

Prairie du Pont/Fish Lake Authorized Level Project Summary Report

Phase I

Prepared for



Prepared by



August 12, 2016

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1. General Information / Background

Authorized Level Project

Following the Southwestern Illinois Flood Prevention District Council's (FPD Council) design and construction of levee improvements that are required for accreditation in accordance with 44 CFR 65.10 criteria (FEMA criteria), the FPD Council desires to advance the implementation of the U.S. Army Corps of Engineers' (USACE) Authorized Level Project. The USACE Authorized Level Project further protects the region from a flood in excess of a 100-year FEMA flood event; specifically, the USACE Authorized Level project protects the many residents and businesses throughout southwestern Illinois against an approximately 500-year flood event (the actual Authorized Level Flood Event is defined as 52 feet on the Mississippi River St. Louis, Missouri gage with 2 feet of freeboard, also called the 52+2 Flood Event).

Amec Foster Wheeler was tasked with reviewing the U.S. Army Corps of Engineers' Authorized Level Project decision segments and evaluating cost effectiveness of the most vulnerable improvements of which the FPD Council could begin engineering and construction.

Prairie du Pont / Fish Lake Levee System

This report covers only a portion of the Prairie du Pont/Fish Lake (PdP/FL) Levee System, hence it is considered Phase I. The Summary Report for the Metro East Sanitary District Levee was submitted on August 13, 2015, while the Wood River Levee Summary Report was submitted on June 17, 2015. All of the vulnerable reaches along the PdP/FL Levee System are located along the main stem (along the Mississippi River) of the levee, except for two reaches along Carr Creek on the southern flank.

USACE Authorized Level Project Decision Segments

The USACE St. Louis District has provided Amec Foster Wheeler and the FPD Council a series of three memorandums that document proposed Authorized Level solutions. Each memo discusses specific reaches (decision segments), but it is important to note that USACE has not completed their re-analyses of the PdP/FL system. The three memos provided (dated 3/15/2016, 4/11/2016, and 6/16/2016) only analyze reaches where the FPD Council either constructed seepage berms or did not construct any improvements as part of its FEMA certification design projects. USACE did not analyze reaches in which the FPD Council constructed relief well improvements; the analyses of those reaches will be provided after USACE receives additional funding appropriation to complete the review, at which time Amec Foster Wheeler will prepare Phase II of this report. The FEMA improvements that the FPD Council undertook to the PdP/FL system are complete.

A decision segment is defined as a length of levee, typically 330 feet or some multiple thereof, that USACE isolated as a basis for analysis. Using available subsurface information, each decision segment was evaluated for protection against underseepage, and a decision was made regarding what underseepage improvements, if any, were needed to correct deficiencies of the particular segment. Underseepage improvements generally consist of seepage berms, fill, relief wells, pump stations, and cutoff walls. Decisions about underseepage improvements were based on factors such as constructability, land use, and cost.

The seepage control improvements recommended by USACE are based on reevaluations of the decision segments performed in the spring/summer of 2016, and follow the 2012 USACE Limited Reevaluation Report for PDP/Fish Lake Levee System (LRR). At the time the LRR was completed, none of the FPD Council's FEMA improvements were constructed; therefore, USACE has noted which reaches have had work done by the FPD Council subsequent to the initial underseepage analysis as part of the LRR in 2012.

2. Recommended Plan

Development of Bid Packages

Amec Foster Wheeler has reviewed the USACE decision segments and recommends that one bid package for construction be developed. The quantity of seepage berm material is anticipated to be extremely large; therefore, we anticipate that contractor(s) will need to dredge the Mississippi river to cost-effectively obtain the volume of sand that will be required. With that assumption, the notion of only one single package for the berm work is appropriate so that there are not multiple contractors with multiple barges at any given time. The relief wells could, in theory, be bid as a separate package, but the relief wells are geographically intermixed with the seepage berms meaning there would be multiple contractors working in the similar areas. When multiple contractors work in the same areas there can be additional costs added to both contracts for coordination and routine items such as traffic control and haul routes can become logistically difficult; furthermore, it can be difficult to determine ownership of any restoration that needs performed to roads and other features, which is exacerbated by the fact that PdP/FL system only has a handful of roads to/from the entire levee system. Additionally, recent increases in construction costs throughout St. Louis metro area suggest that the contracting community is flush with construction work; therefore, contractors may be more selective in their bidding and less likely to bid smaller jobs, resulting in a smaller number of bidders per bid package. Likewise, the FPD Council's FEMA projects have demonstrated that the promise of a large construction job often brings out the most competitive bids from general contractors. Finally, the FPD Council has earned a positive reputation throughout the local contracting community, which also helps in obtaining good bids for construction work.

The single bid package has been named Bid Package 15, which is a continuation of the numbering from the FEMA Certification Design and other Authorized Level Construction packages along both the Wood River and MESD levee systems. The resultant bid package is as follows:

- ▶ Bid Package 15 is comprised of 23 USACE decision segments and spans from Levee Station 227+05 to 735+25. This package includes the abandonment of existing creosote impregnated wood stave relief wells, the construction of 16 new seepage berms and approximately 38 relief wells, all of which are tributary to existing pump stations.
 - Decision Segments:
 - Prairie du Pont – Station 227+05 to 250+15 – Seepage Berm
 - Prairie du Pont – Station 253+45 to 263+35 – Seepage Berm
 - Prairie du Pont – Station 276+55 to 279+85 – Relief Wells
 - Prairie du Pont – Station 283+15 to 289+75 – Relief Wells
 - Prairie du Pont – Station 289+75 to 299+65 – Seepage Berm
 - Prairie du Pont – Station 332+65 to 335+95 – Seepage Berm
 - Prairie du Pont – Station 345+85 to 349+15 – Seepage Berm
 - Prairie du Pont – Station 352+45 to 362+35 – Seepage Berm
 - Prairie du Pont – Station 365+65 to 368+95 – Relief Wells
 - Prairie du Pont – Station 385+45 to 405+25 – Seepage Berm
 - Prairie du Pont – Station 405+25 to 408+55 – Relief Wells
 - Prairie du Pont – Station 421+75 to 425+05 – Seepage Berm
 - Prairie du Pont – Station 477+85 to 487+75 – Seepage Berm
 - Prairie du Pont – Station 497+65 to 510+85 – Seepage Berm
 - Fish Lake – Station 567+35 to 584+65 – Relief Wells
 - Fish Lake – Station 584+65 to 590+05 – Seepage Berm
 - Fish Lake – Station 604+10 to 609+85 – Seepage Berm

- Fish Lake – Station 616+45 to 619+75 – Relief Wells
- Fish Lake – Station 626+35 to 639+55 – Seepage Berm
- Fish Lake – Station 652+75 to 659+35 – Seepage Berm
- Fish Lake – Station 665+95 to 672+55 – Relief Wells
- Fish Lake – Station 705+55 to 725+35 – Seepage Berm
- Fish Lake – Station 731+95 to 735+25 – Seepage Berm

Exhibits are included in Appendix 1 depicting the approximate location of each improvement as part of the recommended plan.

Recommendation

It is recommended that the FPD Council proceed with the following work:

Geotechnical Analyses of:

- All relief wells required for the decision segments in this report
- All seepage berms required for the decision segments in this report

Subsurface investigations of:

- All relief wells required for the decision segments in this report
- All seepage berms required for the decision segments in this report

Design, Permitting, and Bid Phase Services of:

- All relief wells required for the decision segments in this report
- All seepage berms required for the decision segments in this report

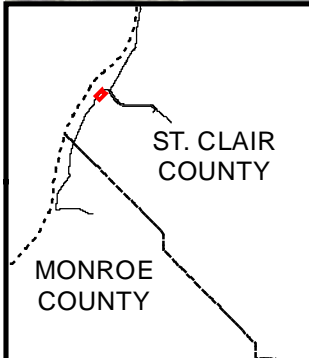
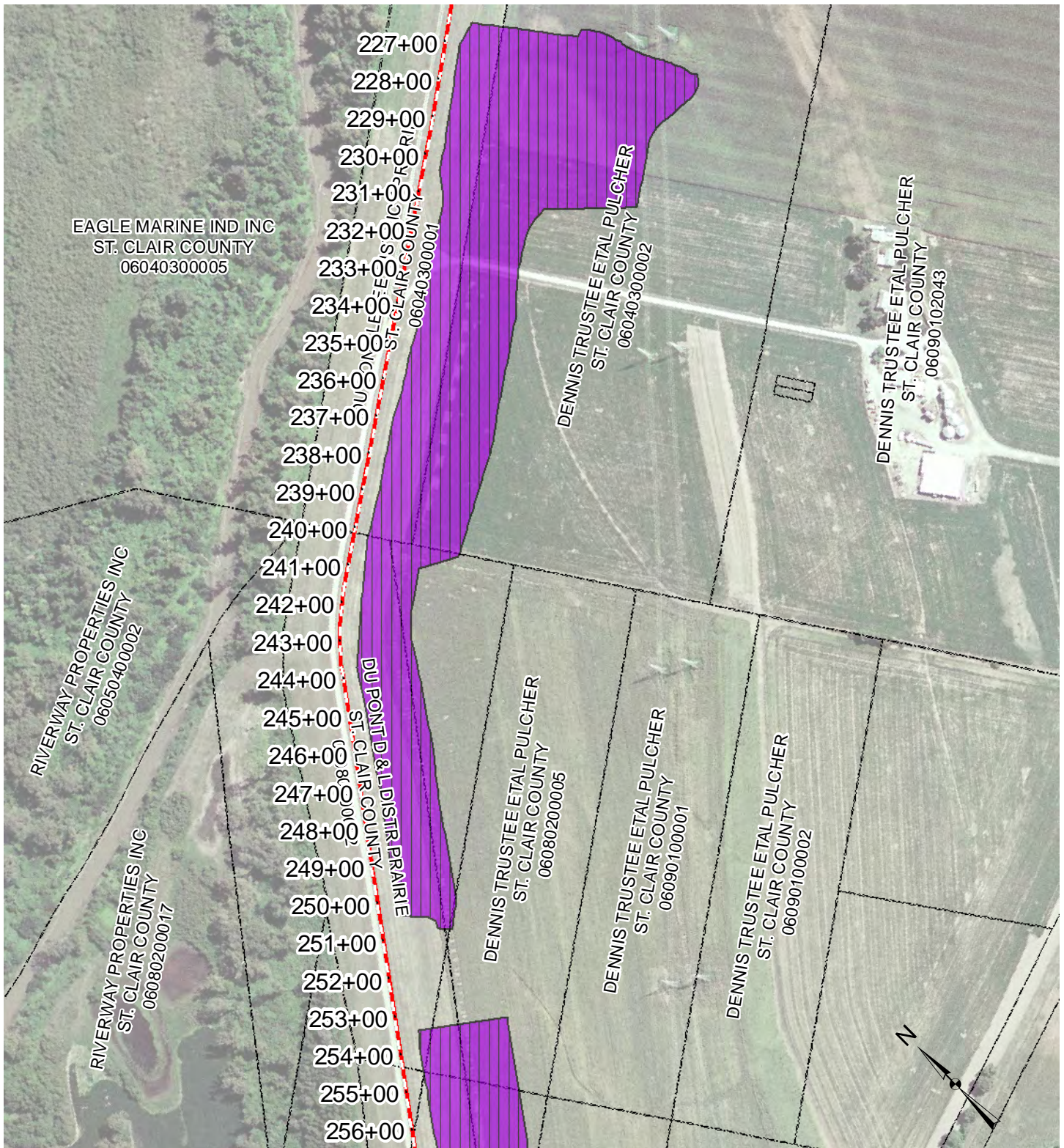
3. Schedule

Upon Board approval of this Plan, Amec Foster Wheeler will develop a scope, schedule, and budget cost for the completion of field activities and design for the Bid Package referenced herein and commence work on a boring plan for subsurface investigations throughout PdP/FL, as USACE approval is estimated to be at least 45-60 days once the plan is submitted. If approved, the scope, schedule, and budget cost for geotechnical analyses, field work (including drilling), engineering, permitting, and bid phase services, will be presented at the September or October 2016 FPD Council board meeting.

4. Risk in Moving Forward

Contrary to the Authorized Level plans in both the Wood River and MESD levee systems, the Authorized Level improvements in the PdP/FL system are unique to the FPD Council since there is no future federal project for the PdP/FL system at this time; therefore, any Authorized Level improvements made to the PdP/FL system will be designed and constructed by the FPD Council. The risk in moving forward with this phase of the PdP/FL Authorized Level Plan is minimal, as the FPD Council is not necessarily bound by USACE solutions or USACE schedules. However, the PdP/FL project is not fully permitted, meaning the FPD Council has the additional step of obtaining the necessary regulatory approvals for the Authorized Level improvements in PdP/FL.

Appendix 1 – Bid Package / Design Reach Exhibits



**USACE Authorized Level of
Protection Planning and Analysis**

BID PACKAGE 15

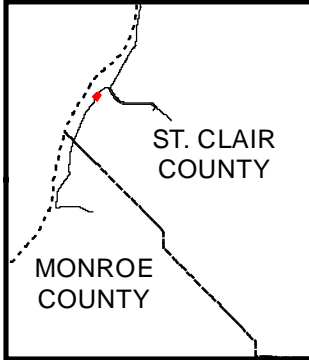
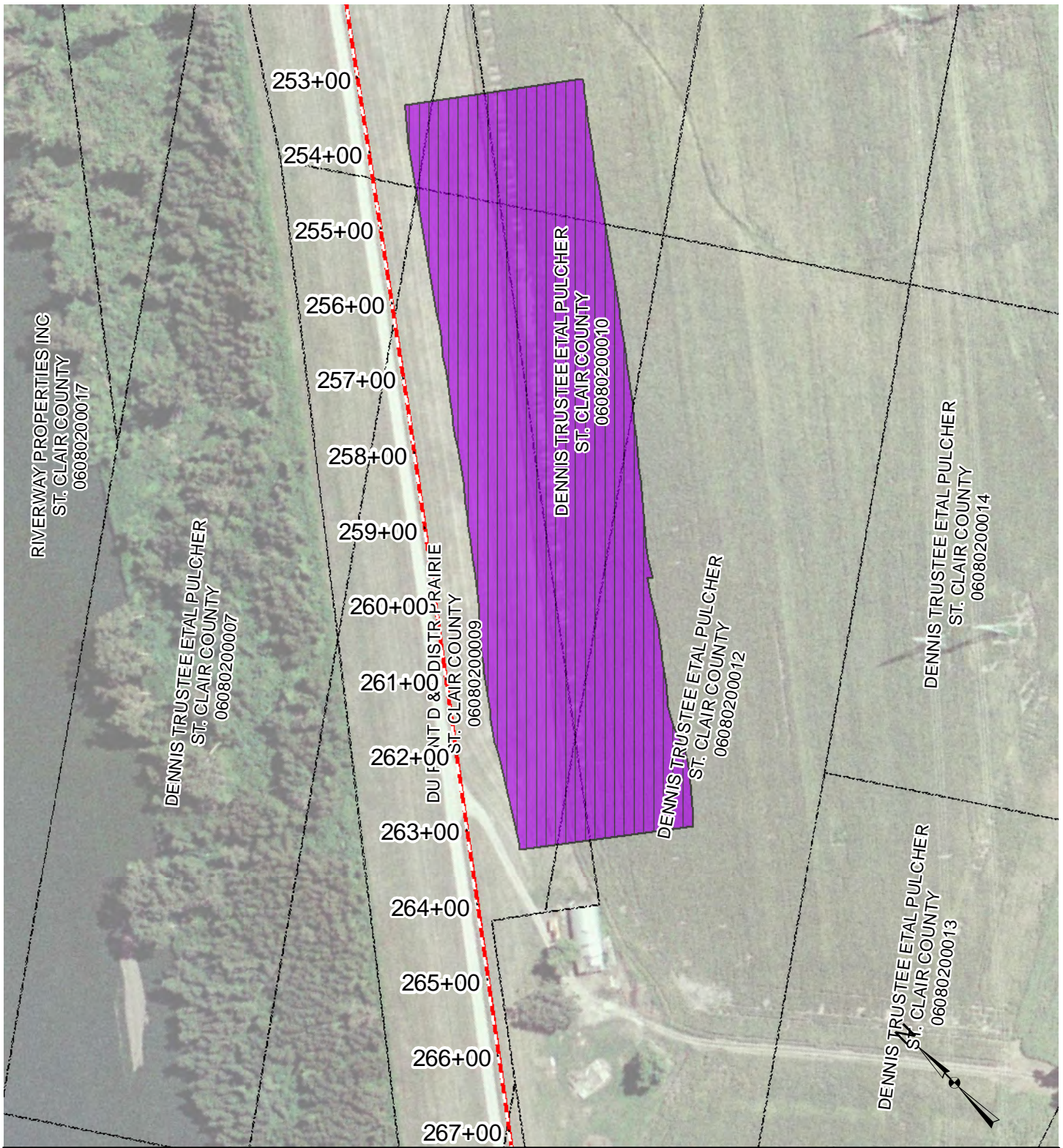
PDP LEVEE SYSTEM

DESIGN STA: 227+05 TO 250+15

08/12/2016 SHEET 1 OF 23

Legend

- Relief Well
- Seepage Berm



**USACE Authorized Level of
Protection Planning and Analysis**

BID PACKAGE 15

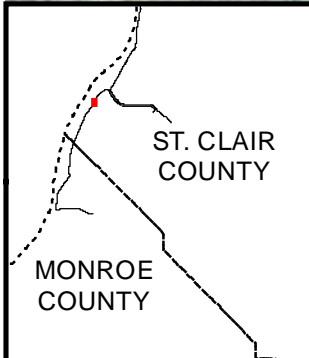
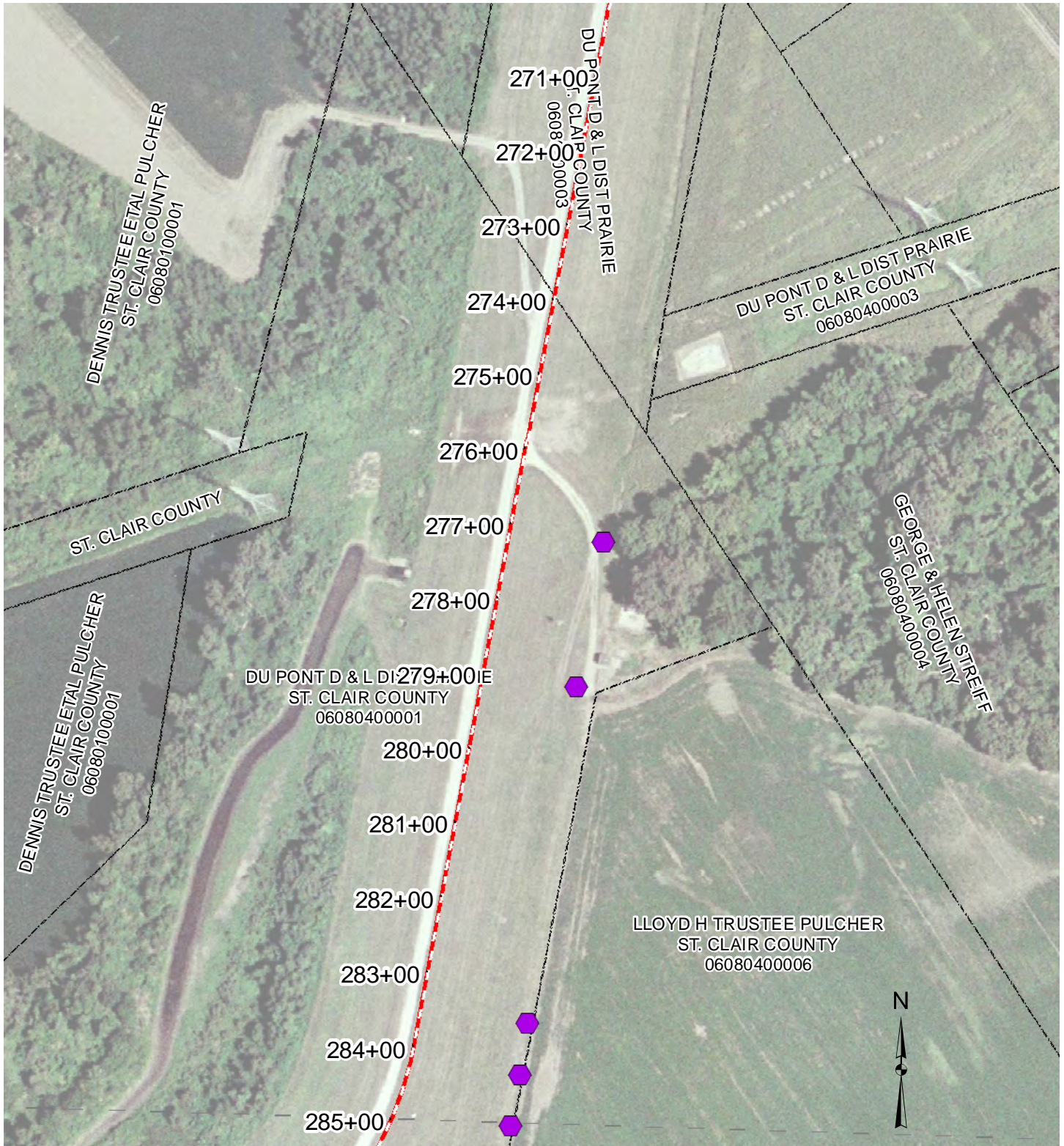
PDP LEVEE SYSTEM

DESIGN STA: 253+45 TO 263+35

08/12/2016 SHEET 2 OF 23

Legend



- Relief Well
- Seepage Berm

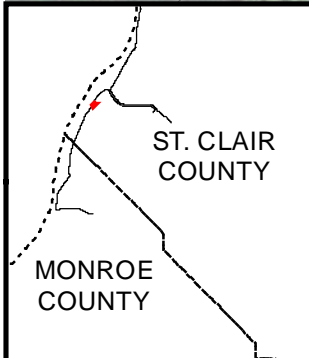
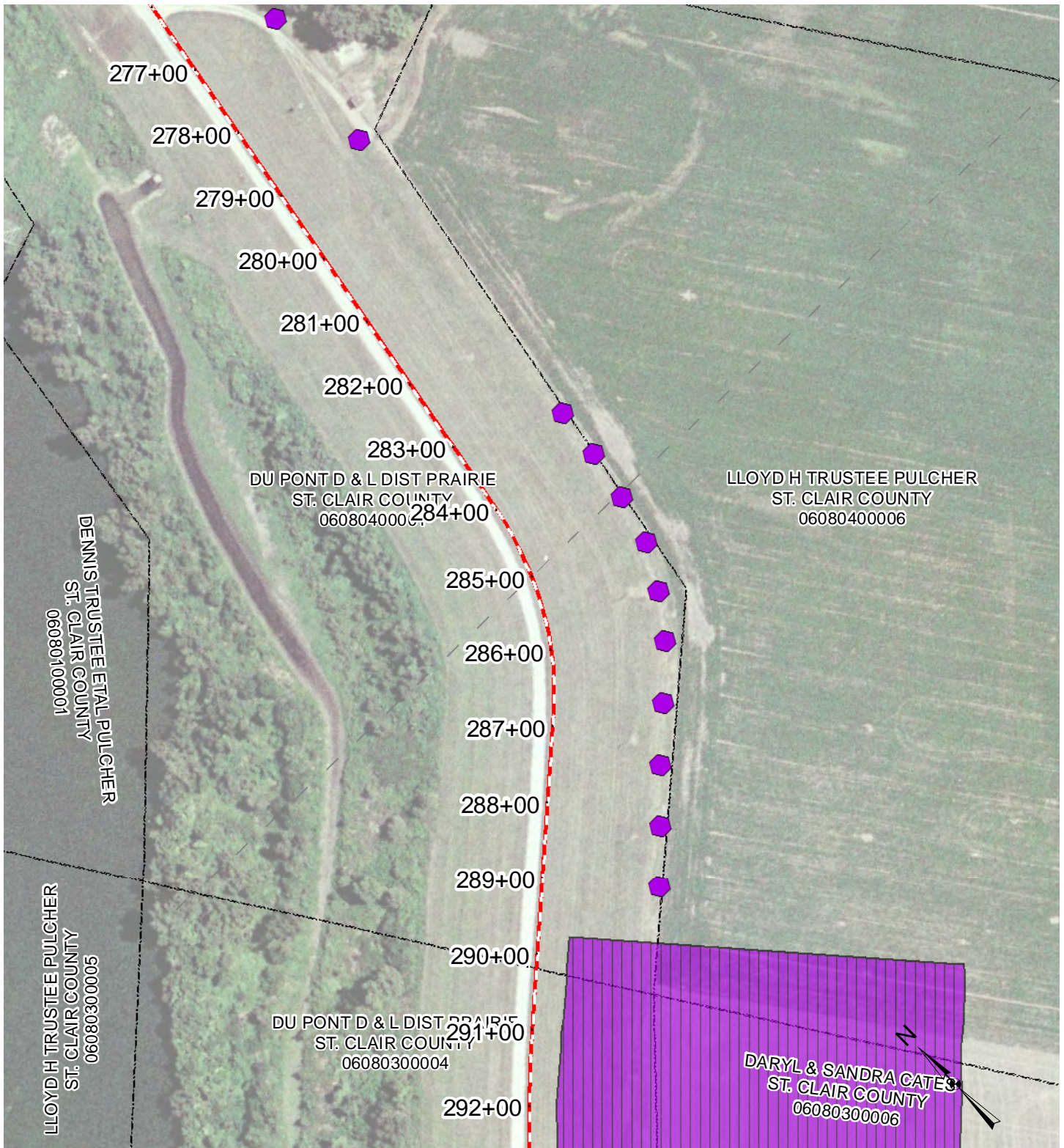


USACE Authorized Level of Protection Planning and Analysis
BID PACKAGE 15
PDP LEVEE SYSTEM
DESIGN STA: 276+55 TO 279+85

08/12/2016 SHEET 3 OF 23

Legend

-  Relief Well
-  Seepage Berm



USACE Authorized Level of Protection Planning and Analysis

BID PACKAGE 15

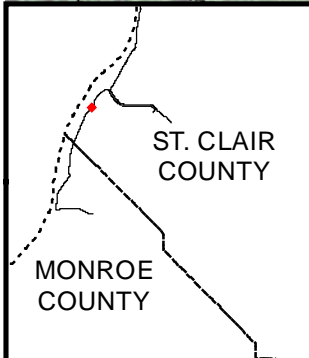
PDP LEVEE SYSTEM

DESIGN STA: 283+15 TO 289+75

08/12/2016 SHEET 4 OF 23

Legend

- Relief Well
- Seepage Berm



**USACE Authorized Level of
Protection Planning and Analysis**



BID PACKAGE 15

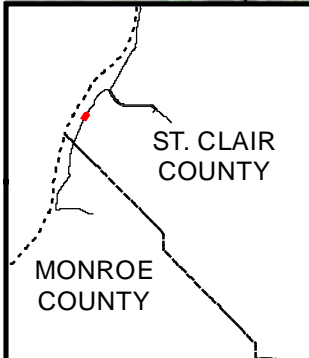
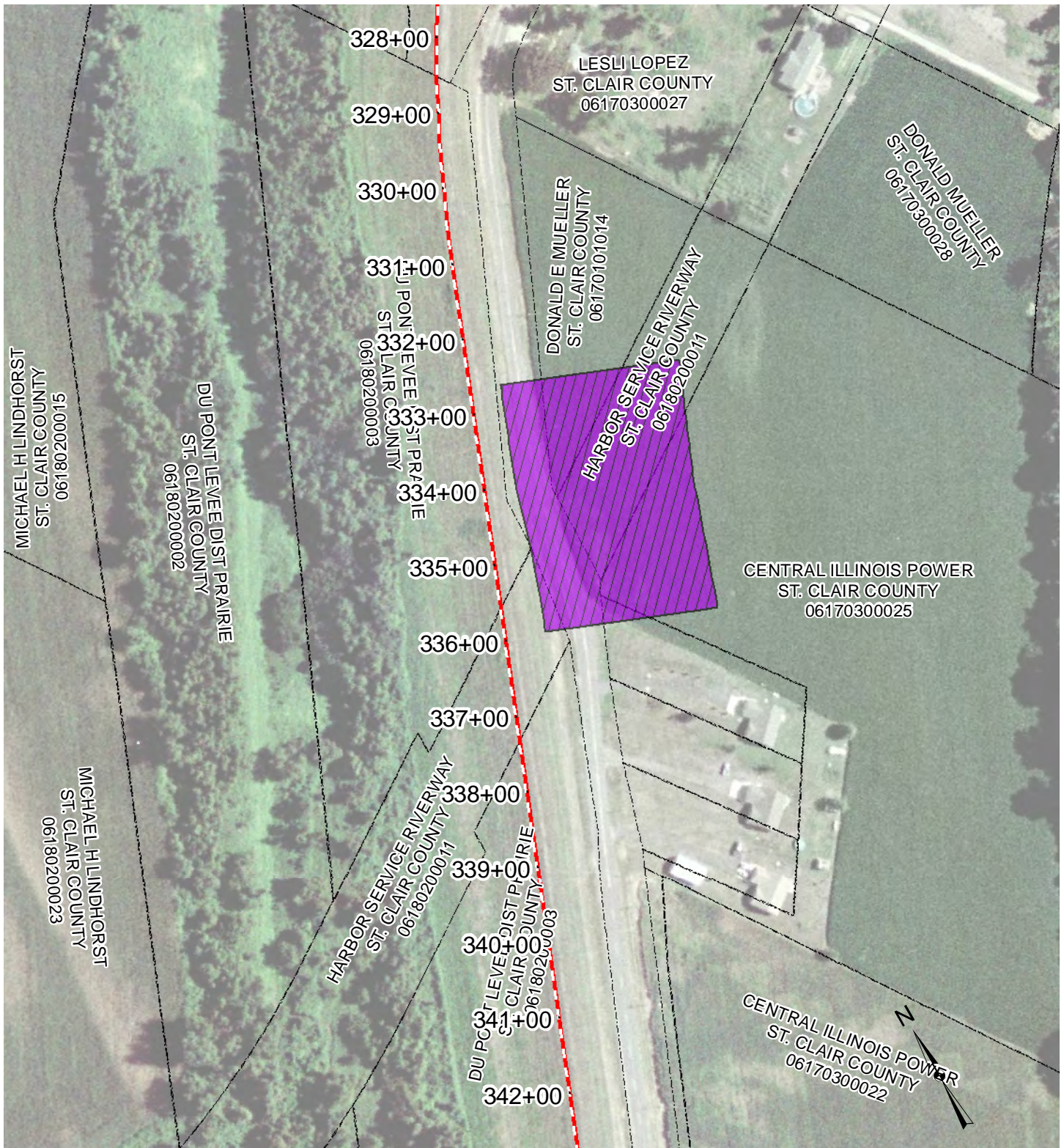
PDP LEVEE SYSTEM

DESIGN STA: 289+75 TO 299+65

08/12/2016 SHEET 5 OF 23

Legend



-  Relief Well
-  Seepage Berm

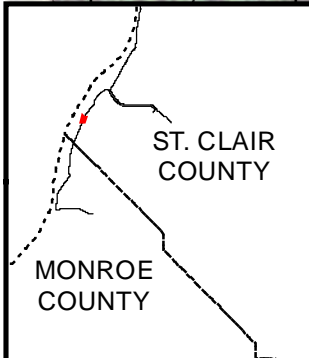
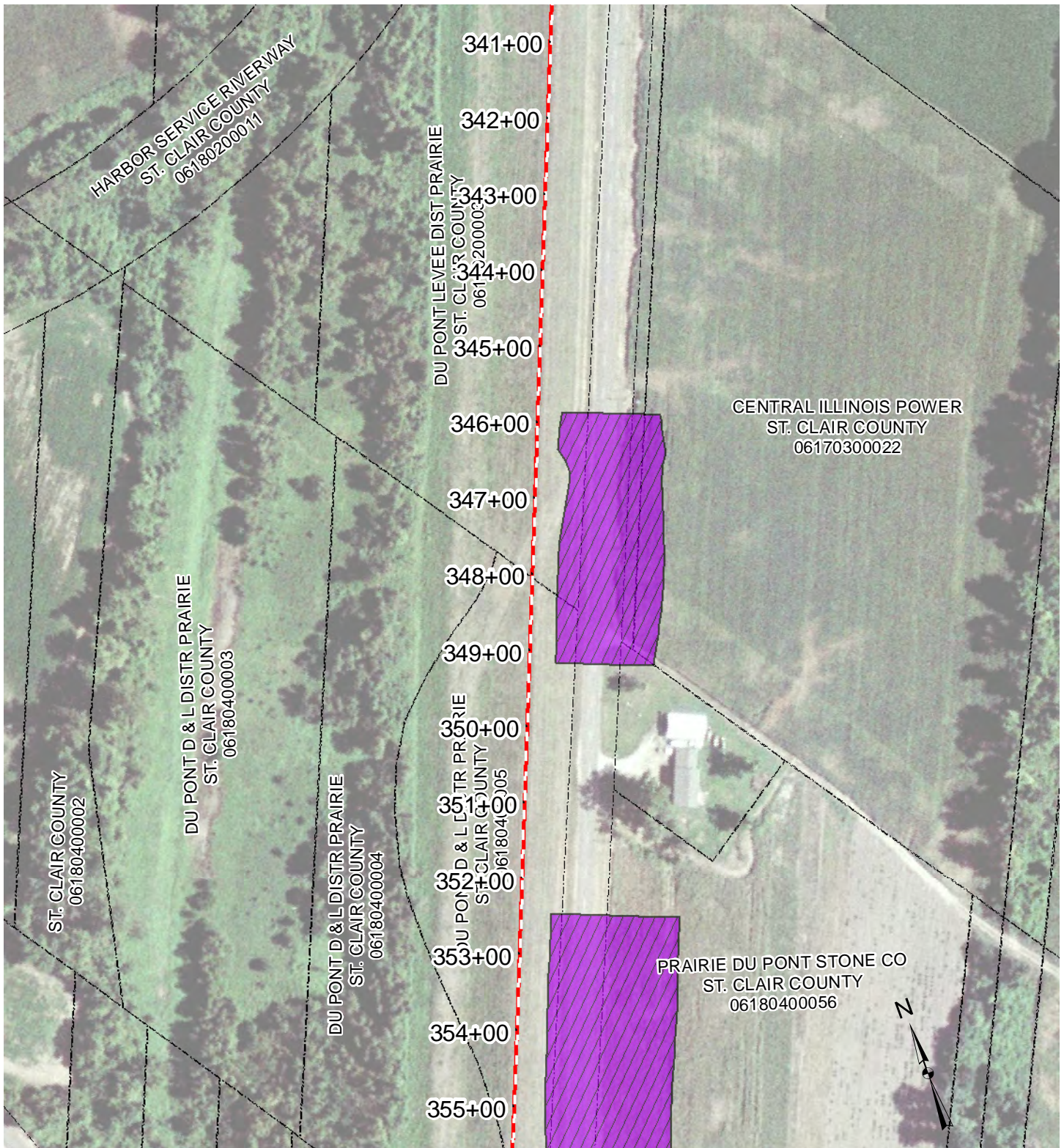


USACE Authorized Level of Protection Planning and Analysis
BID PACKAGE 15
PDP LEVEE SYSTEM
DESIGN STA: 332+65 TO 335+95

08/12/2016 SHEET 6 OF 23

Legend

-  Relief Well
-  Seepage Berm



**USACE Authorized Level of
Protection Planning and Analysis**

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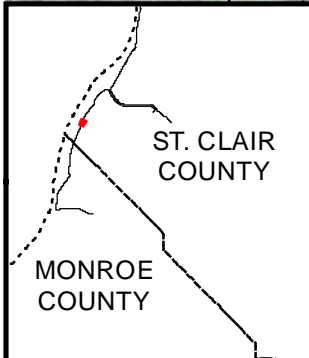
PDP LEVEE SYSTEM

DESIGN STA: 345+85 TO 349+15

08/12/2016 SHEET 7 OF 23

Legend

- Relief Well
- Seepage Berm



USACE Authorized Level of Protection Planning and Analysis

BID PACKAGE 15

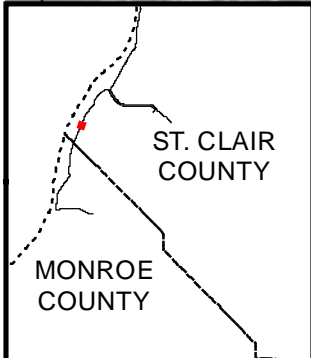
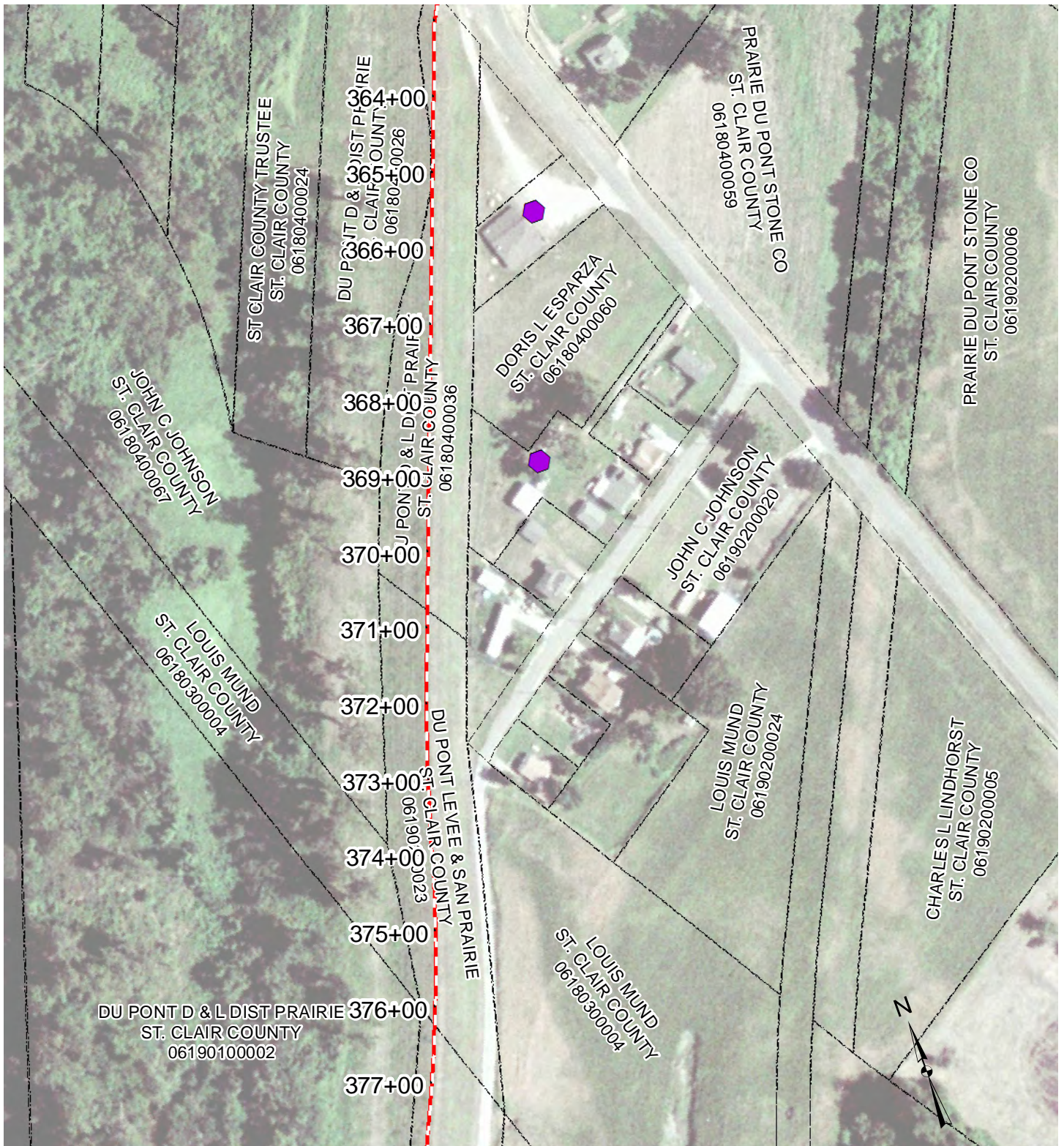
PDP LEVEE SYSTEM

DESIGN STA: 352+45 TO 362+35

08/12/2016 SHEET 8 OF 23

Legend

- Relief Well
- Seepage Berm



USACE Authorized Level of Protection Planning and Analysis

BID PACKAGE 15

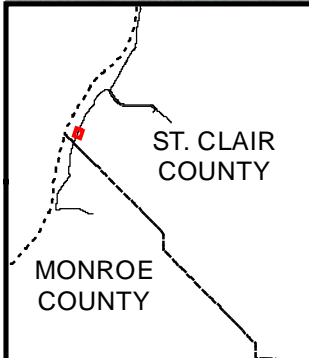
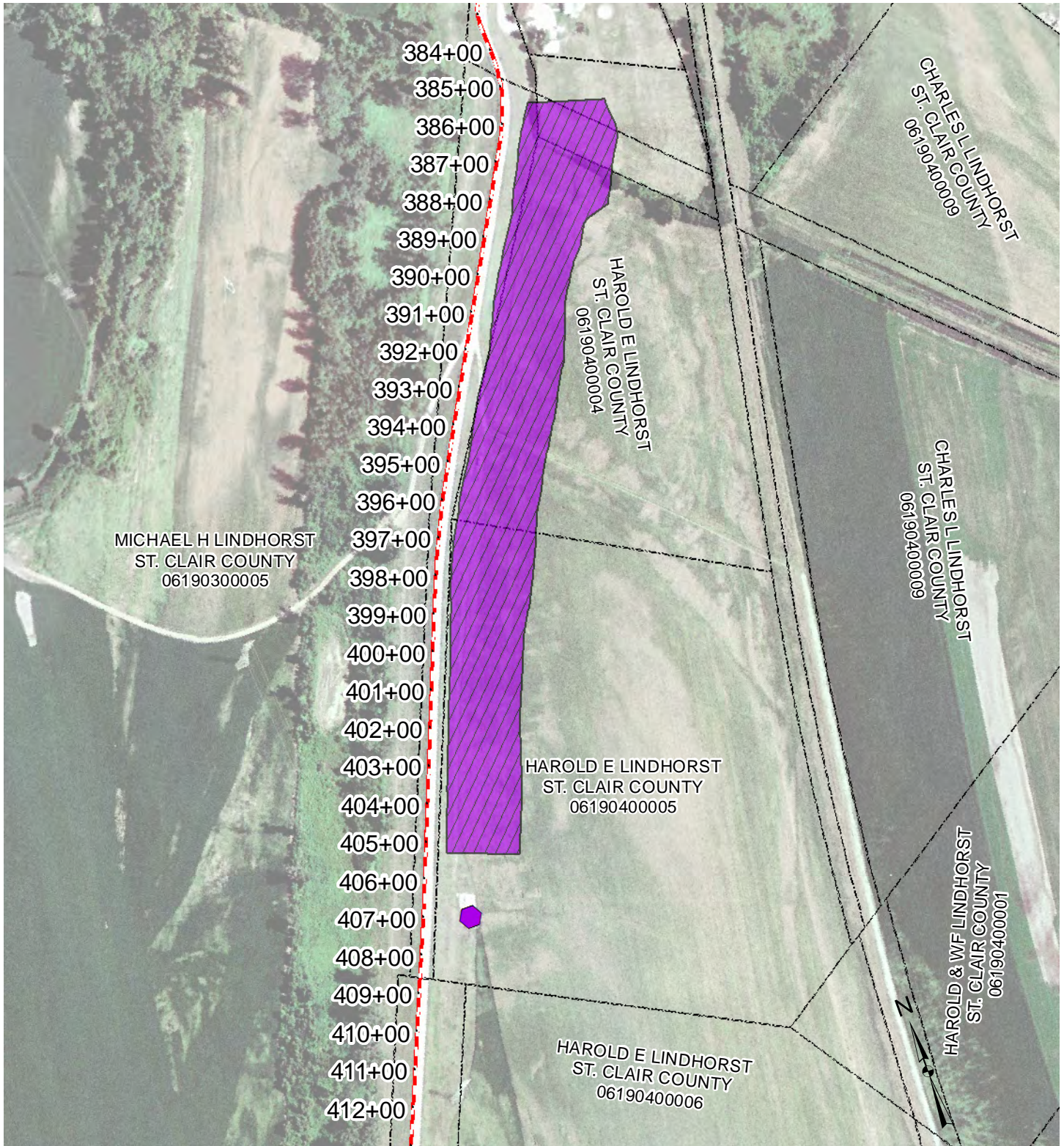
PDP LEVEE SYSTEM

DESIGN STA: 365+65 TO 368+95

08/12/2016 SHEET 9 OF 23

Legend

- Relief Well
- Seepage Berm





USACE Authorized Level of Protection Planning and Analysis

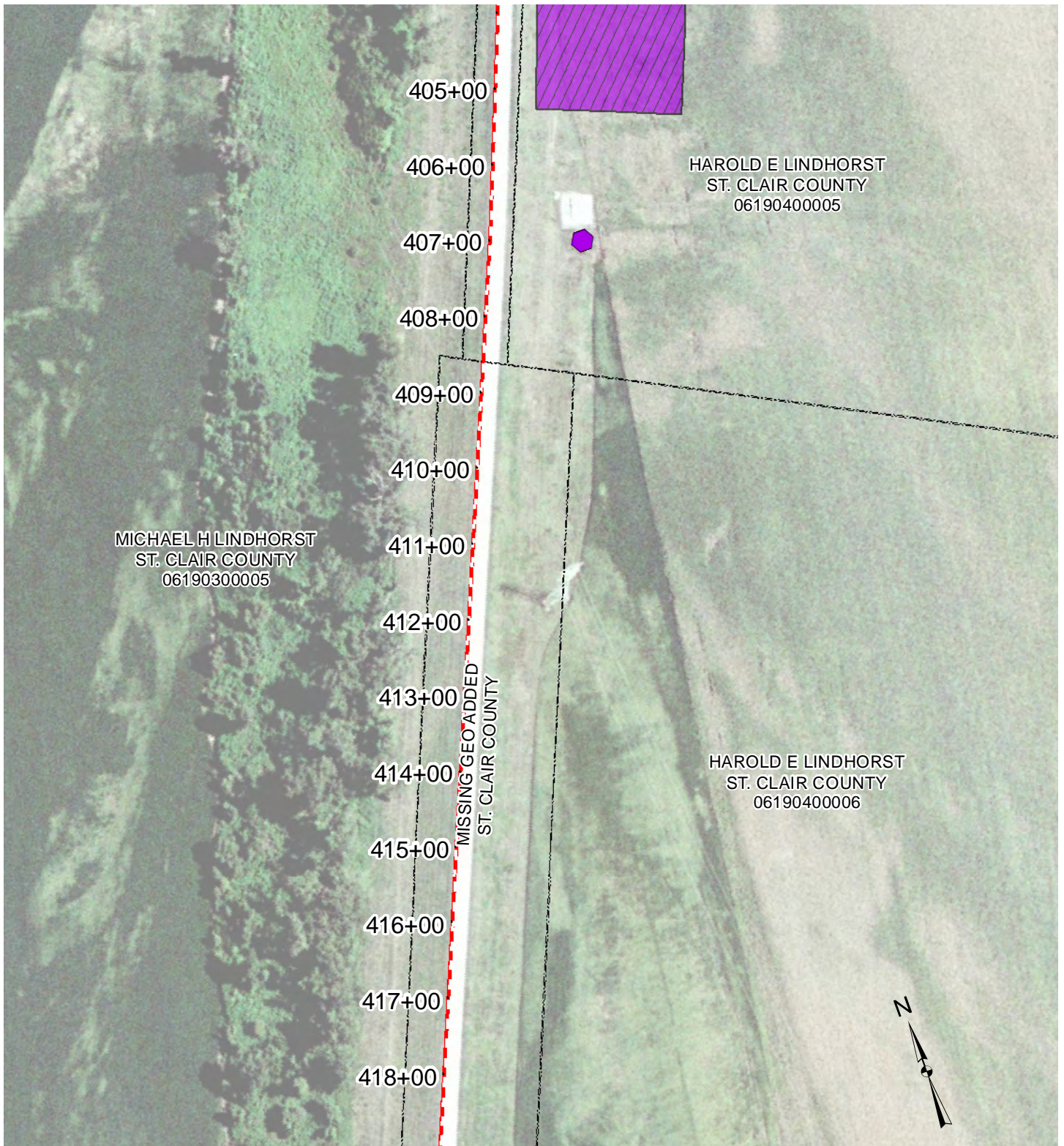
BID PACKAGE 15

PDP LEVEE SYSTEM

DESIGN STA: 385+45 TO 405+25

Legend

-  Relief Well
-  Seepage Berm



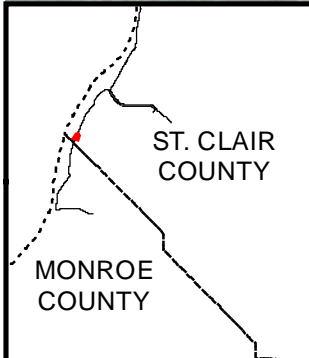
MICHAEL H LINDHORST
ST. CLAIR COUNTY
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HAROLD E LINDHORST
ST. CLAIR COUNTY
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HAROLD E LINDHORST
ST. CLAIR COUNTY
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USACE Authorized Level of Protection Planning and Analysis

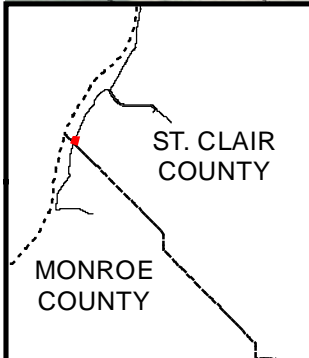
BID PACKAGE 15

PDP LEVEE SYSTEM

DESIGN STA: 405+25 TO 408+55

Legend

-  Relief Well
-  Seepage Berm



**USACE Authorized Level of
Protection Planning and Analysis**



BID PACKAGE 15

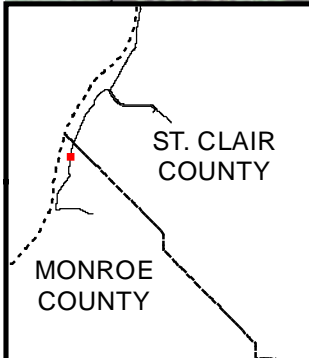
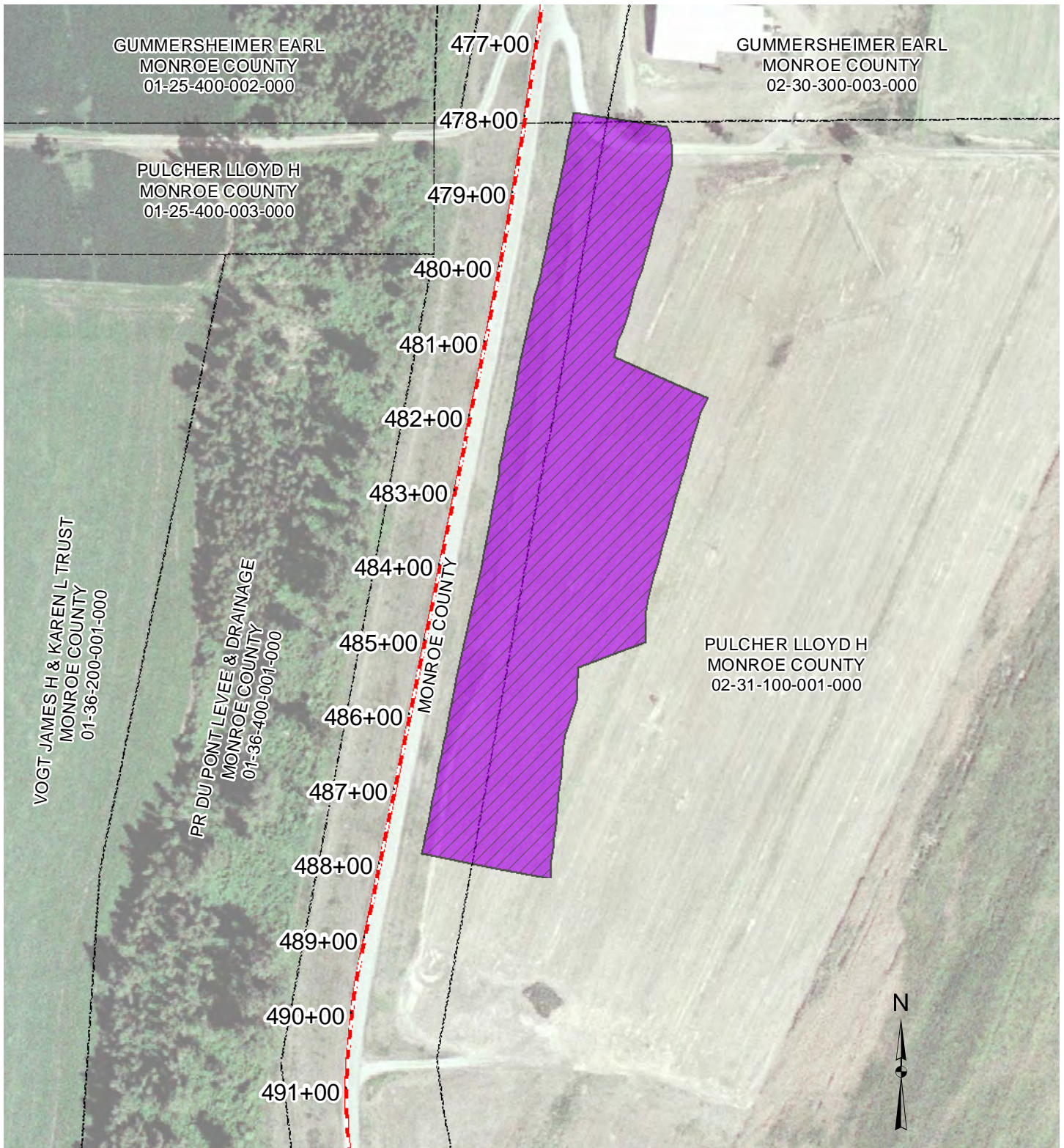
PDP LEVEE SYSTEM

DESIGN STA: 421+75 TO 425+05

08/12/2016 SHEET 12 OF 23

Legend



-  Relief Well
-  Seepage Berm

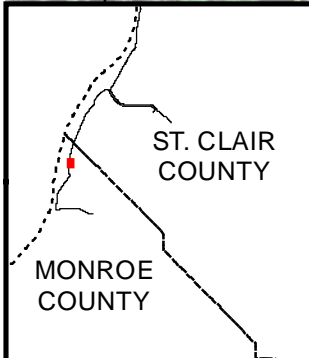
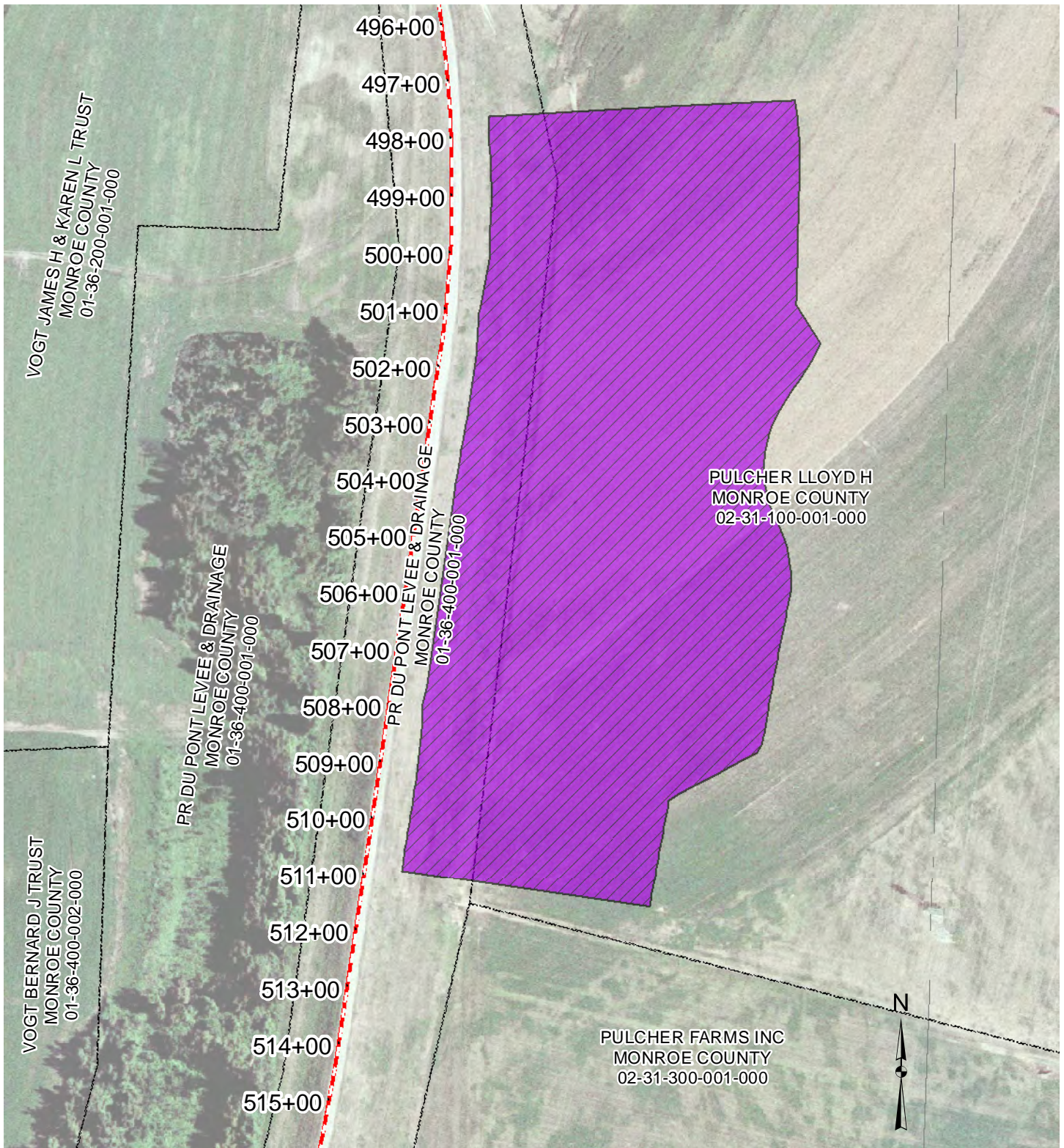


**USACE Authorized Level of
 Protection Planning and Analysis**
BID PACKAGE 15
PDP LEVEE SYSTEM
 DESIGN STA: 477+85 TO 487+75

08/12/2016 SHEET 13 OF 23

Legend

-  Relief Well
-  Seepage Berm





USACE Authorized Level of Protection Planning and Analysis

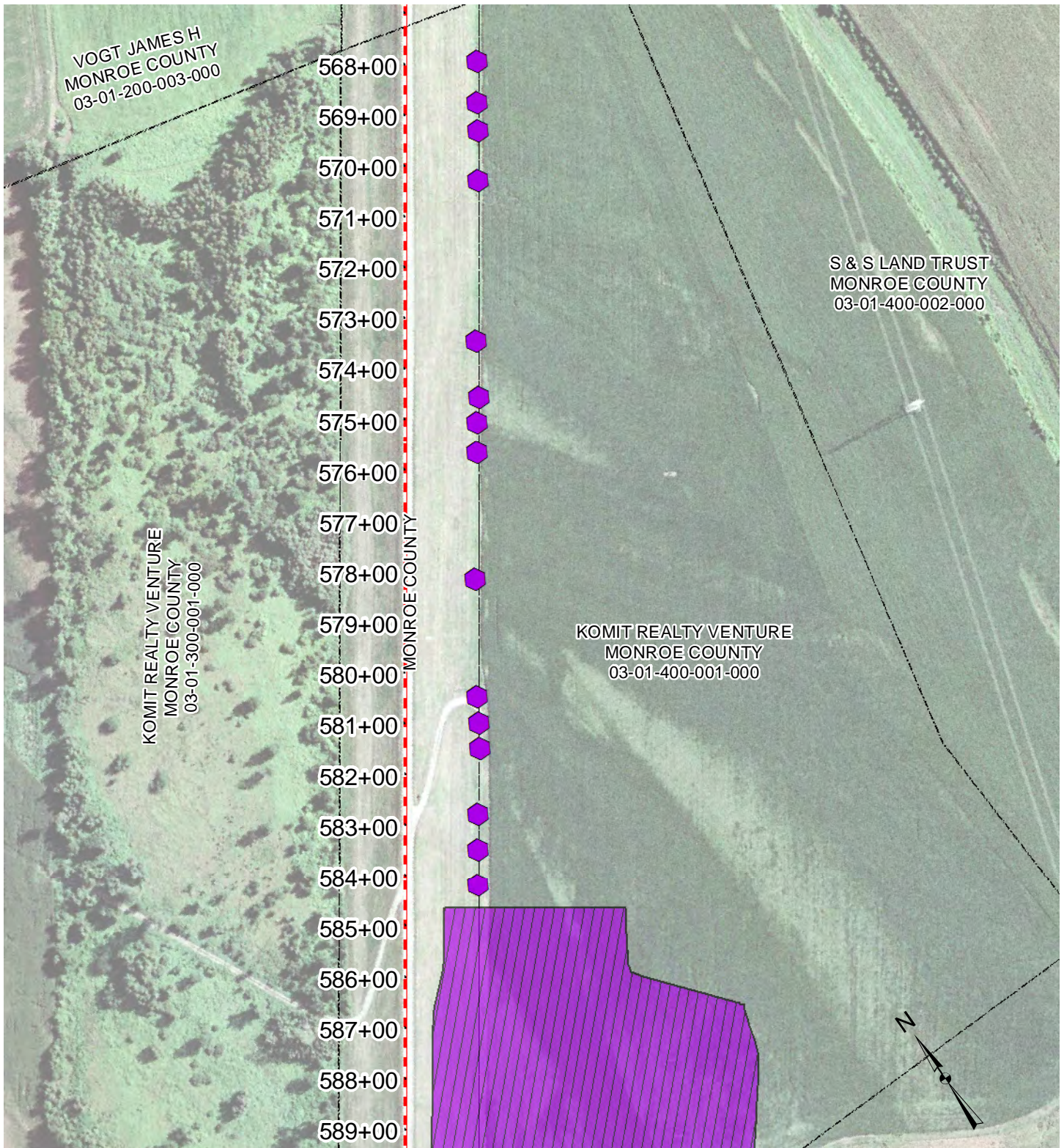
BID PACKAGE 15

PDP LEVEE SYSTEM

DESIGN STA: 497+65 TO 510+85

Legend

-  Relief Well
-  Seepage Berm



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MONROE COUNTY
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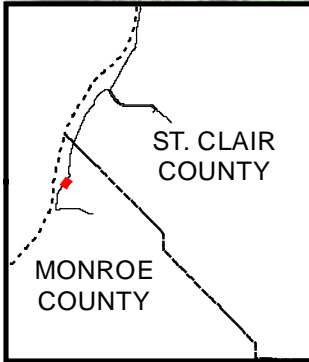
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MONROE COUNTY
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KOMIT REALTY VENTURE
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568+00
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MONROE COUNTY





USACE Authorized Level of Protection Planning and Analysis

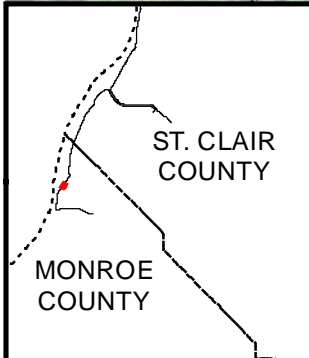
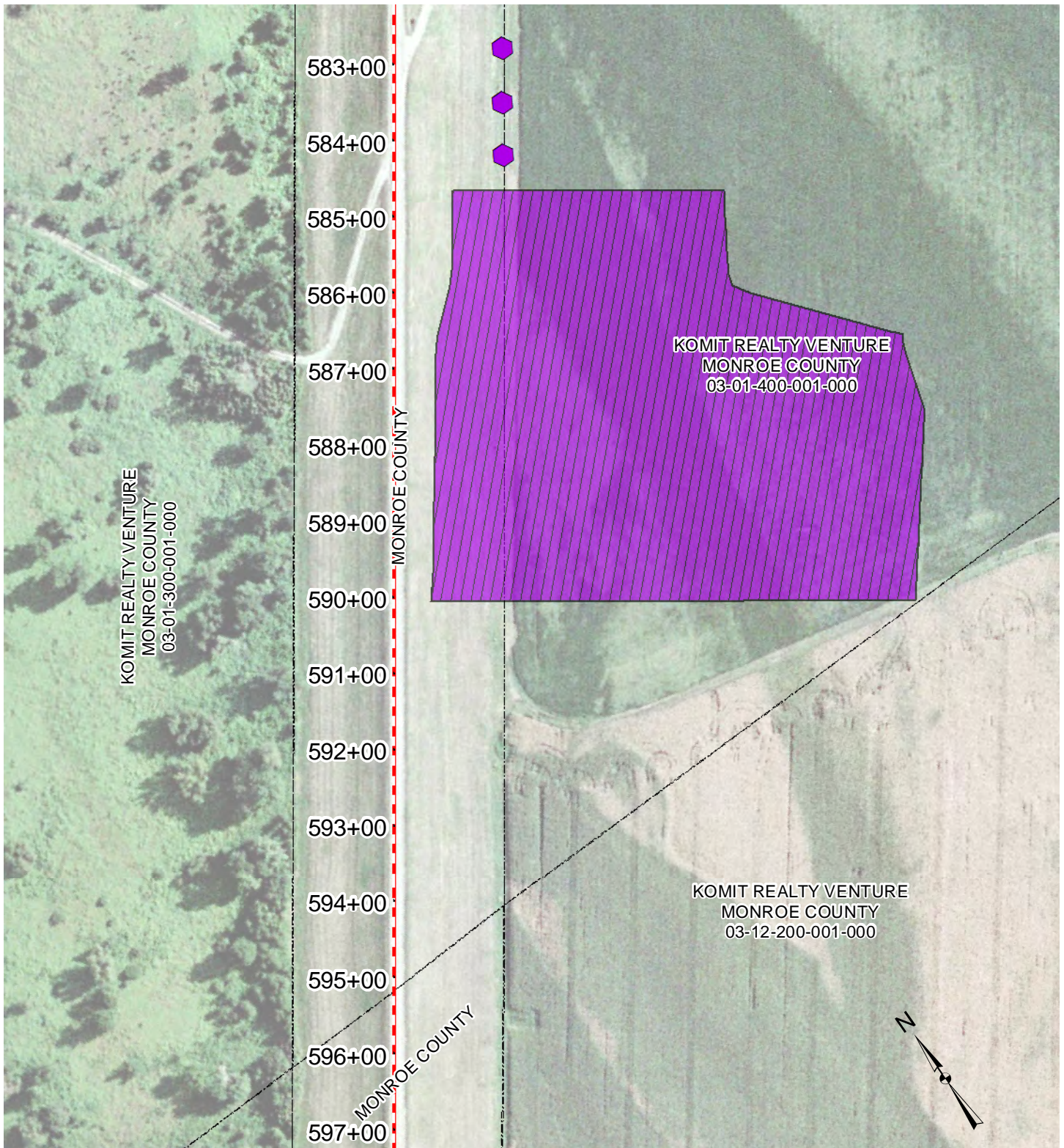
BID PACKAGE 15

PDP LEVEE SYSTEM

DESIGN STA: 567+35 TO 584+65

Legend

-  Relief Well
-  Seepage Berm



**USACE Authorized Level of
Protection Planning and Analysis**



BID PACKAGE 15

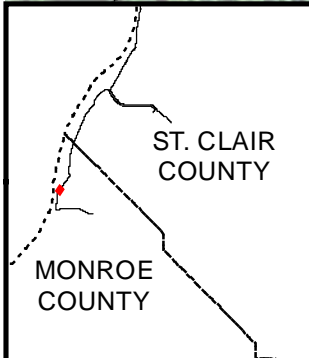
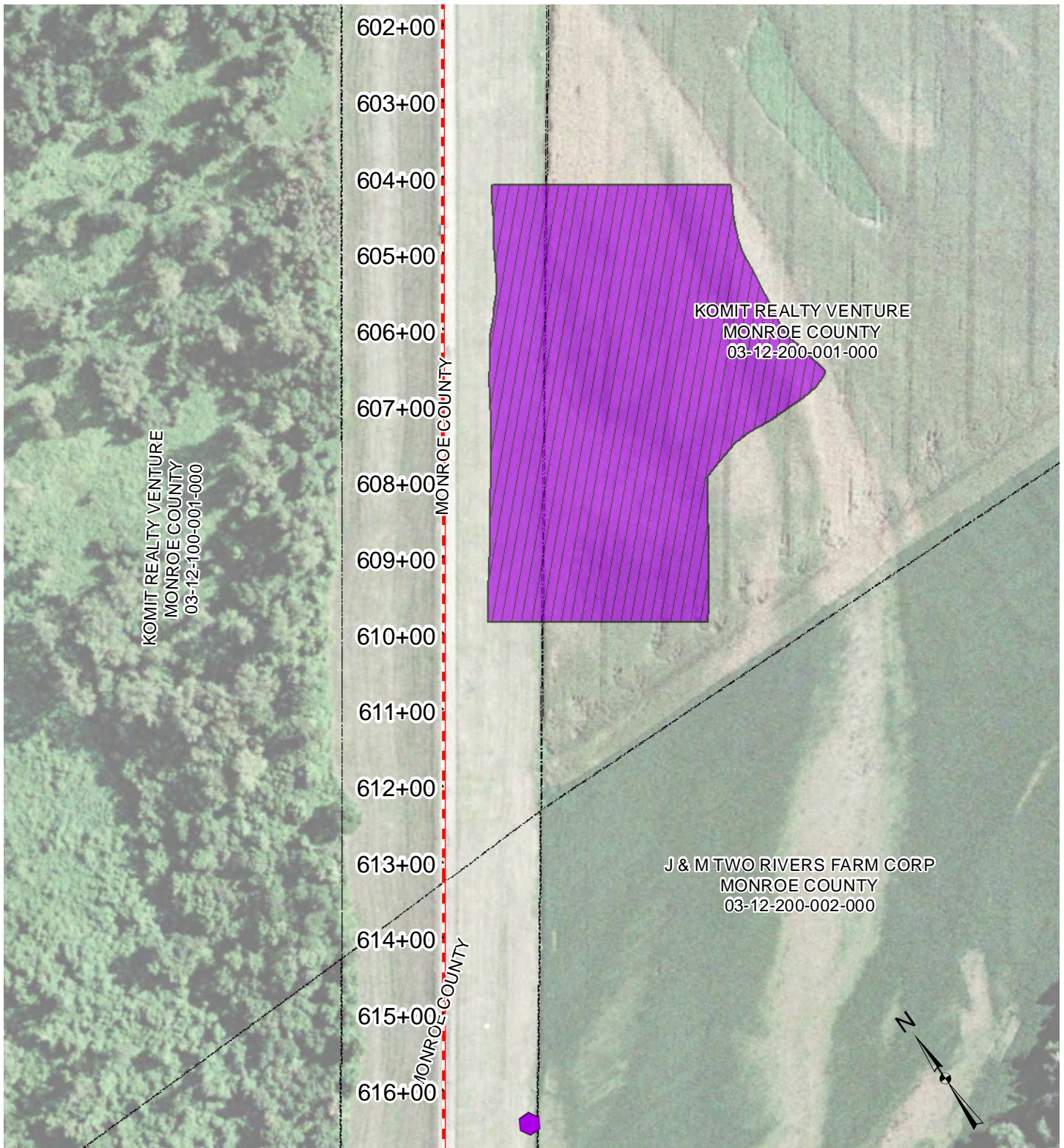
PDP LEVEE SYSTEM

DESIGN STA: 584+65 TO 590+05

08/12/2016 SHEET 16 OF 23

Legend

-  Relief Well
-  Seepage Berm



**USACE Authorized Level of
Protection Planning and Analysis**

BID PACKAGE 15

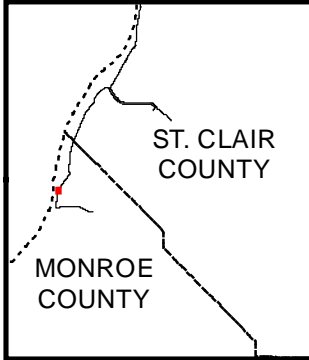
PDP LEVEE SYSTEM

DESIGN STA: 604+10 TO 609+85

08/12/2016 SHEET 17 OF 23

Legend

- Relief Well
- Seepage Berm



**USACE Authorized Level of
Protection Planning and Analysis**



BID PACKAGE 15

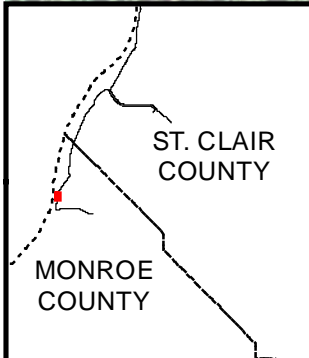
PDP LEVEE SYSTEM

DESIGN STA: 616+45 TO 619+75

08/12/2016 SHEET 18 OF 23

Legend

-  Relief Well
-  Seepage Berm



**USACE Authorized Level of
Protection Planning and Analysis**



BID PACKAGE 15

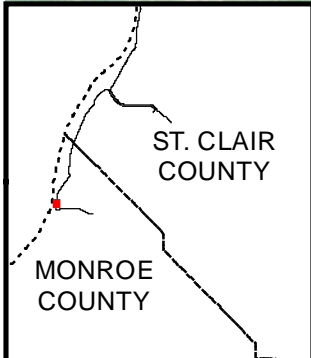
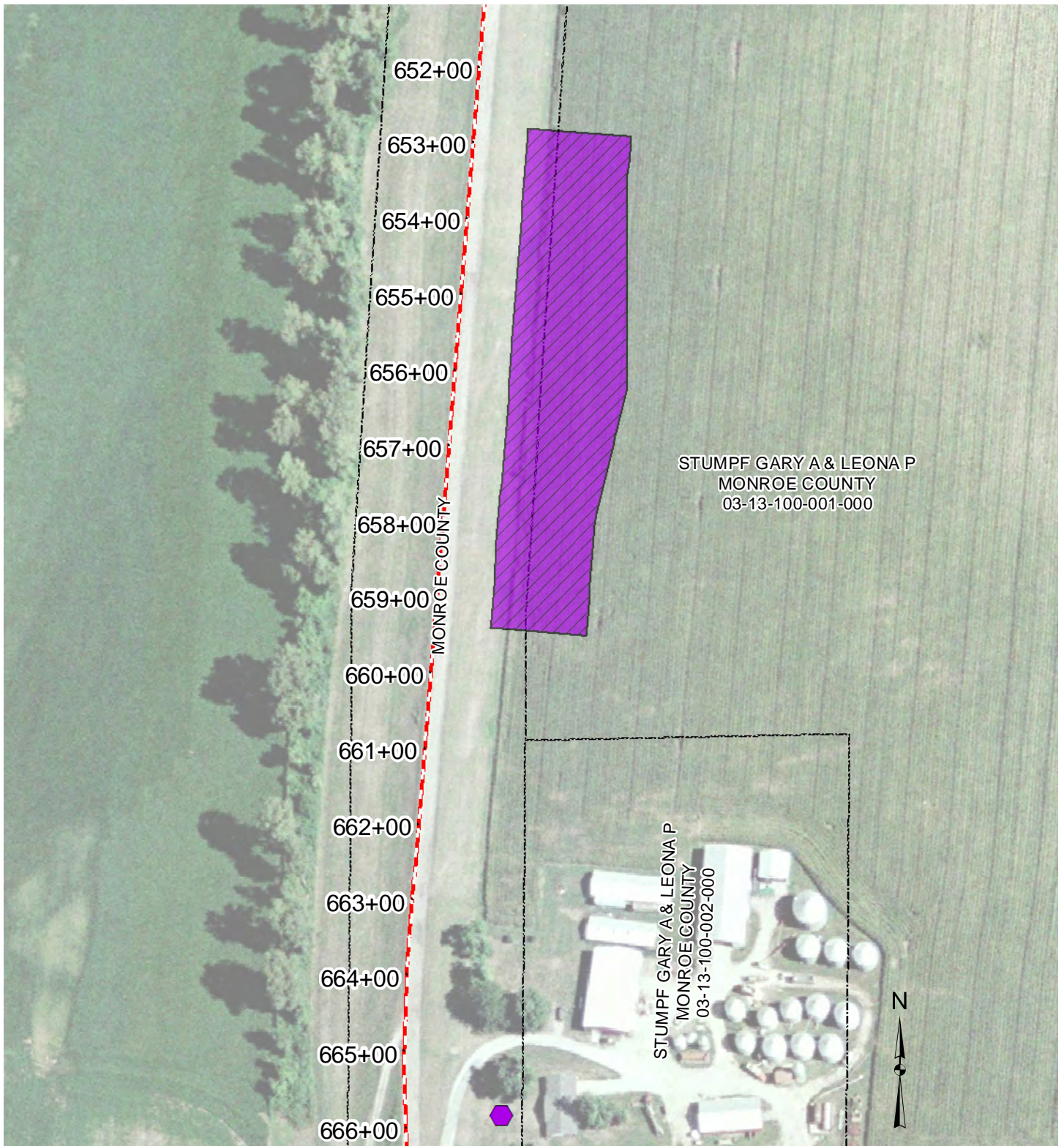
PDP LEVEE SYSTEM

DESIGN STA: 626+35 TO 639+55

08/12/2016 SHEET 19 OF 23

Legend

-  Relief Well
-  Seepage Berm



USACE Authorized Level of Protection Planning and Analysis

BID PACKAGE 15

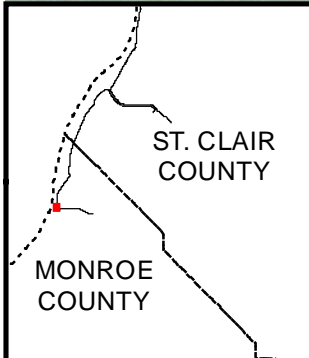
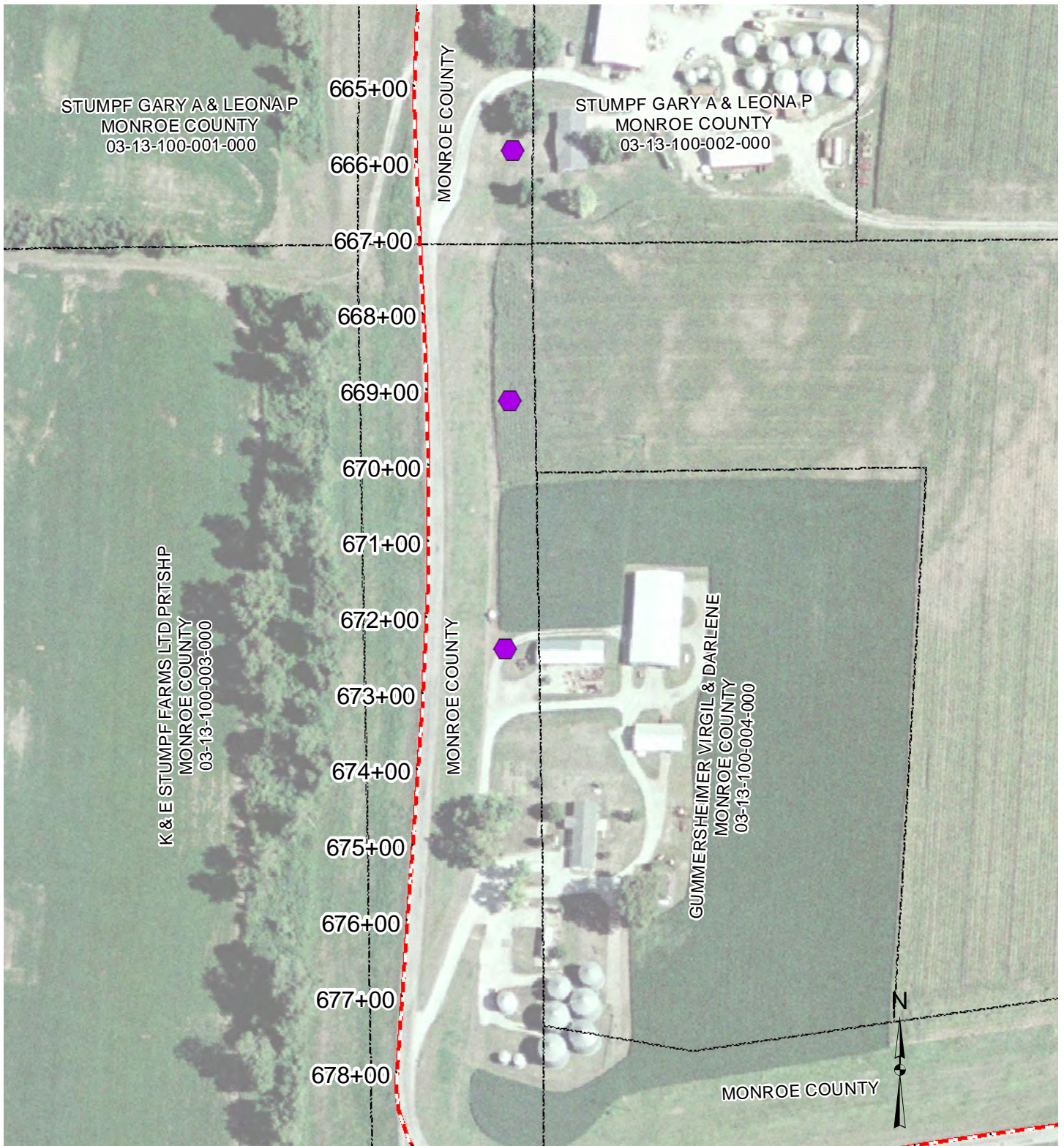
PDP LEVEE SYSTEM

DESIGN STA: 652+75 TO 659+35

08/12/2016 SHEET 20 OF 23

Legend

- Relief Well
- Seepage Berm



**USACE Authorized Level of
Protection Planning and Analysis**

BID PACKAGE 15

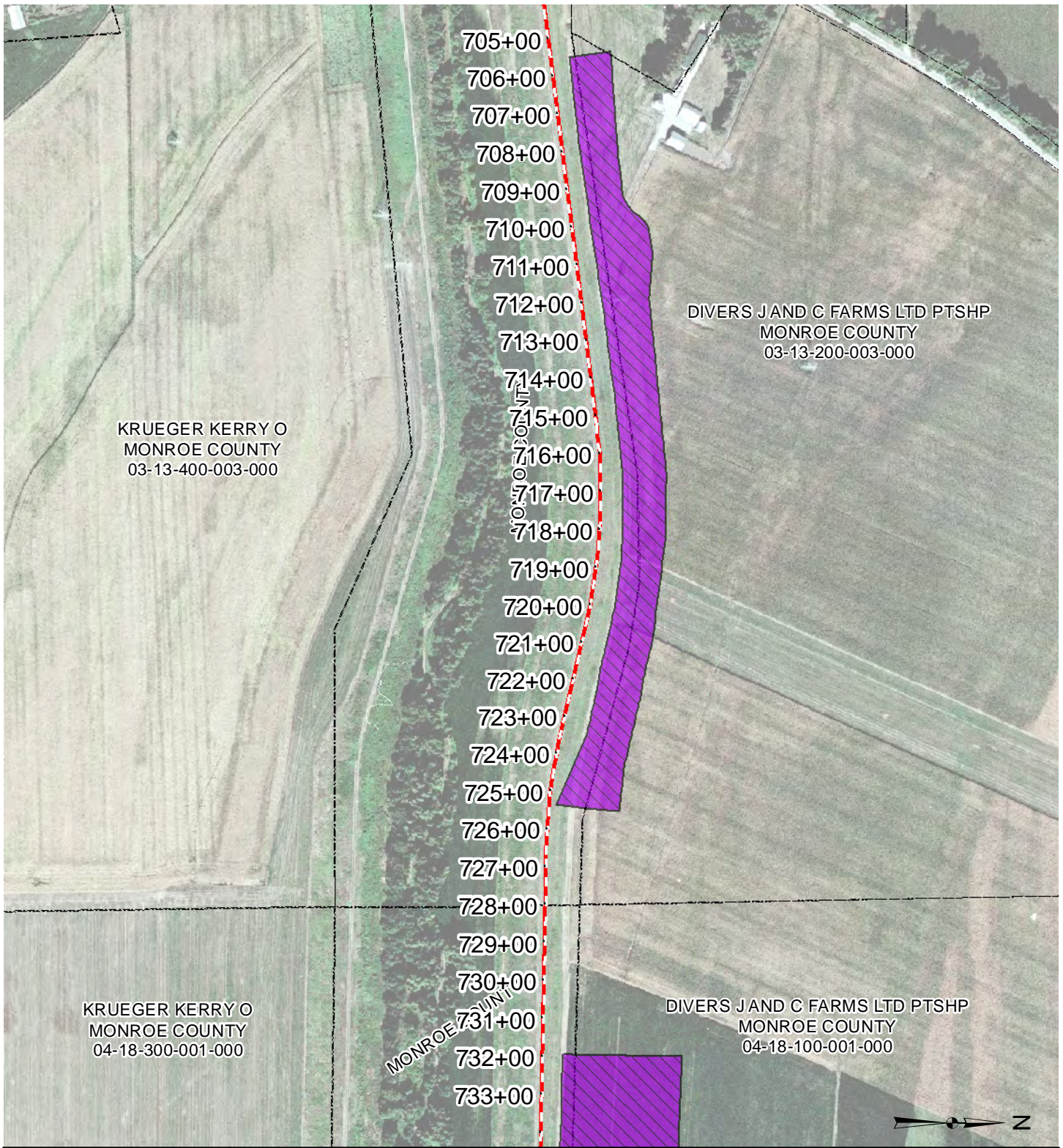
PDP LEVEE SYSTEM

DESIGN STA: 665+95 TO 672+55

08/12/2016 SHEET 21 OF 23

Legend

- Relief Well
- Seepage Berm



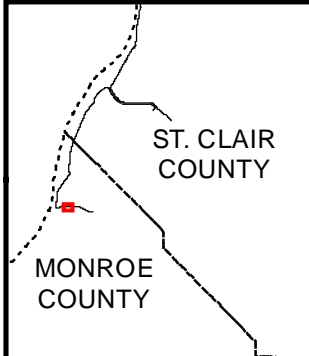
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DIVERS J AND C FARMS LTD PTSHP
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KRUEGER KERRY O
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DIVERS J AND C FARMS LTD PTSHP
MONROE COUNTY
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MONROE COUNTY



ST. CLAIR
COUNTY

MONROE
COUNTY



**USACE Authorized Level of
Protection Planning and Analysis**

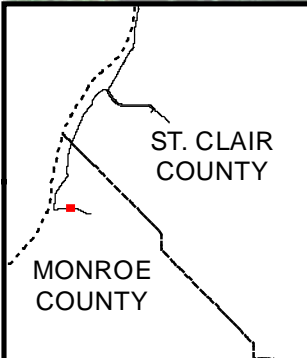
BID PACKAGE 15

PDP LEVEE SYSTEM

DESIGN STA: 705+55 TO 725+35

Legend



-  Relief Well
-  Seepage Berm



USACE Authorized Level of Protection Planning and Analysis
BID PACKAGE 15
PDP LEVEE SYSTEM
 DESIGN STA: 731+95 TO 735+25

08/12/2016 SHEET 23 OF 23

Legend

-  Relief Well
-  Seepage Berm