The GLMRIS Report

Appendix L - Real Estate

U.S.ARMY

USACE
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CONTENTS

CONTENTS (CONT.)

L.1 INTRODUCTION

L.1.1 Appendix Purpose and Structure

The purpose of this appendix is to summarize the real estate requirements for the proposed alternatives. This appendix is in support of the Great Lakes Mississippi River Interbasin Study (GLMRIS). In accordance with the study authorization, the U.S. Army Corps of Engineers (USACE) has evaluated a range of options and technologies, including hydrologic separation, that are intended to prevent aquatic nuisance species (ANS) transfer between the Great Lakes and Mississippi River basins via aquatic pathways. The appendix follows the structure and format suggested in the *Real Estate Handbook* ER 405-1-12; however, because of the preliminary nature of GLMRIS, it does not attempt to conform to the requirements of a full Real Estate Plan.

L.1.2 Study Area Boundaries

The primary focus area of this report are pathways within the Chicago Area Waterway System (CAWS). The CAWS consists of approximately 128 mi of waterways in the Chicago Metropolitan Area used for conveyance of stormwater runoff and municipal wastewater, commercial navigation, and flood control. Many of the waterways are manmade canals and channels, while others are natural streams, many of which have been dredged, realigned, widened, and straightened.

L.1.3 Authority

GLMRIS was authorized in the *Water Resources Development Act of 2007* (WRDA 2007), Public Law 110-114, §3061(d) as follows:

> "FEASIBILITY STUDY – The Secretary, in consultation with appropriate Federal, State, local and nongovernmental entities, shall conduct, at Federal expense, a feasibility study of the range of options and technologies available to prevent the spread of aquatic nuisance species between the Great Lakes and Mississippi River Basins through the Chicago Sanitary and Ship Canal and other aquatic pathways."

L.1.4 Scope of Work

The intent of the GLMRIS report is to present a range of options and technologies, summarized in a series of alternatives, to prevent the transfer of ANS between the Great Lakes and Mississippi River basins through aquatic pathways. The report does not include a recommended plan, but does include potential effects of the developed alternatives on aquatic and riparian environments, cultural and archaeological resources, and social and economic resources.

The Real Estate Division has analyzed preliminary areas of the features for each recommended alternative, conducted preliminary analysis on land values in the identified areas, and attempted to highlight any issues, risks, incremental costs, and opportunities associated with the real estate component of each alternative. The division has made recommendations for the minimum required standard real estate interest for each feature and identified areas where invoking navigation servitude is appropriate.

Anticipated requirements for lands, easements, rights-of-way, relocations, and disposal areas (LERRD) are based on preliminary mapping by Real Estate Division personnel and information furnished by the project development team.

This appendix does not attempt to identify individual owners and exact tracts of land required for implementing a specific project. It is conceptual in nature and meant to support GLMRIS by identifying costs and risks associated with the real estate component of each alternative. This appendix is preliminary, for planning purposes only, and subject to change. Future real estate appendices will further define the real estate requirements in accordance with the *Real Estate Handbook.*

L.2 PROJECT DESCRIPTION/ALTERNATIVES

A list of project features and a brief discussion of each alternative follows.

L.2.1 No New Federal Action

The No New Federal Action Alternative does not require any real estate and therefore is not considered further in this appendix.

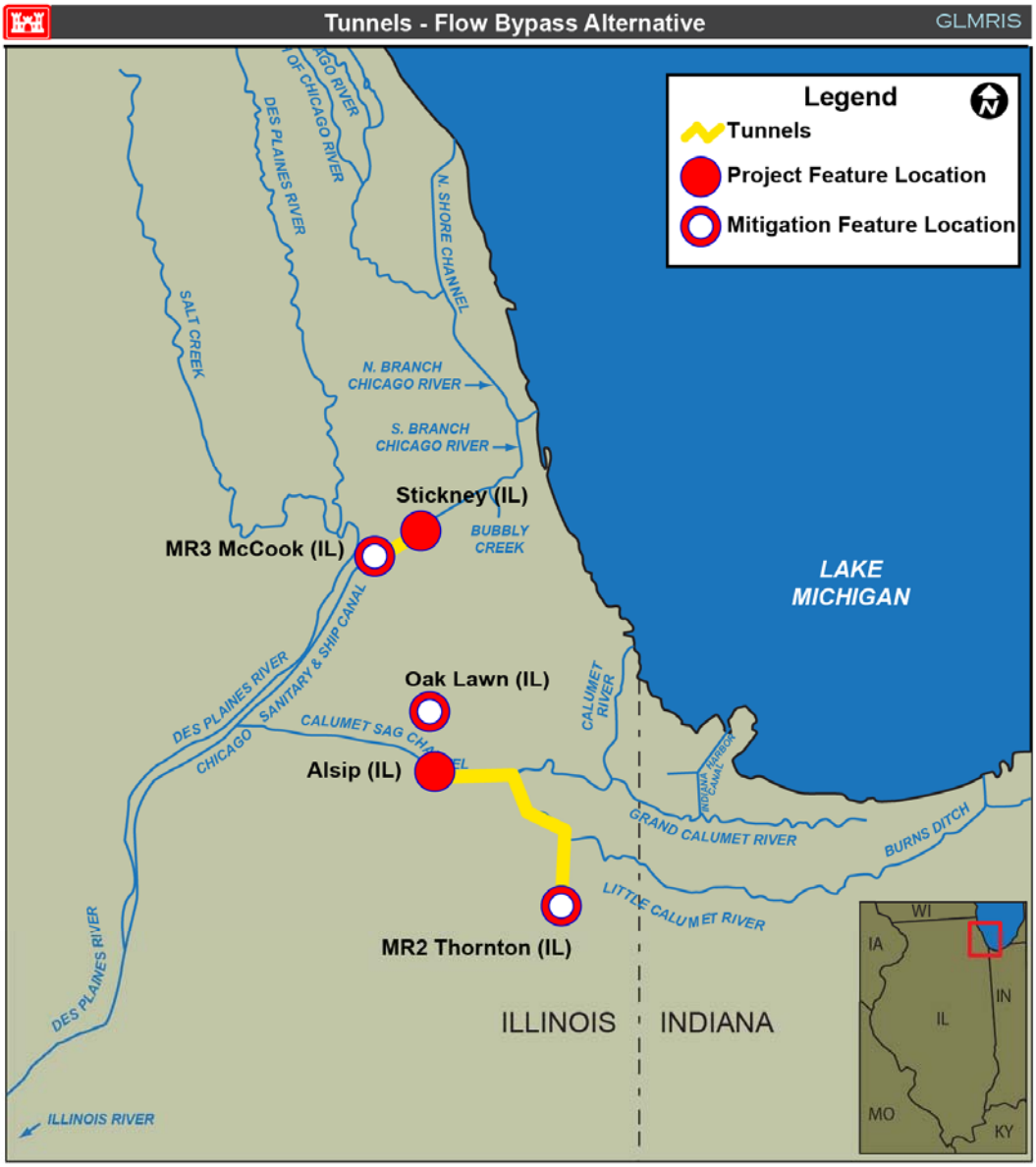
L.2.2 Nonstructural Measures

This alternative considers nonstructural approaches (i.e., do not require engineered construction for implementation and operation) for controlling interbasin transfer through the CAWS. The recommendations found in this alternative do not require any real estate and therefore are not considered further in this appendix.

L.2.3 Mid-System Control Technologies without a Buffer Zone – Flow Bypass Alternative

This alternative includes nonstructural measures and has two single-point ANS control technologies located at Stickney, Illinois, and Alsip, Illinois. These technologies reduce the risk of transfer of ANS between basins in both directions.

Location	Feature	Perm. Estate Size (acres)	Permanent Estate Type	Temp. Easement Size (acres)
Stickney (IL)	GLRMIS lock	10.5	Navigational Servitude	2.2
	Lock and Electric Barrier Building	2.8	Fee Simple	2.1
	ANS Treatment Plant	9.1	Fee Simple	
	Conveyance Tunnel	16.0	Utility Easement	NA
	Reservoir (McCook 1)	140	Fee Simple	10
Alsip (IL)	GLRMIS lock	12.3	Navigational Servitude	1.7
	Lock and Electric Barrier Building	2.2	Fee Simple	
	ANS Treatment Plant	9.9	Fee Simple	1
	Conveyance Tunnel	17.5	Utility Easement	NA
	Reservoir (Thornton 1)	190	Fee Simple	10
	Reservoir (Oak Lawn)	90	Fee Simple	12

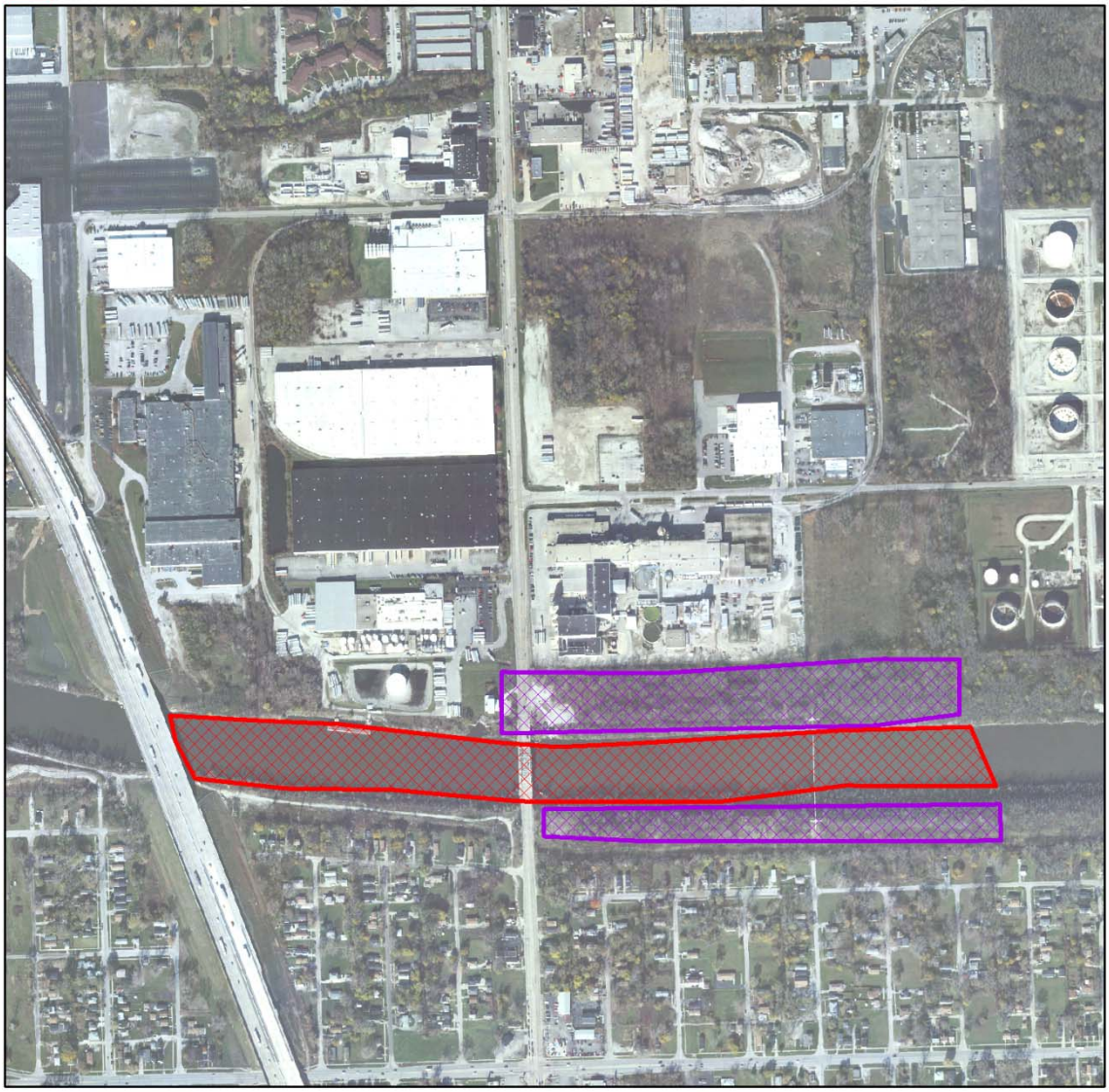


Flow Bypass Alternative
4.9 mile utility easement of 24 feet along the CSSC from Stickney to McCook 1 Reservoir.
Associated access easement every 3000 ft at shaft outlets, for a total of 1.7 acres.
5.0 mile utility easement of 26 feet along the Cal-Sag Channel and Little Calumet River from Alsip to Thornton 1 Reservoir.
Associated access easement every 3000 feet at shaft outlets, for a total of 1.7 acres.

* It is assumed that all easements will be within the public right of way

Map is not to scale.

Alsip (IL) - Flow Bypass Alternative GLMRIS



Legend

October 2013

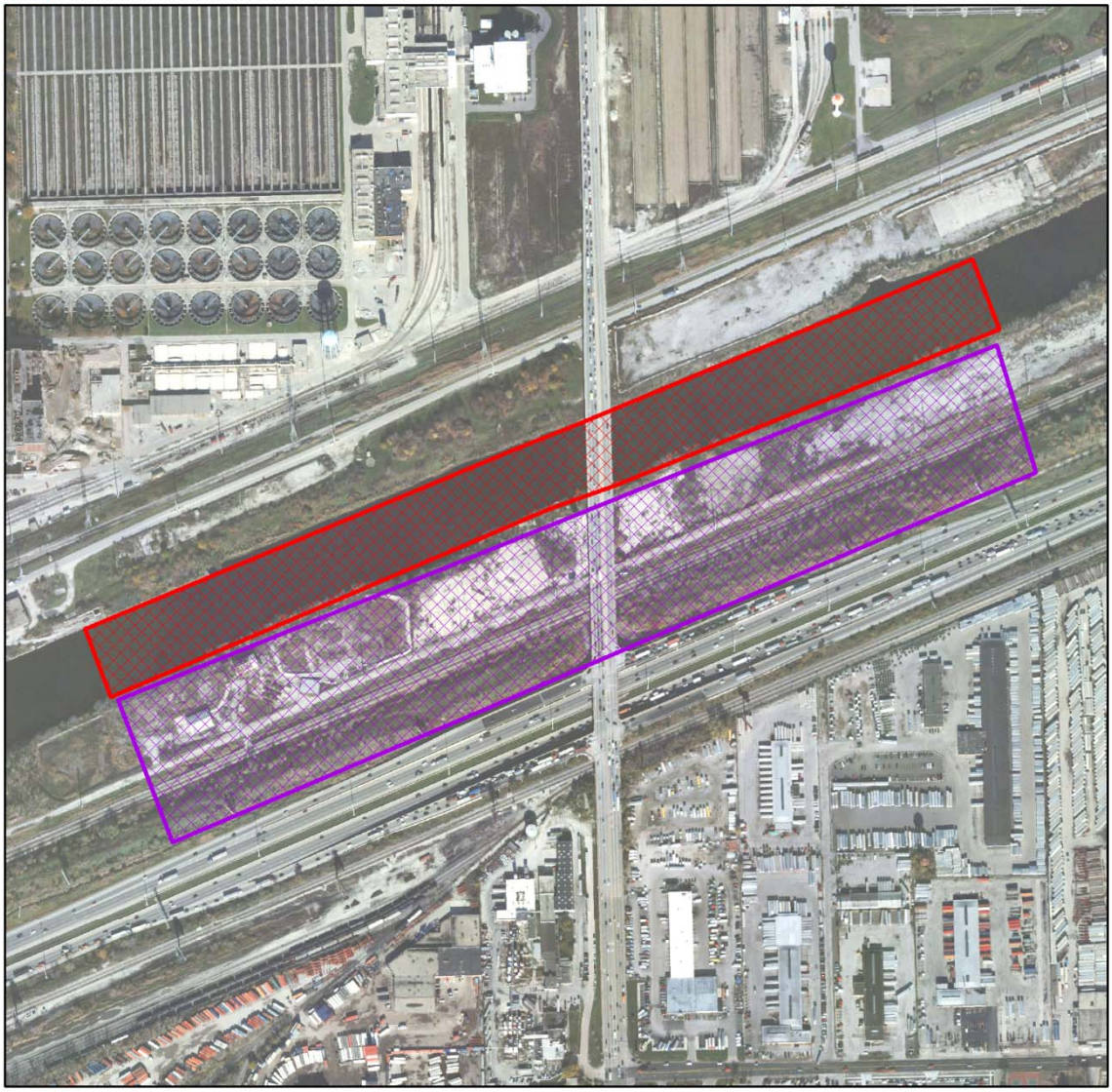
GLMRIS Lock (12.3 Acres) will be located within Hatched Area - Navigational Servitude

ANS Treatment Plant (9.9 Acres) & Lock and Electric Barrier Building (2.2 Acres) will be within Hatched Area - Fee Simple

NOT TO SCALE

****Further evaluation is required to determine exact location of project and mitigation features.**

Stickney (IL) - Flow Bypass Alternative GLMRIS



October 2013

Legend

GLMRIS Lock (10.5 Acres) will be located within Hatched Area - Navigational Servitude

ANS Treatment Plant (9.1 Acres) & Lock and Electric Barrier Building (2.8 Acres) will be within Hatched Area - Fee Simple

****Further evaluation is required to determine exact location of project and mitigation features.**

NOT TO SCALE

Oak Lawn Reservoir - Mid-System Hydrologic Separation Alternative & Flow Bypass Alternative & Hybrid CSSC Open Alternative

Legend

October 2013

Reservoir (90 Acres) will be within Hatched Area - Fee Simple

NOT TO SCALE

****Further evaluation is required to determine exact location of project and mitigation features.**

A Second Reservoir at McCook - Flow Bypass Alternative GLMRIS

Legend

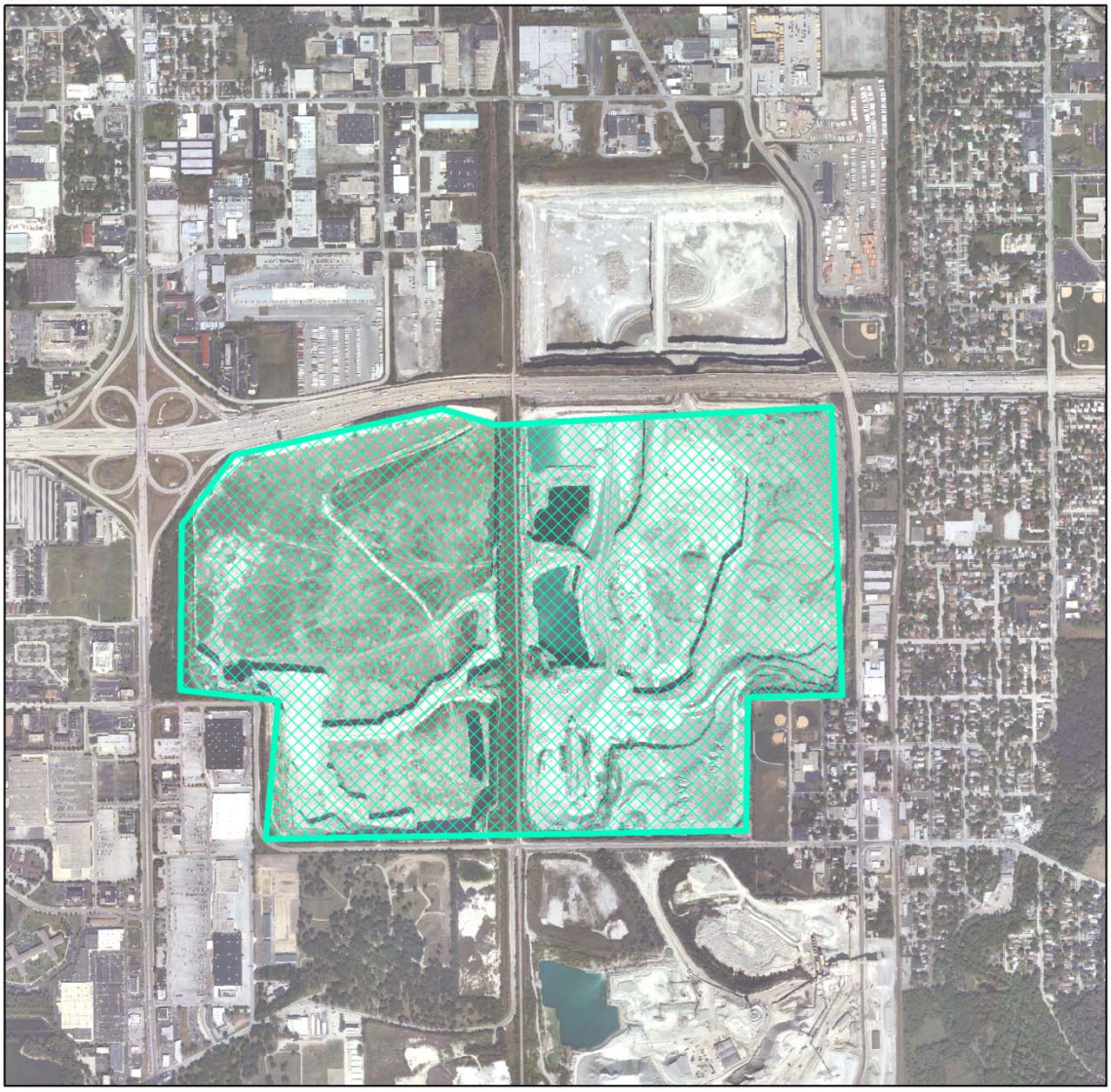
November 2013

A new reservoir (140 Acres) will be within Hatched Area - Fee Simple

NOT TO SCALE

****Further evaluation is required to determine exact location of project and mitigation features.**

A Second Reservoir at Thornton - Flow Bypass Alternative GLMRIS



November 2013

Legend

A new reservoir (190 Acres) to be within Hatched Area - Fee

****Further evaluation is required to determine exact location of project and mitigation features.**

NOT TO SCALE

L.2.4 Technology Alternative with a Buffer Zone – CAWS Buffer Zone Alternative

This alternative creates an ANS-free buffer zone by installing ANS control measures along all five aquatic connections between the CAWS and Lake Michigan and by installing ANS control measures at the downstream entry of the CAWS at the Brandon Road Lock and Dam. This is achieved by upgrading or replacing the existing control structures at Wilmette, Illinois, Chicago, Illinois, the T.J. O'Brien Lock and Dam, and the Brandon Road Lock and Dam and by constructing physical barriers along the uncontrolled pathways of the Grand Calumet River and Little Calumet River at the Illinois-Indiana state line and Hammond, Indiana.

Location	Feature	Perm. Estate Size (acres)	Permanent Estate Type	Temp. Easement Size (acres)
Wilmette (IL)	Rehab existing control structure	0.2	Fee Simple	0.8
	ANS Treatment Plant	1.3	Fee Simple	
Chicago (IL)	Lock with electric barrier	12	Navigational Servitude	3.4
	ANS Treatment plant for lock structure		Fee Simple	NA
	ANS treatment plant for diversion		Fee Simple	NA
TJ O'Brien (IN)	Lock with electric barrier	10	Navigational Servitude	3.4
	ANS Treatment plans for lock structure	7.5	Fee Simple	1.75
	ANS Treatment Plant for diversion		Fee Simple	
State Line (IL/IN)	Physical barrier	0.03	Navigational Servitude	NA
	Barrier land	0.5	Fee Simple	1.2
	Reservoir at State Line (golf course)	130	Fee Simple	10
Hammond (IN)	Physical barrier	0.05	Navigational Servitude	NA
	Barrier land	0.2	Fee Simple	1
	Conveyance Tunnel	23.5	Utility Easement	NA
	Reservoir (Thornton 2)	115	Fee Simple	10
Brandon Road (IL)	Lock with electric barrier	10.5	Navigational Servitude	NA
	Barrier building	3	Fee simple	3.6

Wilmette (IL) - CAWS Buffer Zone Alternative & Hybrid CSSC Open Alternative

Legend

October 2013

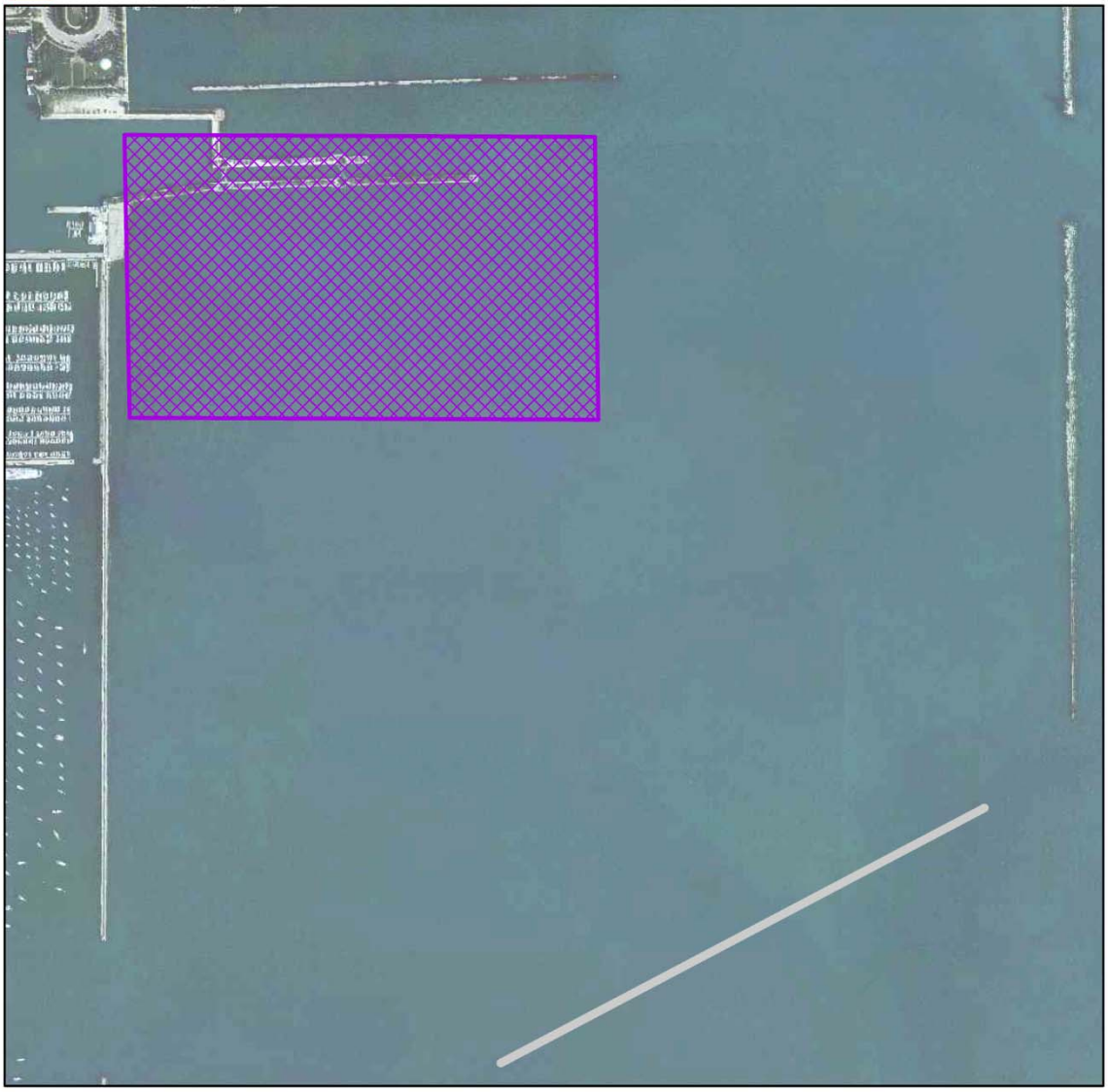
Screened Sluice Gates - Rehab Existing Control - 0.2 Acres

ANS Treatment Plant & Site Acess (1.3 acres) will be within Hatched Area - Fee Simple

NOT TO SCALE

****Further evaluation is required to determine exact location of project and mitigation features.**

Chicago (IL) - CAWS Buffer Zone Alternative & Hybrid CSSC Open Alternative



Legend

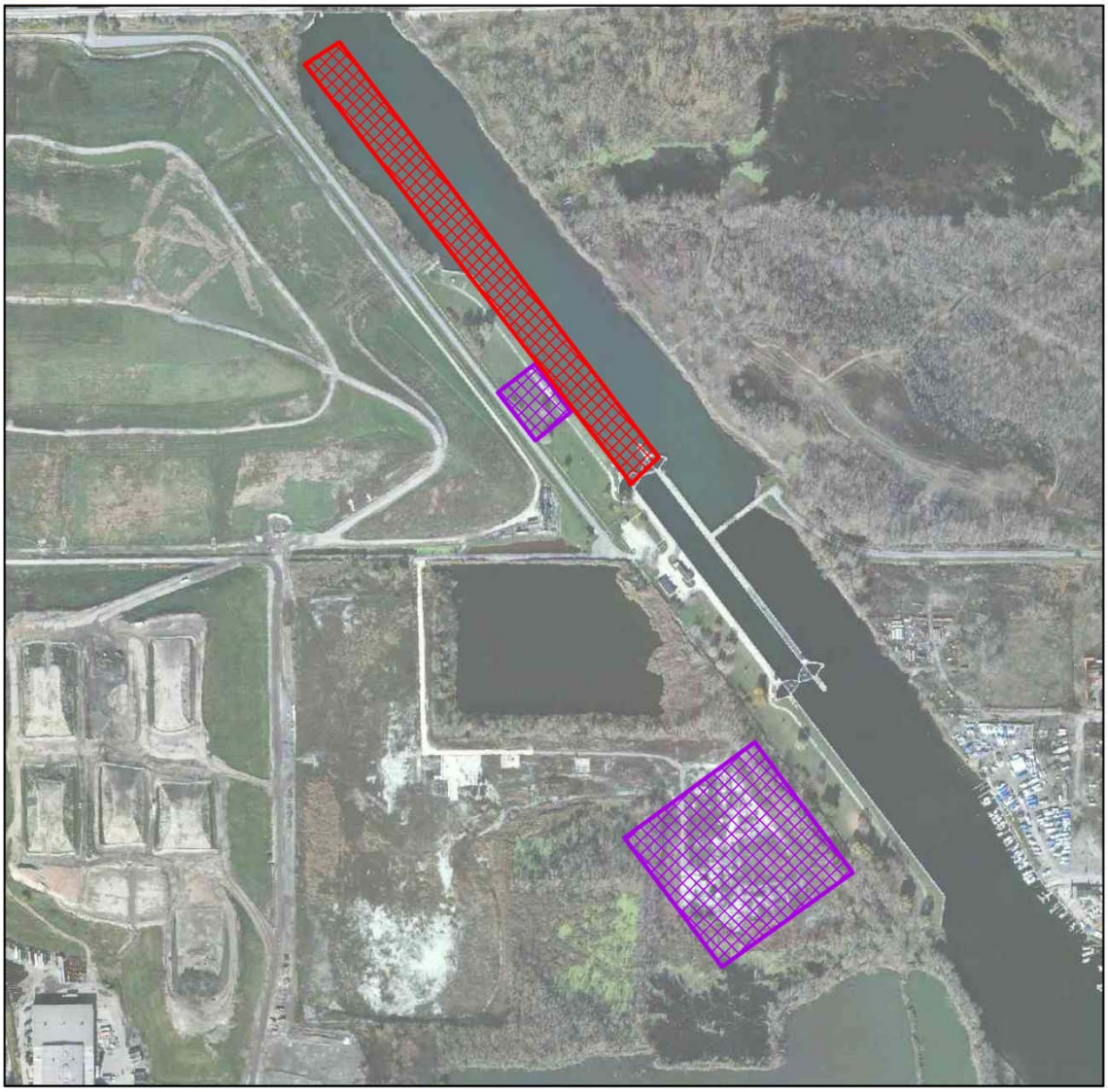
12 Acres within Hatched Area needed for New Lock, ANS Treatment Plant Etc - Navigational Servitude

October 2013

NOT TO SCALE

****Further evaluation is required to determine exact location of project and mitigation features.**

TJ O'Brien (IN) - CAWS Buffer Zone Alternative & Hybrid Cal-Sag Open Alternative



Legend

October 2013

Lock with Electric Barrier (10 Acres) will be within Hatched Area - Navigational Servitude

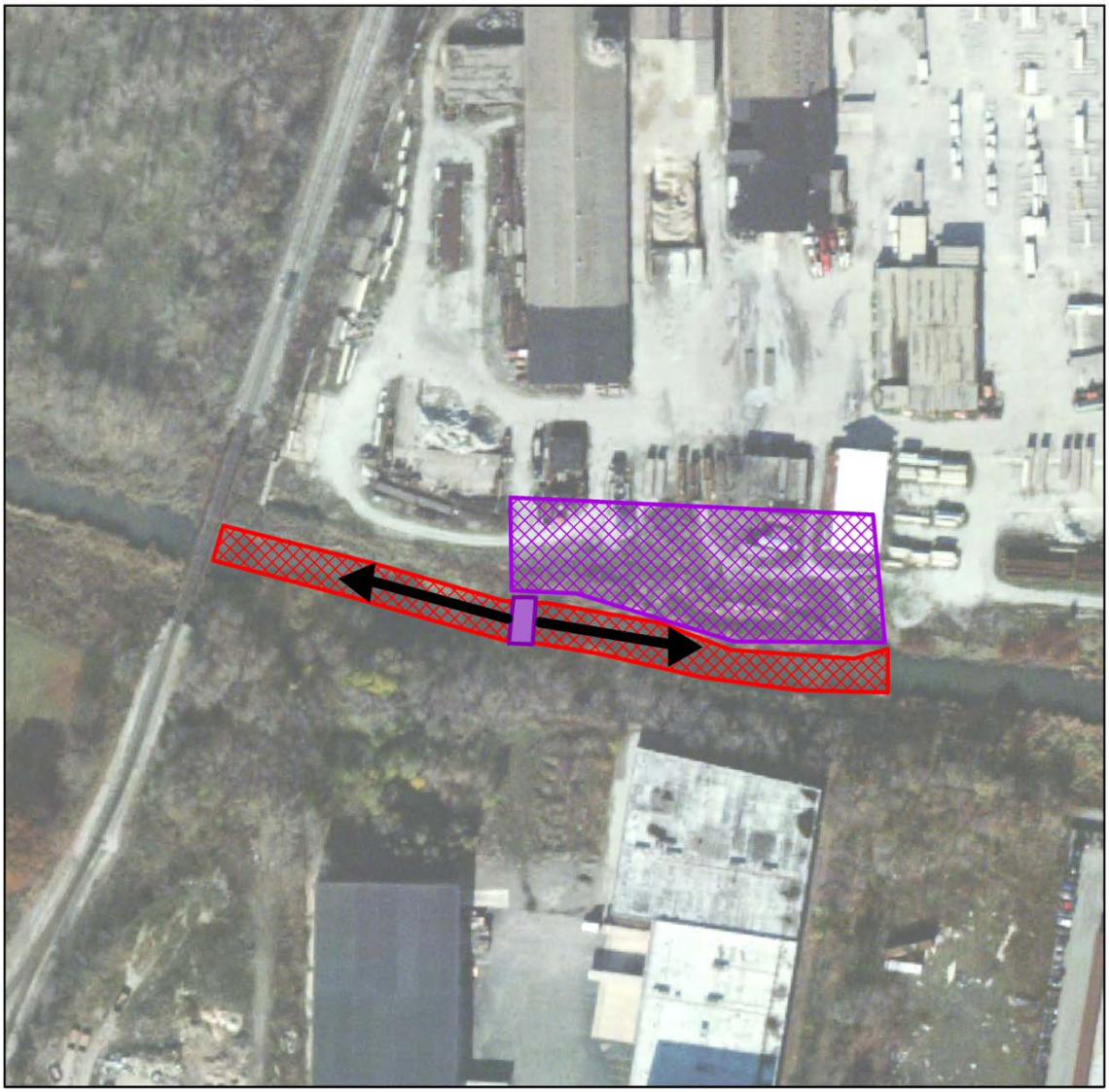
ANS Treatment Plant (7.5 Acres) will be within Hatched Area - Fee Simple

N

NOT TO SCALE

****Further evaluation is required to determine exact location of project and mitigation features.**

Stateline (IL/IN) - CAWS Buffer Zone Alternative & Hybrid Cal-Sag Open Alternative



Legend

June 2013

- Physical Barrier - Navigational Servitude - 0.03 Acres
- Physical Barrier will be within Hatched Area
- Barrier Easement (0.5 Acres) will be within Hate Area - Fee Simple

NOT TO SCALE

****Further evaluation is required to determine exact location of project and mitigation features.**

State Line (IL/IN) - CAWS Buffer Zone Alternative & Hybrid Cal-Sag Open Alternative

Legend

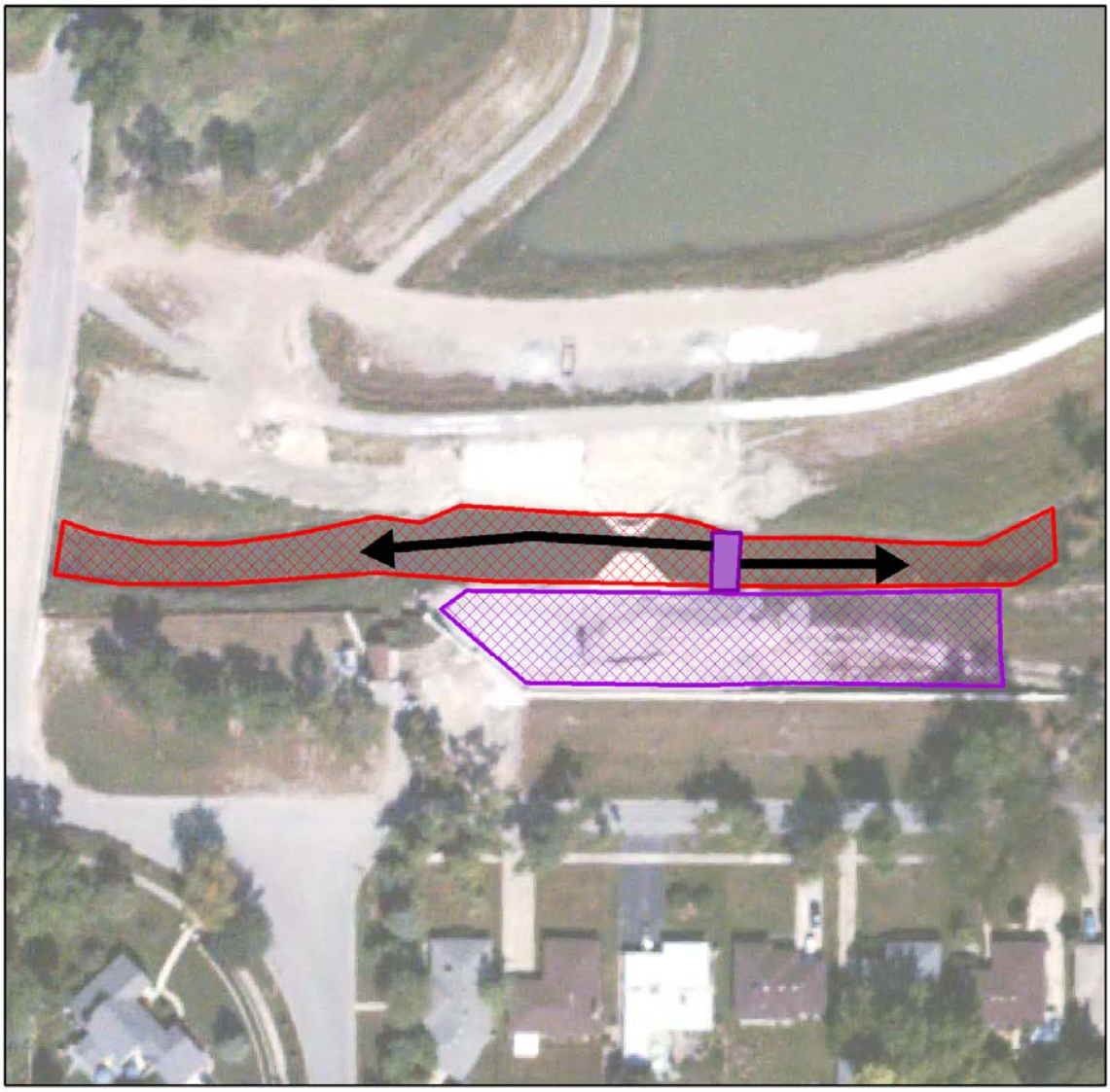
October 2013

Reservoir (130 Acres) will be within Hatched Area - Fee Simple

NOT TO SCALE

****Further evaluation is required to determine exact location of project and mitigation features.**

Hammond (IN) - CAWS Buffer Zone Alternative &
Lakefront Hydrologic Separation Alternative & Hybrid Cal-Sag Open Alternative



Legend

October 2013

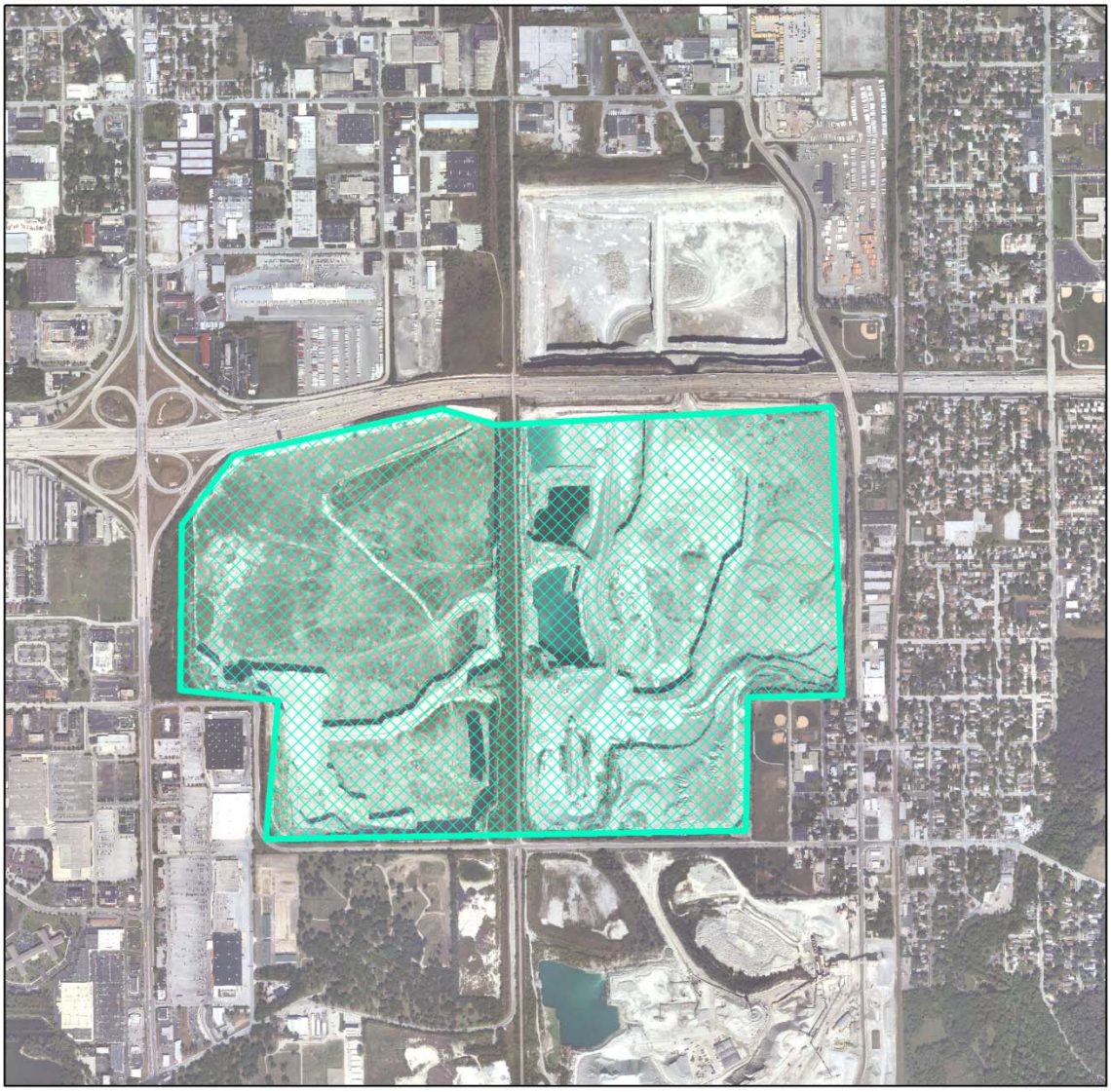
- Physical Barrier - Navigational Servitude - 0.05 Acres
- Physical Barrier will be within Hatched Area
- Barrier Easement (0.2 Acres) will be located within Hatched Area - Fee Simple

NOT TO SCALE

****Further evaluation is required to determine exact location of project and mitigation features.**

A Second Reservoir at Thornton - Hybrid Cal-Sag Open Alternative & CAWS Buffer Zone Alternative

GLMRIS



Legend

November 2013

A new reservoir (115 Acres) will be within Hatched Area - Fee Simple

NOT TO SCALE

****Further evaluation is required to determine exact location of project and mitigation features.**

Brandon Road (IL) - CAWS Buffer Zone Alternative &
Hybrid CSSC Open Alternative & Hybrid Cal-Sag Open Alternative

Legend

October 2013

Lock with Electric Barrier (10.5 Acres) will be within Hatched Area - Navigational Servitude

Electric Barrier Building (3 Acres) will be within Hatched Area - Fee Simple

N

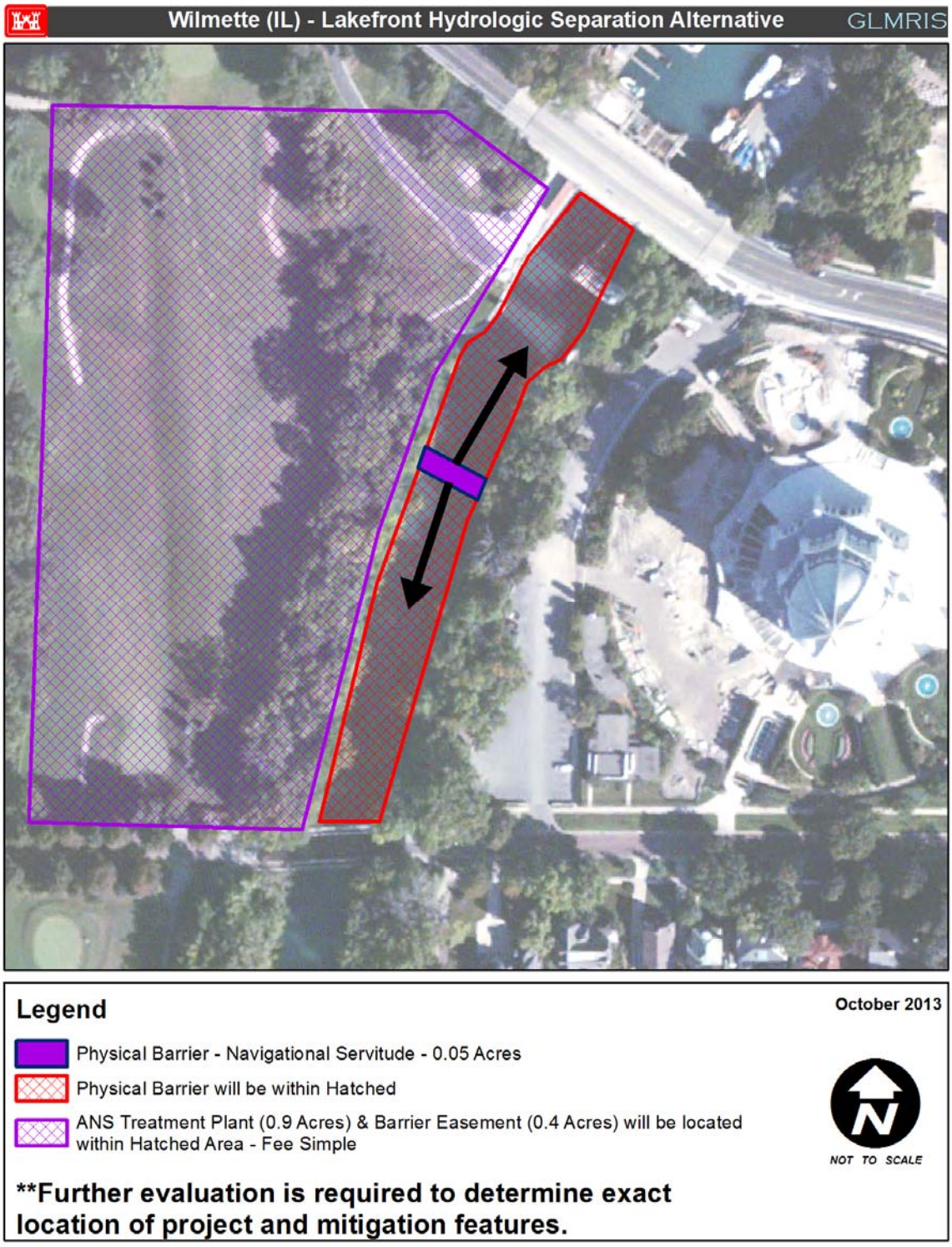
NOT TO SCALE

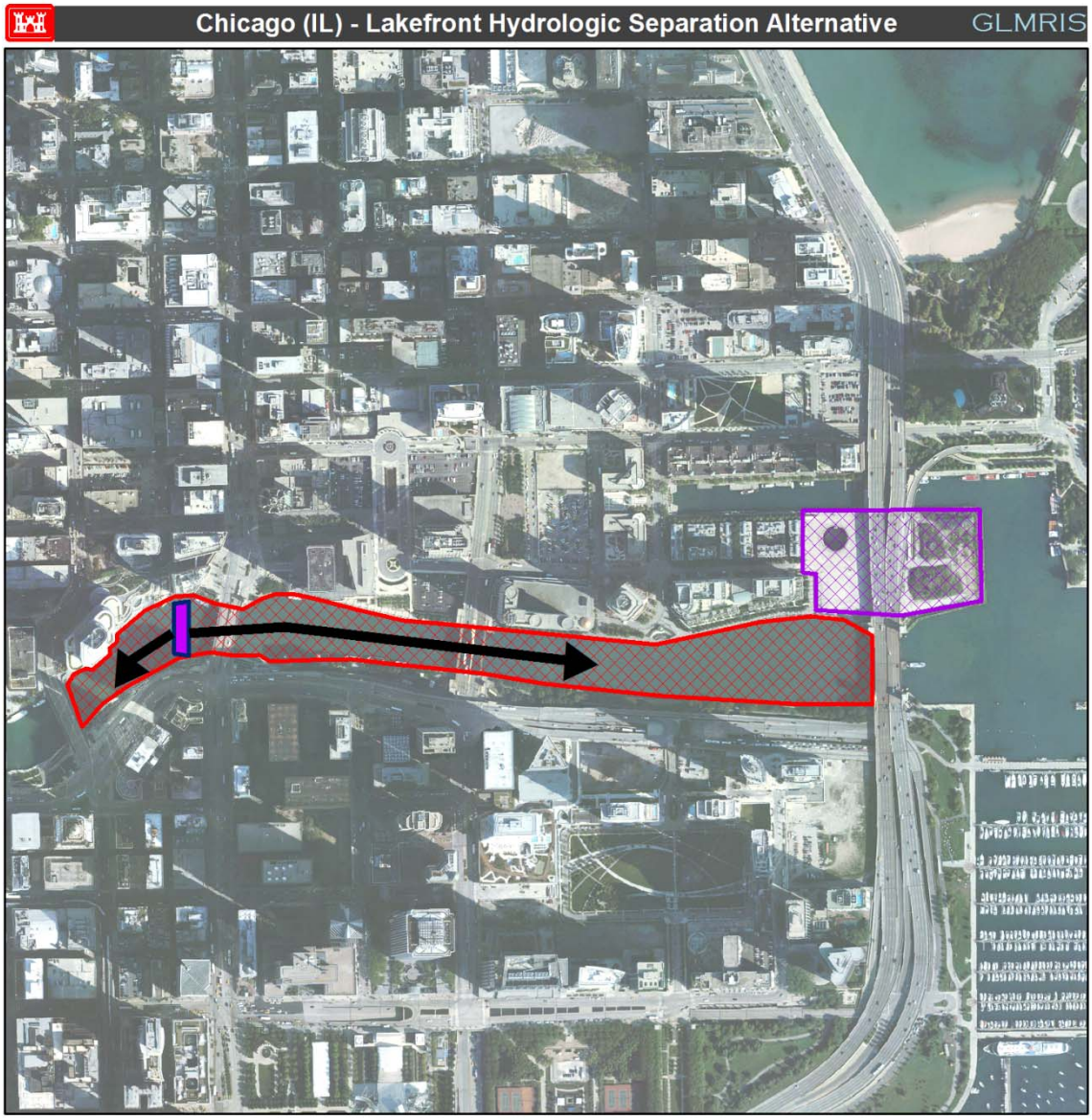
****Further evaluation is required to determine exact location of project and mitigation features.**

L.2.5 Lakefront Hydrologic Separation

This alternative has four physical barriers located at Wilmette, Chicago , and Calumet City in Illinois and at Hammond, Indiana.

Location	Feature	Perm. Estate Size (acres)	Permanent Estate Type	Temp. Easement Size (acres)
Wilmette (IL)	Physical Barrier	0.05	Navigational Servitude	NA
	Barrier land	0.4	Fee Simple	0.9
	ANS Treatment Plant	0.9	Fee Simple	
	Conveyance Tunnel	55.4	Utility Easement	NA
Chicago (IL)	Physical Barrier	0.1	Navigational Servitude	NA
	Barrier land	0.5	Fee Simple	0.5
	ANS Treatment Plant	3.2	Fee Simple	1.4
	Conveyance Tunnel	83.2	Utility Eaesment	NA
	Reservoir (McCook 2)	80	Fee Simple	10
	Small Boat Rec Harbor	30	Navigational Servitude	NA
	Rec Harbor Land area	5	Fee Simple	1
Calumet City (IL)	Physical Barrier	0.15	Navigational Servitude	NA
	Barrier land	2	Fee Simple	1.5
	ANS Treatment Plant	3.3	Fee Simple	1
	Conveyance Tunnel	28.6	Utility Easement	NA
Hammond (IN)	Physical Barrier	0.05	Navigational Servitude	NA
	Barrier land	0.2	Fee Simple	1
	Conveyance Tunnel	22.8	Utility Easement	NA
	Reservoir (Thornton 3)	160	Fee Simple	10


Wilmette (IL) - Lakefront Hydrologic Separation Alternative
GLMRIS
Legend
October 2013
Physical Barrier - Navigational Servitude - 0.05 Acres
Physical Barrier will be within Hatched
ANS Treatment Plant (0.9 Acres) & Barrier Easement (0.4 Acres) will be located within Hatched Area - Fee Simple
N
NOT TO SCALE
**Further evaluation is required to determine exact location of project and mitigation features.


Chicago (IL) - Lakefront Hydrologic Separation Alternative
GLMRIS
Legend
October 2013
Physical Barrier - Navigational Servitude - 0.1 Acres
Physical Barrier will be within Hatched
ANS Treatment Plant (3.2 Acres) & Barrier Easement (0.5 Acres) will be located within Hatched Area - Fee Simple
**Further evaluation is required to determine exact location of project and mitigation features.
NOT TO SCALE

A Second Reservoir at McCook - Lakefront Hydrologic Separation Alternative

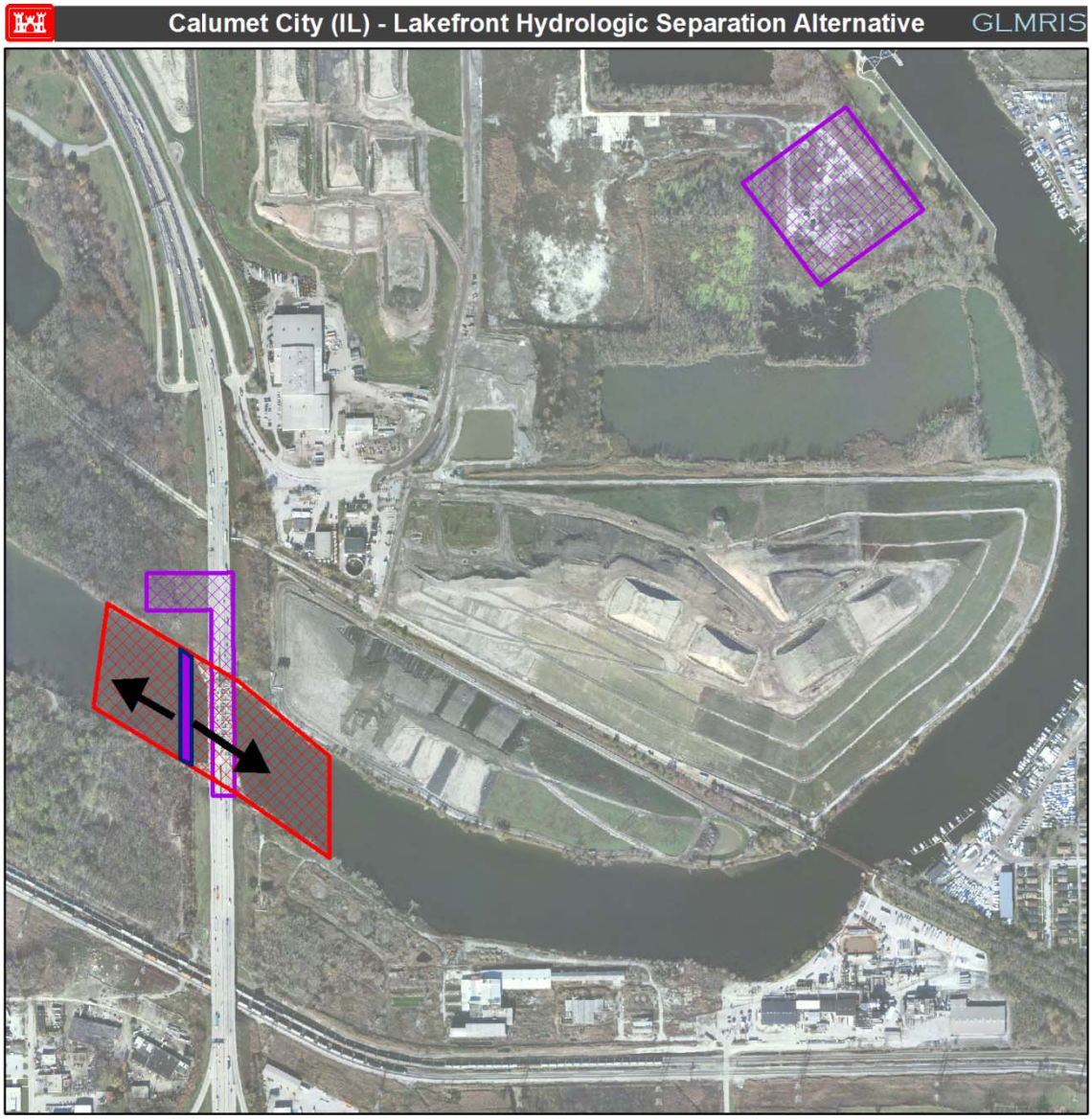
November 2013

Legend

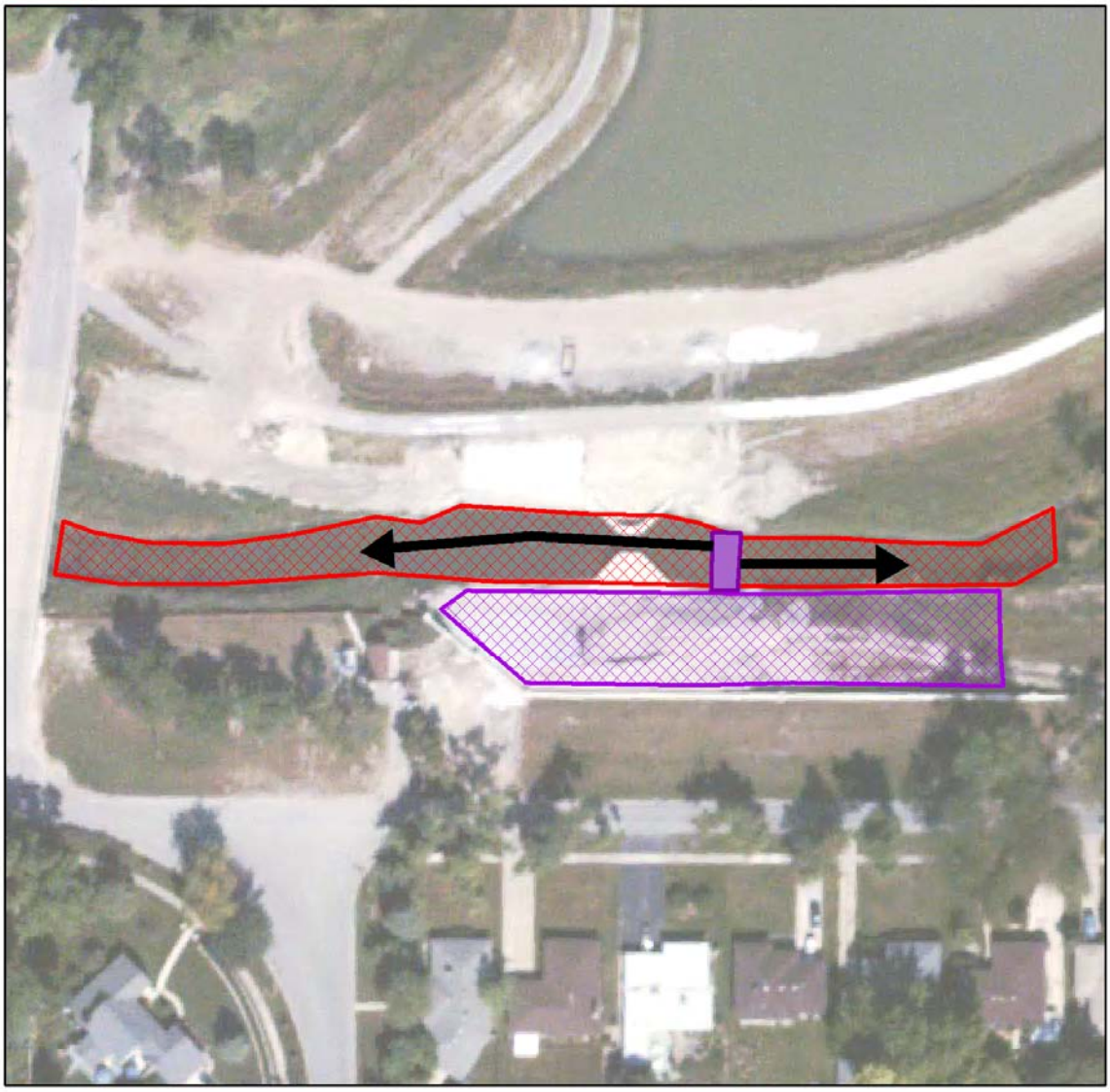
A new reservoir (80 Acres) will be within Hatched Area - Fee

NOT TO SCALE

****Further evaluation is required to determine exact location of project and mitigation features.**


Calumet City (IL) - Lakefront Hydrologic Separation Alternative
GLMRIS
Legend
October 2013
Physical Barrier - Navigational Servitude - 0.15 Acres
Physical Barrier will be within Hatched
ANS Treatment Plant (3.3 Acres) & Barrier Easement (2 Acres) will be located within Hatched Area - Fee Simple
N
NOT TO SCALE
**Further evaluation is required to determine exact location of project and mitigation features.

Hammond (IN) - CAWS Buffer Zone Alternative &
Lakefront Hydrologic Separation Alternative & Hybrid Cal-Sag Open Alternative



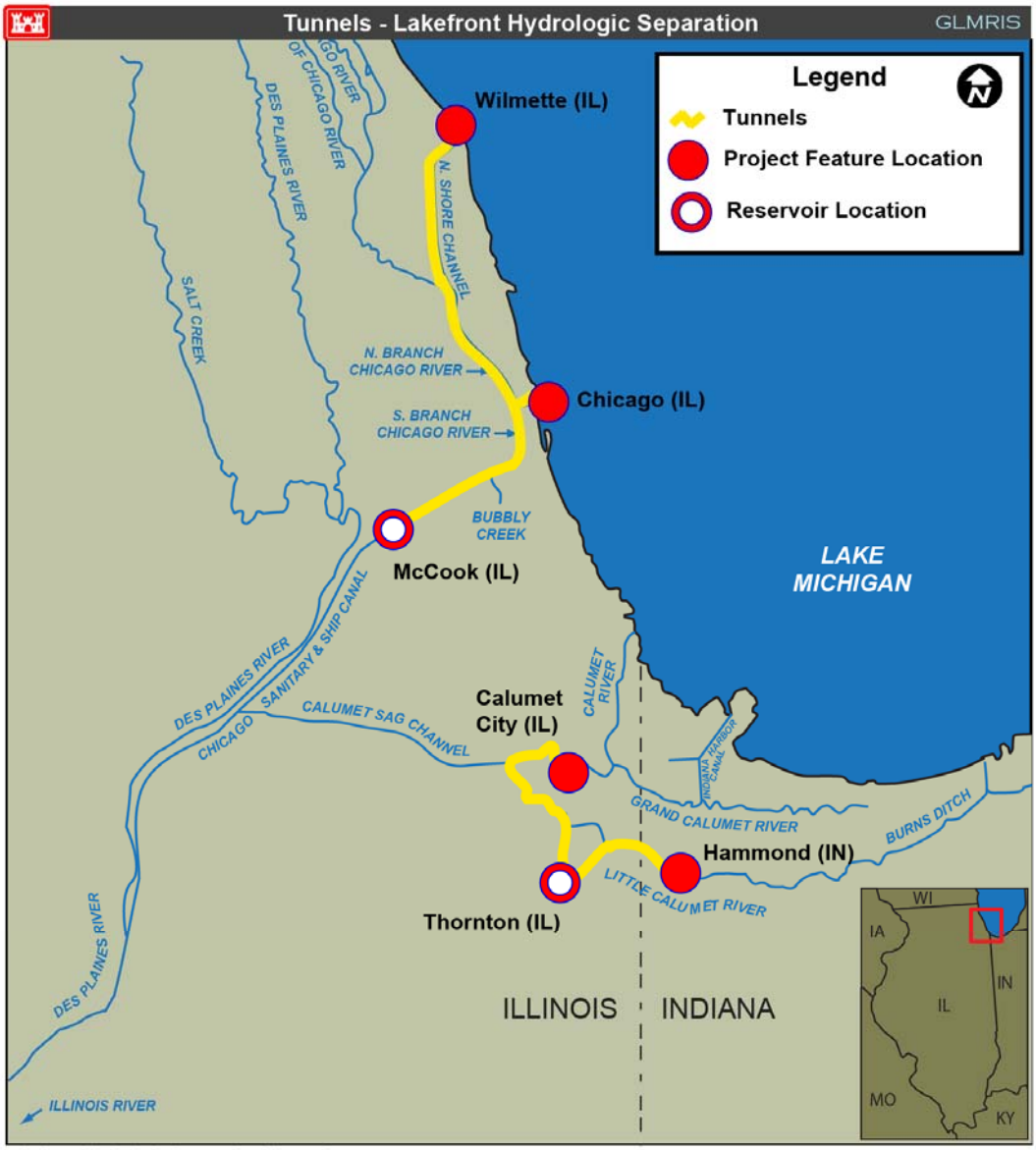
Legend

October 2013

- Physical Barrier - Navigational Servitude - 0.05 Acres
- Physical Barrier will be within Hatched Area
- Barrier Easement (0.2 Acres) will be located within Hatched Area - Fee Simple

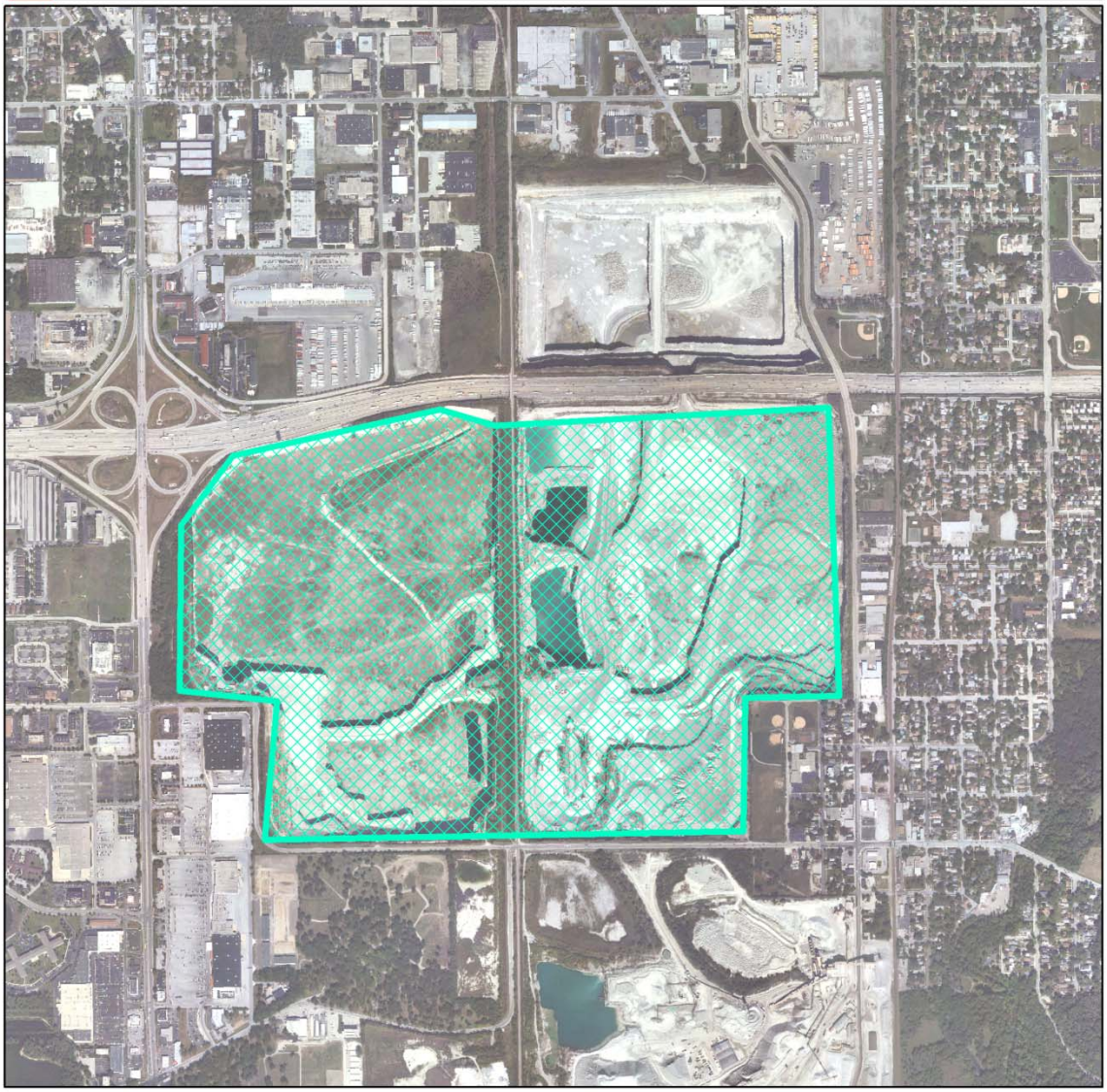
NOT TO SCALE

****Further evaluation is required to determine exact location of project and mitigation features.**



Lakefront Hydrologic Separation Alternative:
13.1 Mile utility easement of 32 feet along the Chicago North Branch River from Wilmette to Chicago.
Associated access easement every 3000 ft at shaft outlets, for a total of 4.6 acres.
12.5 Mile utility easement of 52 feet along the CSSC from Chicago to McCook 2 Reservoir.
Associated access easement every 3000 ft at shaft outlets, for a total of 4.4 acres.
5.5 Mile utility easement of 40 feet along the Cal-Sag/Little Calumet River from Calumet City to Thornton 3 Reservoir.
Associated access easement every 3000 ft at shaft outlets, for a total of 1.9 acres.
7.2 Mile utility easement of 24 feet along the Little Calumet River from Hammond to Thornton 3 Reservoir.
Associated access easement every 3000 ft at shaft outlets, for a total of 2.5 acres.
* It is assumed that all easements will be within the public right of way.
Map is not to scale.

A Second Reservoir at Thornton - Lakefront Hydrologic Separation Alternative



November 2013

Legend

A new reservoir (160 Acres) will be within Hatched Area - Fee

NOT TO SCALE

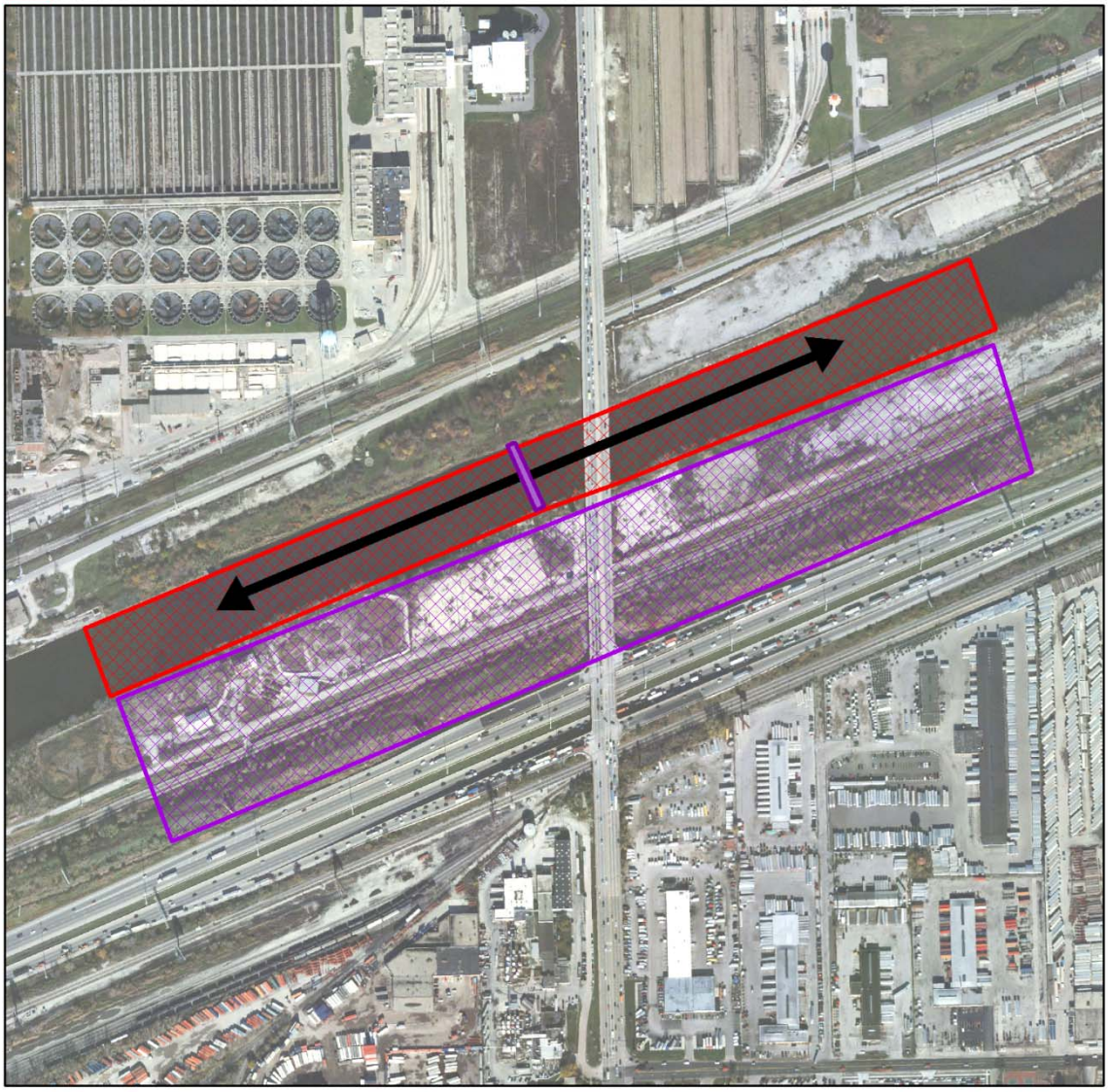
****Further evaluation is required to determine exact location of project and mitigation features.**

L.2.6 Mid-System Hydrologic Separation

This alternative has two physical barriers located at Stickney and Alsip in Illinois.

Location	Feature	Perm. Estate Size (acres)	Permanent Estate Type	Temp. Easement Size (acres)
Stickney (IL)	Physical Barrier	0.1	Navigational Servitude	NA
	Barrier	2	Fee Simple	1.4
	ANS Treatment Plant	10	Fee Simple	
Alsip (IL)	Physical Barrier	0.2	Navigational Servitude	NA
	Barrier land	1.6	Fee Simple	0.5
	ANS Treatment Plant	5.3	Fee Simple	1
	Reservoir (Oak Lawn)	90	Fee Simple	12
Water Quality features	Conveyance Tunnel (Lawrence To McCook)	68.0	Utility Easement	NA
	WRP Conveyance Tunnel (Wilmette to Stickney)	39.2	Utility Easement	NA
	Conveyance Tunnel (Hammond to WQ Thornton)	28.6	Utility Easement	NA
	Conveyance Tunnel (Calumet to WQ Thornton)	27.6	Utility Easement	NA
	WRP Conveyance Tunnel (Calumet to Alsip)	16.6	Utility Easement	NA
	Reservoir (WQ McCook)	110	Fee Simple	10
	Reservoir (WQ Thornton)	90	Fee Simple	10

Stickney (IL) - Mid-System Hydrologic Separation Alternative & Hybrid Cal-Sag Open Alternative



Legend

October 2013

Physical Barrier - Navigational Servitude - 0.1

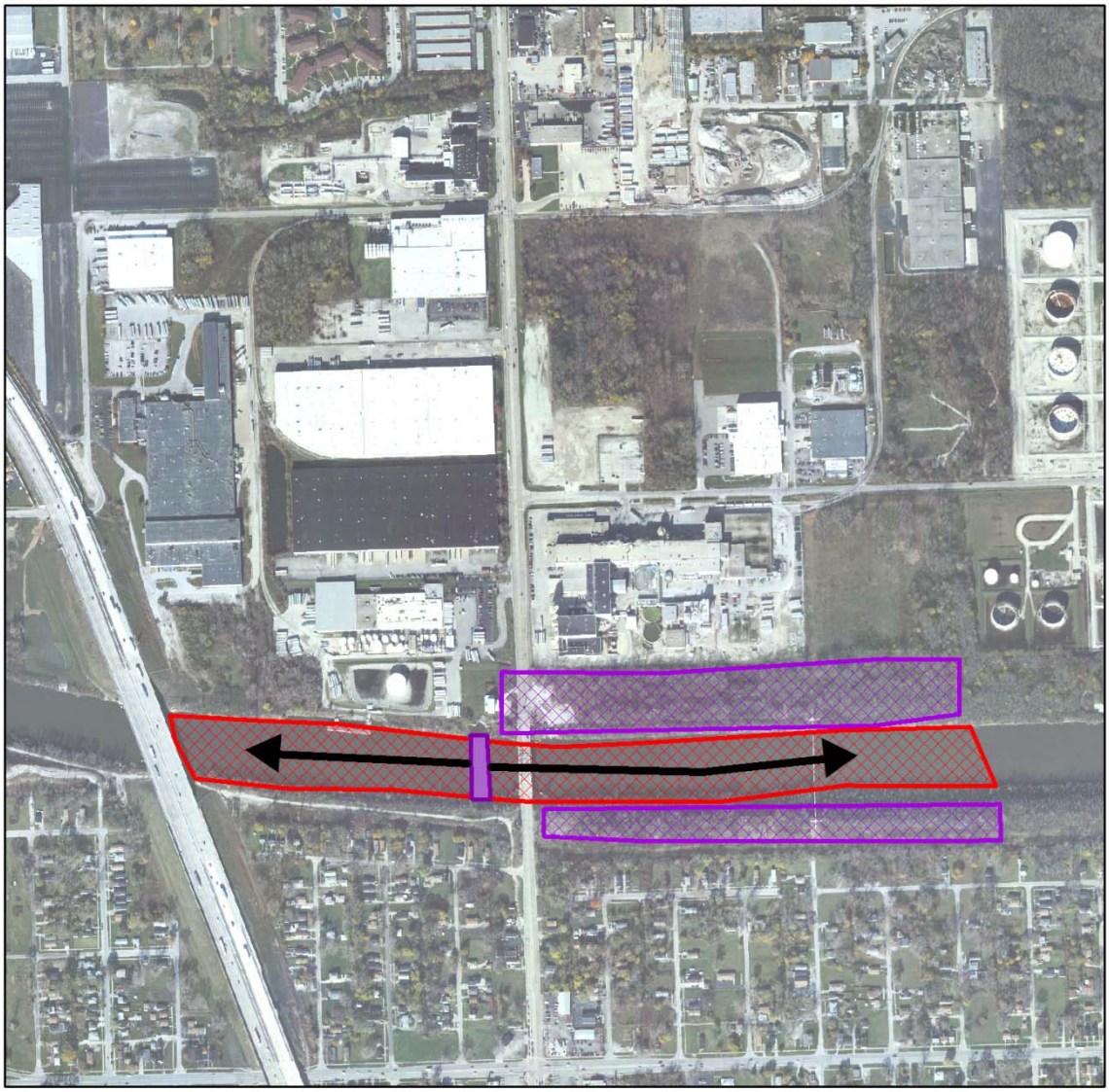
Physical Barrier will be within Hatched

ANS Treatment Plant (10.0 Acres) & Barrier Easement (2 Acres) will be within Hatched Area - Fee Simple

NOT TO SCALE

****Further evaluation is required to determine exact location of project and mitigation features.**

Alsip (IL) - Mid-System Hydrologic Separation Alternative & Hybrid CSSC Open Alternative



Legend

October 2013

- Physical Barrier - Navigational Servitude - 0.1
- Physical Barrier will be within Hatched
- ANS Treatment Plant (5.4 Acres) & Barrier Easement (1.6 Acres) will be within Hatched Area - Fee Simple

NOT TO SCALE

****Further evaluation is required to determine exact location of project and mitigation features.**

Oak Lawn Reservoir - Mid-System Hydrologic Separation Alternative & Flow Bypass Alternative & Hybrid CSSC Open Alternative

Legend

October 2013

Reservoir (90 Acres) will be within Hatched Area - Fee Simple

NOT TO SCALE

****Further evaluation is required to determine exact location of project and mitigation features.**

Mid-System Hydrologic Separation Altnerative

12.5 mile utility easement of 42 feet along the North Branch of the Chicago River and the CSSC from Lawrence Ave to WQ McCook Reservoir.
Associated access easement every 3000 ft at shaft outlets, for a total of 4.4 acres.

12.5 mile utility easement of 23 feet along the North Branch of the Chicago River and the CSSC from Wilmette to Stickney.
Associated access easement every 3000 ft at shaft outlets, for a total of 4.4 acres.

5.5 mile utility easement of 40 feet along the Little Calumet River from Hammond to WQ Thornton Reservoir.
Associated access easement every 3000 ft at shaft outlets, for a total of 1.9 acres.

5.3 mile utility easement of 23 feet along the Cal-Sag Channel from Calumet to Alsip.
Associated access easement every 3000 ft at shaft outlets, for a total of 1.9 acres.

5.8 mile utility easement of 40 feet from Calumet to WQ Thornton Reservoir.
Associated access easement every 3000 ft at shaft outlest for a total of 2.0 acres.

Map is not to scale.

A Second Reservoir at McCook - Mid-System Separation Alternative
& Hybrid Cal-Sag Open Alternative

November 2013

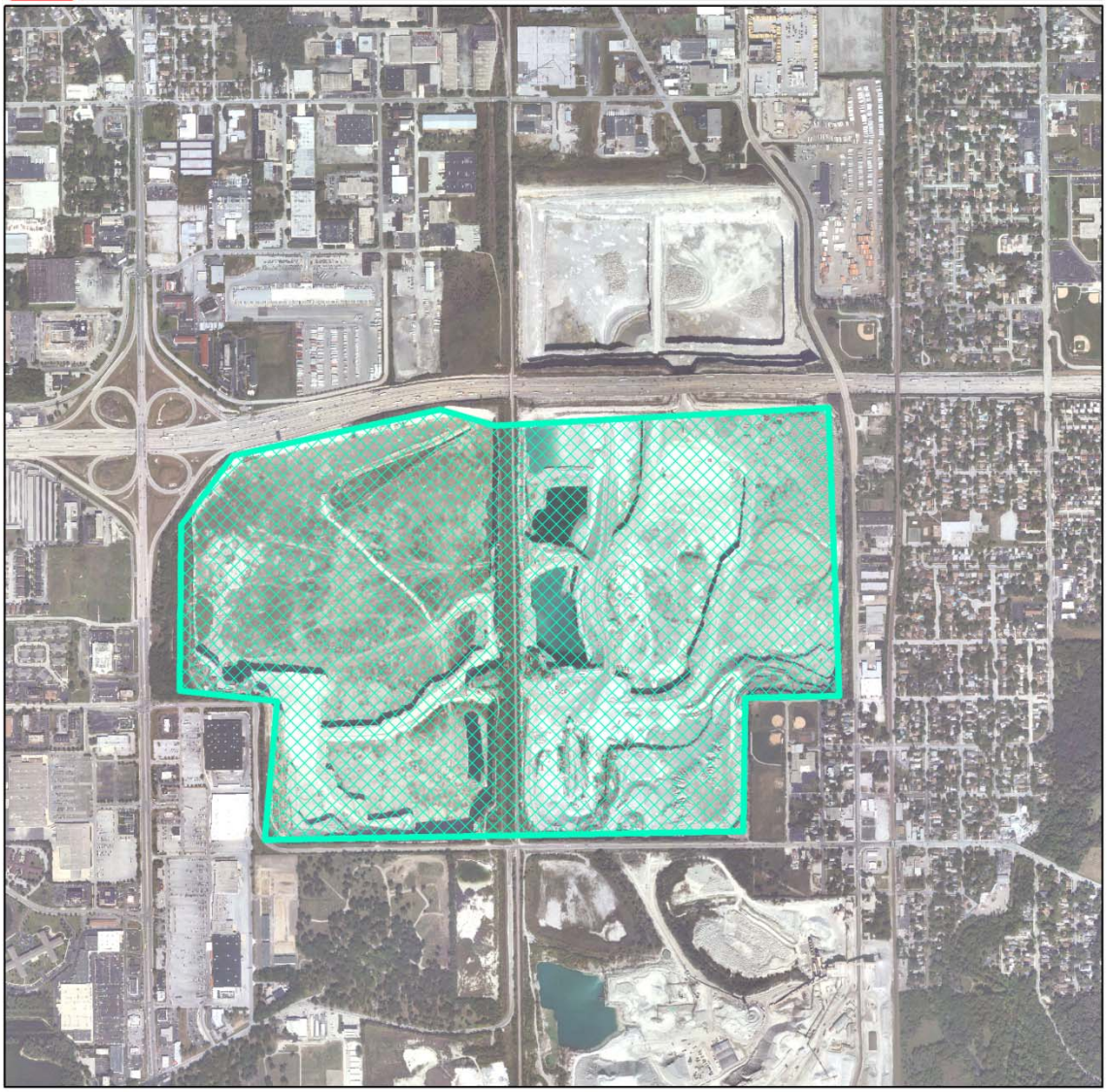
Legend

A new reservoir (115 Acres) will be within Hatched Area - Fee

NOT TO SCALE

****Further evaluation is required to determine exact location of project and mitigation features.**

A Second Reservoir at Thornton - Hybrid CSSC Open Alternative &
Mid-System Hydrologic Separation Alternative



November 2013

Legend

A new reservoir (90 Acres) to be within Hatched Area - Fee

NOT TO SCALE

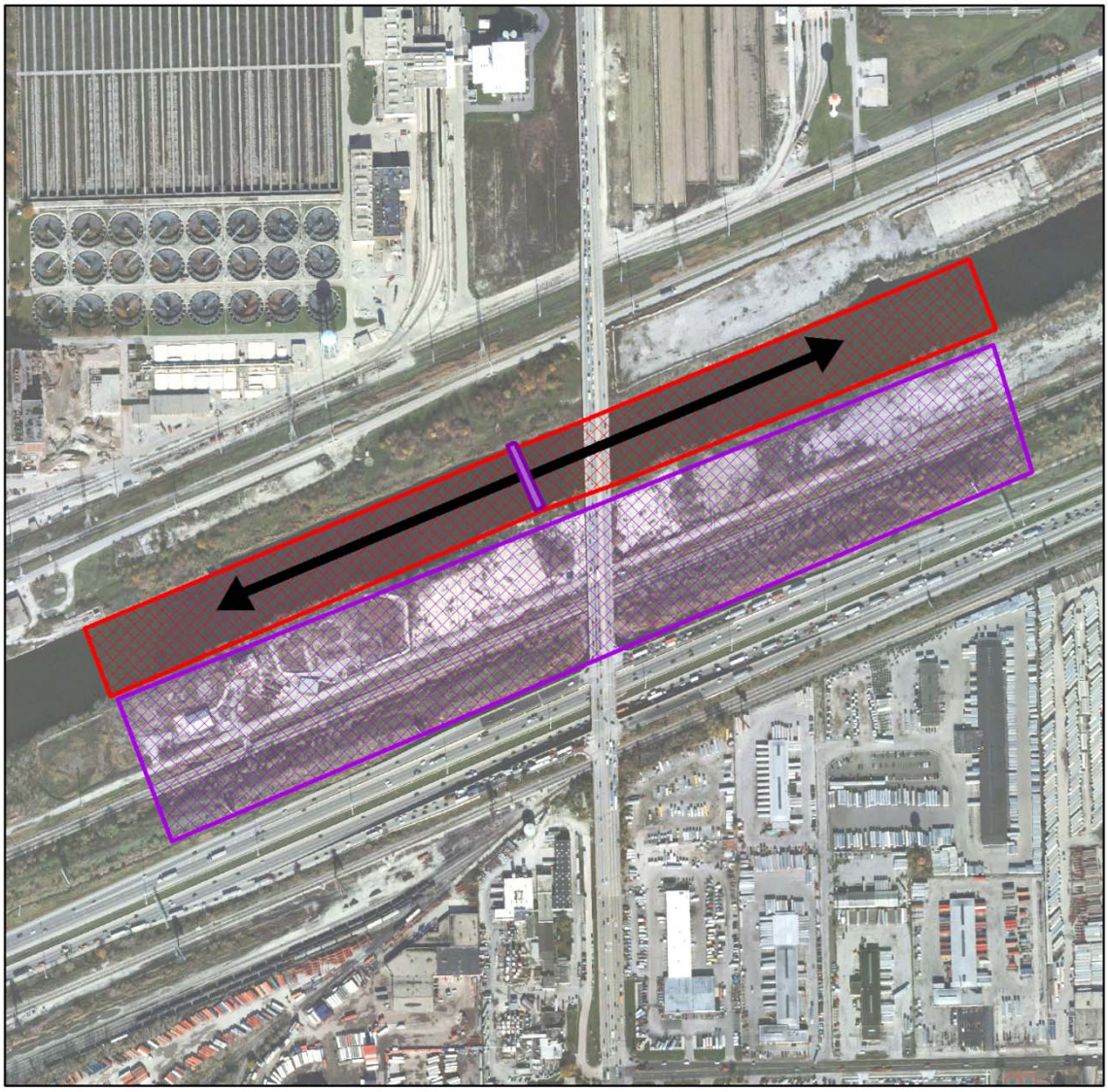
****Further evaluation is required to determine exact location of project and mitigation features.**

L.2.7 Mid-System Separation Cal-Sag Open Control Technologies with a Buffer Zone – Hybrid Cal-Sag Open Alternative

This alternative has three physical barriers: at Stickney, Illinois, the Illinois-Indiana state line, and Hammond, Indiana, disconnecting four of the five aquatic pathways between the CAWS and Lake Michigan. Along the remaining aquatic pathway an ANS-free buffer zone is created by installing ANS control measures at the T.J. O'Brien Lock and Dam and the Brandon Road Lock and Dam.

Location	Feature	Perm. Estate Size (acres)	Permanent Estate Type	Temp. Easement Size (acres)
Stickney (IL)	Physical barrier	0.1	Navigational Servitude	NA
	Barrier land	2	Fee Simple	1.4
	ANS Treatment Plant	10	Fee Simple	
TJ O'Brien (IN)	Lock with electric barrier	10	Navigational Servitude	3.4
	ANS treatment plant for lock structure	7.5	Fee Simple	1.75
	ANS treatment plant for diversion		Fee Simple	
State Line (IL/IN)	Physical barrier	0.03	Navigational Servitude	NA
	Barrier land	0.5	Fee Simple	1.2
	Reservoir (State Line)	130	Fee Simple	10
Hammond (IN)	Physical Barrier	0.05	Navigational Servitude	NA
	Barrier land	0.2	Fee Simple	1
	Conveyance Tunnel	23.5	Utility Easement	NA
	Reservoir (Thornton 2)	115	Fee Simple	10
Brandon Road (IL)	New lock structure w/ electric barrier	10.5	Navigational Servitude	NA
	Barrier building	3	Fee Simple	3.6
Water Quality features	Conveyance Tunnel (Lawrence to McCook)	68.0	Utility Easement	NA
	Reservoir (WQ McCook)	110	Fee Simple	10
	Conveyance Tunnel (Wilmette to Stickney)	39.2	Utility Easement	NA

Stickney (IL) - Mid-System Hydrologic Separation Alternative & Hybrid Cal-Sag Open Alternative



Legend

October 2013

Physical Barrier - Navigational Servitude - 0.1

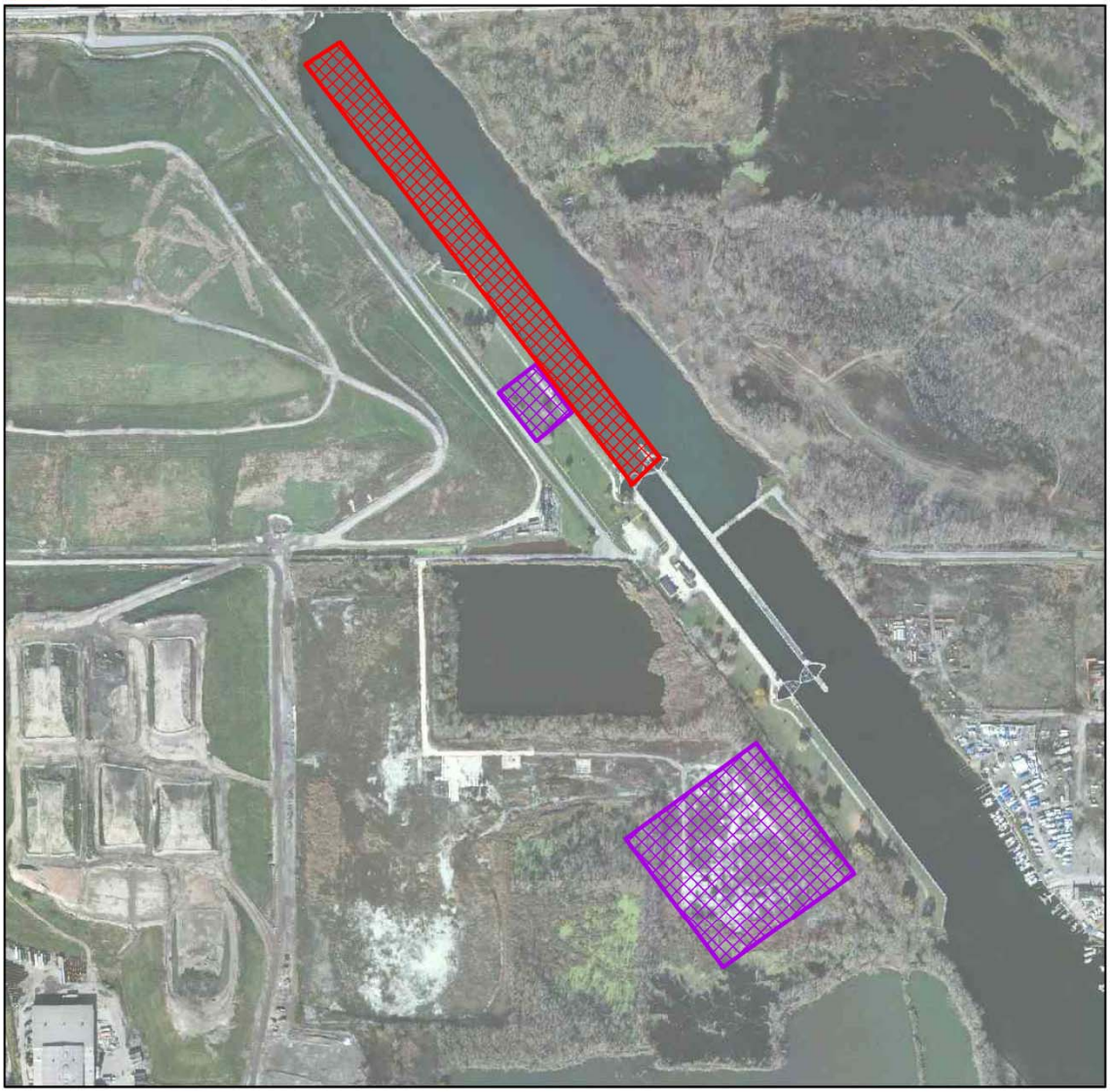
Physical Barrier will be within Hatched

ANS Treatment Plant (10.0 Acres) & Barrier Easement (2 Acres) will be within Hatched Area - Fee Simple

NOT TO SCALE

****Further evaluation is required to determine exact location of project and mitigation features.**

TJ O'Brien (IN) - CAWS Buffer Zone Alternative & Hybrid Cal-Sag Open Alternative



Legend

October 2013

Lock with Electric Barrier (10 Acres) will be within Hatched Area - Navigational Servitude

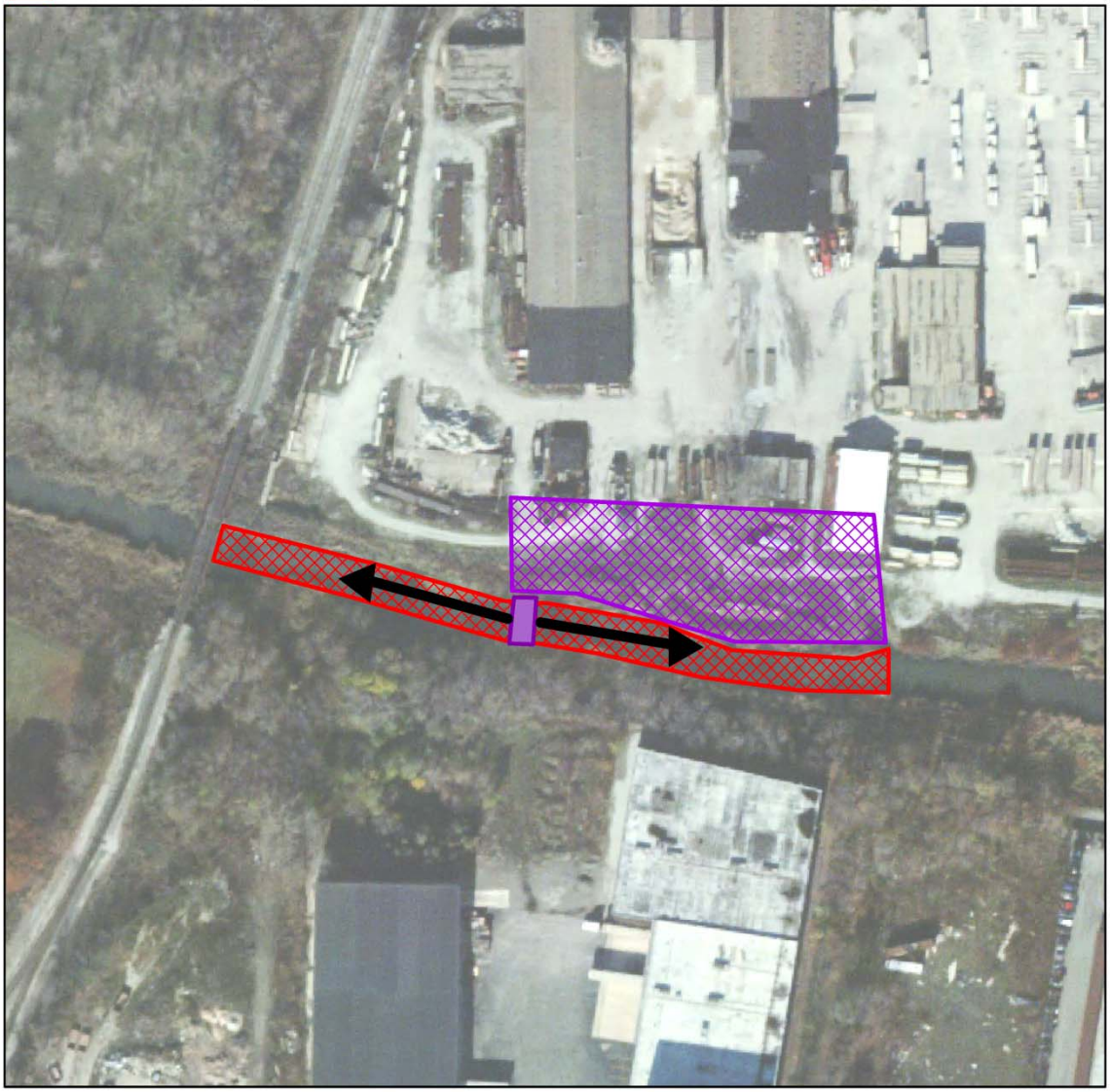
ANS Treatment Plant (7.5 Acres) will be within Hatched Area - Fee Simple

N

NOT TO SCALE

****Further evaluation is required to determine exact location of project and mitigation features.**

Stateline (IL/IN) - CAWS Buffer Zone Alternative & Hybrid Cal-Sag Open Alternative



Legend

June 2013

- Physical Barrier - Navigational Servitude - 0.03 Acres
- Physical Barrier will be within Hatched Area
- Barrier Easement (0.5 Acres) will be within Hate Area - Fee Simple

NOT TO SCALE

****Further evaluation is required to determine exact location of project and mitigation features.**

State Line (IL/IN) - CAWS Buffer Zone Alternative & Hybrid Cal-Sag Open Alternative

Legend

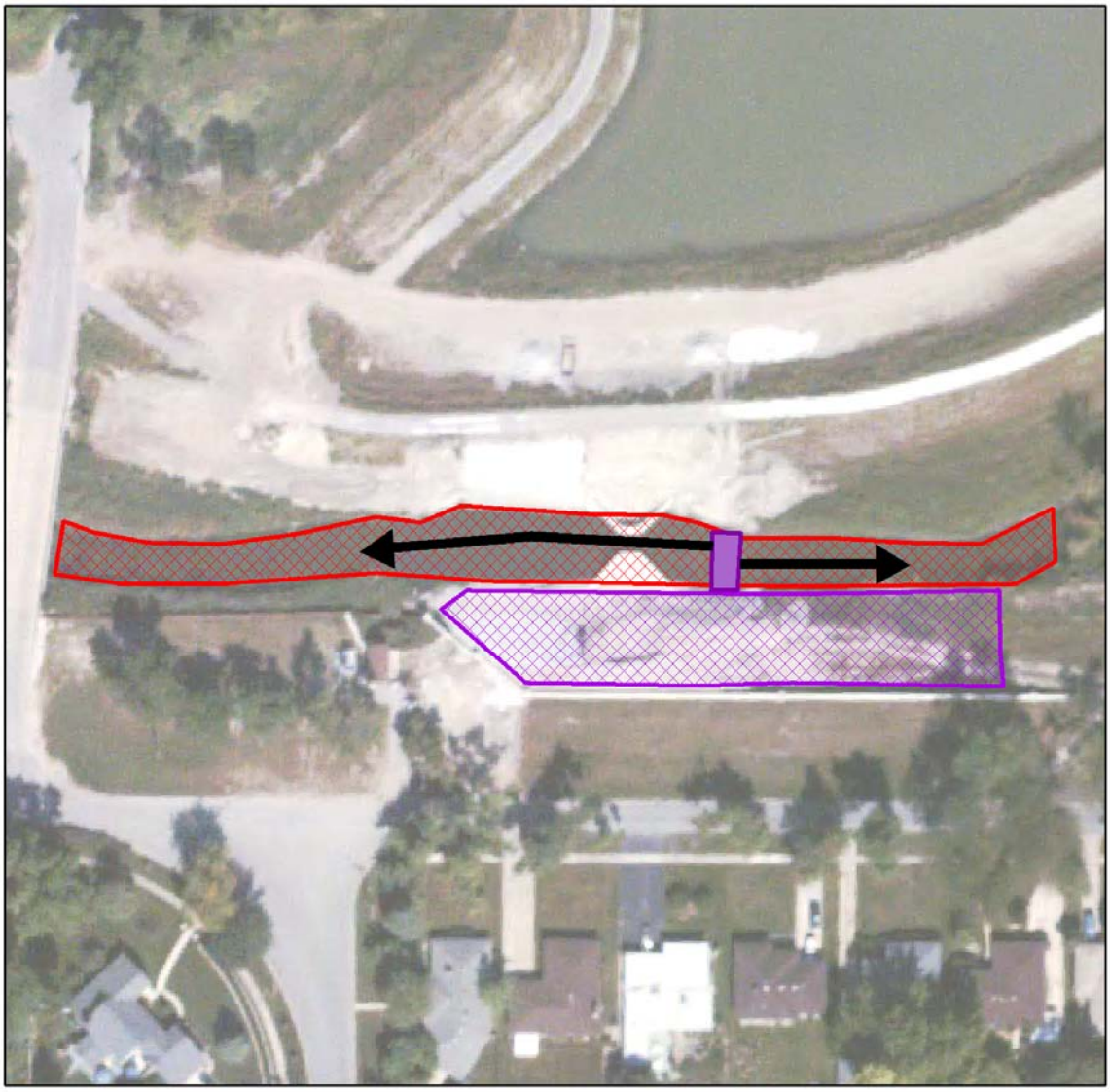
October 2013

Reservoir (130 Acres) will be within Hatched Area - Fee Simple

NOT TO SCALE

****Further evaluation is required to determine exact location of project and mitigation features.**

Hammond (IN) - CAWS Buffer Zone Alternative &
Lakefront Hydrologic Separation Alternative & Hybrid Cal-Sag Open Alternative



Legend

October 2013

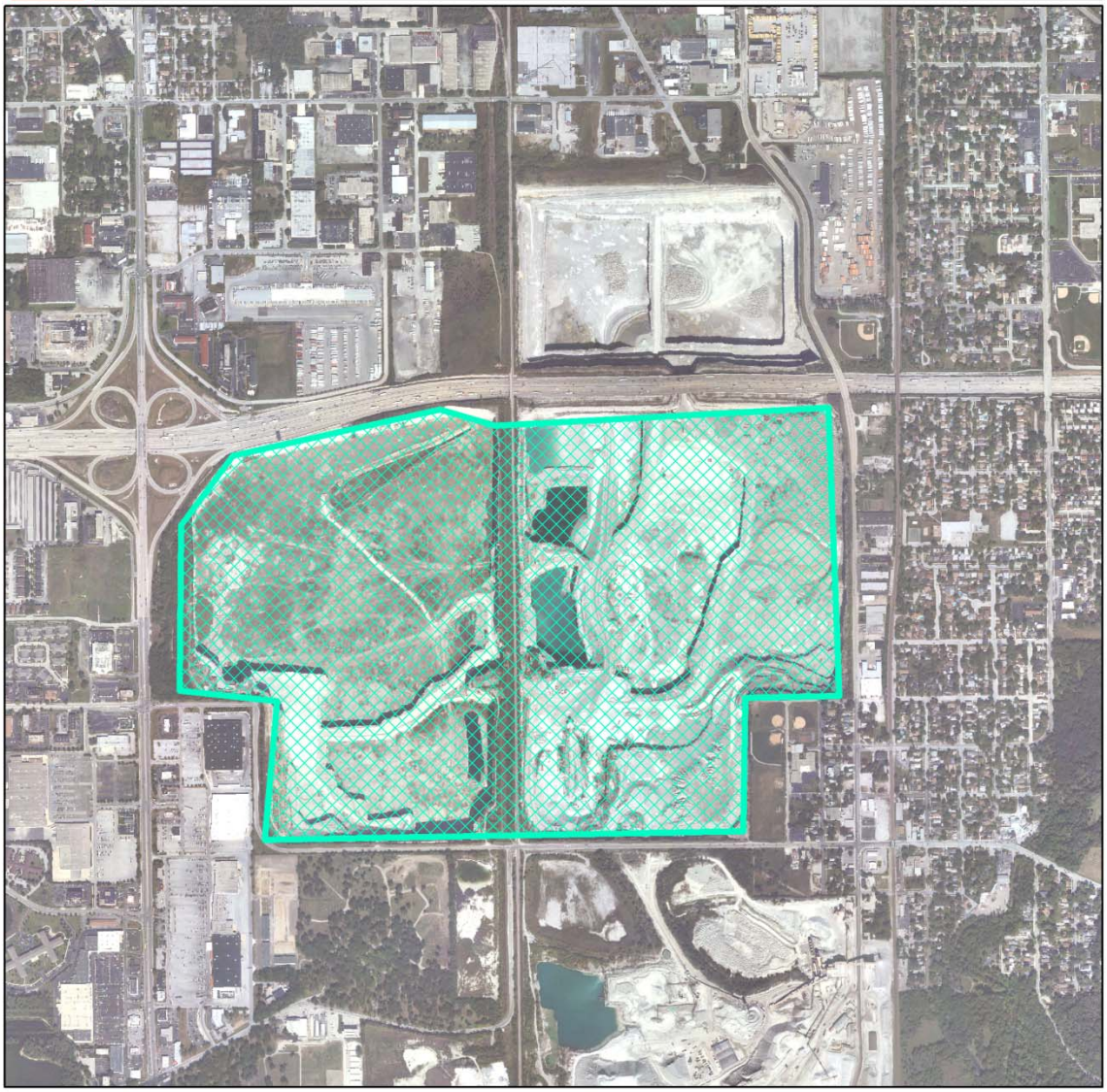
- Physical Barrier - Navigational Servitude - 0.05 Acres
- Physical Barrier will be within Hatched Area
- Barrier Easement (0.2 Acres) will be located within Hatched Area - Fee Simple

NOT TO SCALE

****Further evaluation is required to determine exact location of project and mitigation features.**

A Second Reservoir at Thornton - Hybrid Cal-Sag Open Alternative & CAWS Buffer Zone Alternative

GLMRIS



Legend

November 2013

A new reservoir (115 Acres) will be within Hatched Area - Fee Simple

NOT TO SCALE

****Further evaluation is required to determine exact location of project and mitigation features.**

Brandon Road (IL) - CAWS Buffer Zone Alternative & Hybrid CSSC Open Alternative & Hybrid Cal-Sag Open Alternative

Legend

October 2013

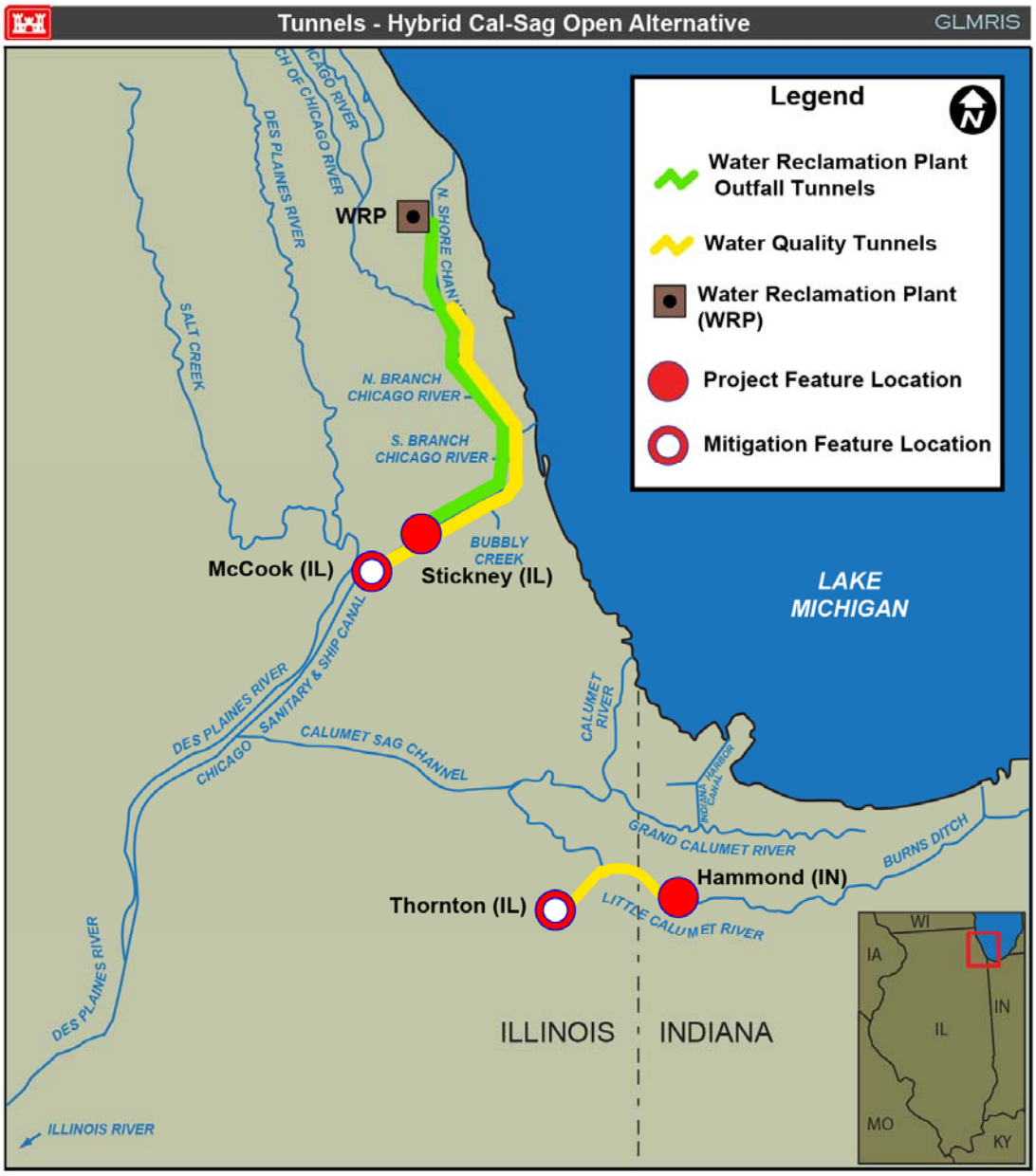
Lock with Electric Barrier (10.5 Acres) will be within Hatched Area - Navigational Servitude

Electric Barrier Building (3 Acres) will be within Hatched Area - Fee Simple

N

NOT TO SCALE

****Further evaluation is required to determine exact location of project and mitigation features.**



Hybrid Cal-Sag Open Alternative
12.5 mile utility easement of 23 feet along the North Branch of the Chicago River and the CSSC from Wilmette to Stickney.
Associated access easement every 3000 ft at shaft outlets, for a total of 4.4 acres.
12.5 mile utility easement of 42 feet along the North Branch of the Chicago River and the CSSC from Lawrence to WQ McCook Reservoir.
Associated access easement every 3000 ft at shaft outlets, for a total of 4.4 acres.
7.2 Mile utility easement of 24 feet along the Little Calumet River from Hammond to Thornton 2 Reservoir.
Associated access easement every 3000 ft at shaft outlets, for a total of 2.5 acres.
* It is assumed that all easements will be within the public right of way

Map is not to scale.

A Second Reservoir at McCook - Mid-System Separation Alternative
& Hybrid Cal-Sag Open Alternative

November 2013

Legend

A new reservoir (115 Acres) will be within Hatched Area - Fee

NOT TO SCALE

****Further evaluation is required to determine exact location of project and mitigation features.**

L.2.8 Mid-System Separation CSSC Open Control Technologies with a Buffer Zone – Hybrid CSSC Open Alternative

This alternative has a physical barrier located at Alsip, Illinois, disconnecting three of the five aquatic pathways between the CAWS and Lake Michigan. Along the two remaining aquatic pathways an ANS-free buffer zone is created by installing ANS control measures at Wilmette, Chicago, and the Brandon Road Lock and Dam, all in Illinois.

Location	Feature	Perm. Estate Size (acres)	Permanent Estate Type	Temp. Easement Size (acres)
Wilmette (IL)	Rehab existing control structure	0.2	Fee Simple	0.8
	ANS Treatment Plant	1.3	Fee Simple	
Chicago (IL)	New lock structure w/ electric barrier	13.2	Navigational Servitude	NA
	Treatment plant for barrier	12	Fee Simple	NA
	ANS Treatment Plant for diversion		Fee Simple	NA
Alsip (IL)	Physical barrier	0.2	Navigational Servitude	NA
	Barrier land	1.6	Fee Simple	0.5
	ANS Treatment Plant	5.3	Fee Simple	1
	Reservoir (Oak Lawn)	90	Fee Simple	12
Brandon Rd (IL)	New lock structure w/ electric barrier	10.5	Navigational Servitude	NA
	Barrier building	3	Fee Simple	3.6
Water Quality features	Conveyance Tunnel (Calumet to Alsip)	16.6	Utility Easement	NA
	Conveyance Tunnel (Calumet to WQ Thornton)	27.6	Utility Easement	NA
	Conveyance Tunnel (Hammond to WQ Thornton)	28.6	Utility Easement	NA
	Reservoir (WQ Thornton)	90	Fee Simple	10

Wilmette (IL) - CAWS Buffer Zone Alternative & Hybrid CSSC Open Alternative

Legend

October 2013

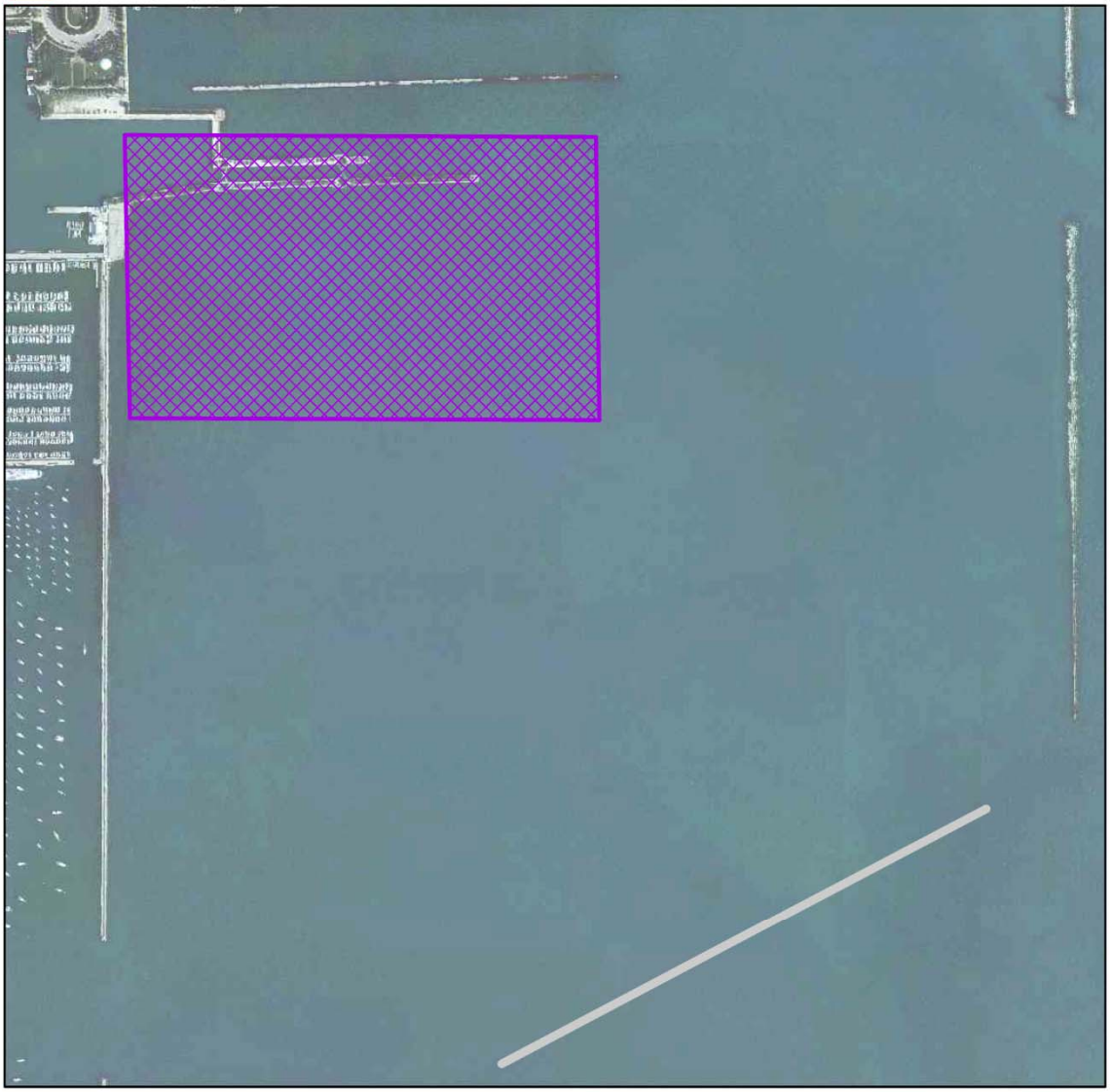
Screened Sluice Gates - Rehab Existing Control - 0.2 Acres

ANS Treatment Plant & Site Acess (1.3 acres) will be within Hatched Area - Fee Simple

NOT TO SCALE

****Further evaluation is required to determine exact location of project and mitigation features.**

Chicago (IL) - CAWS Buffer Zone Alternative & Hybrid CSSC Open Alternative



Legend

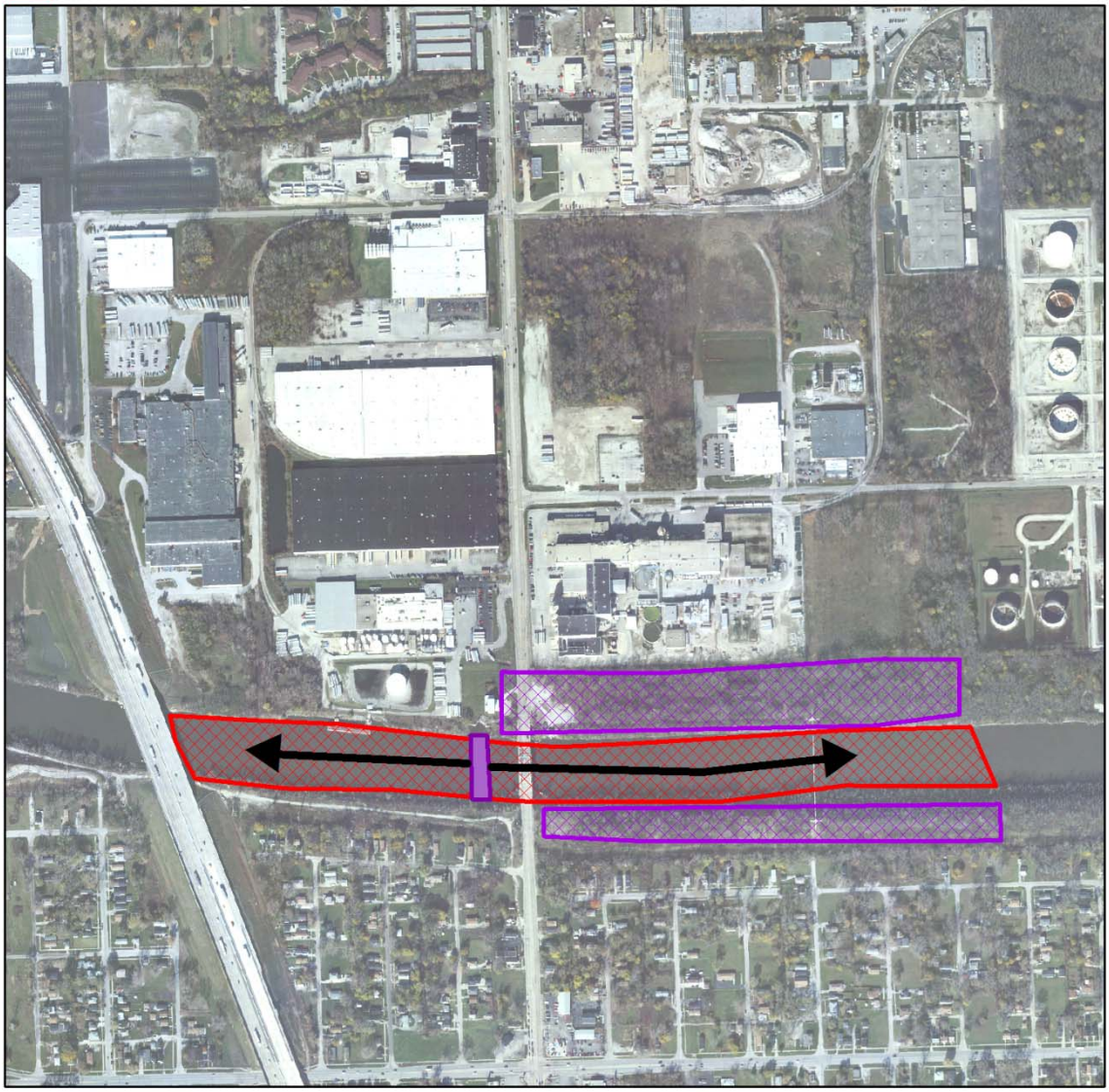
12 Acres within Hatched Area needed for New Lock, ANS Treatment Plant Etc - Navigational Servitude

October 2013

NOT TO SCALE

****Further evaluation is required to determine exact location of project and mitigation features.**

Alsip (IL) - Mid-System Hydrologic Separation Alternative & Hybrid CSSC Open Alternative



Legend

October 2013

Physical Barrier - Navigational Servitude - 0.1

Physical Barrier will be within Hatched

ANS Treatment Plant (5.4 Acres) & Barrier Easement (1.6 Acres) will be within Hatched Area - Fee Simple

NOT TO SCALE

****Further evaluation is required to determine exact location of project and mitigation features.**

Oak Lawn Reservoir - Mid-System Hydrologic Separation Alternative & Flow Bypass Alternative & Hybrid CSSC Open Alternative

Legend

October 2013

Reservoir (90 Acres) will be within Hatched Area - Fee Simple

NOT TO SCALE

****Further evaluation is required to determine exact location of project and mitigation features.**

Brandon Road (IL) - CAWS Buffer Zone Alternative &
Hybrid CSSC Open Alternative & Hybrid Cal-Sag Open Alternative

Legend

October 2013

Lock with Electric Barrier (10.5 Acres) will be within Hatched Area - Navigational Servitude

Electric Barrier Building (3 Acres) will be within Hatched Area - Fee Simple

N

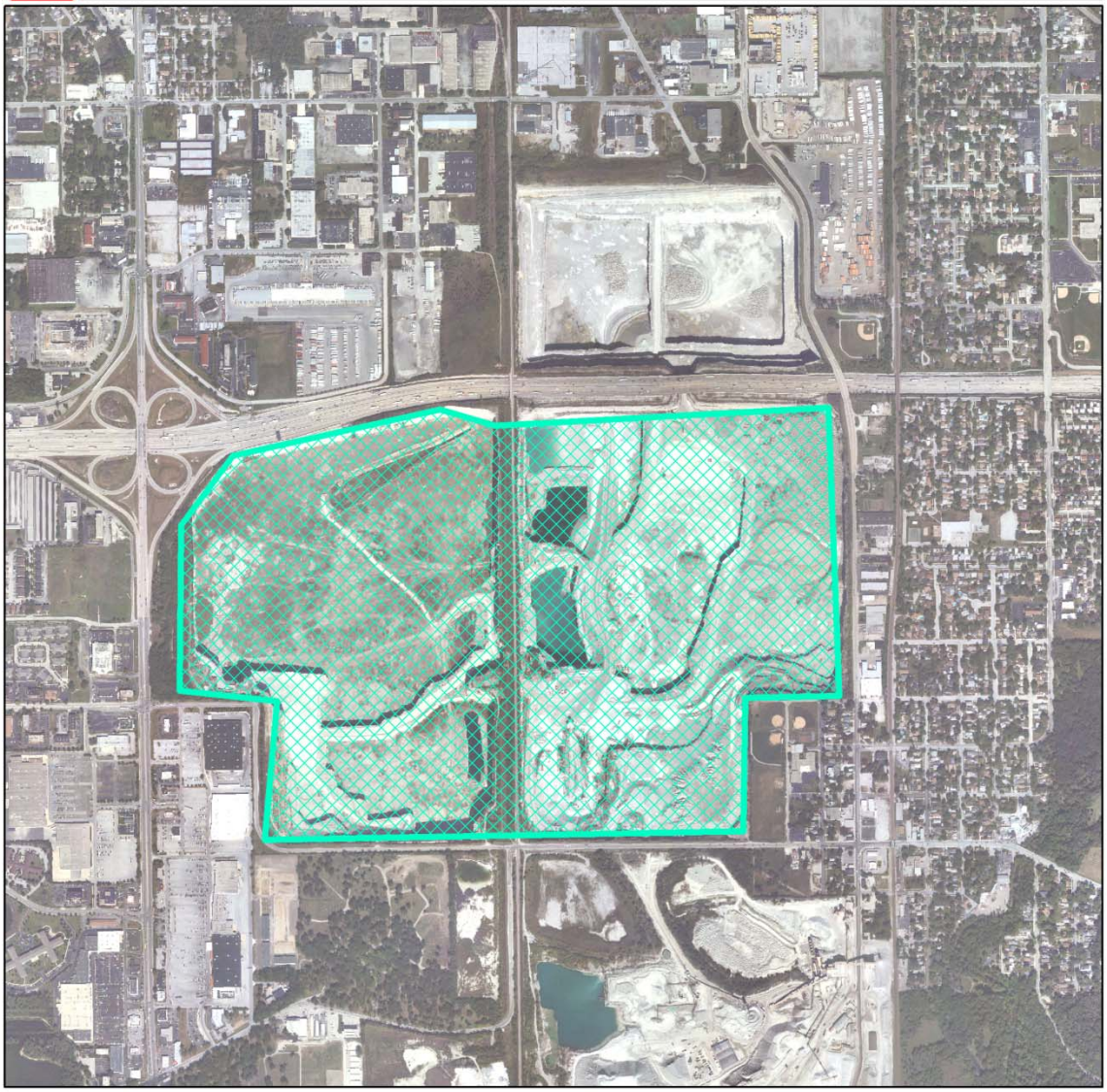
NOT TO SCALE

****Further evaluation is required to determine exact location of project and mitigation features.**

Hybrid CSSC Open Alternative
5.5 mile utility easement of 40 feet along the LCR from Hammond to WQ Thornton Reservoir.
Associated access easement every 3000 ft at shaft outlets, for a total of 1.9 acres.
5.3 mile utility easement of 13 feet along the LCR from Calumet to Alsip.
Associated access easement every 3000 ft at shaft outlets, for a total of 1.9 acres.
5.8 mile utility easement of 40 feet from Calumet to Thornton 2 Reservoir.
Associated access easement every 3000 ft at shaft outlest for a total of 2.0 acres.
* It is assumed that the majority of easements will be within the public right of way.

Map is not to scale.

A Second Reservoir at Thornton - Hybrid CSSC Open Alternative &
Mid-System Hydrologic Separation Alternative



November 2013

Legend

A new reservoir (90 Acres) to be within Hatched Area - Fee

NOT TO SCALE

****Further evaluation is required to determine exact location of project and mitigation features.**

L.3 NONFEDERAL-SPONSOR LANDS

This study does not attempt to identify specific nonfederal sponsorship; therefore, no nonfederal-sponsor-owned lands are identified.

L.4 RECOMMENDED ESTATES

L.4.1 Standard Estates

The required standard estates identified to implement the alternatives include fee simple, utility easement, and temporary work area easement. Other standard estates that may be utilized but not specifically identified in this report are channel improvement easement and flowage easement depending on induced flooding impacts.

L.4.2 Nonstandard Estates

At this time no nonstandard estates are recommended. However, because of the likelihood of acquisition from other governmental agencies, use of nonstandard estates is likely. Nonstandard estates will be submitted for approval to USACE headquarters.

L.5 EXISTING FEDERAL PROJECTS

Several authorized federal projects within the CAWS and beyond are within the area of study. The following list is a summary of those projects. The impact on each project, including the real estate requirements, which could change, will be evaluated as the study is further developed. Some of these projects include federally owned land, such as the Chicago Harbor Lock and the T.J. O'Brien Lock, while others are cost-share projects with non-federal sponsors holding the required real estate.

- Chicago Harbor Lock, Illinois
- Chicago Harbor, Illinois
- T.J. O'Brien Lock and Controlling Works, Illinois Waterway, Illinois
- Illinois Waterway, Illinois
- Calumet Harbor and Approach Channel, Chicago, Illinois, and Lake County, Indiana
- Indiana Harbor and Canal
- Burns Waterway Harbor, Portage, Indiana
- Chicago Sanitary and Ship Canal (CSSC) ANS Dispersal Barriers
- Chicagoland Underflow Plan: Thornton Reservoir
- Chicagoland Underflow Plan: McCook Reservoir
- Little Calumet River Local Flood Control and Recreation Project
- Cady Marsh Ditch, Little Calumet River
- Plum Creek, Indiana and Illinois

L.6 FEDERALLY OWNED LAND

Within the alternatives there are several sites with federal land ownership. In addition, there are sites that have been provided as an item of cooperation for federal projects. Federal lands include land at Chicago Harbor Lock and T.J. O'Brien Lock and Controlling Works. Further study will identify specific areas of federal ownership that could be implemented without real estate acquisition.

L.7 NAVIGATION SERVITUDE

Certain features of this study propose projects that would be constructed below the ordinary high-water mark. In addition, takings liability could arise from induced flooding as a result of a dam-like structure(s) placed in the CAWS, additional flooding that results from the modified operation of the CAWS and the TARP, and interference with the rights of access of certain riparian owners.

USACE would be responsible for acquiring a real estate interest for lands above the ordinary high-water mark that are permanently flooded or permanently subjected to intermittent flooding. The navigation servitude protects the government from paying compensation for taking property below the ordinary high-water mark, and also protects the government from liability from interference with riparian rights. Because the project features affect navigation and commerce, the use of the navigation servitude is assumed for all recommended project features below the ordinary high-water mark. Additional details and acreage of riparian areas affected are included in the real estate maps.

L.8 PROJECT AREA MAPS

All real estate maps are preliminary in nature and subject to change. The Real Estate Division has compiled generalized maps showing the acreages required and recommended corresponding estates for each alternative. For the purposes of this conceptual level of study, individual ownership and tract identification have not been included. Rather, generalized areas of likely implementation have been identified. Future study will identify specific site alternatives in more detail.

L.9 INDUCED FLOODING

At this level of study the alternatives do not induce flooding, and mitigation features have been recommended in order to avoid induced flooding and damages. However, further analysis could identify areas of induced flooding, and the appropriate flowage easements will be required following a determination of takings by the USACE Office of Counsel.

L.10 BASELINE COST ESTIMATE

L.10.1 Caveats

A baseline cost estimate was developed in conjunction with USACE appraisal staff. Estimates are preliminary in nature and subject to change. The following caveats apply to all estimates presented below, some of which are general or extraordinary assumptions; others are hypothetical conditions that will be examined to determine veracity and cost impacts upon further study. All these caveats could affect these cost estimates significantly.

- Tunnels will be constructed in existing public rights-of-way.
- Barriers were assumed to be dams.
- Values are calculated by using assessed values or historical knowledge of the area.
- Temporary easements and access areas are included in the hatched area of each map.
- Utility relocations are estimated at 25% of the estimated real estate value.
- No business relocations are required.
- There are no hazardous, toxic, and radioactive waste (HTRW) concerns on any of the properties.
- There are no title concerns on any of the properties.
- All municipalities will support the projects.
- Topography was not known at the time of the valuation.
- No site visits were conducted at the time of the valuation.
- Connections between barriers and treatment areas were not identified so they were not
- included in the valuation.
- Areas of water were assumed to be navigational servitude.
- No mineral rights were evaluated.
- No grave sites will be disturbed.
- No historical sites will be identified on any of the sites.
- No easements or rights to other owners exist on any of the sites.
- In the event that the area between the spreadsheet and the maps differ, the large size
- was assumed.

L.10.1.1 Incremental Real Estate Costs

Incremental real estate costs are added costs that were formerly captured as contingencies:

- Potential uneconomic remnants, 5%
- Unknowns for level of study definition, 20%
- Unforeseen aspects due to inaccessibility, 5%
- Cost/value increases from potential development pressures and/or zoning changes, 10%
- Negotiation latitude above estimated market value, 20%
- Potential for excessive condemnation costs/awards, 30%
- Potential for unknown natural resources or minerals, 0%
- Other incremental costs (please identify), 10%

L.10.1.2 Total Incremental Costs: 100%

Because of the proposed conceptual size and scope of this project, an incremental cost of 100% has been included in the estimated real estate costs to address potential risks, including project scope revision requiring additional lands, land appreciation at time of valuation, business or personal relocation costs, sale price/settlement negotiations, or condemnation, or other unforeseeable risks.

L.10.2 Mid-System Control Technologies without a Buffer Zone – Flow Bypass Alternative

Mid-System Control Technologies without a Buffer Zone - "Flow Bypass Alternative"								
Location	**Feature**	**Perm. Estate Size (acres)**	**Permanent Estate Type**	**Temp. Easement Size (acres)**	**Estimated Real Estate Value**	**Estimated Utility Relocation Cost**	**Estimated # Owners**	**Estimated Admin Costs**
Stickney (IL)	GLRMIS lock	10.5	Navigational Servitude	2.2	$ 4,400,000	$ 1,100,000	1	$ 20,000
	Lock and Electric Barrier Building	2.8	Fee Simple	2.1			2	$ 40,000
	ANS Treatment Plant	9.1	Fee Simple				2	$ 40,000
	Conveyance Tunnel	16.0	Utility Easement	NA			20	$ 400,000
	Reservoir (McCook 1)	140	Fee Simple	10			1	$ 20,000
Alsip (IL)	GLRMIS lock	12.3	Navigational Servitude	1.7	$ 8,650,000	$ 2,162,500	1	$ 20,000
	Lock and Electric Barrier Building	2.2	Fee Simple				2	$ 40,000
	ANS Treatment Plant	9.9	Fee Simple	1			2	$ 40,000
	Conveyance Tunnel	17.5	Utility Easement	NA			20	$ 400,000
	Reservoir (Thornton 1)	190	Fee Simple	10			1	$ 20,000
	Reservoir (Oak Lawn)	90	Fee Simple	12			2	$ 40,000
					$ 13,050,000	**$ 3,262,500**	**Total**	**$ 1,080,000**
							LERRD w/ Admin	**$ 17,392,500**
							Incremental Costs	**100% $ 17,392,500**
							Total LERRD	**$ 34,785,000**

L.10.3 Technology Alternative with Buffer Zone – CAWS Buffer Zone Alternative

Technology Alternative with a Buffer Zone - "CAWS Buffer Zone Alternative"								
Location	**Feature**	**Perm. Estate Size (acres)**	**Permanent Estate Type**	**Temp. Easement Size (acres)**	**Estimated Real Estate Value**	**Estimated Utility Relocation Cost**	**Estimated # Owners**	**Estimated Admin Costs**
Wilmette (IL)	Rehab existing control structure	0.2	Fee Simple	0.8	$ 50,000	$ 12,500	1	$ 20,000
	ANS Treatment Plant	1.3	Fee Simple				2	$ 40,000
Chicago (IL)	Lock with electric barrier	12	Navigational Servitude	3.4	$ 1,200,000	$ 300,000	1	$ 20,000
	ANS Treatment plant for lock structure		Fee Simple	NA			2	$ 40,000
	ANS treatment plant for diversion		Fee Simple	NA			2	$ 40,000
TJ O'Brien (IN)	Lock with electric barrier	10	Navigational Servitude	3.4	$ 271,000	$ 67,750	1	$ 20,000
	ANS Treatment plans for lock structure	7.5	Fee Simple	1.75			2	$ 40,000
	ANS Treatment Plant for diversion		Fee Simple				2	$ 40,000
State Line (IL/IN)	Physical barrier	0.03	Navigational Servitude	NA	$ 1,140,000	$ 285,000	1	$ 20,000
	Barrier land	0.5	Fee Simple	1.2			2	$ 40,000
	Reservoir at State Line (golf course)	130	Fee Simple	10			2	$ 40,000
Hammond (IN)	Physical barrier	0.05	Navigational Servitude	NA	$ 2,500,000	$ 625,000	1	$ 20,000
	Barrier land	0.2	Fee Simple	1			1	$ 20,000
	Conveyance Tunnel	23.5	Utility Easement	NA			20	$ 400,000
	Reservoir (Thornton 2)	115	Fee Simple	10			1	$ 20,000
Brandon Road (IL)	Lock with electric barrier	10.5	Navigational Servitude	NA	$ 123,000	$ 30,750	1	$ 20,000
	Barrier building	3	Fee simple	3.6			1	$ 20,000
					$5,284,000	**$1,321,000**	**Total**	**$ 860,000**
							LERRD w/ Admin	**$ 7,465,000**
							Incremental Costs	**100%** **$ 7,465,000**
							Total LERRD	**$ 14,930,000**

L.10.4 Lakefront Hydrologic Separation

Lakefront Hydrologic Separation								
Location	**Feature**	**Perm. Estate Size (acres)**	**Permanent Estate Type**	**Temp. Easement Size (acres)**	**Estimated Real Estate Value**	**Estimated Utility Relocation Cost**	**Estimated # Owners**	**Estimated Admin Costs**
Wilmette (IL)	Physical Barrier	0.05	Navigational Servitude	NA	$ 50,000	$ 12,500	1	$ 20,000
	Barrier land	0.4	Fee Simple	0.9			2	$ 40,000
	ANS Treatment Plant	0.9	Fee Simple				2	$ 40,000
	Conveyance Tunnel	55.4	Utility Easement	NA			20	$ 400,000
Chicago (IL)	Physical Barrier	0.1	Navigational Servitude	NA	$ 7,700,000	$ 1,925,000	1	$ 20,000
	Barrier land	0.5	Fee Simple	0.5			1	$ 20,000
	ANS Treatment Plant	3.2	Fee Simple	1.4			2	$ 40,000
	Conveyance Tunnel	83.2	Utility Eaesment	NA			40	$ 800,000
	Reservoir (McCook 2)	80	Fee Simple	10			1	$ 20,000
	Small Boat Rec Harbor	30	Navigational Servitude	NA			1	$ 20,000
	Rec Harbor Land area	5	Fee Simple	1			2	$ 40,000
Calumet City (IL)	Physical Barrier	0.15	Navigational Servitude	NA	$ 3,500,000	$ 875,000	1	$ 20,000
	Barrier land	2	Fee Simple	1.5			1	$ 20,000
	ANS Treatment Plant	3.3	Fee Simple	1			1	$ 20,000
	Conveyance Tunnel	28.6	Utility Easement	NA			20	$ 400,000
Hammond (IN)	Physical Barrier	0.05	Navigational Servitude	NA	$ 2,500,000	$ 625,000	1	$ 20,000
	Barrier land	0.2	Fee Simple	1			2	$ 40,000
	Conveyance Tunnel	22.8	Utility Easement	NA			20	$ 400,000
	Reservoir (Thornton 3)	160	Fee Simple	10			1	$ 20,000
					$13,750,000	**$3,437,500**	**Total**	**$ 2,400,000**
							LERRD w/ Admin	**$ 19,587,500**
							Incremental Costs **100%**	**$ 19,587,500**
							Total LERRD	**$ 39,175,000**

L.10.5 Mid-System Hydrologic Separation

Mid-System Hydrologic Separation								
Location	**Feature**	**Perm. Estate Size (acres)**	**Permanent Estate Type**	**Temp. Easement Size (acres)**	**Estimated Real Estate Value**	**Estimated Utility Relocation Cost**	**Estimated # Owners**	**Estimated Admin Costs**
Stickney (IL)	Physical Barrier	0.1	Navigational Servitude	NA	$ 420,000	$ 105,000	2	$ 40,000
	Barrier	2	Fee Simple	1.4			1	$ 20,000
	ANS Treatment Plant	10	Fee Simple				2	$ 40,000
Alsip (IL)	Physical Barrier	0.2	Navigational Servitude	NA	$ 9,300,000	$ 2,325,000	1	$ 20,000
	Barrier land	1.6	Fee Simple	0.5			2	$ 40,000
	ANS Treatment Plant	5.3	Fee Simple	1			2	$ 40,000
	Reservoir (Oak Lawn)	90	Fee Simple	12			4	$ 80,000
Water Quality features	Conveyance Tunnel (Lawrence To McCook)	68.0	Utility Easement	NA	$ 5,400,000	$ 1,350,000	10	$ 200,000
	WRP Conveyance Tunnel (Wilmette to Stickney)	39.2	Utility Easement	NA			10	$ 200,000
	Conveyance Tunnel (Hammond to WQ Thornton)	28.6	Utility Easement	NA			10	$ 200,000
	Conveyance Tunnel (Calumet to WQ Thornton)	27.6	Utility Easement	NA			10	$ 200,000
	WRP Conveyance Tunnel (Calumet to Alsip)	16.6	Utility Easement	NA			10	$ 200,000
	Reservoir (WQ McCook)	110	Fee Simple	10			1	$ 20,000
	Reservoir (WQ Thornton)	90	Fee Simple	10			1	$ 20,000
					$ 15,120,000	**$ 3,675,000**	**Total**	**$ 1,320,000**
							LERRD w/ Admin	**$ 20,115,000**
							Incremental Costs **100%**	$ 20,115,000
							Total LERRD	**$ 40,230,000**

L.10.6 Mid-System Separation Cal-Sag Open Control Technologies with a Buffer Zone – Hybrid Cal-Sag Open Alternative

Mid-System Separation Cal-Sag Open Control Technologies with a Buffer Zone - "Hybrid Cal-Sag Open Alternative"								
Location	**Feature**	**Perm. Estate Size (acres)**	**Permanent Estate Type**	**Temp. Easement Size (acres)**	**Estimated Real Estate Value**	**Estimated Utility Relocation Cost**	**Estimated # Owners**	**Estimated Admin Costs**
Stickney (IL)	Physical barrier	0.1	Navigational Servitude	NA	$ 420,000	$ 105,000	2	$ 40,000
	Barrier land	2	Fee Simple	1.4			1	$ 20,000
	ANS Treatment Plant	10	Fee Simple				2	$ 40,000
TJ O'Brien (IN)	Lock with electric barrier	10	Navigational Servitude	3.4	$ 271,000	$ 67,750	1	$ 20,000
	ANS treatment plant for lock structure	7.5	Fee Simple	1.75			2	$ 40,000
	ANS treatment plant for diversion		Fee Simple				2	$ 40,000
State Line (IL/IN)	Physical barrier	0.03	Navigational Servitude	NA	$ 1,140,000	$ 285,000	1	$ 20,000
	Barrier land	0.5	Fee Simple	1.2			2	$ 40,000
	Reservoir (State Line)	130	Fee Simple	10			2	$ 40,000
Hammond (IN)	Physical Barrier	0.05	Navigational Servitude	NA	$ 2,500,000	$ 625,000	1	$ 20,000
	Barrier land	0.2	Fee Simple	1			1	$ 20,000
	Conveyance Tunnel	23.5	Utility Easement	NA			20	$ 400,000
	Reservoir (Thornton 2)	115	Fee Simple	10			1	$ 20,000
Brandon Road (IL)	New lock structure w/ electric barrier	10.5	Navigational Servitude	NA	$ 123,000	$ 30,750	1	$ 20,000
	Barrier building	3	Fee Simple	3.6			1	$ 20,000
Water Quality features	Conveyance Tunnel (Lawrence to McCook)	68.0	Utility Easement	NA	$ 3,000,000	$ 750,000	10	$ 200,000
	Reservoir (WQ McCook)	110	Fee Simple	10			10	$ 200,000
	Conveyance Tunnel (Wilmette to Stickney)	39.2	Utility Easement	NA			10	$ 200,000
					$ 7,454,000	**$ 1,863,500**	**Total**	**$ 1,400,000**
						Total LERRD w/ Admin		**$ 10,717,500**
						Incremental Costs	**100%**	**$ 10,717,500**
							Total LERRD	**$ 21,435,000**

L.10.7 Mid-System Separation CSSC Open Control Technologies with a Buffer Zone – Hybrid CSSC Open Alternative

Mid-System Separation CSSC Open Control Technologies with a Buffer Zone - "Hybrid CSSC Open Alternative"								
Location	**Feature**	**Perm. Estate Size (acres)**	**Permanent Estate Type**	**Temp. Easement Size (acres)**	**Estimated Real Estate Value**	**Estimated Utility Relocation Cost**	**Estimated # Owners**	**Estimated Admin Costs**
Wilmette (IL)	Rehab existing control structure	0.2	Fee Simple	0.8	$ 50,000	$ 12,500	1	$ 20,000
	ANS Treatment Plant	1.3	Fee Simple				2	$ 40,000
Chicago (IL)	New lock structure w/ electric barrier	13.2	Navigational Servitude	NA	$ 1,200,000	$ 300,000	1	$ 20,000
	Treatment plant for barrier	12	Fee Simple	NA			2	$ 40,000
	ANS Treatment Plant for diversion		Fee Simple	NA			2	$ 40,000
Alsip (IL)	Physical barrier	0.2	Navigational Servitude	NA	$ 9,300,000	$ 2,325,000	1	$ 20,000
	Barrier land	1.6	Fee Simple	0.5			2	$ 40,000
	ANS Treatment Plant	5.3	Fee Simple	1			2	$ 40,000
	Reservoir (Oak Lawn)	90	Fee Simple	12			4	$ 80,000
Brandon Rd (IL)	New lock structure w/ electric barrier	10.5	Navigational Servitude	NA	$ 123,000	$ 30,750	1	$ 20,000
	Barrier building	3	Fee Simple	3.6			1	$ 20,000
Water Quality features	Conveyance Tunnel (Calumet to Alsip)	16.6	Utility Easement	NA	$ 2,400,000	$ 600,000	10	$ 200,000
	Conveyance Tunnel (Calumet to WQ Thornton)	27.6	Utility Easement	NA			10	$ 200,000
	Conveyance Tunnel (Hammond to WQ Thornton)	28.6	Utility Easement	NA			10	$ 200,000
	Reservoir (WQ Thornton)	90	Fee Simple	10			10	$ 200,000
					$ 13,073,000	**$ 3,268,250**	**Total**	**$ 1,180,000**
						Total LERRD w/ Admin		**$ 17,521,250**
						Incremental Costs	**100%**	**$ 17,521,250**
						Total LERRD		**$ 35,042,500**

L.11 RELOCATION ASSISTANCE BENEFITS (P.L. 91-646)

No specific relocations have been identified in any of the proposed alternatives. However, because of the large scale and size of the alternatives, P.L. 91-646 (Uniform Relocation Assistance and Real Property Acquisitions Policies Act of 1970) benefits are likely. Significant costs of business and residential relocations could be likely for mitigation and specific project features. Further study and analysis during future phases of planning will identify specific relocations.

L.12 MINERAL/TIMBER ACTIVITY

No timber activity is affected by the proposed alternatives. Mineral activity, particularly at the proposed reservoirs, could be affected.

L.13 NON-FEDERAL SPONSOR CAPABILITY

Implementation of any of the alternatives will require nonfederal participation. A nonfederal sponsor willing to cost-share a plan is required by the *Planning Guidance Notebook* (Department of the Army 2000) in order to recommend authorization of a project. A Chief's Report recommending authorization of a project could not be provided to Congress without this requirement. At this time no nonfederal sponsor has been specifically identified. Should a recommendation for authorization of a project proceed, a nonfederal sponsor will likely be responsible for real estate acquisition. Government agencies responsible for the CAWS include the Metropolitan Water Reclamation District of Greater Chicago (MWRDGC), the State of Illinois, and the City of Chicago. All three agencies are capable of performing the real estate acquisitions required to be a nonfederal sponsor; however, for the purposes of this study no sponsors have been identified.

Involvement of a nonfederal sponsor(s) willing to cost-share a plan is required by USACE policy in order to recommend authorization of a project. See the *Planning Guidance Notebook* (Department of the Army 2000) at 4-3 . Under current law, nonfederal sponsors are required to pay for 35% of environmental restoration projects implemented by USACE, and such projects may not be implemented until a nonfederal sponsor enters into an agreement and assumes obligations on a variety of matters, including cost-sharing, real estate acquisition, and operation and maintenance activities; see 33 USC 2213(c)(7), (j). Thus implementation of a GLMRIS alternative could not proceed unless a nonfederal sponsor is identified, or the statutory authorization for implementation of a GLMRIS alternative specifically changes these requirements.

L.14 ZONING ORDINANCES ENACTED

At this preliminary level of study rezoning, it is not anticipated that rezoning is necessary to support the project LERRD requirements. However, this determination is subject to change in future phases of study.

L.15 ACQUISITION SCHEDULE

At a preliminary level of study, it is difficult to provide a detailed real estate acquisition schedule. In general, for each alternative the construction of conveyance tunnels and reservoirs precedes other engineering features. As such, discussion on availability of real estate for reservoirs and conveyance tunnels should be given primary focus. A 24-month acquisition schedule prior to the first contract award is assumed. A detailed implementation schedule can be found in the main report.

L.16 UTILITIES/FACILITIES TO BE RELOCATED

At the preliminary planning phases, no specific utilities or facilities have been identified as potential relocations. However, because of the structural nature and the urbanized environment in and around the CAWS, utility and facility relocations are considered highly likely. For the purposes of cost estimating, estimated utility relocation costs have been allocated as 25% of the estimated real estate value based on previous project experience in the local area. This estimate is preliminary in nature and subject to change.

L.17 HTRW

The HTRW assessment was conducted primarily on the identification of regulated sites within the immediate vicinity of the project area through a database search, followed by further investigation of selected sites. Environmental concerns at and near the proposed GLMRIS project sites are summarized in Appendix G.

In general, properties along the CSSC, South Branch of the Chicago River, Calumet River, Grand Calumet River, Indiana Harbor and Canal, Cal-Sag Channel, and Little Calumet River downstream of the Cal-Sag Channel confluence are likely to have RECs due to current or past industrial uses. Many properties in these areas have some history in Comprehensive Environmental Response, Compensation and Liability Information System (CERCLIS), Resource Conservation and Recovery Act (RCRA), or other state or local site remediation programs. In addition, leaking underground storage tanks (LUSTs) are likely to be encountered in these developed areas, and solid waste facilities or landfills may be present. Many past HTRW investigations have been conducted for locations along the CSSC, South Fork SBCR, Little Calumet River, and Grand Calumet River, and may be utilized in existing information reviews or to aid in screening initial alternative project sites.

GLMRIS features may be selected for implementation at sites with significant environmental concerns and outstanding legal obligations. Under current law, nonfederal sponsors are required to pay for 35% of environmental restoration projects implemented by USACE, and such projects may not be implemented until a nonfederal sponsor enters into an agreement and assumes obligations for various matters, including cost-sharing, real estate acquisition, and operation and maintenance activities [33 U.S.C. § 2213(c)(7), (j)]. Thus, implementation of a GLMRIS alternative could not proceed unless a nonfederal sponsor is identified or the statutory authorization for implementation of a GLMRIS alternative specifically changes these requirements. For cost-shared projects, the nonfederal sponsor is responsible for ensuring that the development and execution of federal, state, and/or locally required HTRW response actions are accomplished at 100% nonproject cost. No cost-sharing credit is provided for the cost of response actions (Department of the Army 1992).

L.18 OWNER ATTITUDES/ISSUES

Detailed analysis of parcels and specific owners has not been conducted at this level of study. Future ownership details will be more fully developed in the future so that an assessment of ownership attitudes can be developed. The alternatives would require acquisition from both public and private entities. To date, the following stakeholder activities have taken place.

Through the scoping process with federal, state, and local agencies, as well as the initial National Environmental Policy Act (NEPA) public scoping effort, the study team recognized the critical nature of stakeholder engagement in the execution of GLMRIS. In accordance with the USACE Implementation Guidance, the GLMRIS team developed a variety of methods to obtain input to the study process from appropriate federal, state, local and nongovernmental entities. Key efforts included the establishment of a multi-agency advisory committee, the release of interim study products, and a strong presence on the Web and social media.

L.19 SPONSOR NOTIFICATION

Should any of the proposed alternatives proceed to further study, potential local sponsors will be notified of the risks of advanced real estate acquisition.

L.20 OTHER REAL ESTATE ISSUES

Further real estate issues will be identified in future studies.

L.21 REFERENCES

Department of the Army, U.S. Army Corps of Engineers. 1987. Real Estate Notebook, ER-405-1-12. Washington, D.C.

Department of the Army, U.S. Army Corps of Engineers. 1993. Water Resource Policies and Authorities: Hazardous, Toxic, and Radioactive Water (HTRW) Guidance for Civil Works Projects, ER 1165-2-132. Washington, D.C. June 26.

Department of the Army, U.S. Army Corps of Engineers. 2000. Planning: Planning Guidance Notebook, ER-1105-2-100. Washington, D.C. April 22.