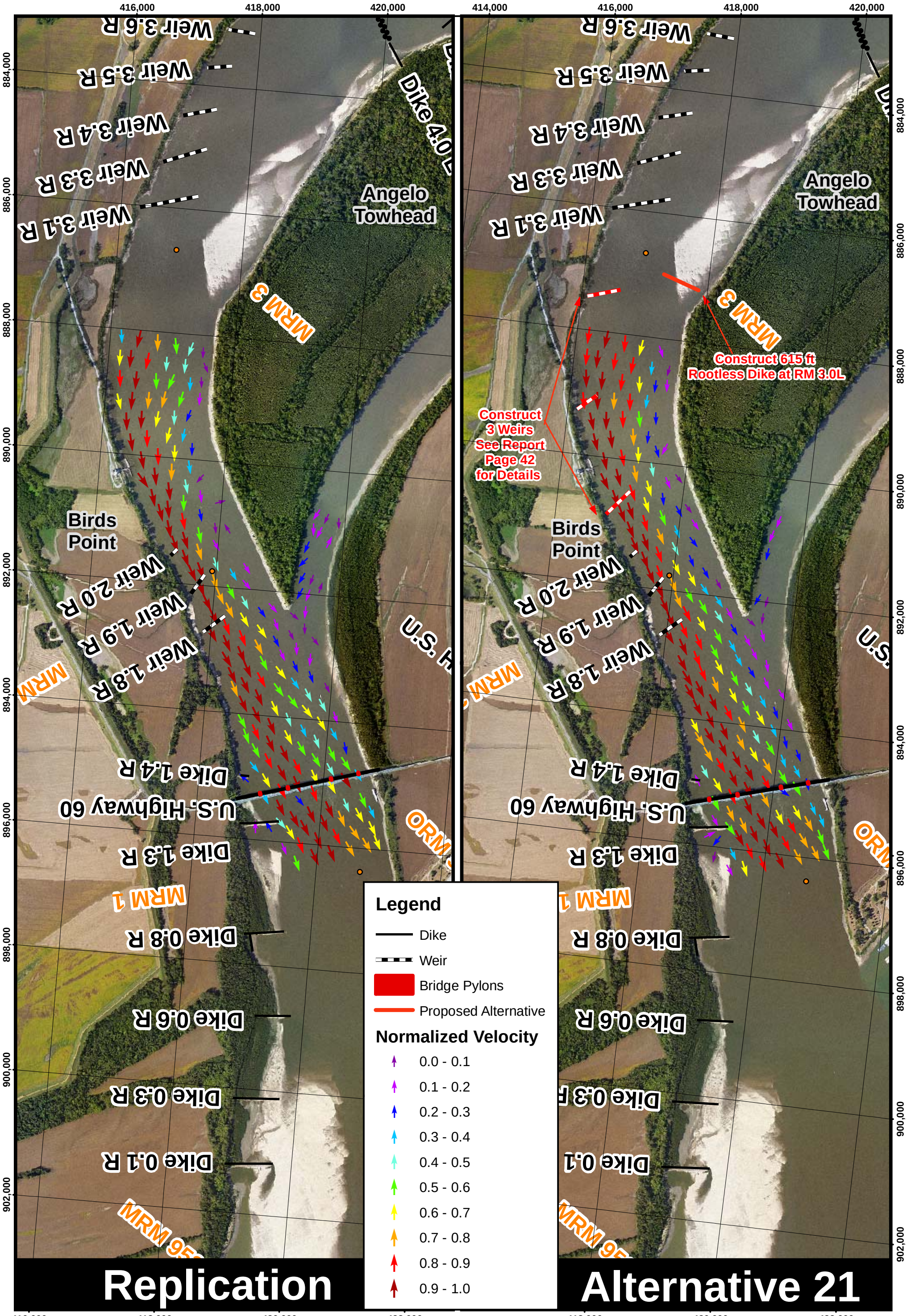

PLATE NUMBER 68

0 500 1,000 2,000 Feet

Replication Scan vs. Alternative 21 Velocity Results

2008 AERIAL PHOTOGRAPH

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CORPS OF ENGINEERS
ST. LOUIS, MISSOURI

Confluence of the Ohio and Mississippi
St Louis District
Bird's Point
HSR Model

DESIGNED BY: A Cox		SURVEY DATE: 10/12/2011
DRAWN BY: A Rockwell	REVIEWED BY: E Brauer, P.E.	CHECKED BY: J Brown, P.E.
SUBMITTED: A Cox	APPROVED: Rob Davinroy, P.E.	
FILE NAME: L:\Bird'sPoint\Plates	PLOT DATE: 10/12/2011	

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US Army Corps of Engineers
St. Louis District

Mississippi River
Missouri
Kentucky
Illinois
Angelo Towhead
Cairo
Ohio River
Birds Point
U.S. Highway 60
Weir 6.05 L
Weir 6.0 L
Weir 5.8 L
Weir 5.7 L
Dike 5.4 L
Dike 5.2 L
Dike 4.4 L
Dike 4.0 L
Dike 4.2 L
Weir 4.2 R
Weir 4.0 R
Weir 3.9 R
Weir 3.7 R
Weir 3.6 R
Weir 3.5 R
Weir 3.4 R
Weir 3.3 R
Weir 3.1 R
Weir 2.0 R
Weir 1.9 R
Weir 1.8 R
Dike 1.4 R
Dike 1.3 R
Dike 0.8 R
Dike 0.6 R
Dike 0.3 R
Dike 0.1 R
MRM 4
MRM 3
MRM 2
MRM 1
MRM 5
ORM 980
ORM 981
MRM 953
MRM 952
MRM 951
MRM 950
Construct 300 x 300 ft Chevron at RM 3.0L
Construct 3 Weirs See Report Page 43 for Details

Legend

- Dredge Cut
- Weir
- Dike
- Bridge Pylons
- Proposed Alternative

Elevation Referenced to LWRP (ft)

- 10 - 0.00
- 10 - 0
- 0 - -2
- -2 - -4
- -4 - -6
- -6 - -8
- -8 - -10
- -10 - -12
- -12 - -14
- -14 - -16
- -16 - -18
- -18 - -20
- -20 - -30
- -30 - -40
- -40 - -50
- -65.35 - -50

Replication

Alternative 22

PLATE NUMBER 69

0 1,250 2,500 5,000 Feet

Replication Scan vs. Alternative 22 Bathymetry Results

2008 AERIAL PHOTOGRAPH

U.S. ARMY ENGINEER DIVISION
CORPS OF ENGINEERS
ST. LOUIS, MISSOURI

Confluence of the Ohio and Mississippi
St Louis District
Bird's Point
HSR Model

DESIGNED BY: A Cox		SURVEY DATE: 10/13/2011	
DRAWN BY: A Rockwell	REVIEWED BY: E Brauer, P.E.	CHECKED BY: J Brown, P.E.	
SUBMITTED: A Cox	APPROVED: Rob Davinroy, P.E.		
FILE NAME: L:\Bird'sPoint\Plates	PLOT DATE: 10/13/2011		

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US Army Corps of Engineers
St. Louis District

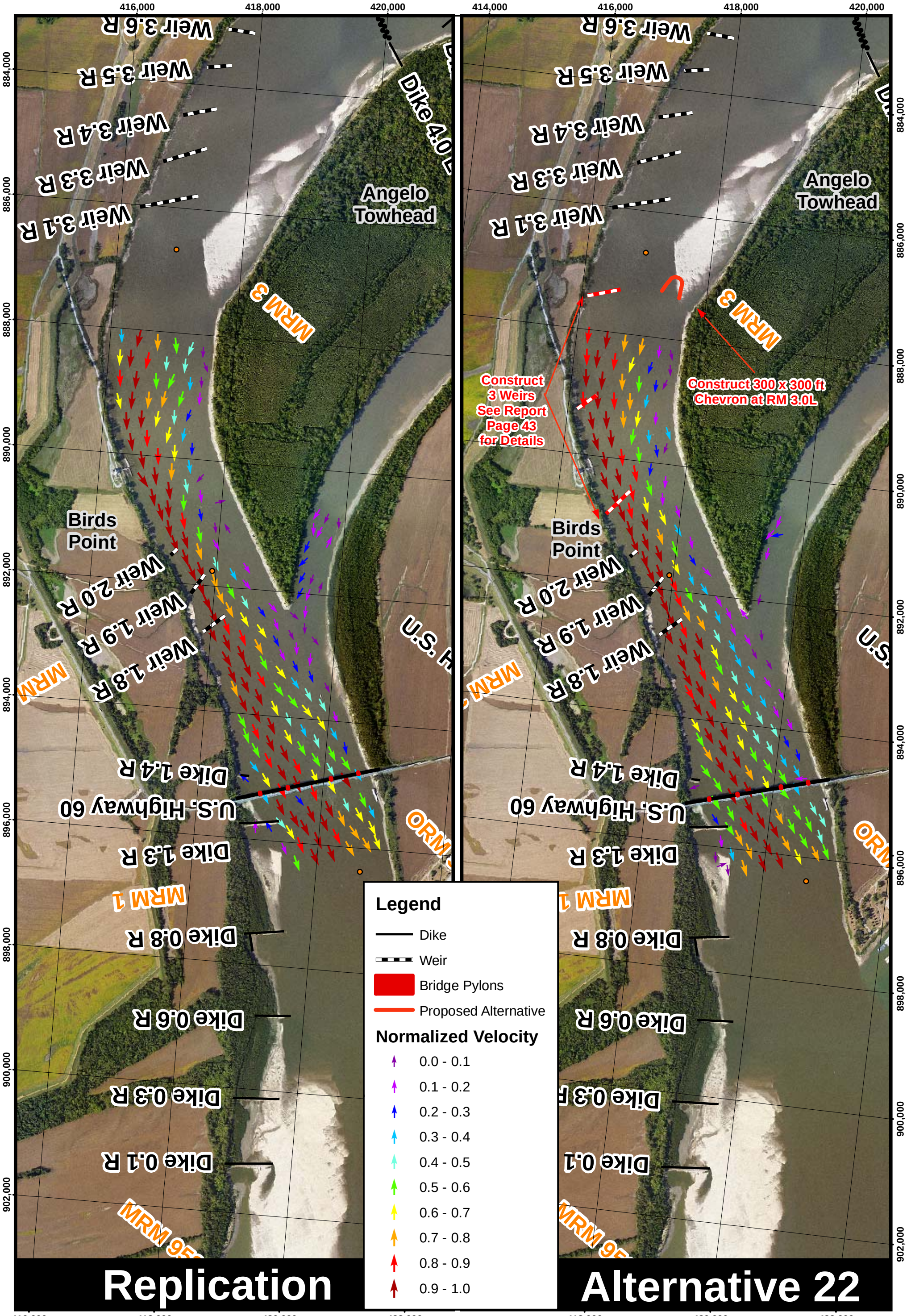

PLATE NUMBER 70

0 500 1,000 2,000 Feet

Replication Scan vs. Alternative 22 Velocity Results

2008 AERIAL PHOTOGRAPH

U.S. ARMY ENGINEER DIVISION CORPS OF ENGINEERS ST. LOUIS, MISSOURI	DESIGNED BY: A Cox		SURVEY DATE: 10/13/2011
	DRAWN BY: A Rockwell	REVIEWED BY: E Brauer, P.E.	CHECKED BY: J Brown, P.E.
Confluence of the Ohio and Mississippi St Louis District Bird's Point HSR Model	SUBMITTED: A Cox	APPROVED: Rob Davinroy, P.E.	
	FILE NAME: L:\Bird'sPoint\Plates	PLOT DATE: 10/13/2011	

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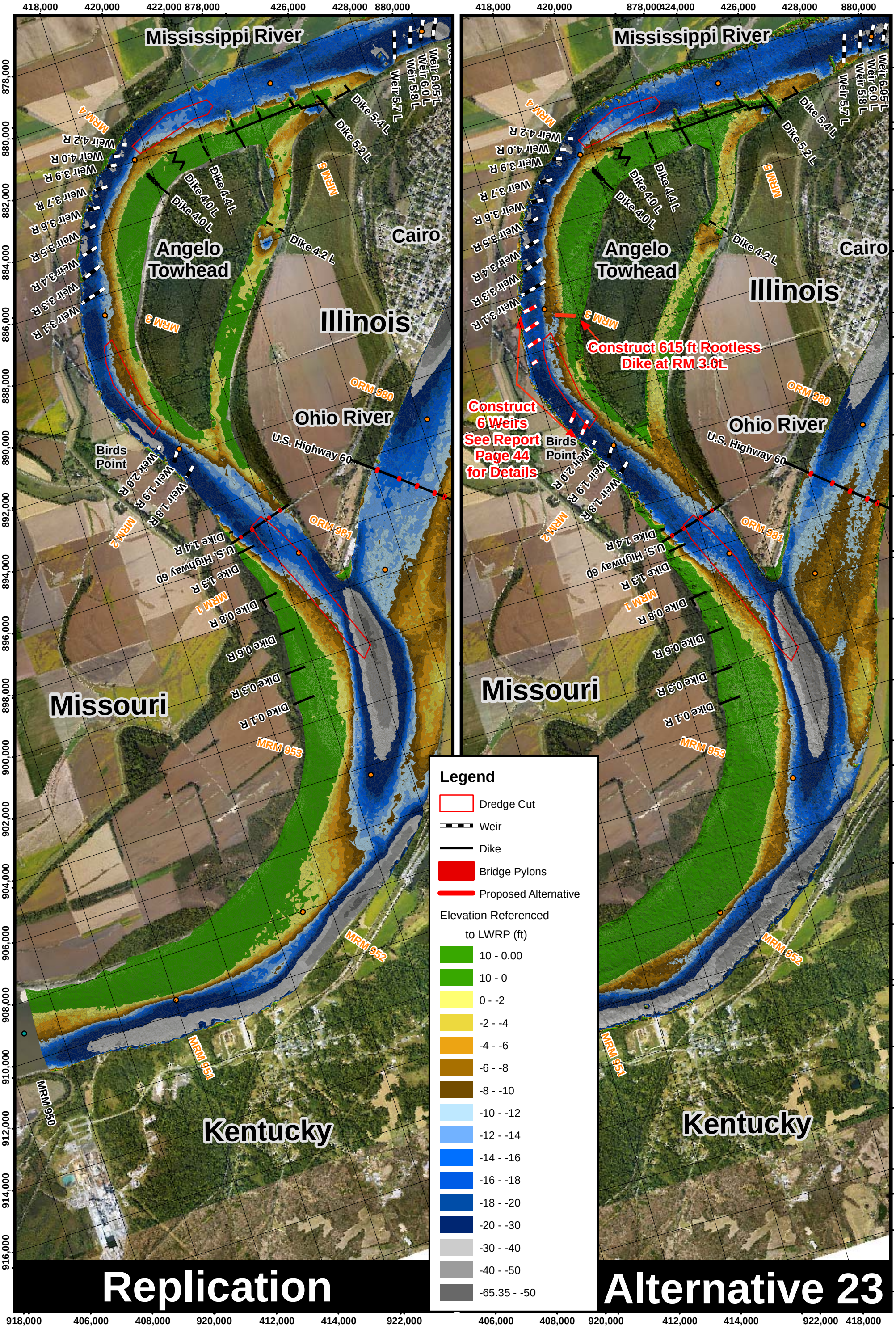

PLATE NUMBER 71

0 1,250 2,500 5,000 Feet

Replication Scan vs. Alternative 23 Bathymetry Results

2008 AERIAL PHOTOGRAPH

U.S. ARMY ENGINEER DIVISION CORPS OF ENGINEERS ST. LOUIS, MISSOURI	DESIGNED BY: A Cox		SURVEY DATE: 10/14/2011
	DRAWN BY: A Rockwell	REVIEWED BY: E Brauer, P.E.	CHECKED BY: J Brown, P.E.
Confluence of the Ohio and Mississippi St Louis District Bird's Point HSR Model	SUBMITTED: A Cox	APPROVED: Rob Davinroy, P.E.	
	FILE NAME: L:\Bird'sPoint\Plates	PLOT DATE: 10/14/2011	

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US Army Corps of Engineers St. Louis District

Replication

Alternative 23

Angelo Towhead

Birds Point

MRM 3

MRM 1

Weir 3.6 R

Weir 3.5 R

Weir 3.4 R

Weir 3.3 R

Weir 3.1 R

Weir 2.0 R

Weir 1.9 R

Weir 1.8 R

Dike 4.0 L

Dike 1.4 R

U.S. Highway 60

Dike 1.3 R

Dike 0.8 R

Dike 0.6 R

Dike 0.3 R

Dike 0.1 R

Construct 6 Weirs See Report Page 44 for Details

Construct 615 ft Rootless Dike at RM 3.0L

Legend

- Dike
- Weir
- Bridge Pylons
- Proposed Alternative

Normalized Velocity

- 0.0 - 0.1
- 0.1 - 0.2
- 0.2 - 0.3
- 0.3 - 0.4
- 0.4 - 0.5
- 0.5 - 0.6
- 0.6 - 0.7
- 0.7 - 0.8
- 0.8 - 0.9
- 0.9 - 1.0

416,000 418,000 420,000 422,000

884,000 886,000 888,000 890,000 892,000 894,000 896,000 898,000 900,000 902,000

PLATE NUMBER 72

0 500 1,000 2,000 Feet

Replication Scan vs. Alternative 23 Velocity Results

2008 AERIAL PHOTOGRAPH

U.S. ARMY ENGINEER DIVISION
CORPS OF ENGINEERS
ST. LOUIS, MISSOURI

Confluence of the Ohio and Mississippi
St Louis District
Bird's Point
HSR Model

DESIGNED BY: A Cox		SURVEY DATE: 10/14/2011
DRAWN BY: A Rockwell	REVIEWED BY: E Brauer, P.E.	CHECKED BY: J Brown, P.E.
SUBMITTED: A Cox	APPROVED: Rob Davinroy, P.E.	
FILE NAME: L:\Bird'sPoint\Plates	PLOT DATE: 10/14/2011	

APPLIED RIVER ENGINEERING CENTER

US Army Corps of Engineers
St. Louis District

Mississippi River
Missouri
Kentucky
Illinois
Angelo Towhead
Cairo
Ohio River
Birds Point
U.S. Highway 60
Weir 6.05 L
Weir 6.0 L
Weir 5.8 L
Weir 5.7 L
Dike 5.4 L
Dike 5.2 L
Dike 4.4 L
Dike 4.0 L
Dike 4.2 L
Weir 4.2 R
Weir 4.0 R
Weir 3.9 R
Weir 3.7 R
Weir 3.6 R
Weir 3.5 R
Weir 3.4 R
Weir 3.3 R
Weir 3.1 R
Weir 2.0 R
Weir 1.9 R
Weir 1.8 R
Dike 1.4 R
Dike 1.3 R
Dike 0.8 R
Dike 0.6 R
Dike 0.3 R
Dike 0.1 R
MRM 4
MRM 3
MRM 2
MRM 1
MRM 5
ORM 980
ORM 981
MRM 953
MRM 952
MRM 951
MRM 950
Construct 615 ft Rootless Dike at RM 3.0L
Construct 4 Weirs See Report Page 45 for Details

Legend

- Dredge Cut
- Weir
- Dike
- Bridge Pylons
- Proposed Alternative

Elevation Referenced to LWRP (ft)

- 10 - 0.00
- 10 - 0
- 0 - -2
- -2 - -4
- -4 - -6
- -6 - -8
- -8 - -10
- -10 - -12
- -12 - -14
- -14 - -16
- -16 - -18
- -18 - -20
- -20 - -30
- -30 - -40
- -40 - -50
- -65.35 - -50

Replication

Alternative 24

PLATE NUMBER 73

0 1,250 2,500 5,000 Feet

Replication Scan vs. Alternative 24 Bathymetry Results

2008 AERIAL PHOTOGRAPH

U.S. ARMY ENGINEER DIVISION
CORPS OF ENGINEERS
ST. LOUIS, MISSOURI

Confluence of the Ohio and Mississippi
St Louis District
Bird's Point
HSR Model

DESIGNED BY: A Cox		SURVEY DATE: 10/14/2011	
DRAWN BY: A Rockwell	REVIEWED BY: E Brauer, P.E.	CHECKED BY: J Brown, P.E.	
SUBMITTED: A Cox	APPROVED: Rob Davinroy, P.E.		
FILE NAME: L:\Bird'sPoint\Plates	PLOT DATE: 10/14/2011		

Applied River Engineering Center

US Army Corps of Engineers
St. Louis District

Replication

Alternative 24

Angelo Towhead

Birds Point

MRM 3

MRM 1

Weir 3.6 R
Weir 3.5 R
Weir 3.4 R
Weir 3.3 R
Weir 3.1 R
Weir 2.0 R
Weir 1.9 R
Weir 1.8 R
Dike 1.4 R
Dike 1.3 R
Dike 0.8 R
Dike 0.6 R
Dike 0.3 R
Dike 0.1 R
Dike 4.0 L
U.S. Highway 60

Construct 4 Weirs See Report Page 45 for Details

Construct 615 ft Rootless Dike at RM 3.0L

Legend

- Dike
- Weir
- Bridge Pylons
- Proposed Alternative

Normalized Velocity

- 0.0 - 0.1
- 0.1 - 0.2
- 0.2 - 0.3
- 0.3 - 0.4
- 0.4 - 0.5
- 0.5 - 0.6
- 0.6 - 0.7
- 0.7 - 0.8
- 0.8 - 0.9
- 0.9 - 1.0

416,000 418,000 420,000 422,000

884,000 886,000 888,000 890,000 892,000 894,000 896,000 898,000 900,000 902,000

PLATE NUMBER 74

0 500 1,000 2,000 Feet

Replication Scan vs. Alternative 24 Velocity Results

2008 AERIAL PHOTOGRAPH

U.S. ARMY ENGINEER DIVISION CORPS OF ENGINEERS ST. LOUIS, MISSOURI	DESIGNED BY: A Cox		SURVEY DATE: 10/14/2011
	DRAWN BY: A Rockwell	REVIEWED BY: E Brauer, P.E.	CHECKED BY: J Brown, P.E.
Confluence of the Ohio and Mississippi St Louis District Bird's Point HSR Model	SUBMITTED: A Cox	APPROVED: Rob Davinroy, P.E.	
	FILE NAME: L:\Bird'sPoint\Plates	PLOT DATE: 10/14/2011	

W S N E

Applied River Engineering Center

US Army Corps of Engineers St. Louis District

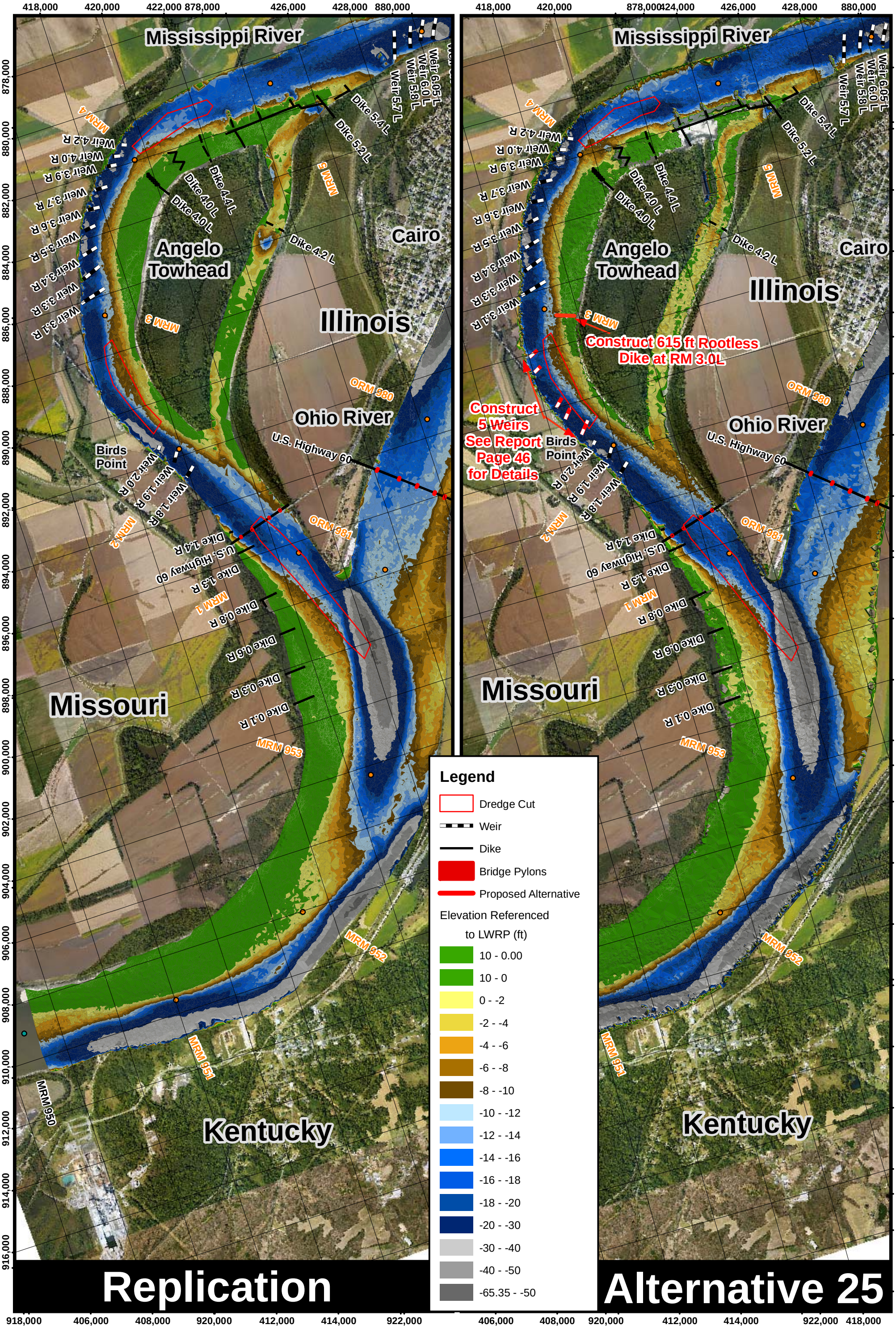

PLATE NUMBER 75

0 1,250 2,500 5,000 Feet

Replication Scan vs. Alternative 25 Bathymetry Results

2008 AERIAL PHOTOGRAPH

U.S. ARMY ENGINEER DIVISION CORPS OF ENGINEERS ST. LOUIS, MISSOURI	DESIGNED BY: A Cox		SURVEY DATE: 10/25/2011
	DRAWN BY: A Rockwell	REVIEWED BY: E Brauer, P.E.	CHECKED BY: J Brown, P.E.
Confluence of the Ohio and Mississippi St Louis District Bird's Point HSR Model	SUBMITTED: A Cox	APPROVED: Rob Davinroy, P.E.	
	FILE NAME: L:\Bird'sPoint\Plates	PLOT DATE: 10/31/2011	

APPLIED RIVER ENGINEERING CENTER

US Army Corps of Engineers St. Louis District

Angelo Towhead

Birds Point

Weir 3.6 R
Weir 3.5 R
Weir 3.4 R
Weir 3.3 R
Weir 3.1 R
Dike 4.0 L
Weir 2.0 R
Weir 1.9 R
Weir 1.8 R
Dike 1.4 R
U.S. Highway 60
Dike 1.3 R
Dike 0.8 R
Dike 0.6 R
Dike 0.3 R
Dike 0.1 R
U.S.
ORM

Construct 615 ft Rootless Dike at RM 3.0L

Construct 5 Weirs See Report Page 46 for Details

Legend

- Dike
- Weir
- Bridge Pylons
- Proposed Alternative

Normalized Velocity

- 0.0 - 0.1
- 0.1 - 0.2
- 0.2 - 0.3
- 0.3 - 0.4
- 0.4 - 0.5
- 0.5 - 0.6
- 0.6 - 0.7
- 0.7 - 0.8
- 0.8 - 0.9
- 0.9 - 1.0

Replication

Alternative 25

416,000 418,000 420,000 422,000

884,000 886,000 888,000 890,000 892,000 894,000 896,000 898,000 900,000 902,000

PLATE NUMBER 76

0 500 1,000 2,000 Feet

Replication Scan vs. Alternative 25 Velocity Results

2008 AERIAL PHOTOGRAPH

U.S. ARMY ENGINEER DIVISION
CORPS OF ENGINEERS
ST. LOUIS, MISSOURI

Confluence of the Ohio and Mississippi
St Louis District
Bird's Point
HSR Model

DESIGNED BY: A Cox
SURVEY DATE: 10/25/2011
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SUBMITTED: A Cox
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FILE NAME: L:\Bird'sPoint\Plates
PLOT DATE: 10/31/2011

W S N E

APPLIED RIVER ENGINEERING CENTER

US Army Corps of Engineers
St. Louis District

Mississippi River
Missouri
Illinois
Kentucky
Angelo Towhead
Cairo
Ohio River
Birds Point
U.S. Highway 60
Shorten Existing Weir 3.1R 260 ft
Shorten Existing Weir 3.3R 120 ft
Construct 615 ft Rootless Dike at RM 3.0L
Construct 4 Weirs See Report Page 47 for Details
MRM 4
MRM 3
MRM 2
MRM 1
MRM 5
ORM 980
ORM 981
MRM 953
MRM 952
MRM 951
MRM 950
Weir 6.05 L
Weir 6.0 L
Weir 5.8 L
Weir 5.7 L
Dike 5.4 L
Dike 5.2 L
Dike 4.4 L
Dike 4.0 L
Dike 4.2 L
Weir 4.2 R
Weir 4.0 R
Weir 3.9 R
Weir 3.7 R
Weir 3.6 R
Weir 3.5 R
Weir 3.4 R
Weir 3.3 R
Weir 3.1 R
Weir 2.0 R
Weir 1.9 R
Weir 1.8 R
Dike 1.4 R
U.S. Highway 60
Dike 1.3 R
Dike 0.8 R
Dike 0.6 R
Dike 0.3 R
Dike 0.1 R

Legend

- Dredge Cut
- Weir
- Dike
- Bridge Pylons
- Proposed Alternative

Elevation Referenced to LWRP (ft)

- 10 - 0.00
- 10 - 0
- 0 - -2
- -2 - -4
- -4 - -6
- -6 - -8
- -8 - -10
- -10 - -12
- -12 - -14
- -14 - -16
- -16 - -18
- -18 - -20
- -20 - -30
- -30 - -40
- -40 - -50
- -65.35 - -50

Replication

Alternative 26

PLATE NUMBER 77

0 1,250 2,500 5,000
Feet

Replication vs Alternative 26
Bathymetry Results
2008 AERIAL PHOTOGRAPH

U.S. ARMY ENGINEER DIVISION
CORPS OF ENGINEERS
ST. LOUIS, MISSOURI

Confluence of the Ohio and Mississippi
St Louis District
Bird's Point
HSR Model

DESIGNED BY: A Cox
SURVEY DATE: 11/04/11
DRAWN BY: A Rockwell
REVIEWED BY: E Brauer, P.E.
CHECKED BY: J Brown, P.E.
SUBMITTED: A Cox
APPROVED: Rob Davinroy, P.E.
FILE NAME: L:\Bird'sPoint\Plates
PLOT DATE: 11/07/2011

Applied River Engineering Center

US Army Corps of Engineers
St. Louis District

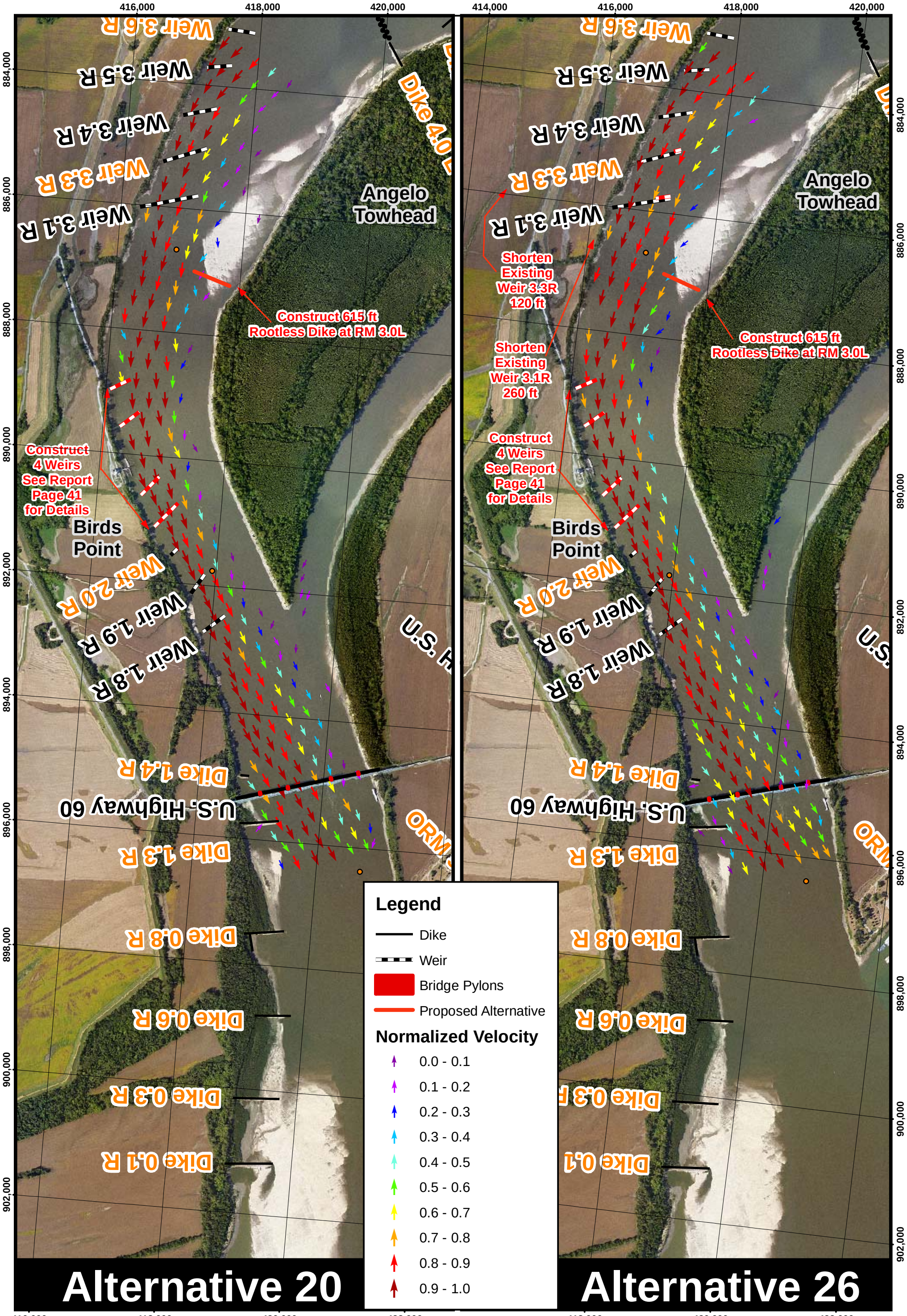

PLATE NUMBER 78

0 500 1,000 2,000 Feet

Alternative 20 vs. Alternative 26
Velocity Results
2008 AERIAL PHOTOGRAPH

U.S. ARMY ENGINEER DIVISION
CORPS OF ENGINEERS
ST. LOUIS, MISSOURI

Confluence of the Ohio and Mississippi
St Louis District
Bird's Point
HSR Model

DESIGNED BY: A Cox		SURVEY DATE: 11/3/2011 (20) 11/4/2011 (26)	
DRAWN BY: A Rockwell	REVIEWED BY: E Brauer, P.E.	CHECKED BY: J Brown, P.E.	
SUBMITTED: A Cox	APPROVED: Rob Davinroy, P.E.		
FILE NAME: L:\Bird'sPoint\Plates	PLOT DATE: 11/07/2011		

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US Army Corps of Engineers
St. Louis District