

404 Permit Application

Platte River Recovery Implementation Program

State Channel Re-Activation Project

Section 21, T14N, R130W, Lincoln County, Nebraska

EA Project No. 1482203
USACE Project #2012-02846



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June 2014
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**SUPPLEMENTAL INFORMATION FOR THE
DEPARTMENT OF THE ARMY PERMIT (33 CFR 325)
CLEAN WATER ACT, SECTION 404, 33 USC 1344
PERMIT APPLICATION TO THE
UNITED STATES ARMY CORPS OF ENGINEERS**

**Platte River Recovery Implementation Program
State Channel Re-Activation Project
Application Version 2.0
USACE File #2012-02846-KEA**

The following information is being submitted in support of the application for a Section 404 permit for the Platte River Recovery Implementation Program's (Program) North Platte State Channel Re-activation Project located north of North Platte, Nebraska. The project area is west of Highway 83 on the north side of the main Platte River channel (see Figure 1, Appendix A). The project is sponsored by the Program and is located on private property. The standard application form (ENG FORM 4345) was used when possible (attached); however, in order to provide enough details on the proposed project, additional space was needed to provide the information required. This document is organized generally to reflect the same structure outlined in ENG FORM 4345.

1.0 INTRODUCTION

In 1997, the states of Colorado, Wyoming, and Nebraska and the U.S. Department of Interior came together in a unique partnership to develop a shared approach to managing the Platte River. Water users from the three states and conservation groups joined the effort, and together these stakeholders developed an innovative approach to better manage the Platte River for the health of the ecosystem and the people that depend on it. These stakeholders entered into a Cooperative Agreement and established a Governance Committee, which consisted of the signatories, water user groups, and environmental organizations, to develop the basin-wide, cooperative Platte River Recovery Implementation Program (Program). The Program is the culmination of that planning effort and is focused on implementing this shared vision for restoration of the Platte River. The Program focuses on "target species"; that is, threatened or endangered species in the Central and Lower Platte River Basin – whooping crane, piping plover, interior least tern, and pallid sturgeon.

The Bureau of Reclamation and the United States Fish and Wildlife Service (USFWS) released the Program's Final Environmental Impact Statement for public review and filed it with the United States Environmental Protection Agency (USEPA) on May 18, 2006. Following public review, a Record of Decision, signed on September 27, 2006, approved the Program.

The overall Program purpose is to offset some of the impacts to the target species and their habitat located in the Central and Lower Platte River corridor. Impacts caused by historic, current, and future water-related activities would be mitigated through the implementation of land and water management actions which result in target species habitat restoration, creation, and/or enhancement.

The Program will perform the following:

- Assist in the conservation and recovery of the target species in the Platte River Basin and thereby provide Endangered Species Act (ESA) regulatory compliance for effects to the target species' river habitats from existing and certain new water-related activities that deplete water from the Platte River upstream of the Loup River confluence.

- Provide a means to ensure that future water uses in the Platte River Basin do not undermine the habitat and species benefits and are in compliance with ESA.
- Help prevent the need to list more species under the ESA.

This project, like many of the Program's projects throughout Nebraska, provides another incremental step to achieving the overall Program purpose. A specific project purpose and project need is described below for the State Channel re-activation.

2.0 PROPOSED PROJECT

The 'State Channel' was created by the Nebraska Department of Roads (NDOR) around 1970 to direct flow in the 'North River Road Channel' into the 'State Channel' and towards the North Platte River as seen in Figure 1. The berm that restricted flow in the North River Road Channel to direct flow to the State Channel was breached in the early 1990's and a portion of the berm was also removed by an unknown source. Breaching the berm effectively cut off the State Channel, and resulted in flow continuing east in the North River Road Channel towards the flood-prone properties along North River Road. Partial re-activation of the State Channel was achieved in May 2012 through disking at the head of the State Channel, with flow naturally clearing disked material and diverting into the State Channel.

The overall design objective of the State Channel Re-Activation Project is to direct high flows from the North River Road Channel into the State Channel in order to increase flows though this reach up to 3,000 cfs without increasing flood impacts to properties along the river.

The flow distribution between the State Channel and the North River Road Channel needs to be controlled to allow a small amount of flow to continue east in the North River Road Channel while high flows are diverted back to the North Platte River via the State Channel.

The combined maximum design flow rate for the North River Road Channel and the State Channel is 200 cfs. According to modeling completed by the Program, approximately 200 cfs is routed to the North River Road Channel when the North Platte River is conveying 3,800 cfs.

The North River Road Channel flows downstream of the State Channel and State Channel flows were estimated using HydroCAD. As presently designed, flow rates at or below 4 cfs will continue down the North River Road Channel only and would not enter the State Channel. As the flow increases in the North River Road Channel above 4 cfs, flow would begin to be diverted starting at the location of the berm south through the State Channel and to the North Platte River.

As presently designed, when the North Platte River is at 3,800 cfs, 186 cfs would be diverted to the State Channel and 14 cfs would be conveyed through the North River Road Channel for a combined capacity of 200 cfs.

Table 1 below displays the dimensions of the berm as currently proposed. The proposed berm extension and enhancement will be constructed with native soil. Work will be completed using typical earth moving equipment such as a dozer, backhoe, skid loader, etc.

Figures 2-9 in Appendix A display several modeling scenarios completed by the Program at varying flow velocities (1,560, 2,400, 3,000 and 3,300 cfs), with and without the berm in place.

Table 1: Berm Dimensions

Berm Extending to the North River Road	
Berm Top Width	4' Min.
Top of Berm Elevation	2807.5'
Berm Length	500'
Berm Across North River Road Channel	
Berm Top Width	12' Min.
Top of Berm Elevation	2807.5'
Maximum Berm Height	4'
Berm Length	200'
Pipe Diameter	18"
State Channel Berm	
Berm Width	4' Min.
Beginning Top of Berm Elevation	2807.5'
End Top of Berm Elevation	2803.7'
Berm Length	2250'

3.0 PROJECT PURPOSE AND NEED

3.1 Purpose

The purpose of this project is to increase the ability of the North Platte River to convey 3,000 cfs without increasing identified flooding conditions upstream of the Highway 83 bridge by reconstructing the State Channel berm to redirect high-flow events from the North River Road Channel south through the State Channel to the North Platte River.

An existing berm was created by the NDOR around 1970 to define a flow path, referred to as the 'State Channel'. The berm directed flow in the 'North River Road Channel' into the 'State Channel' and on to the North Platte River. The portion of the berm that restricted flow in the North River Road Channel to direct that flow to the State Channel was breached in the early 1990's. Breaching the berm effectively cut off the State Channel, and resulted in flow continuing east in the North River Road Channel towards the properties along North River Road.

The conveyance of this reach has generally been decreasing over time. The naturally decreasing conveyance further impacts the Program's ability to pass Environmental Account water from Lake McConaughy without impacting these properties.

3.2 Need

The project is needed to improve the operations of the Environmental Account by increasing the ability of the North Platte River to convey 3,000 cfs without creating increased flood risk. Flows of this magnitude from the Environmental Account are required by the Program to maintain and enhance habitat downstream of the Highway 83 Bridge for threatened and endangered species.

Nebraska's Environmental Account was established as part of Project 1417 Federal Energy Regulatory Commission License and is an account of water in Lake McConaughy available for release for the benefit of the target species and is controlled by USFWS in cooperation with the Program. The ability of the Environmental Account to meet those purposes is currently constrained by the channel capacity of the North Platte River near North Platte, Nebraska.

4.0 ADDITIONAL ALTERNATIVES CONSIDERED

Over the last ten years the Program has evaluated and considered several additional alternatives that would improve the ability of the North Platte River to convey 3,000 cfs without increasing identified flooding conditions upstream of the Highway 83 bridge. Below is a brief summary of each of the past actions or considerations.

Choke Point Vegetation Treatment

The Program began disking, shredding, mowing, and spraying herbicide on vegetation above and below the Highway 83 bridge in 2007 continuing through 2012. This action did not have a sufficient nor permanent impact on conveyance.

Channel Restoration

In July 2007, the Program evaluated restoration and enhancement of historic natural channels of the North Platte River floodplain upstream of the State Channel through removal of common reed (*Phragmites australis*). The project intent was to remove *Phragmites* either chemically or mechanically in designated areas and to re-open the identified natural channels by re-grading these channels 6-18 inches deep by 20-30 feet wide. The re-grading portion of this project was not implemented as naturally occurring high flows accomplished much of the channel re-opening desired.

Sediment Collector

The Program evaluated options to install sediment collectors upstream of the Highway 83 Bridge, which would essentially remove sediment without dredging. The operation and maintenance of a sediment collection system was not practical for this location.

Dredging

In September 2012, the Program compared several dredging alternatives to determine optimal dredging location, amount, and dimensions using 1-D sediment transport hydraulic modeling. The purpose of dredging would be to decrease the water surface elevation and increase hydraulic capacity at the Program's goal of 3,000 cfs. Cost estimates for the most effective dredging alternative were \$1.6 M and would have required removal of 230,000 cubic yards of material. Modeling indicated that dredging at this level would be required at a frequency of once every three to five years.

Dredging with Jetties

The Program also evaluated an alternative including dredging and installation of 19 small jetties downstream of Highway 83 making a narrower low flow channel. The intent was to increase velocity though the reach thereby making the reach self-scouring and reducing the need for repeated dredging. The advantage gained at low flows was overshadowed by the increased stage at higher flows such as 50- to 100-year flows. This alternative has not been evaluated further at this time.

Property Buyouts

In August 2012 the Program met with several property owners affected by the flooding to gage interest and determine the likelihood of buyouts. There has been no action towards property buyouts at this time beyond this meeting.

5.0 RESPONSE TO USACE LETTER, APRIL 2, 2013

During the initial permit application correspondence was received from the USACE project manager on April 2, 2013, with several detailed questions. Answers to these questions are summarized below, except for a description of the berm dimensions, which have been listed above in the project description (see Table 1).

1. How will the bridge and the south stream bank be impacted by higher flows?

The flow from the North River Road Channel flows into the North Platte River west of the bridge and therefore the bridge hydraulics will not be impacted by a partial diversion of the North River Road Channel.

The State Channel outlets approximately 1,500 feet north of the North Platte River's south bank. The impact of the flow diverted to the river through the State Channel will be completely dissipated in far less distance.

2. Will higher flows in the main channel cause a deepening of that channel? If this is the case, will this cause stream bank erosion?

According to modeling completed by the Program, diverting flow from the North River Road Channel will increase North Platte River flows at the State Channel outlet by 6 percent. This minor increase will not increase river velocities enough to alter the current dynamics of the river.

3. Will the wetlands downstream of the dike (north side of the main channel) be impacted; if so, how many acres? How will they be impacted? How will the impacts be mitigated?

Based upon the wetland delineation completed by EA on October 4, 2012, at the location of the State Channel berm, there is a strong presence of hydrology at the site due to a high water table. At that time, two wetland sample points towards the south side of the berm recorded very shallow depths to groundwater (SP-1 @ 25 inches and SP-2 @ 13 inches). Based upon the adjacency to the North Platte River it is assumed that wetland hydrology exists throughout this area due to high groundwater levels.

Therefore, considering the majority of the original State Channel berm is intact, and that the footprint of the original berm will be expanded only slightly, minimal, if any, impacts are expected to occur to the existing downstream wetlands due to the strong presence of groundwater hydrology. In addition, the project design allows base flows in the North River Road Channel to continue through the berm and will convey up to 14 cfs during high flow events, thus allowing the hydrology of the North River Road Channel to remain intact.

Pre and post project hydrologic modeling has also been completed estimate impacts to surface hydrology. Based upon the modeling results, it appears that backwater flooding will occur throughout most of the area post-construction. Table 2 displays the total area of surface water inundation that would be anticipated based on modeling results within the area identified in the April 2, 2013 as the functional assessment boundary. The total area of the functional assessment area is 140 acres.

Table 2: Surface Water Inundation

Flow Scenario (cfs)	Berm Presence	Inundation Area (acres)	Percent Area	% Difference with Berm
1,560	With	43.2	31%	-6%
	Without	52.1	37%	--
2,400	With	74.7	54%	-9%
	Without	87.2	62%	--
3,000	With	87.4	63%	-12%
	Without	103.6	74%	--
3,300	With	100.3	72%	-12%
	Without	117.4	84%	--

As seen in Table 2, the total area inundated is reduced between 6 to 12% post-project, thus the majority of the area within the functional assessment area will remain hydrologically connected to low-flow flood waters. It is assumed the remaining area will become saturated though high groundwater levels.

At this point the Program has discussed potential compensatory mitigation alternatives for the 2.76 acres of wetlands anticipated to be impacted by the berm footprint. There is currently no plan for wetland mitigation; however, the Program will be ready to discuss compensatory mitigation when that time arrives.

4. If a permit is issued and if the project is completed, will there be any plan to monitor the impacts of the dike? How/how often will the site be monitored after target flows/high flows have passed? What type of data will be gathered?

If a permit issued, the Program will create a monitoring plan utilizing all tools available in the area. The Program currently has several monitoring wells around the project site and also has stream gage stations in place above and below the proposed CMP in the North River Road Channel. The Program has been gathering water level data for both groundwater and surface water and can use this information as a baseline to be compared to post-construction flows and groundwater level conditions. Monitoring locations are shown in Figure 1 in Appendix A. Following construction, the Program could also monitor downstream wetlands for potential impacts.

6.0 DISCHARGE MATERIAL AND IMPACTS

Native onsite soil will be used to make improvements to the State Channel berm. There will not be any fill material brought into the area from offsite locations to complete construction. Discharge of fill is unavoidable in order to complete construction. An estimate of permanent impacts is provided in the tables below. Temporary impacts would be expected but have not been estimated at this point in time.

The berm improvements will require onsite soil and small quantities of riprap around the 18-inch CMP within the North River Road Channel. The estimated fill quantities are as follows:

Table 3: State Channel Project Impact Quantities

Location	Description	Estimated Fill Quantity (CY)	Material
1	North River Road Channel Extension	105	Soil
2	North River Road Channel Berm	325	Soil
3	State Channel Berm	655	Soil
4	North River Road Channel CMP Erosion Control	40	Rip-rap
Total		1,125	

Table 4: State Channel Project Impact Area

Location	Description	Impact Area (Acres)
1	North River Road Channel Extension	0.16
2	North River Road Channel Berm	0.19
3	State Channel Berm	2.40
4	North River Road Channel CMP Erosion Control	0.01
Total		2.76

The total estimated impact for the project over totals 2.76 acres based on the preliminary design. The lengths and widths shown in Figure 1 in Appendix A are approximate.

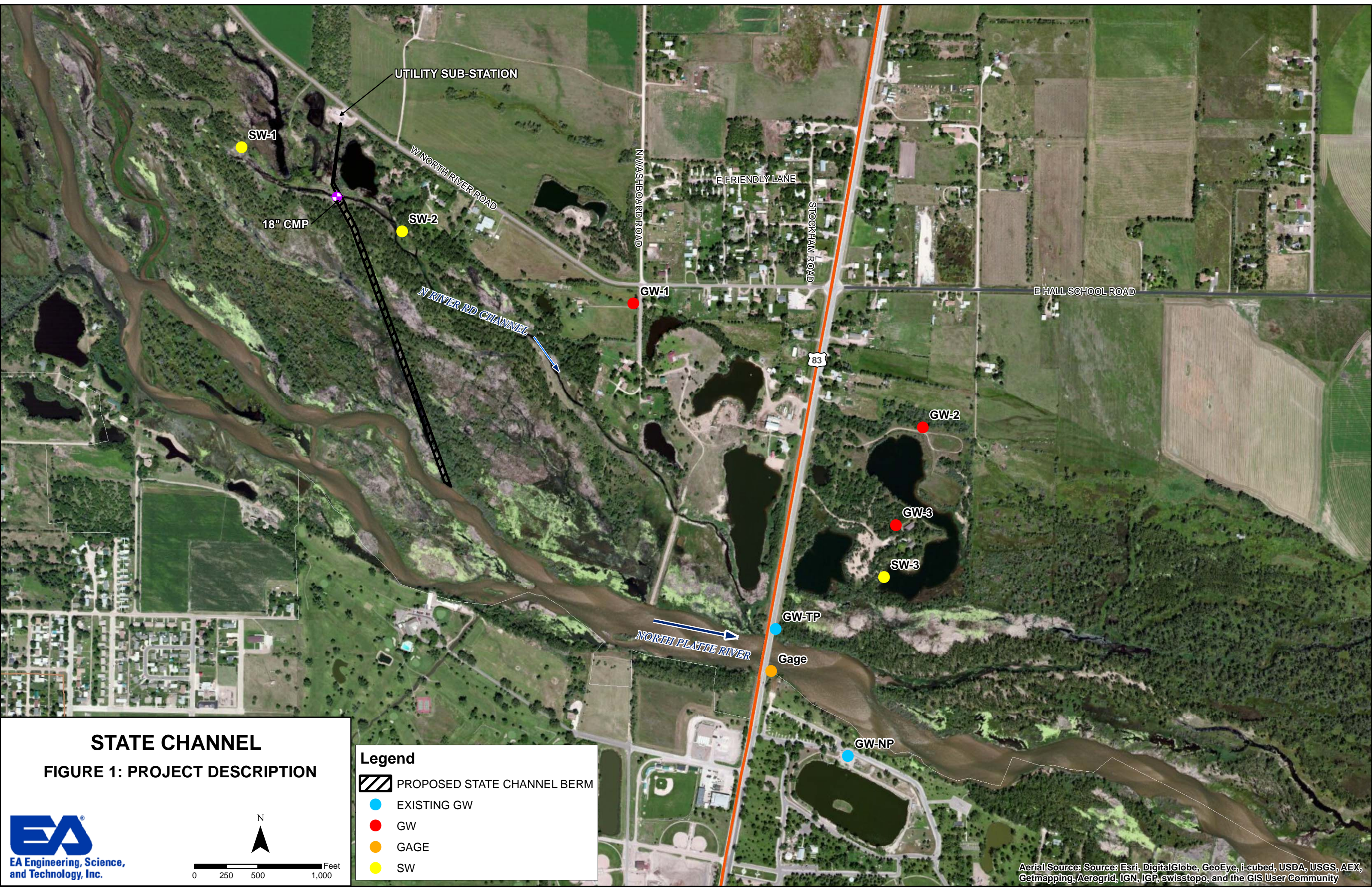
7.0 AVOIDANCE, MINIMIZATION, & COMPENSATION

The preliminary design included elements to minimize or avoid impacts to aquatic resources as summarized below:

- During construction, efforts will be taken to minimize disturbances and discharge during construction.
- Another alternative for the berm was considered 500 feet upstream but would have resulted in far greater impacts to aquatic resources.
- The Program has also considered an alternative that would have extended the berm from the end of the proposed location to the east 2,000 feet along the north bank, but this would have resulted in greater impacts to aquatic resources.
- The current design includes an 18-inch CMP that would allow passage of normal 'base flows' to continue down the North River Road Channel. This was included in the design to minimize impacts to the existing hydrology within this channel.

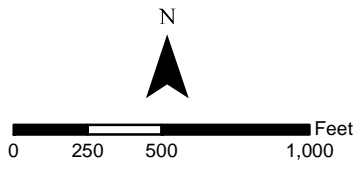
If necessary, the Program will consider onsite mitigation alternatives including enhancement or creation of wetlands near the berm construction site. As of the time which this application was submitted the Program has not specifically evaluated mitigation alternatives.

Attachment A – Figures



STATE CHANNEL

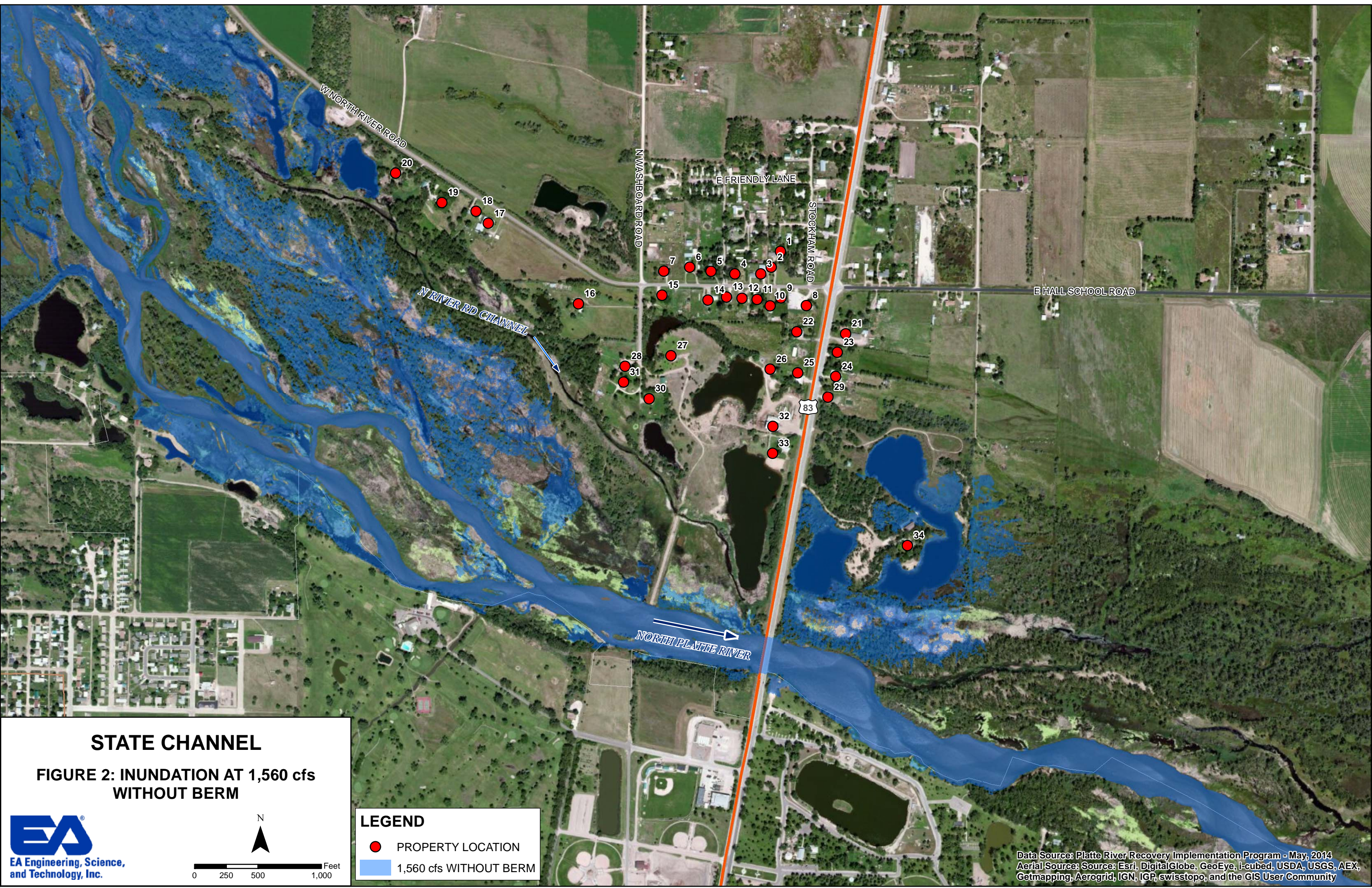
FIGURE 1: PROJECT DESCRIPTION



Legend

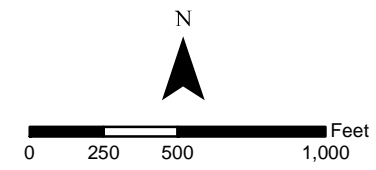
- PROPOSED STATE CHANNEL BERM
- EXISTING GW
- GW
- GAGE
- SW

Aerial Source: Esri, DigitalGlobe, GeoEye, i-cubed, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community



STATE CHANNEL

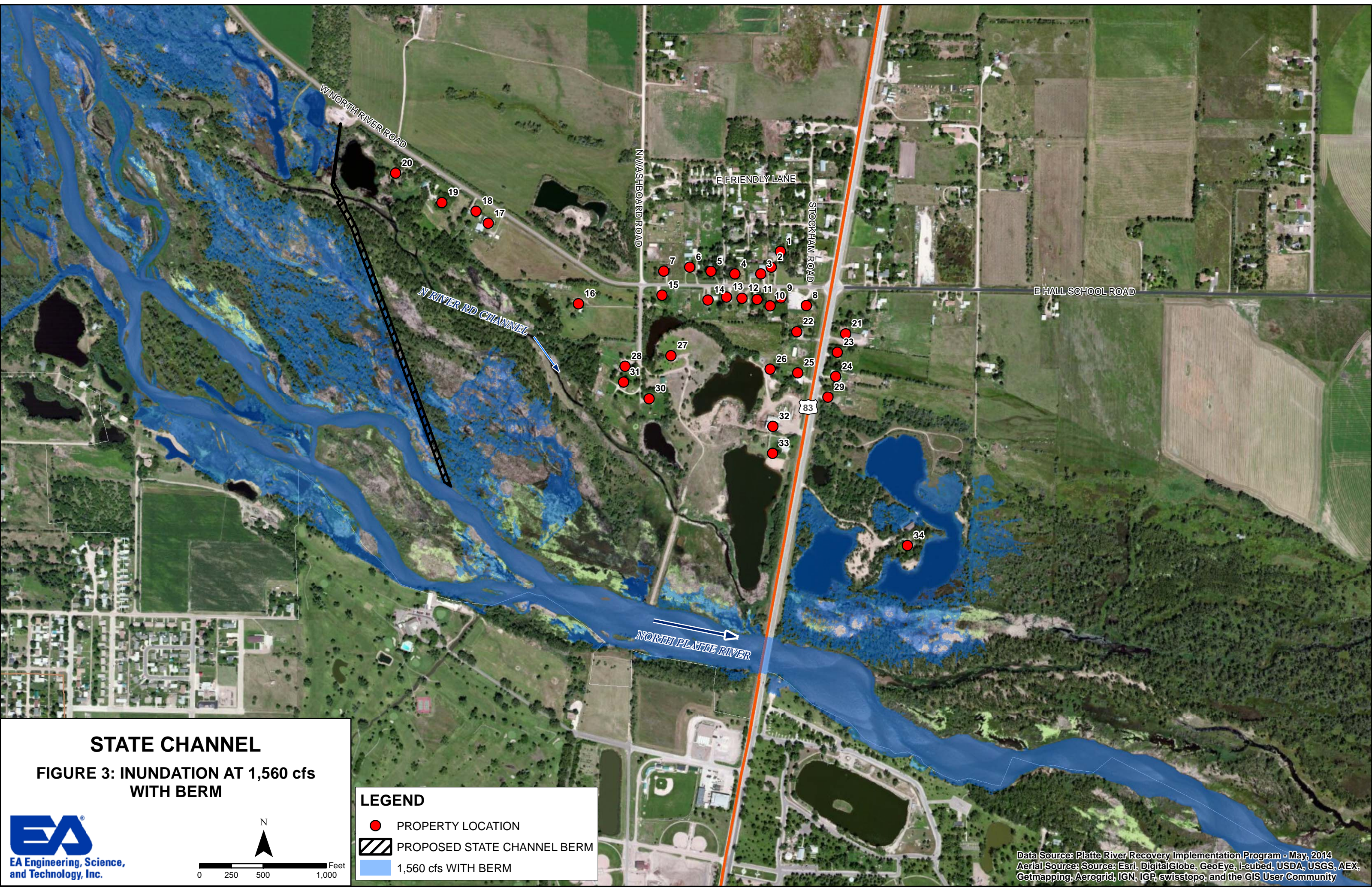
**FIGURE 2: INUNDATION AT 1,560 cfs
WITHOUT BERM**



LEGEND

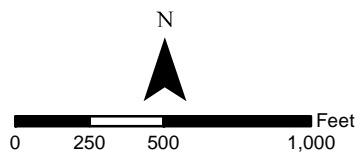
- PROPERTY LOCATION
- 1,560 cfs WITHOUT BERM

Data Source: Platte River Recovery Implementation Program - May, 2014
Aerial Source: Source: Esri, DigitalGlobe, GeoEye, i-cubed, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community



STATE CHANNEL

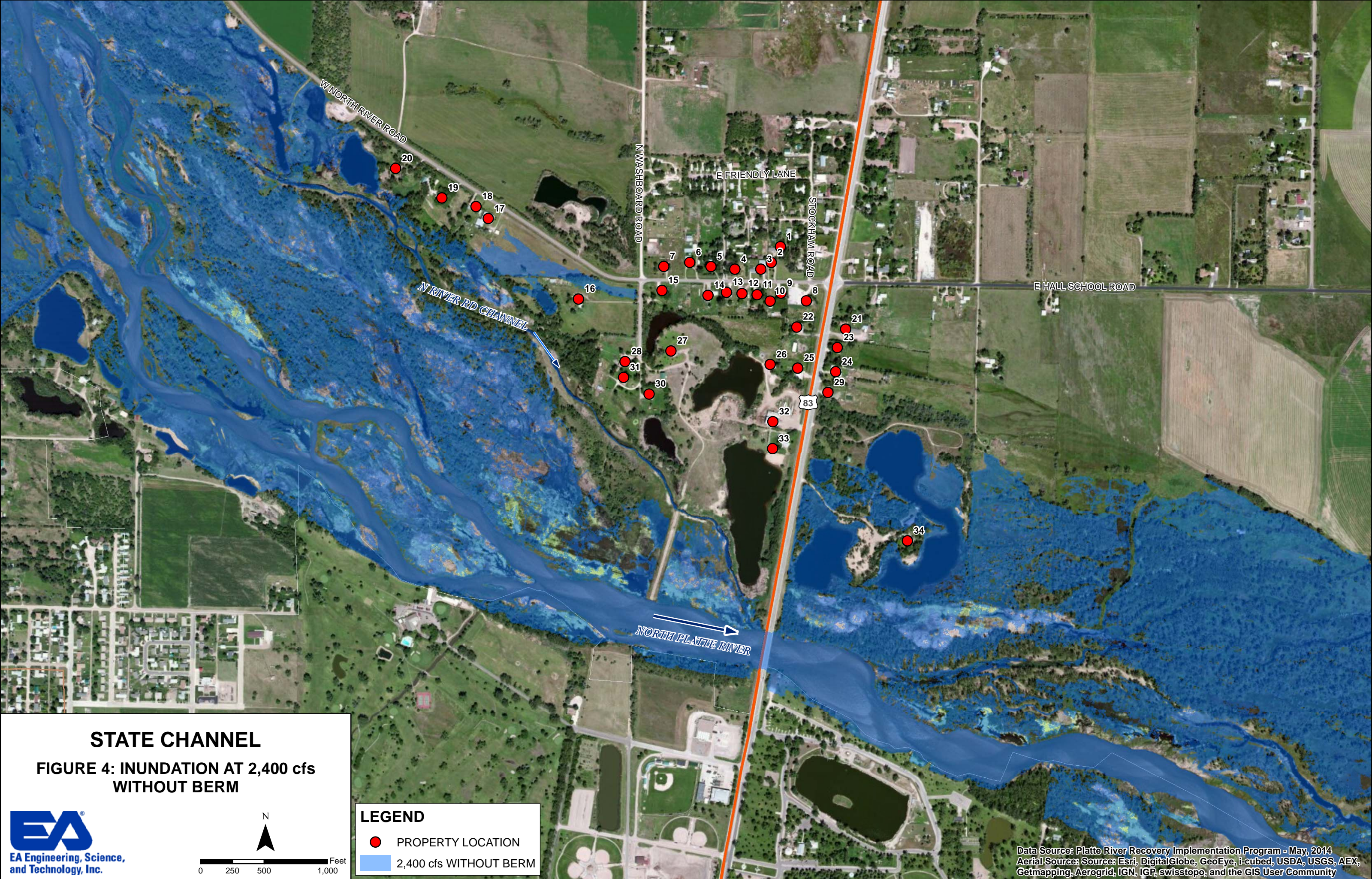
FIGURE 3: INUNDATION AT 1,560 cfs
WITH BERM



LEGEND

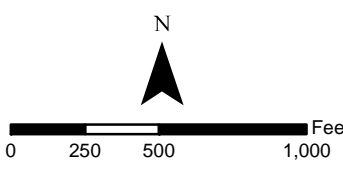
- PROPERTY LOCATION
- PROPOSED STATE CHANNEL BERM
- 1,560 cfs WITH BERM

Data Source: Platte River Recovery Implementation Program - May, 2014
Aerial Source: Source: Esri, DigitalGlobe, GeoEye, i-cubed, USDA, USGS, AEX,
Getmapping, Aerogrid, IGN, ICP, swisstopo, and the GIS User Community



STATE CHANNEL

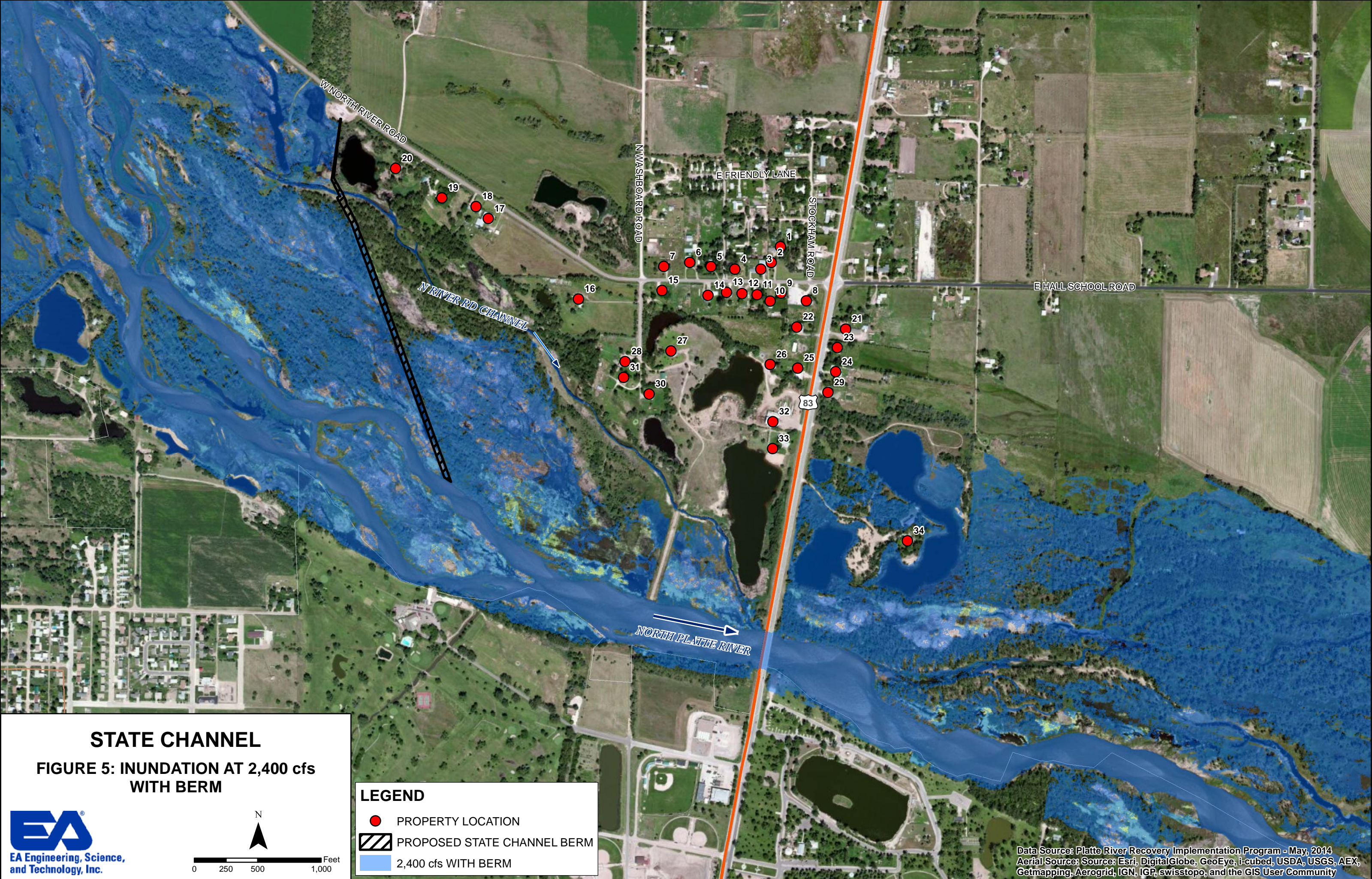
**FIGURE 4: INUNDATION AT 2,400 cfs
WITHOUT BERM**



LEGEND

- PROPERTY LOCATION
- 2,400 cfs WITHOUT BERM

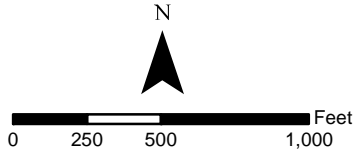
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Aerial Source: Source: Esri, DigitalGlobe, GeoEye, i-cubed, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community



Data Source: Platte River Recovery Implementation Program - May, 2014
Aerial Source: Source: Esri, DigitalGlobe, GeoEye, i-cubed, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community

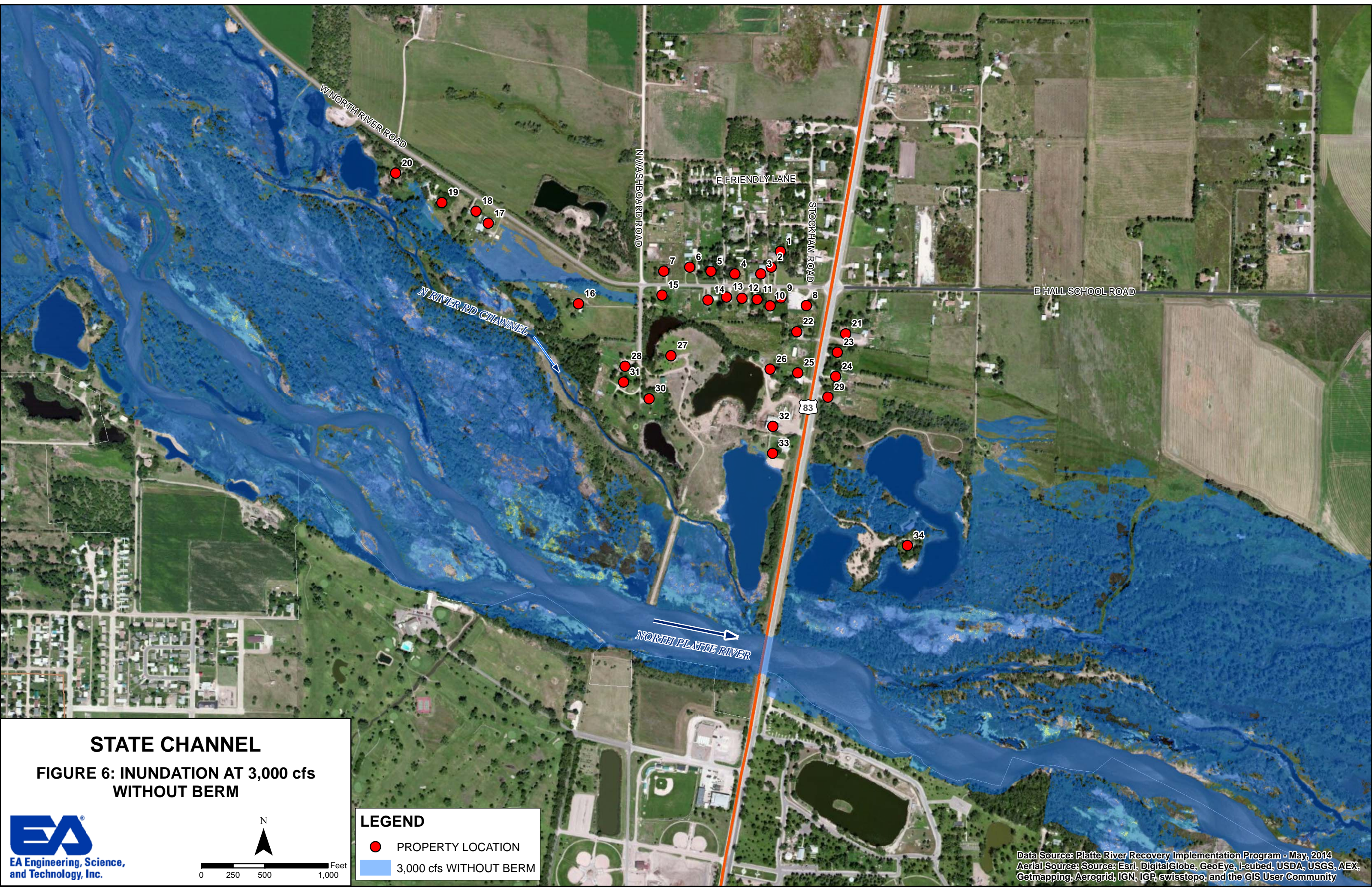
STATE CHANNEL

**FIGURE 5: INUNDATION AT 2,400 cfs
WITH BERM**



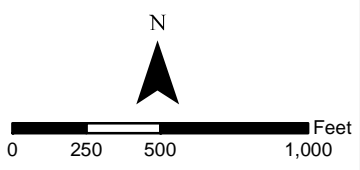
LEGEND

- PROPERTY LOCATION
- PROPOSED STATE CHANNEL BERM
- 2,400 cfs WITH BERM



STATE CHANNEL

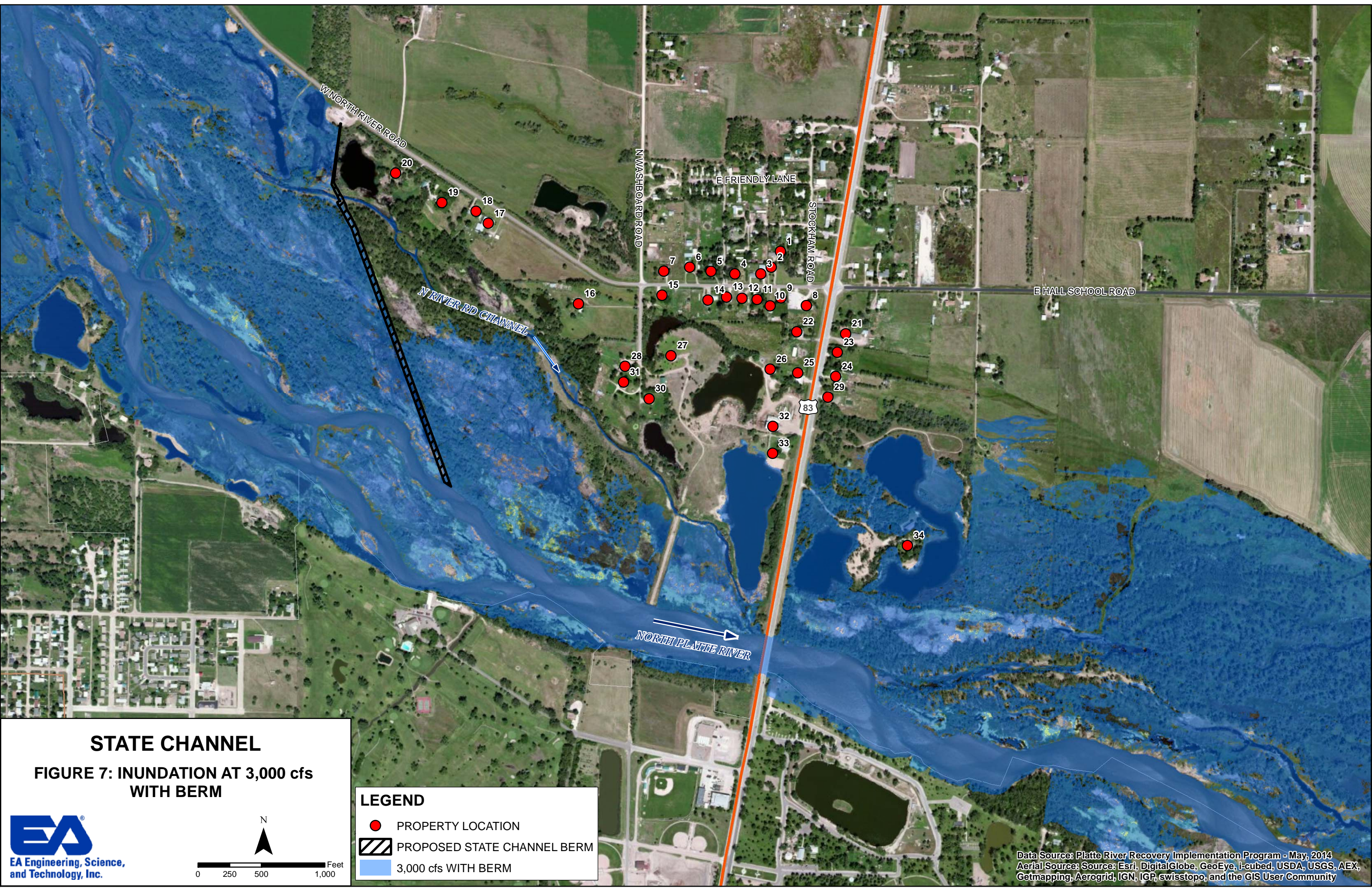
**FIGURE 6: INUNDATION AT 3,000 cfs
WITHOUT BERM**



LEGEND

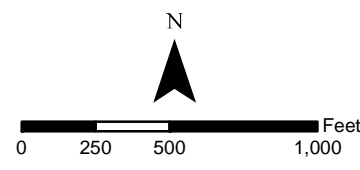
- PROPERTY LOCATION
- 3,000 cfs WITHOUT BERM

Data Source: Platte River Recovery Implementation Program - May, 2014
Aerial Source: Esri, DigitalGlobe, GeoEye, i-cubed, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community



STATE CHANNEL

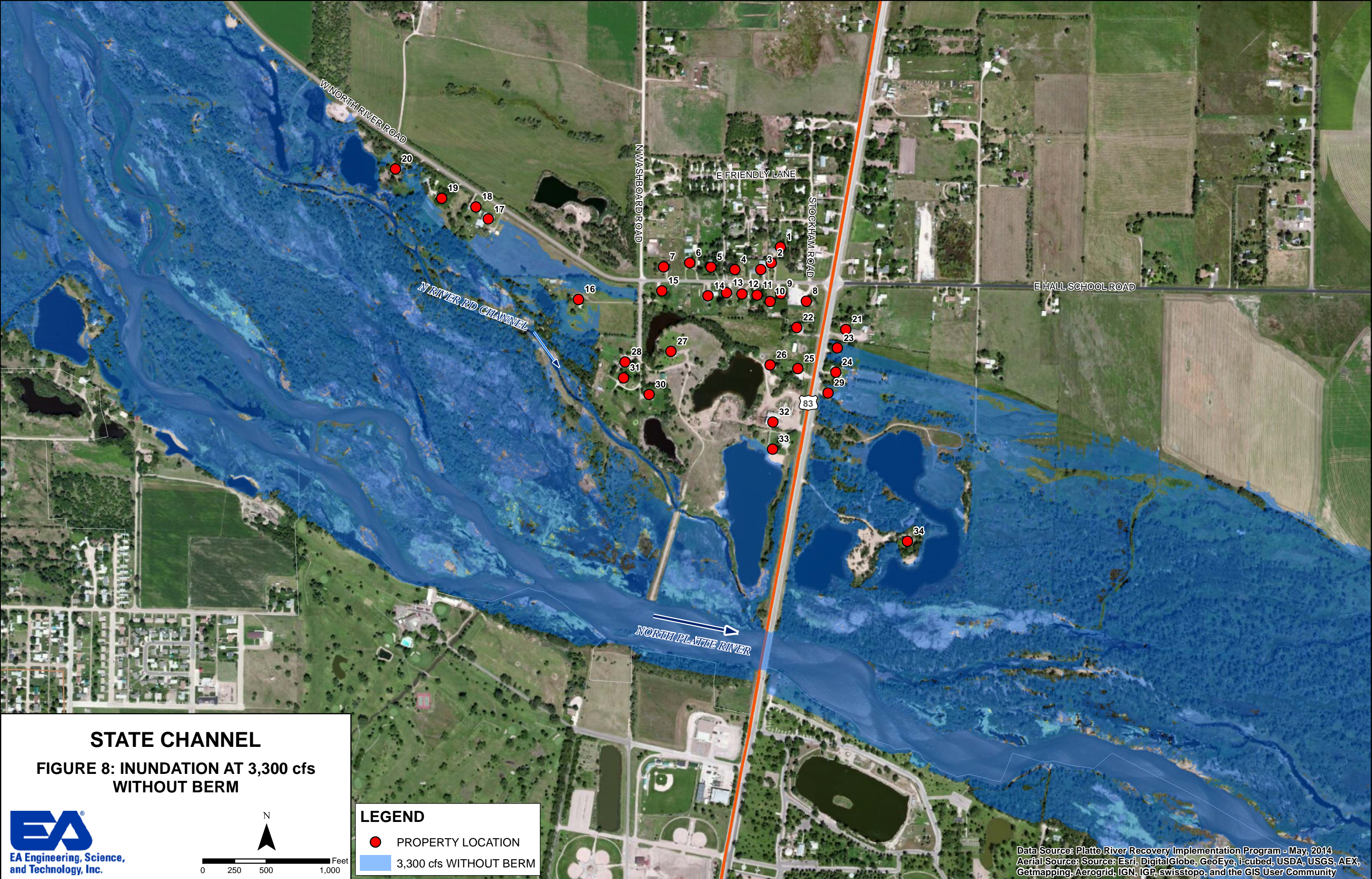
**FIGURE 7: INUNDATION AT 3,000 cfs
WITH BERM**



LEGEND

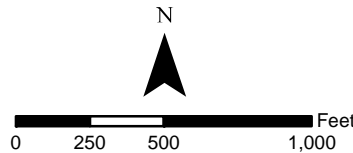
- PROPERTY LOCATION
- PROPOSED STATE CHANNEL BERM
- 3,000 cfs WITH BERM

Data Source: Platte River Recovery Implementation Program - May, 2014
Aerial Source: Esri, DigitalGlobe, GeoEye, i-cubed, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community



STATE CHANNEL

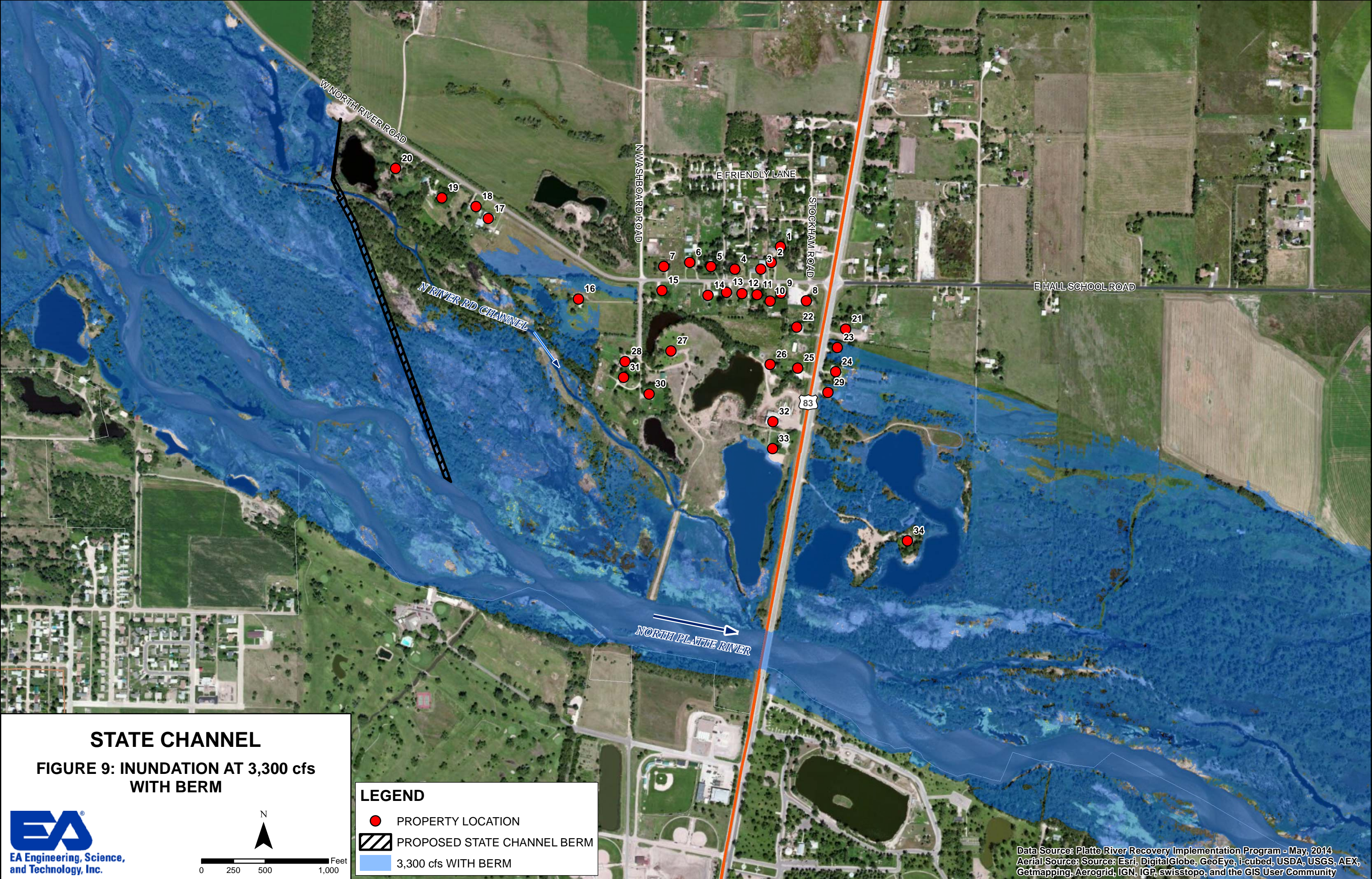
**FIGURE 8: INUNDATION AT 3,300 cfs
WITHOUT BERM**



LEGEND

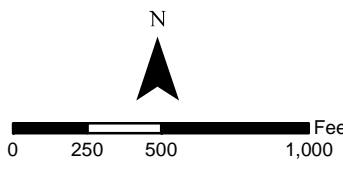
- PROPERTY LOCATION
- 3,300 cfs WITHOUT BERM

Data Source: Platte River Recovery Implementation Program - May, 2014
Aerial Source: Source: Esri, DigitalGlobe, GeoEye, i-cubed, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, ICP, swisstopo, and the GIS User Community



STATE CHANNEL

**FIGURE 9: INUNDATION AT 3,300 cfs
WITH BERM**



LEGEND

- PROPERTY LOCATION
- PROPOSED STATE CHANNEL BERM
- 3,300 cfs WITH BERM

Data Source: Platte River Recovery Implementation Program - May, 2014
Aerial Source: Source: Esri, DigitalGlobe, GeoEye, i-cubed, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community

Attachment B – Form 4345

17. DIRECTIONS TO THE SITE

From the intersection of Highway 30 and Highway 83 in North Platte, Nebraska, travel north approximately 1.15 miles to North River Road. Travel west on North River Road approximately 0.8 miles. Project location will be on the south side of North River Road.

18. Nature of Activity (Description of project, include all features)

See Supplemental Information

19. Project Purpose (Describe the reason or purpose of the project, see instructions)

See Supplemental Information

USE BLOCKS 20-23 IF DREDGED AND/OR FILL MATERIAL IS TO BE DISCHARGED

20. Reason(s) for Discharge

See Supplemental Information

21. Type(s) of Material Being Discharged and the Amount of Each Type in Cubic Yards:

Type	Type	Type
Amount in Cubic Yards	Amount in Cubic Yards	Amount in Cubic Yards

See Supplemental Information

22. Surface Area in Acres of Wetlands or Other Waters Filled (see instructions)

Acres See Supplemental Information
or
Linear Feet

23. Description of Avoidance, Minimization, and Compensation (see instructions)

See Supplemental Information

24. Is Any Portion of the Work Already Complete? ☐ Yes ☒ No IF YES, DESCRIBE THE COMPLETED WORK

Construction has not started, preliminary design is underway.

25. Addresses of Adjoining Property Owners, Lessees, Etc., Whose Property Adjoins the Waterbody (If more than can be entered here, please attach a supplemental list).

a. Address- See Original Application

City - NA State - NA Zip - NA

b. Address- NA

City - NA State - NA Zip - NA

c. Address- NA

City - NA State - NA Zip - NA

d. Address- NA

City - NA State - NA Zip - NA

e. Address- NA

City - NA State - NA Zip - NA

26. List of Other Certificates or Approvals/Denials received from other Federal, State, or Local Agencies for Work Described in This Application.

AGENCY	TYPE APPROVAL*	IDENTIFICATION NUMBER	DATE APPLIED	DATE APPROVED	DATE DENIED
NDEQ	Cons. Stormwater	NA	NA	NA	NA
Lincoln Co.	Flood Plain	NA	NA	NA	NA

* Would include but is not restricted to zoning, building, and flood plain permits

27. Application is hereby made for permit or permits to authorize the work described in this application. I certify that this information in this application is complete and accurate. I further certify that I possess the authority to undertake the work described herein or am acting as the duly authorized agent of the applicant.

SIGNATURE OF APPLICANT

DATE

SIGNATURE OF AGENT

DATE

The Application must be signed by the person who desires to undertake the proposed activity (applicant) or it may be signed by a duly authorized agent if the statement in block 11 has been filled out and signed.

18 U.S.C. Section 1001 provides that: Whoever, in any manner within the jurisdiction of any department or agency of the United States knowingly and willfully falsifies, conceals, or covers up any trick, scheme, or disguises a material fact or makes any false, fictitious or fraudulent statements or representations or makes or uses any false writing or document knowing same to contain any false, fictitious or fraudulent statements or entry, shall be fined not more than \$10,000 or imprisoned not more than five years or both.