

ST. CHARLES PARISH WEST BANK MASTER DRAINAGE PLAN HAHNVILLE 2 WATERSHED

EXECUTIVE SUMMARY

The goal of this section is to give a high-level overview of the process and results of the hydraulic and hydrologic study of the Hahnville 2 watershed. This summary shall always be accompanied by the comprehensive detailed report, which follows this section.

This report presents the results of a basin-wide modeling study for the Hahnville 2 drainage basin. The purpose of this study was to identify necessary improvements to the major conveyance systems to mitigate the effects of the 100-yr event. Drainage features that were considered as part of the system upgrades were the construction of ditches and replacement of culverts along critical areas within the Hahnville 2 basin along with jack-and-bore culverts across the UP railroad. This model can be used to identify other deficiencies and provide inputs for targeted analyses that are focused on upgrades at the subdivision-scale.

WATERSHED CHARACTERISTICS

The Hahnville 2 drainage basin is located on the west bank of the Mississippi River in St. Charles Parish (SCP), Louisiana. The focus area for this analysis is approximately 2,220 acres (Figure 1) and is drained via gravity by a system of canals that are tidally influenced due to the connection with Lac des Allemands to the west. The Vial Canal serves as the primary outfall for Hahnville 2. It drains southwest under the bridge at LA 3127 and then west in the Eighty Arpent Canal.

CURRENT DRAINAGE ISSUES

At present, the majority of drainage issues occur due to the lack of conveyance capacity through the UP railroad. Residential areas adjacent to the railroad have experienced frequent flooding in recent years resulting from short duration rainfall events with high intensity.

PROPOSED CONDITIONS MODEL

The development of the proposed conditions model focused on upgrading the existing drainage system within the Hahnville 2 basin. These upgrades include jack-and-bore culverts through the UP railroad and additional channels within the northern and southern basin. Considerations were made for planned and potential future development.

MODEL RESULTS

The following sections review the model results for the Existing Conditions (EC) and Proposed Conditions (PC) model simulations. Since the aim of the drainage basin upgrades is to reduce the impacts experienced by the 100-yr event, those simulation results will be the focus of this analysis and review.

ALTERNATIVES

By the request of the SCP Administration, TBS analyzed the conceptual cost to construct the proposed improvements to convey the stormwater flow produced by the 25-year rainfall event. The proposed conditions model was constructed to analyze the effects of various storms on the 100-year improvements. Therefore, TBS tabulated the flows generated from running the 25-year rainfall event against the 100-year improvements. These flows were then used to theoretically size channel and culvert improvements which could convey these flows. These resulting “25-year improvements” have not been analyzed to determine the effect on water surface elevation. However, they have been considered for cost comparison purposes as tabulated in the section below. If SCP should decide to construct any improvement to the 25-year size, further analysis is required. It should be noted that railroad crossings which are required to be sized for the 100-yr storm by the railroad companies remain sized as such in all cost calculations.

CONCEPTUAL COST ESTIMATE








Table 11 Table below provides a summary for conceptual-level cost estimates associated with the recommended improvements. The table includes the cost for the “25-year improvements” as discussed above as well as the 100-year improvements as analyzed in the model. Mitigation, permitting, and land acquisition costs are not included as part of this cost assessment, as these costs can vary significantly depending on the final layout of the improvements determined during detailed design.

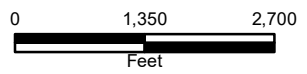
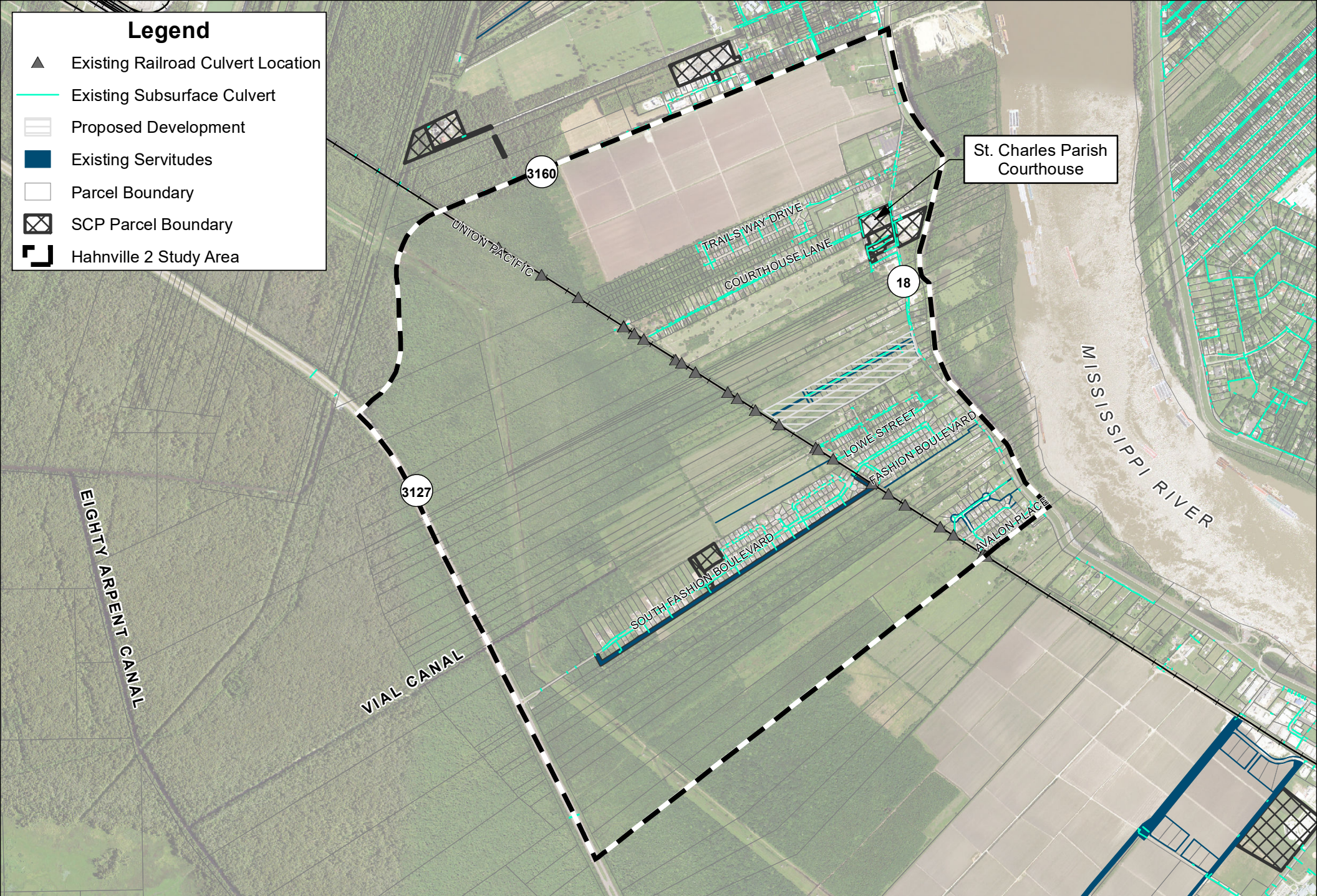
Conceptual project cost summary table

Prioritization Level	Improvement Group	Name	25-year Total Cost*	100-year Total Cost*
1	IG-1	Bamboo Street	\$1,245,000	\$1,327,700
	IG-2	Plantation Road	\$522,300	\$526,400
	IG-3	Fashion Plantation Estates	\$910,500	\$1,043,000
	Priority 1 Projects Subtotal		\$2,677,800	\$2,897,100
2	IG-4	Avalon Subdivision	\$1,236,600	\$1,273,700
	IG-5	Courthouse Lane	\$845,000	\$845,000
	Priority 2 Projects Subtotal		\$2,081,600	\$2,118,700

3	IG-6	River Place Estates Phase I	\$539,800	\$602,600
	IG-7	Fashion Golf and Country Club	\$528,900	\$528,900
	IG-8	River Road and Trails Way Drive	\$824,400	\$824,400
	IG-9	River Place Estates Phases II and III	\$772,400	\$772,400
	Priority 3 Projects Subtotal		\$2,665,500	\$2,728,300
4	IG-10	Pump Station	\$9,689,375	\$19,020,600
Total Cost for Improvements			\$17,114,275	\$26,764,700

Legend

-  Existing Railroad Culvert Location
-  Existing Subsurface Culvert
-  Proposed Development
-  Existing Servitudes
-  Parcel Boundary
-  SCP Parcel Boundary
-  Hahnville 2 Study Area



NOTES:
 1. Background Image Source: NAIP, 2015
 2. IG Extent is meant for general description only. Final locations for all IGs have not been established as part of this phase of the project. Locations are subject to change as part of permitting and detailed engineering design.

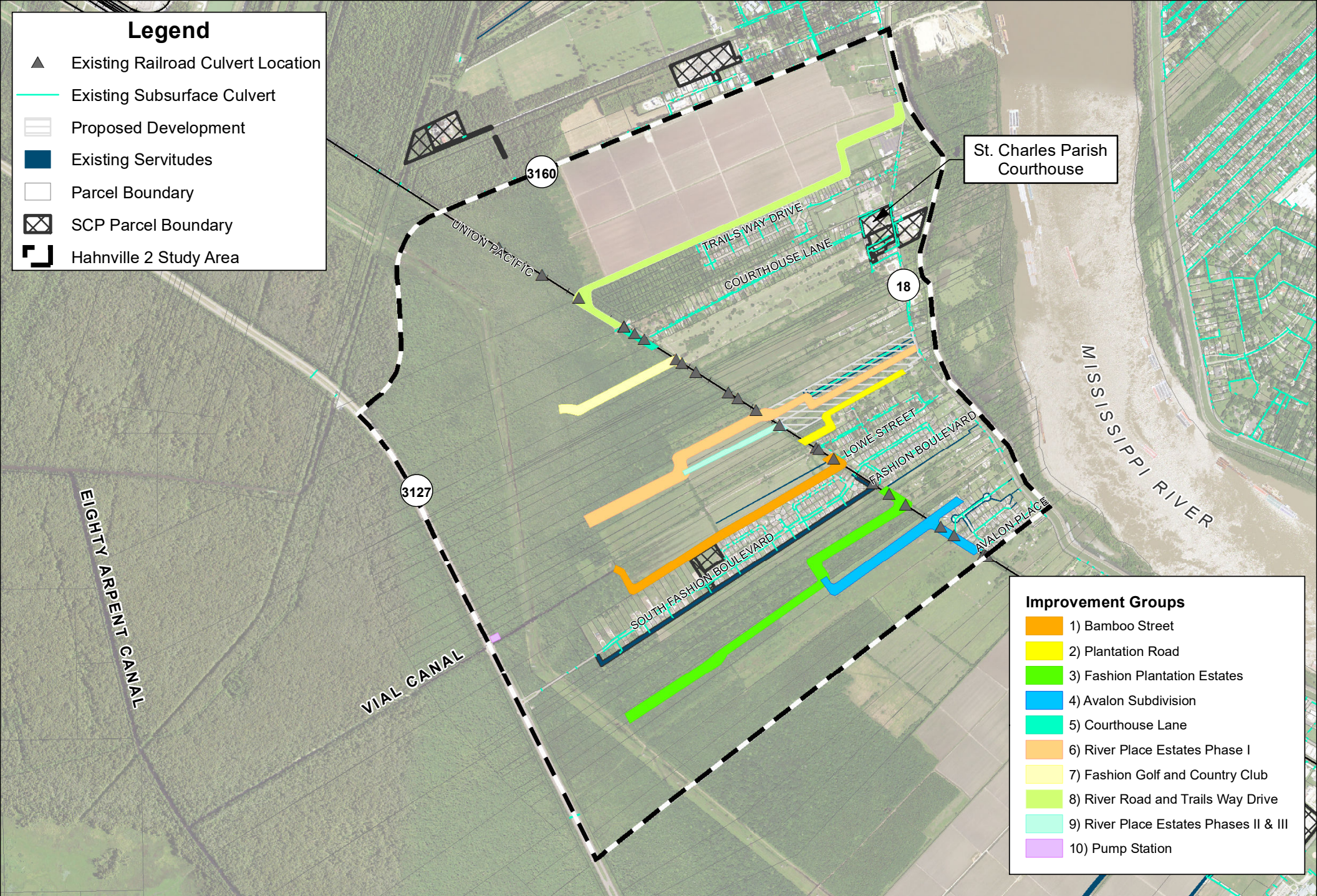
EXHIBIT ES-1 – EXISTING INFRASTRUCTURE

EXISTING CONDITIONS

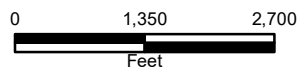
HAHVILLE 2 WATERSHED

Legend

- ▲ Existing Railroad Culvert Location
- Existing Subsurface Culvert
- ▨ Proposed Development
- Existing Servitudes
- Parcel Boundary
- ⊠ SCP Parcel Boundary
- ⌚ Hahnville 2 Study Area



- ### Improvement Groups
- 1) Bamboo Street
 - 2) Plantation Road
 - 3) Fashion Plantation Estates
 - 4) Avalon Subdivision
 - 5) Courthouse Lane
 - 6) River Place Estates Phase I
 - 7) Fashion Golf and Country Club
 - 8) River Road and Trails Way Drive
 - 9) River Place Estates Phases II & III
 - 10) Pump Station












NOTES:
 1. Background Image Source: NAIP, 2015
 2. IG Extent is meant for general description only. Final locations for all IGs have not been established as part of this phase of the project. Locations are subject to change as part of permitting and detailed engineering design.

EXHIBIT ES-2 – IMPROVEMENT GROUPS PROPOSED DRAINAGE SYSTEM IMPROVEMENTS

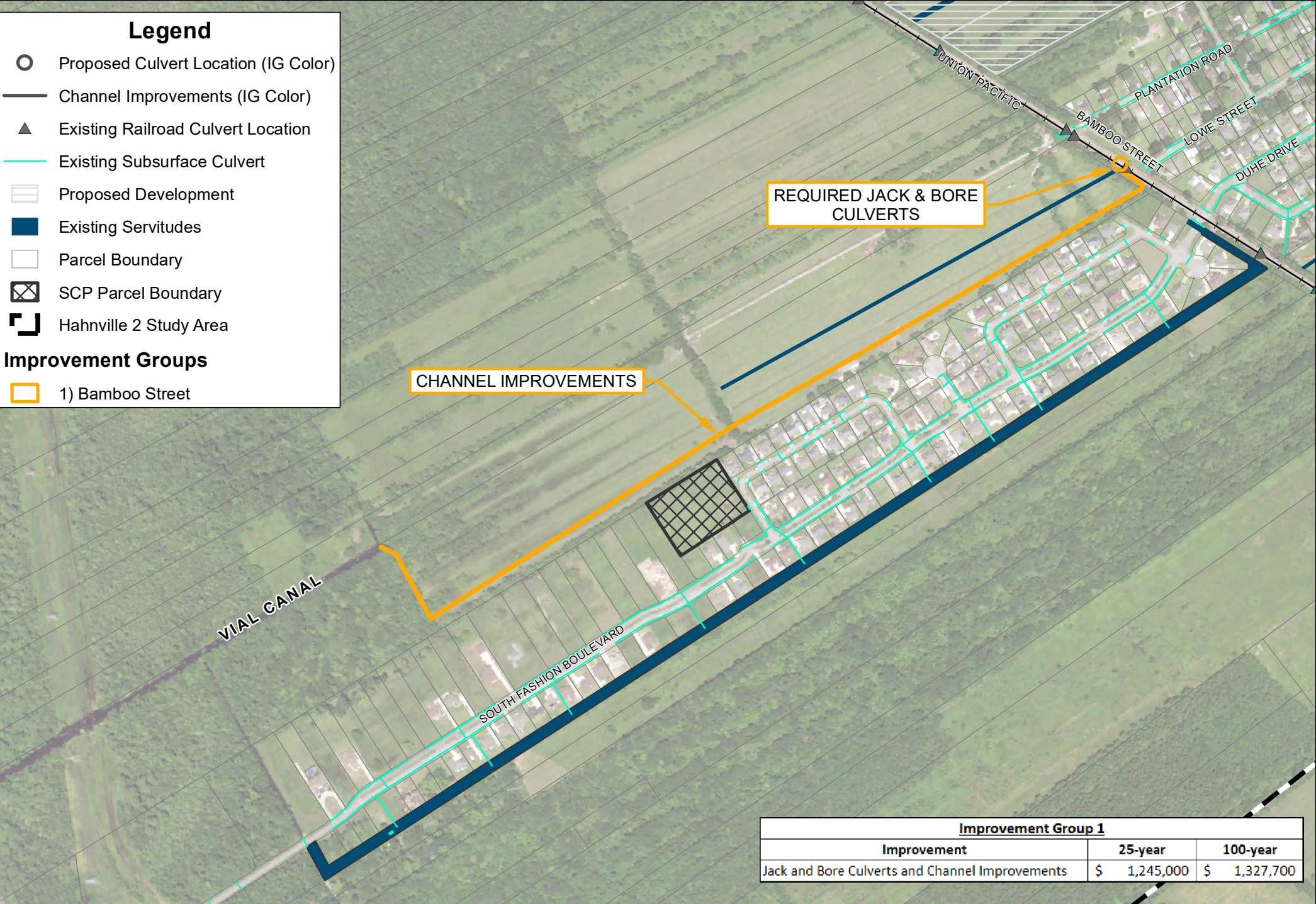
HAHNVILLE 2 WATERSHED

Legend

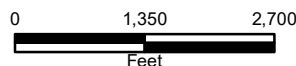
-  Proposed Culvert Location (IG Color)
-  Channel Improvements (IG Color)
-  Existing Railroad Culvert Location
-  Existing Subsurface Culvert
-  Proposed Development
-  Existing Servitudes
-  Parcel Boundary
-  SCP Parcel Boundary
-  Hahnville 2 Study Area

Improvement Groups

-  1) Bamboo Street












Improvement Group 1		
Improvement	25-year	100-year
Jack and Bore Culverts and Channel Improvements	\$ 1,245,000	\$ 1,327,700





NOTES:
 1. Background Image Source: NAIP, 2015
 2. IG Extent is meant for general description only. Final locations for all IGs have not been established as part of this phase of the project. Locations are subject to change as part of permitting and detailed engineering design. As such, costs associated with each IG do not include property acquisition

EXHIBIT ES-3 – IMPROVEMENT GROUP 1 PROPOSED DRAINAGE SYSTEM IMPROVEMENTS HAHNVILLE 2 WATERSHED

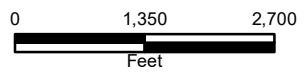
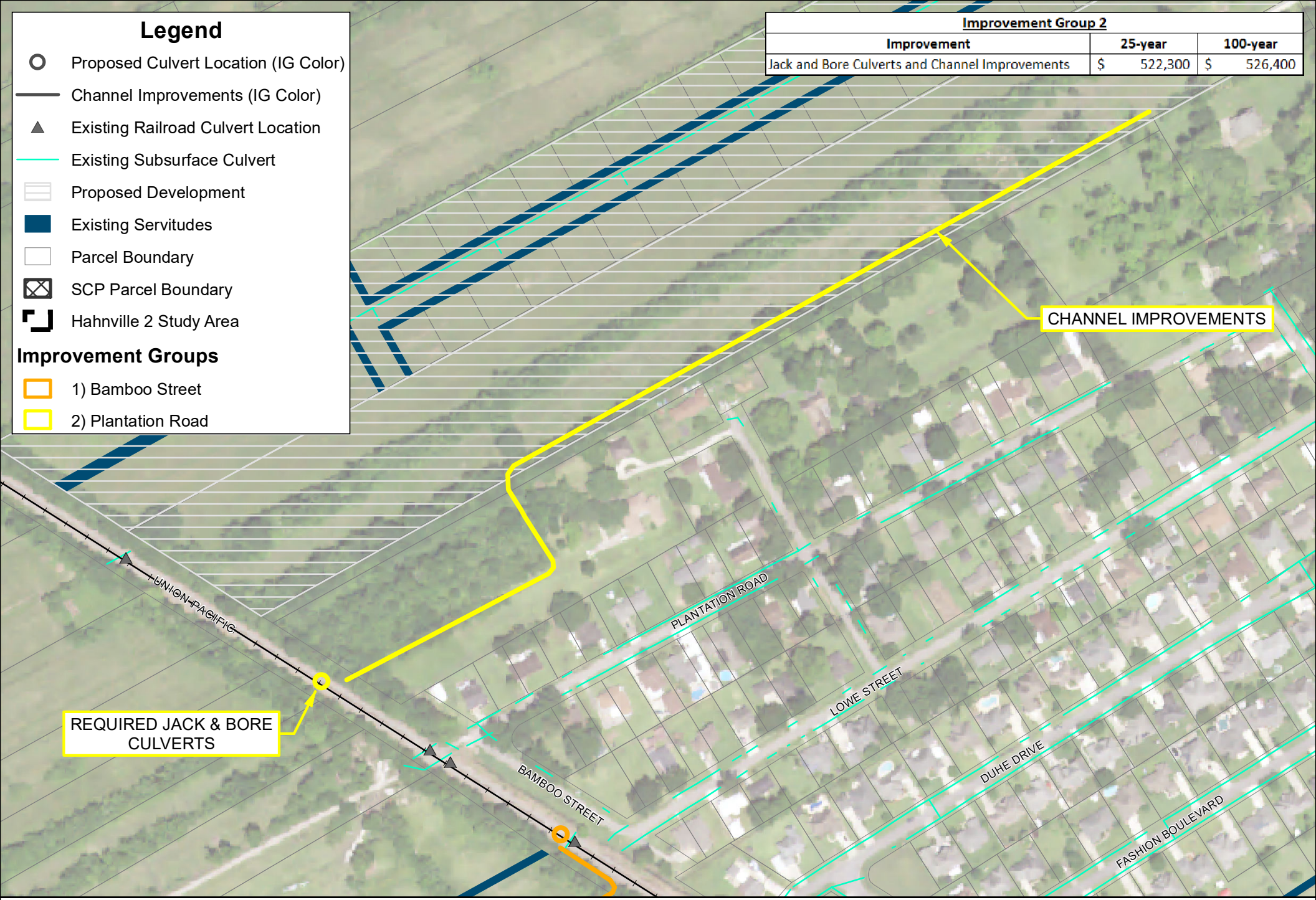
Legend

-  Proposed Culvert Location (IG Color)
-  Channel Improvements (IG Color)
-  Existing Railroad Culvert Location
-  Existing Subsurface Culvert
-  Proposed Development
-  Existing Servitudes
-  Parcel Boundary
-  SCP Parcel Boundary
-  Hahnville 2 Study Area

Improvement Groups

-  1) Bamboo Street
-  2) Plantation Road

Improvement Group 2		
Improvement	25-year	100-year
Jack and Bore Culverts and Channel Improvements	\$ 522,300	\$ 526,400












NOTES:
 1. Background Image Source: NAIP, 2015
 2. IG Extent is meant for general description only. Final locations for all IGs have not been established as part of this phase of the project. Locations are subject to change as part of permitting and detailed engineering design. As such, costs associated with each IG do not include property acquisition

EXHIBIT ES-4 – IMPROVEMENT GROUP 2 PROPOSED DRAINAGE SYSTEM IMPROVEMENTS

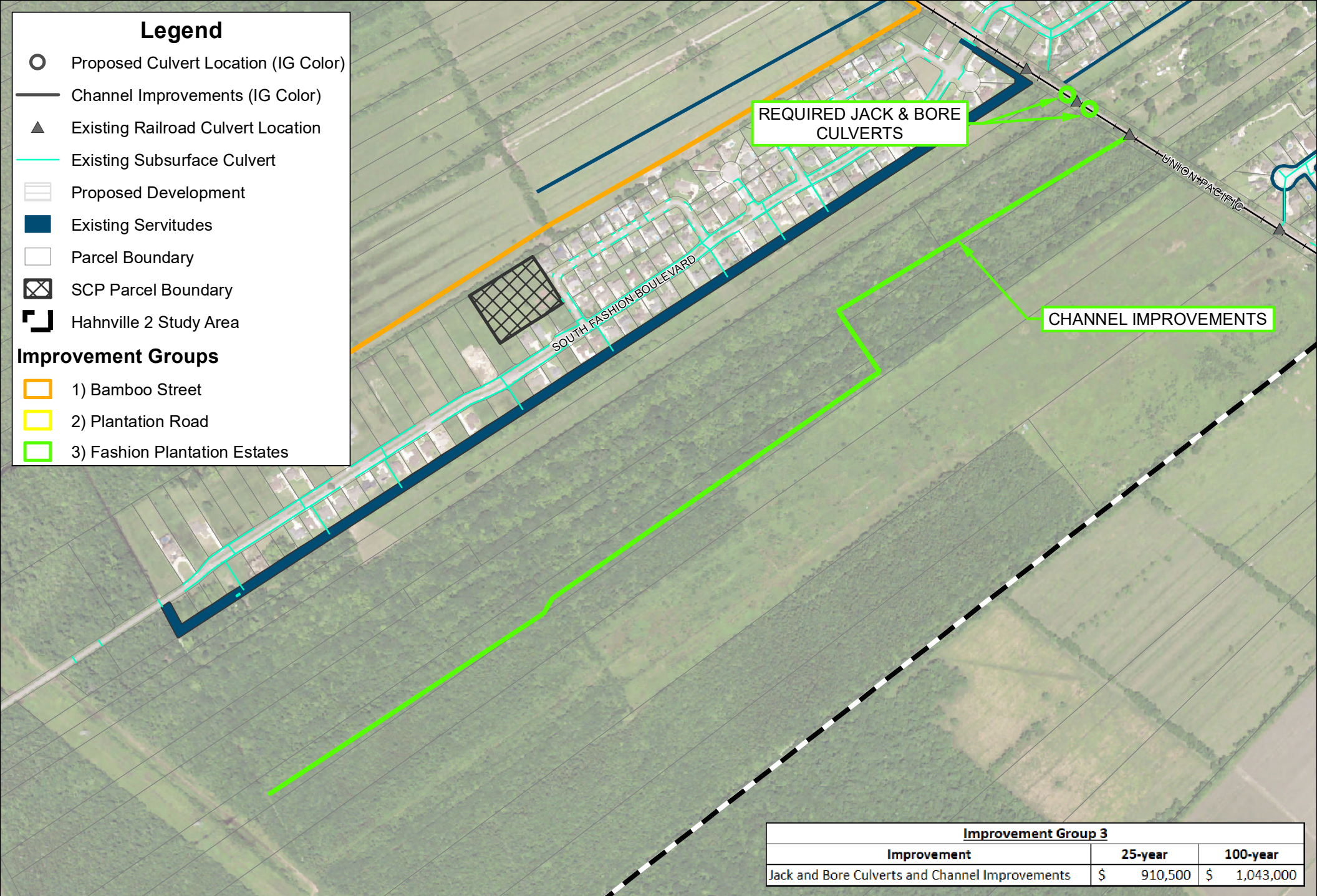
HAHNVILLE 2 WATERSHED

Legend

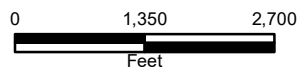
-  Proposed Culvert Location (IG Color)
-  Channel Improvements (IG Color)
-  Existing Railroad Culvert Location
-  Existing Subsurface Culvert
-  Proposed Development
-  Existing Servitudes
-  Parcel Boundary
-  SCP Parcel Boundary
-  Hahnville 2 Study Area

Improvement Groups

-  1) Bamboo Street
-  2) Plantation Road
-  3) Fashion Plantation Estates



Improvement Group 3		
Improvement	25-year	100-year
Jack and Bore Culverts and Channel Improvements	\$ 910,500	\$ 1,043,000












NOTES:
 1. Background Image Source: NAIP, 2015
 2. IG Extent is meant for general description only. Final locations for all IGs have not been established as part of this phase of the project. Locations are subject to change as part of permitting and detailed engineering design. As such, costs associated with each IG do not include property acquisition


EXHIBIT ES-5 – IMPROVEMENT GROUP 3 PROPOSED DRAINAGE SYSTEM IMPROVEMENTS

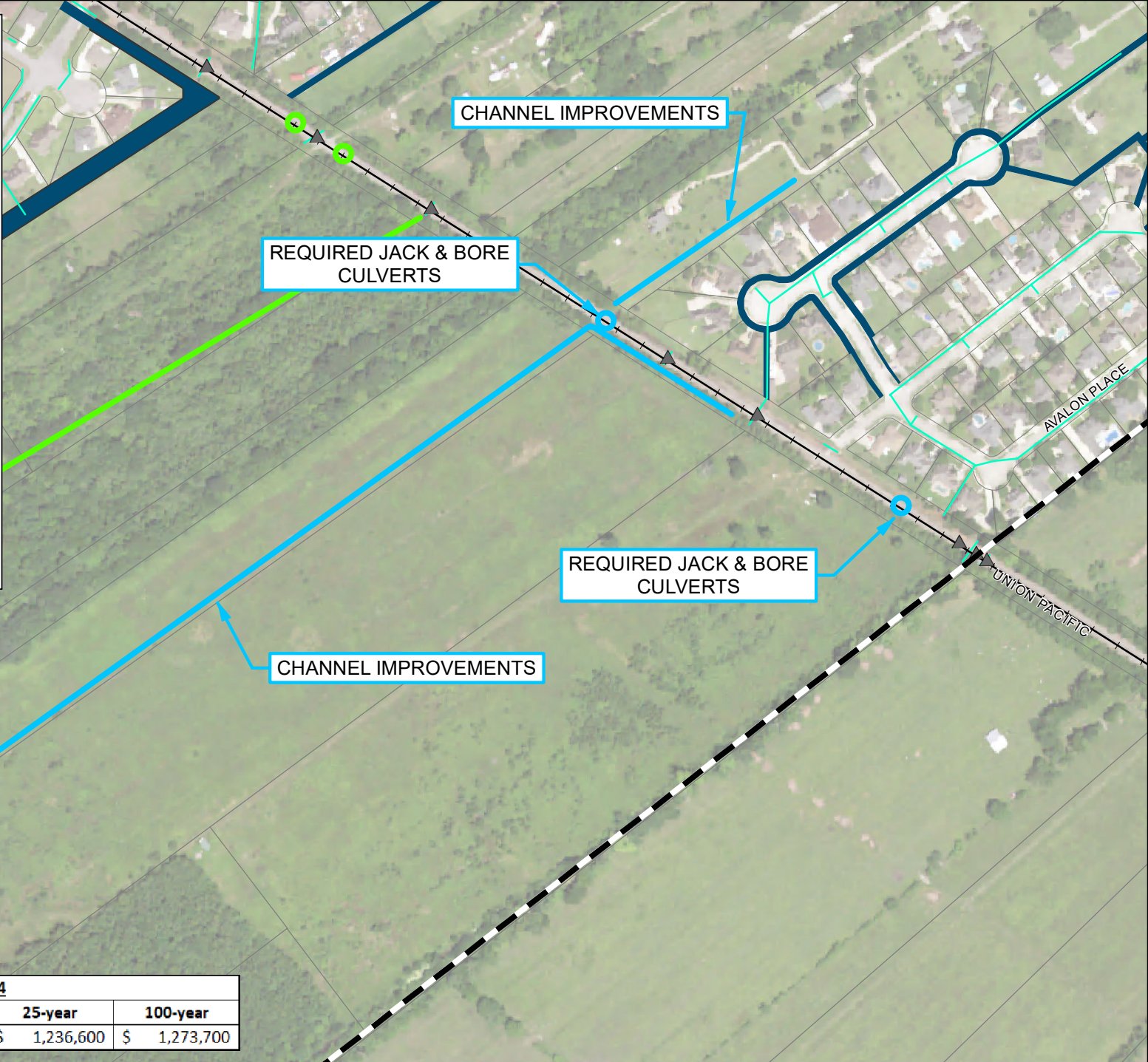
HAHNVILLE 2 WATERSHED

Legend

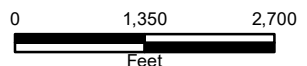
-  Proposed Culvert Location (IG Color)
-  Channel Improvements (IG Color)
-  Existing Railroad Culvert Location
-  Existing Subsurface Culvert
-  Proposed Development
-  Existing Servitudes
-  Parcel Boundary
-  SCP Parcel Boundary
-  Hahnville 2 Study Area

Improvement Groups

-  1) Bamboo Street
-  2) Plantation Road
-  3) Fashion Plantation Estates
-  4) Avalon Subdivision



Improvement Group 4		
Improvement	25-year	100-year
Jack and Bore Culverts and Channel Improvements	\$ 1,236,600	\$ 1,273,700












NOTES:
 1. Background Image Source: NAIP, 2015
 2. IG Extent is meant for general description only. Final locations for all IGs have not been established as part of this phase of the project. Locations are subject to change as part of permitting and detailed engineering design. As such, costs associated with each IG do not include property acquisition

EXHIBIT ES-6 – IMPROVEMENT GROUP 4 PROPOSED DRAINAGE SYSTEM IMPROVEMENTS

HAHNVILLE 2 WATERSHED

Legend

-  Proposed Culvert Location (IG Color)
-  Channel Improvements (IG Color)
-  Existing Railroad Culvert Location
-  Existing Subsurface Culvert
-  Proposed Development
-  Existing Servitudes
-  Parcel Boundary
-  SCP Parcel Boundary
-  Hahnville 2 Study Area

Improvement Groups

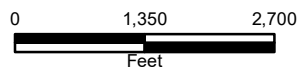
-  1) Bamboo Street
-  2) Plantation Road
-  3) Fashion Plantation Estates
-  4) Avalon Subdivision
-  5) Courthouse Lane



REQUIRED JACK & BORE
CULVERTS

Improvement Group 5

Improvement	25-year	100-year
Jack and Bore Culverts	\$ 845,000	\$ 845,000












NOTES:
 1. Background Image Source: NAIP, 2015
 2. IG Extent is meant for general description only. Final locations for all IGs have not been established as part of this phase of the project. Locations are subject to change as part of permitting and detailed engineering design. As such, costs associated with each IG do not include property acquisition

EXHIBIT ES-7 – IMPROVEMENT GROUP 5 PROPOSED DRAINAGE SYSTEM IMPROVEMENTS

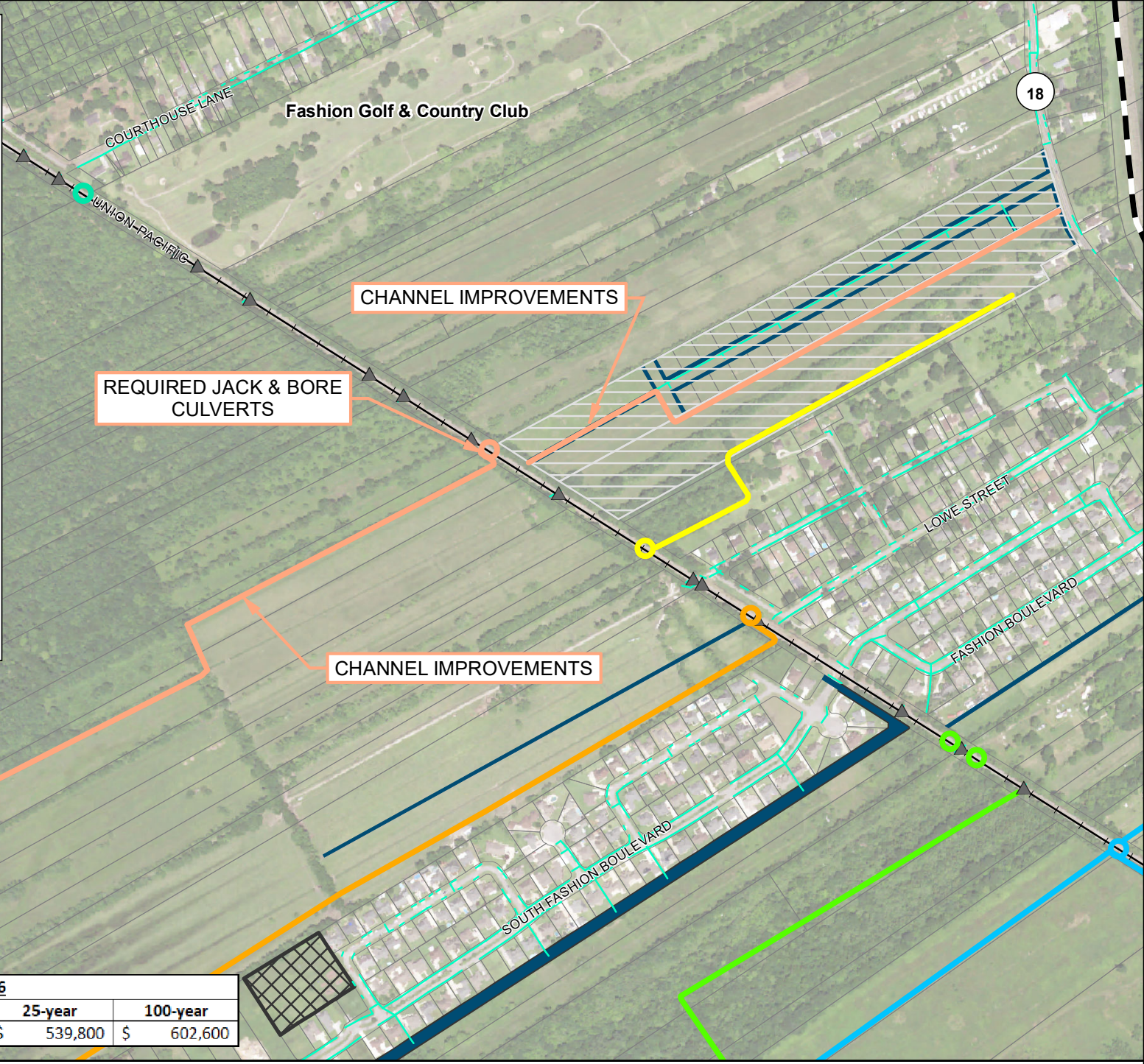
HAHNVILLE 2 WATERSHED

Legend

-  Proposed Culvert Location (IG Color)
-  Channel Improvements (IG Color)
-  Existing Railroad Culvert Location
-  Existing Subsurface Culvert
-  Proposed Development
-  Existing Servitudes
-  Parcel Boundary
-  SCP Parcel Boundary
-  Hahnville 2 Study Area

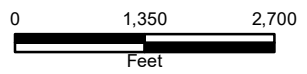
Improvement Groups

-  1) Bamboo Street
-  2) Plantation Road
-  3) Fashion Plantation Estates
-  4) Avalon Subdivision
-  5) Courthouse Lane
-  6) River Place Estates Phase I



Improvement Group 6

Improvement	25-year	100-year
Jack and Bore Culverts and Channel Improvements	\$ 539,800	\$ 602,600












NOTES:
 1. Background Image Source: NAIP, 2015
 2. IG Extent is meant for general description only. Final locations for all IGs have not been established as part of this phase of the project. Locations are subject to change as part of permitting and detailed engineering design. As such, costs associated with each IG do not include property acquisition

EXHIBIT ES-8 – IMPROVEMENT GROUP 6 PROPOSED DRAINAGE SYSTEM IMPROVEMENTS

HAHNVILLE 2 WATERSHED

Legend

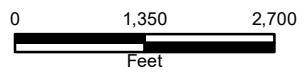
-  Proposed Culvert Location (IG Color)
-  Channel Improvements (IG Color)
-  Existing Railroad Culvert Location
-  Existing Subsurface Culvert
-  Proposed Development
-  Existing Servitudes
-  Parcel Boundary
-  SCP Parcel Boundary
-  Hahnville 2 Study Area

Improvement Groups

-  1) Bamboo Street
-  2) Plantation Road
-  3) Fashion Plantation Estates
-  4) Avalon Subdivision
-  5) Courthouse Lane
-  6) River Place Estates Phase I
-  7) Fashion Golf and Country Club



Improvement Group 7		
Improvement	25-year	100-year
Jack and Bore Culverts and Channel Improvements	\$ 504,600	\$ 528,900












NOTES:
 1. Background Image Source: NAIP, 2015
 2. IG Extent is meant for general description only. Final locations for all IGs have not been established as part of this phase of the project. Locations are subject to change as part of permitting and detailed engineering design. As such, costs associated with each IG do not include property acquisition

EXHIBIT ES-9 – IMPROVEMENT GROUP 7 PROPOSED DRAINAGE SYSTEM IMPROVEMENTS

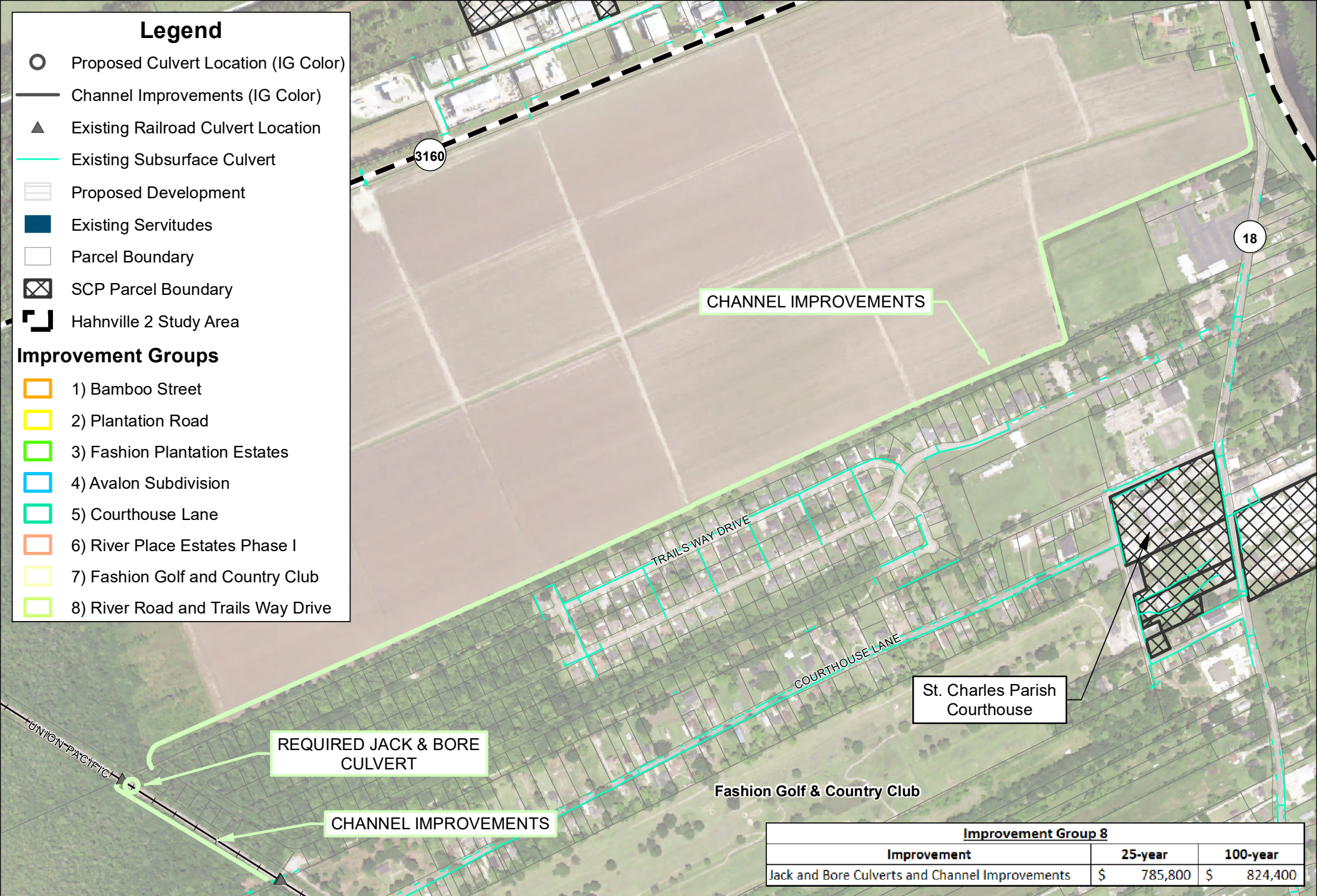
HAHNVILLE 2 WATERSHED

Legend

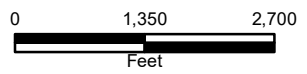
-  Proposed Culvert Location (IG Color)
-  Channel Improvements (IG Color)
-  Existing Railroad Culvert Location
-  Existing Subsurface Culvert
-  Proposed Development
-  Existing Servitudes
-  Parcel Boundary
-  SCP Parcel Boundary
-  Hahnville 2 Study Area

Improvement Groups

-  1) Bamboo Street
-  2) Plantation Road
-  3) Fashion Plantation Estates
-  4) Avalon Subdivision
-  5) Courthouse Lane
-  6) River Place Estates Phase I
-  7) Fashion Golf and Country Club
-  8) River Road and Trails Way Drive



Improvement Group 8		
Improvement	25-year	100-year
Jack and Bore Culverts and Channel Improvements	\$ 785,800	\$ 824,400












NOTES:
 1. Background Image Source: NAIP, 2015
 2. IG Extent is meant for general description only. Final locations for all IGs have not been established as part of this phase of the project. Locations are subject to change as part of permitting and detailed engineering design. As such, costs associated with each IG do not include property acquisition

EXHIBIT ES-10 – IMPROVEMENT GROUP 8 PROPOSED DRAINAGE SYSTEM IMPROVEMENTS

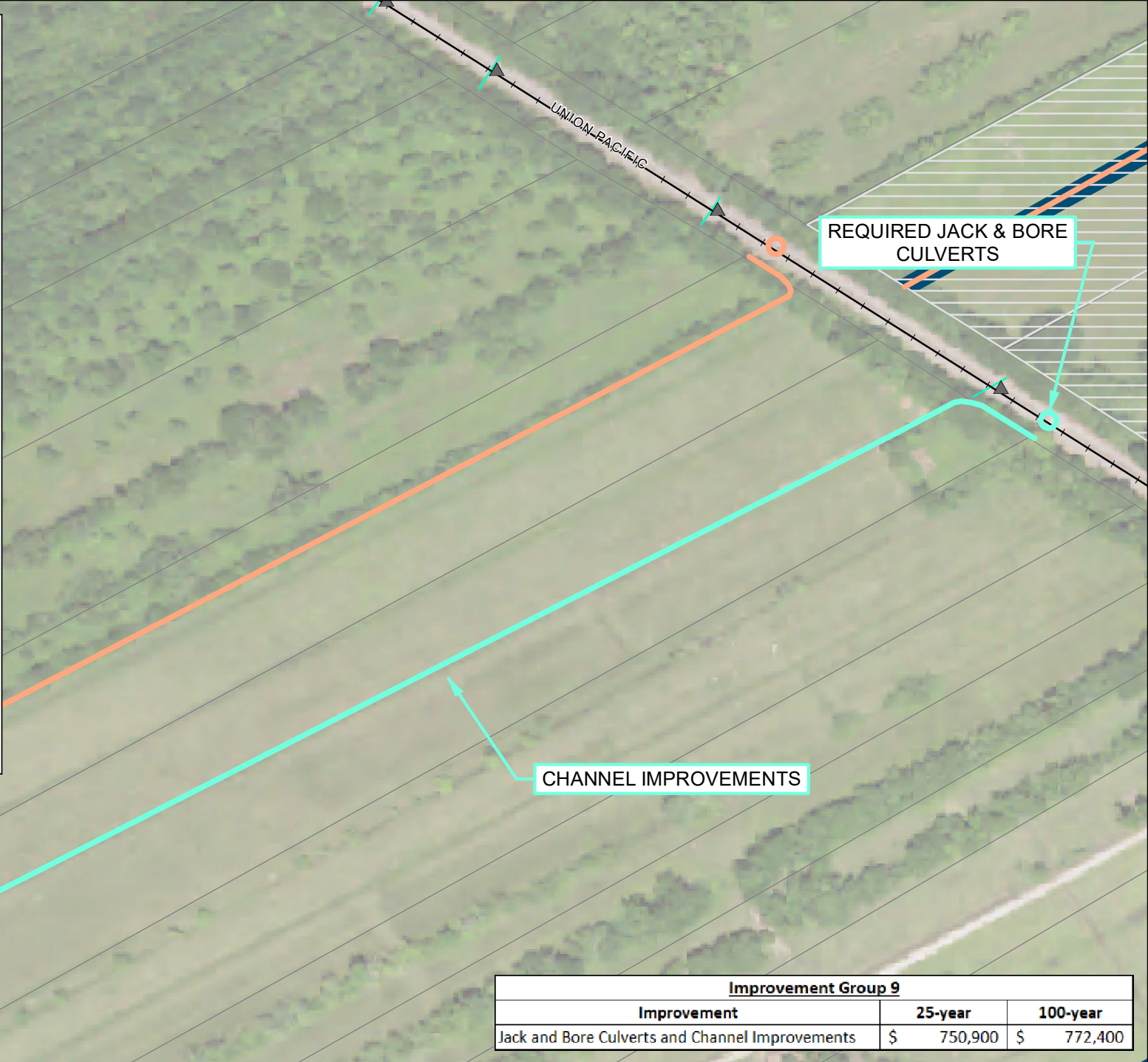
HAHNVILLE 2 WATERSHED

Legend

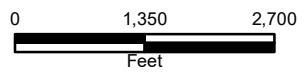
-  Proposed Culvert Location (IG Color)
-  Channel Improvements (IG Color)
-  Existing Railroad Culvert Location
-  Existing Subsurface Culvert
-  Proposed Development
-  Existing Servitudes
-  Parcel Boundary
-  SCP Parcel Boundary
-  Hahnville 2 Study Area

Improvement Groups

-  1) Bamboo Street
-  2) Plantation Road
-  3) Fashion Plantation Estates
-  4) Avalon Subdivision
-  5) Courthouse Lane
-  6) River Place Estates Phase I
-  7) Fashion Golf and Country Club
-  8) River Road and Trails Way Drive
-  9) River Place Estates Phases II & III



Improvement Group 9		
Improvement	25-year	100-year
Jack and Bore Culverts and Channel Improvements	\$ 750,900	\$ 772,400












NOTES:
 1. Background Image Source: NAIP, 2015
 2. IG Extent is meant for general description only. Final locations for all IGs have not been established as part of this phase of the project. Locations are subject to change as part of permitting and detailed engineering design. As such, costs associated with each IG do not include property acquisition

EXHIBIT ES-11 – IMPROVEMENT GROUP 9 PROPOSED DRAINAGE SYSTEM IMPROVEMENTS

HAHNVILLE 2 WATERSHED

Legend

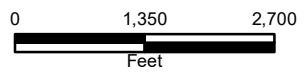
-  Proposed Culvert Location (IG Color)
-  Channel Improvements (IG Color)
-  Existing Railroad Culvert Location
-  Existing Subsurface Culvert
-  Proposed Development
-  Existing Servitudes
-  Parcel Boundary
-  SCP Parcel Boundary
-  Hahnville 2 Study Area

Improvement Groups

-  1) Bamboo Street
-  2) Plantation Road
-  3) Fashion Plantation Estates
-  4) Avalon Subdivision
-  5) Courthouse Lane
-  6) River Place Estates Phase I
-  7) Fashion Golf and Country Club
-  8) River Road and Trails Way Drive
-  9) River Place Estates Phases II & III
-  10) Pump Station



Improvement Group 10		
Improvement	25-year	100-year
Pump Station	\$ 9,689,375	\$ 19,020,600










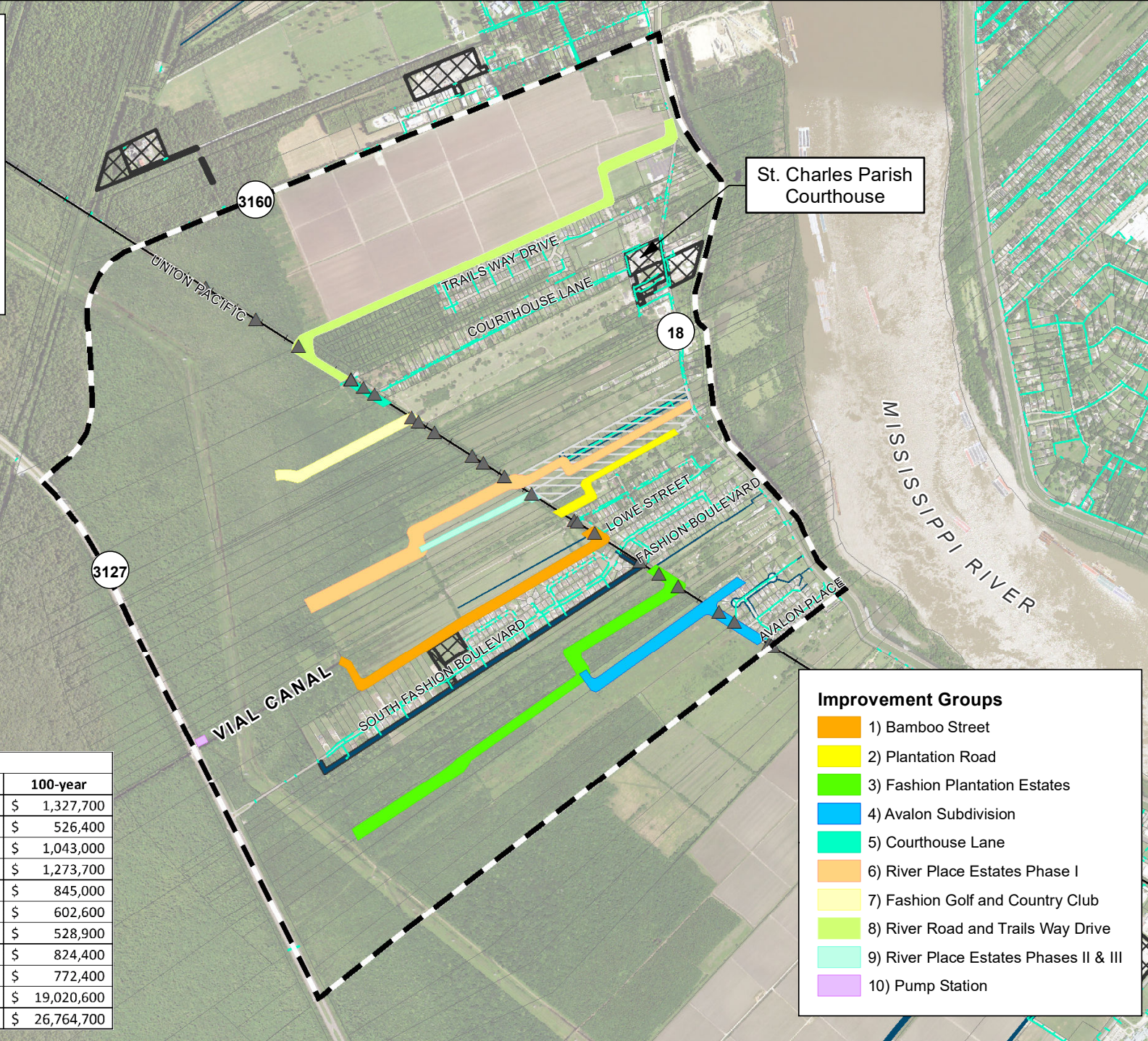
NOTES:
 1. Background Image Source: NAIP, 2015
 2. IG Extent is meant for general description only. Final locations for all IGs have not been established as part of this phase of the project. Locations are subject to change as part of permitting and detailed engineering design. As such, costs associated with each IG do not include property acquisition

EXHIBIT ES-12 – IMPROVEMENT GROUP 10 PROPOSED DRAINAGE SYSTEM IMPROVEMENTS

HAHNVILLE 2 WATERSHED

Legend

-  Existing Railroad Culvert Location
-  Existing Subsurface Culvert
-  Proposed Development
-  Existing Servitudes
-  Parcel Boundary
-  SCP Parcel Boundary
-  Hahnville 2 Study Area



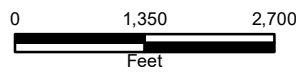
St. Charles Parish Courthouse

Summary Table

Improvement Group	25-year	100-year
1 - Bamboo Street	\$ 1,245,000	\$ 1,327,700
2 - Plantation Road	\$ 522,300	\$ 526,400
3 - Fashion Plantation Estates	\$ 910,500	\$ 1,043,000
4 - Avalon Subdivision	\$ 1,236,600	\$ 1,273,700
5 - Courthouse Lane	\$ 845,000	\$ 845,000
6 - River Place Estates Phase I	\$ 539,800	\$ 602,600
7 - Fashion Golf and Country Club	\$ 504,600	\$ 528,900
8 - River Road and Trails Way Drive	\$ 785,800	\$ 824,400
9 - River Place Estates Phases II & III	\$ 750,900	\$ 772,400
10 - Pump Station	\$ 9,689,375	\$ 19,020,600
Total	\$ 17,029,875	\$ 26,764,700

Improvement Groups

-  1) Bamboo Street
-  2) Plantation Road
-  3) Fashion Plantation Estates
-  4) Avalon Subdivision
-  5) Courthouse Lane
-  6) River Place Estates Phase I
-  7) Fashion Golf and Country Club
-  8) River Road and Trails Way Drive
-  9) River Place Estates Phases II & III
-  10) Pump Station



NOTES:
 1. Background Image Source: NAIP, 2015
 2. IG Extent is meant for general description only. Final locations for all IGs have not been established as part of this phase of the project. Locations are subject to change as part of permitting and detailed engineering design.

EXHIBIT ES-13 – IMPROVEMENT GROUPS SUMMARY

PROPOSED DRAINAGE SYSTEM IMPROVEMENTS

HAHNVILLE 2 WATERSHED