

# ST. CHARLES PARISH WEST BANK MASTER DRAINAGE PLAN HAHNVILLE 1 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 1 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 1 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 1 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 1 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 2,509 acres 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 northern basin has one primary outfall canal north of the UP. This canal flows from the southwestern boundary of the focus area, via cross-drain culverts at the existing Union Pacific (UP) railroad and a bridge at LA 3127 before joining with the Eighty Arpent Canal and west to the St. Charles Canal.

## CURRENT DRAINAGE ISSUES

At present, the majority of drainage issues occur due to the lack of conveyance capacity within localized drainage systems in the neighborhoods. Residential areas along two key streets, King Street and River Park Drive, have experienced frequent flooding in recent years resulting from short duration rainfall events with high intensity.

## PROPOSED IMPROVEMENTS

The development of the proposed conditions model focused on upgrading the existing drainage system within the Hahnville 1 basin. These upgrades include channel modifications to convey surface water runoff from the affected areas in the northern portion of the basin to the outfall and proposed culvert installations at the UP railroad crossings. The following exhibits show the proposed improvements as defined in the report and consolidated into “Improvement Groups.”

**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**

The table below provides a summary for conceptual-level cost estimates associated with each improvement group. 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

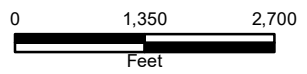
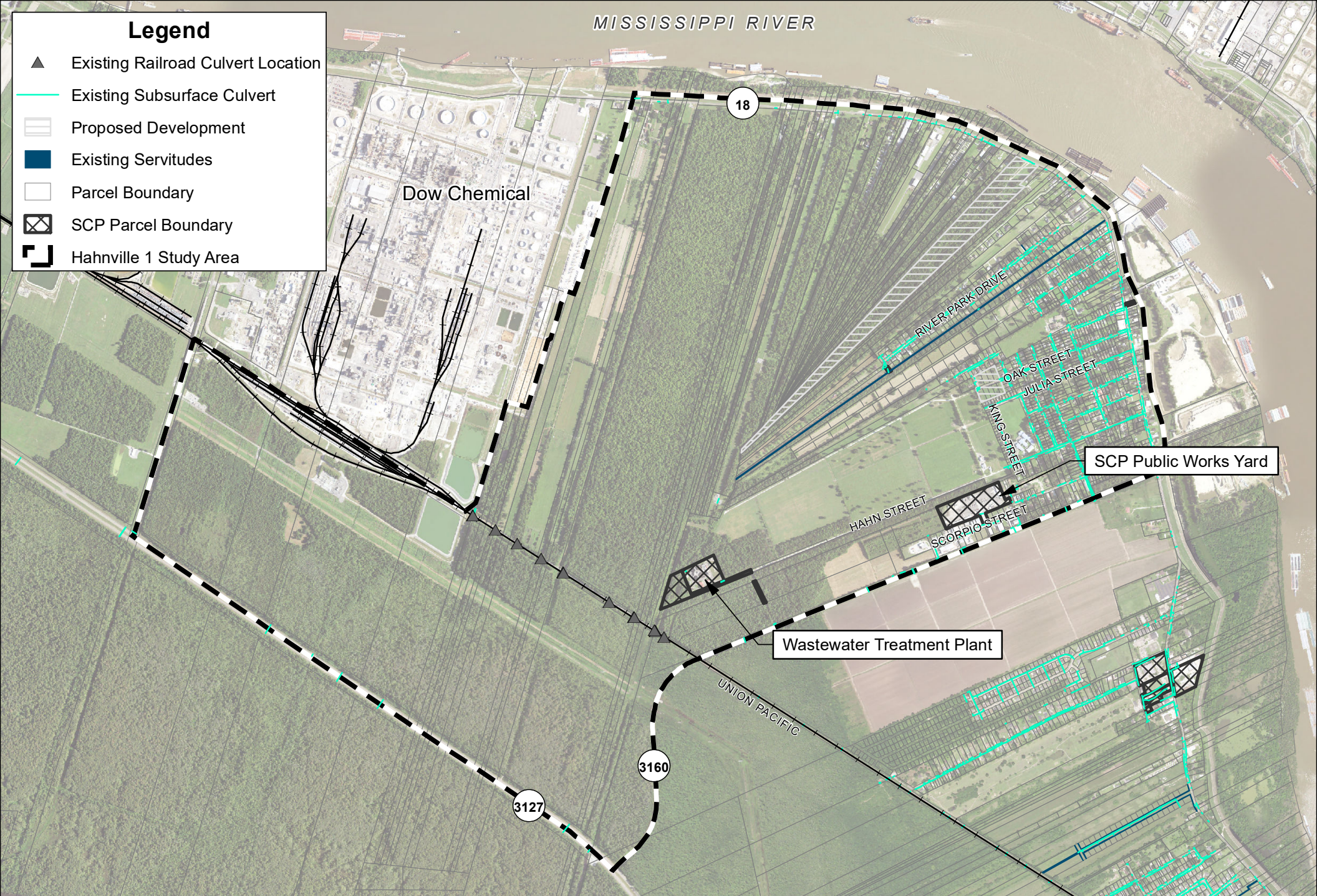
Prioritization Level	Improvement Group	Name	25-year Total Cost*	100-year Total Cost*
1	IG-1	King Street	\$615,400	\$679,600
	IG-2	Hahn Street	\$394,100	\$516,400
	Priority 1 Projects Subtotal		\$1,009,500	\$1,196,000
2	IG-3	River Park Drive	\$488,700	\$503,200
	IG-4	Sunset Court	\$313,200	\$340,500
	Priority 2 Projects Subtotal		\$801,900	\$843,700

3	IG-5	River Road Estates West Channel	\$200,800	\$232,400
	IG-6	River Road Estates East Channel	\$211,200	\$242,800
	Priority 3 Projects Subtotal		\$412,000	\$475,200
4	IG-7	Jack and Bore (East)	\$481,600	\$481,600
	IG-8	Jack and Bore (West – 1)	\$487,100	\$487,100
	IG-9	Jack and Bore (West – 2)	\$488,100	\$488,100
	IG-10	Jack and Bore (West – 3)	\$496,400	\$496,400
	Priority 4 Projects Subtotal		\$1,953,200	\$1,953,200
<b>Total Cost for Improvements</b>			\$4,176,600	\$4,468,100

\*Total Cost includes 20% contingency.

### Legend

-  Existing Railroad Culvert Location
-  Existing Subsurface Culvert
-  Proposed Development
-  Existing Servitudes
-  Parcel Boundary
-  SCP Parcel Boundary
-  Hahnville 1 Study Area



NOTES:  
1. Background Image Source: NAIP, 2015

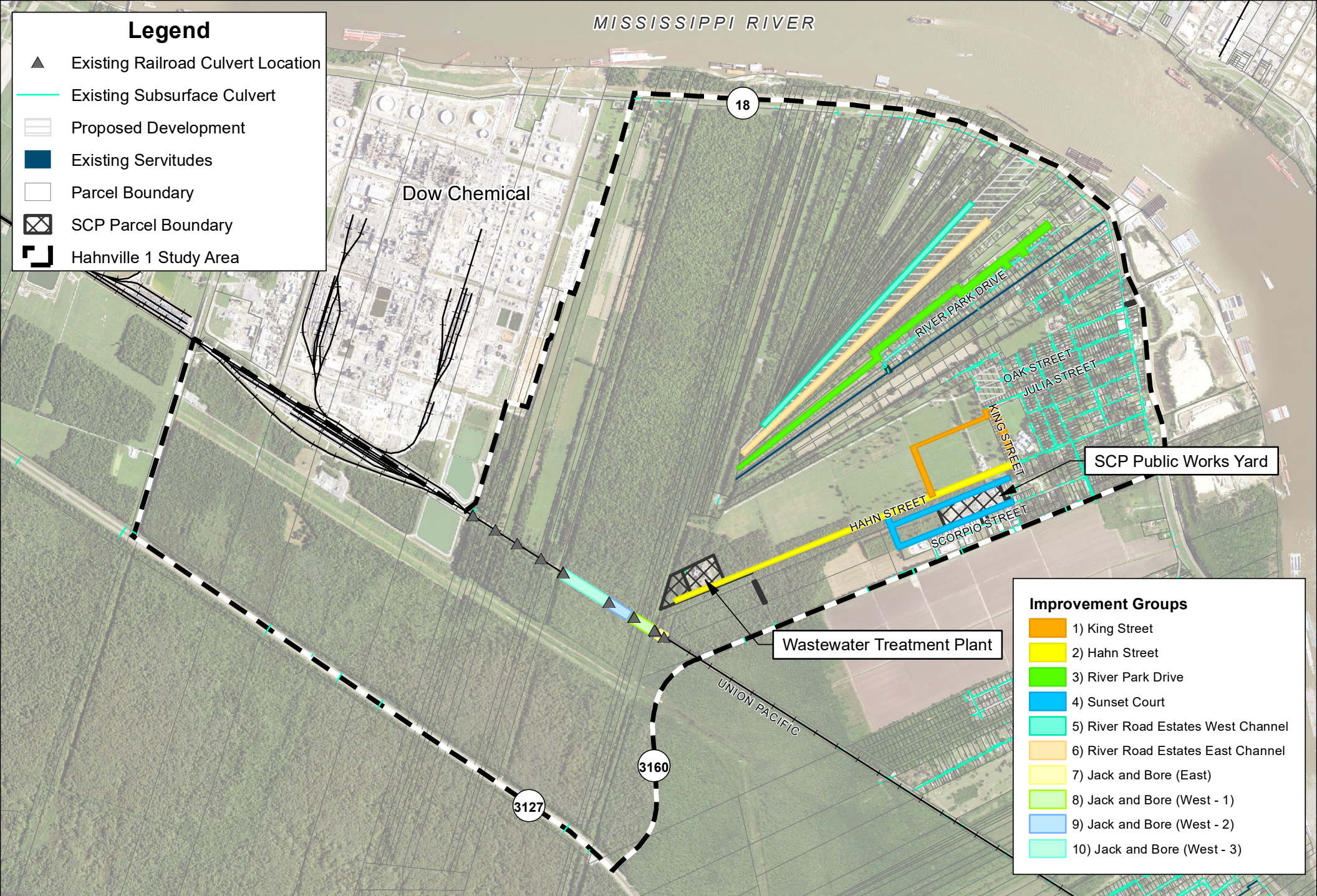
## EXHIBIT ES-1 – EXISTING INFRASTRUCTURE

EXISTING CONDITIONS

HAHNVILLE 1 WATERSHED

**Legend**

- ▲ Existing Railroad Culvert Location
- Existing Subsurface Culvert
- ▨ Proposed Development
- Existing Servitudes
- Parcel Boundary
- ⊠ SCP Parcel Boundary
- ⌚ Hahnville 1 Study Area



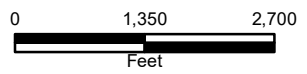
- Improvement Groups**
- 1) King Street
  - 2) Hahn Street
  - 3) River Park Drive
  - 4) Sunset Court
  - 5) River Road Estates West Channel
  - 6) River Road Estates East Channel
  - 7) Jack and Bore (East)
  - 8) Jack and Bore (West - 1)
  - 9) Jack and Bore (West - 2)
  - 10) Jack and Bore (West - 3)

Wastewater Treatment Plant

SCP Public Works Yard

Dow Chemical

UNION PACIFIC














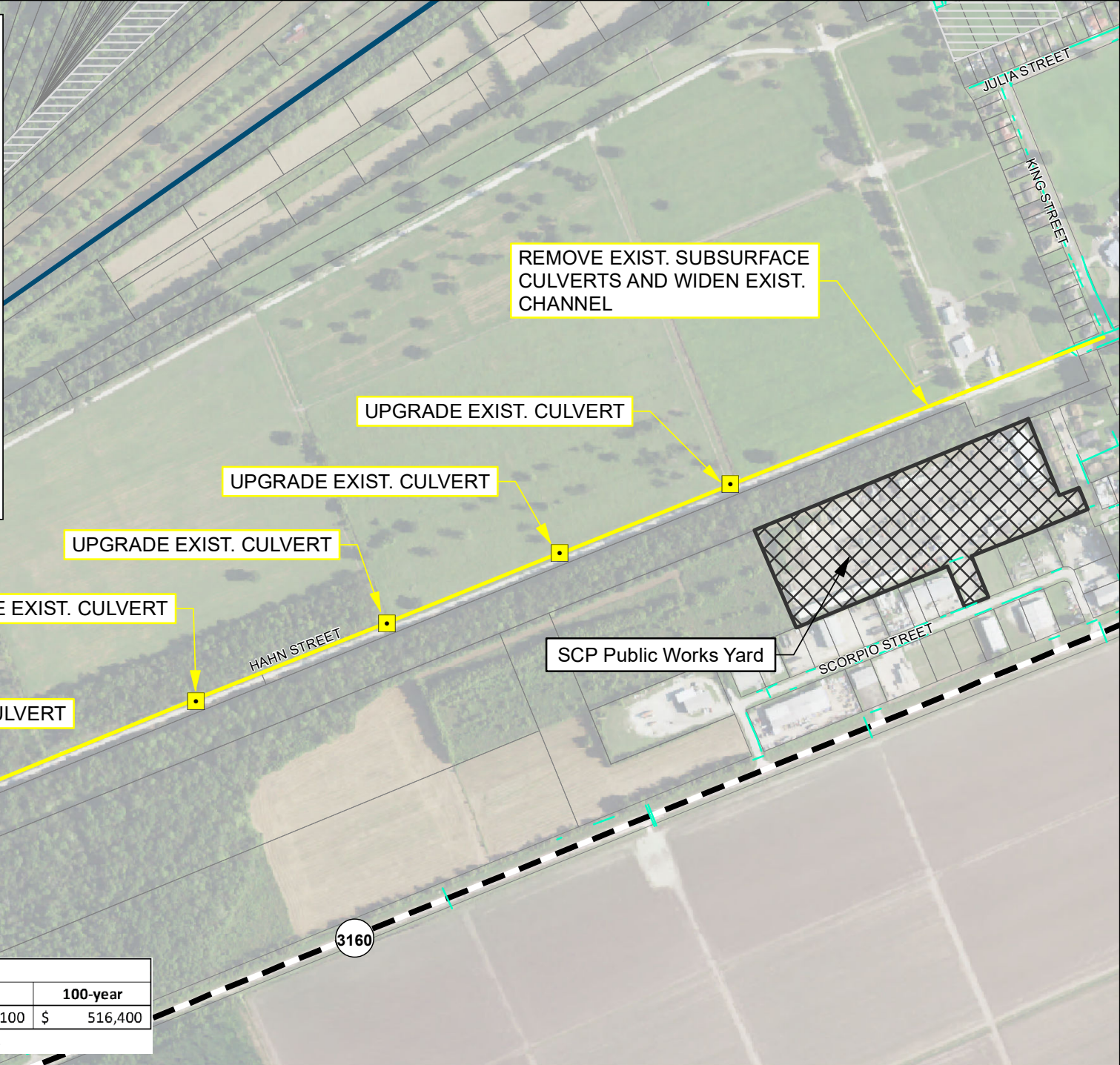
NOTES:  
 1. Background Image Source: NAIP, 2015  
 2. IG Extent is meant for general description only. Final locations for all IGs have not been established as part of this phase of the project. Locations are subject to change as part of permitting and detailed engineering design. As such, costs associated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

**EXHIBIT ES-2 – IMPROVEMENT GROUPS**  
**PROPOSED DRAINAGE SYSTEM IMPROVEMENTS**

HAHNVILLE 1 WATERSHED

# Legend

-  Proposed Culvert Location (IG Color)
  -  Culvert Replacement Location (IG Color)
  -  Channel Improvements (IG Color)
  -  Existing Railroad Culvert Location
  -  Existing Subsurface Culvert
  -  Proposed Development
  -  Existing Servitudes
  -  Parcel Boundary
  -  SCP Parcel Boundary
  -  Hahnville 1 Study Area
- Improvement Groups**
-  IG2 - Hahn Street



Improvement Group 2		
Improvement	25-year	100-year
Outfall Channel and Culvert Improvements	\$ 394,100	\$ 516,400

Note: IG 2 will be constructed first, as it is the outfall channel for IG 1 and IG 4.













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## EXHIBIT ES-3 – IMPROVEMENT GROUP 2 PROPOSED DRAINAGE SYSTEM IMPROVEMENTS

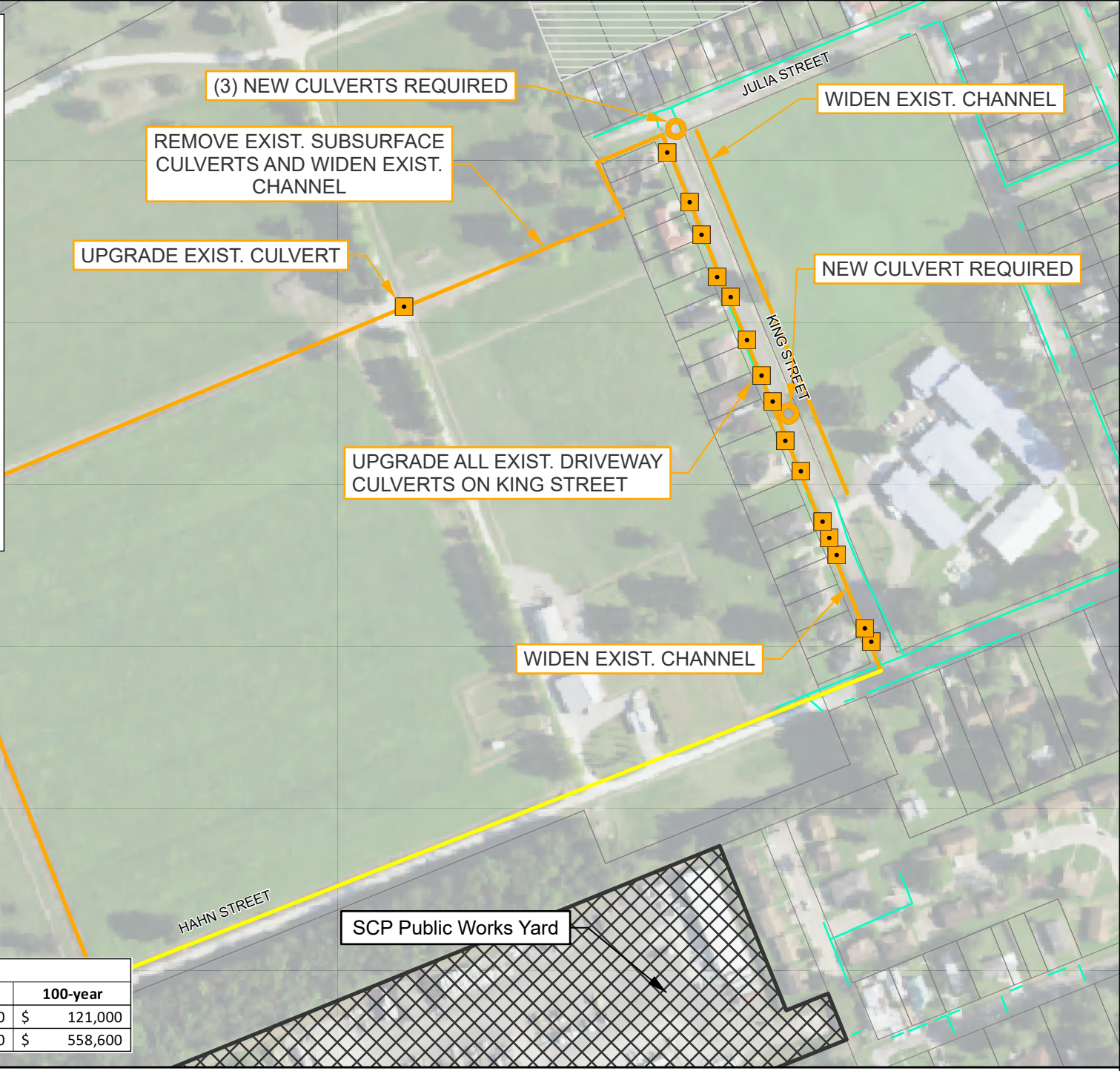
HAHNVILLE 1 WATERSHED

# Legend

-  Proposed Culvert Location (IG Color)
-  Culvert Replacement Location (IG Color)
-  Channel Improvements (IG Color)
-  Existing Railroad Culvert Location
-  Existing Subsurface Culvert
-  Proposed Development
-  Existing Servitudes
-  Parcel Boundary
-  SCP Parcel Boundary
-  Hahnville 1 Study Area

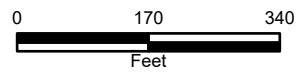
## Improvement Groups

-  IG1 - King Street
-  IG2 - Hahn Street



### Improvement Group 1

Improvement	25-year	100-year
Outfall Channel Improvements	\$ 100,400	\$ 121,000
Channel and Culvert Improvements (King Street)	\$ 515,000	\$ 558,600













NOTES:  
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## EXHIBIT ES-4 – IMPROVEMENT GROUP 1 PROPOSED DRAINAGE SYSTEM IMPROVEMENTS

HAHNVILLE 1 WATERSHED

# Legend

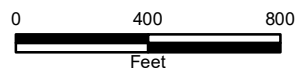
-  Proposed Culvert Location (IG Color)
-  Culvert Replacement Location (IG Color)
-  Channel Improvements (IG Color)
-  Existing Railroad Culvert Location
-  Existing Subsurface Culvert
-  Proposed Development
-  Existing Servitudes
-  Parcel Boundary
-  SCP Parcel Boundary
-  Hahnville 1 Study Area

## Improvement Groups

-  IG1 - King Street
-  IG2 - Hahn Street
-  IG3 - River Park Drive

REMOVE EXIST. SUBSURFACE  
CULVERTS AND WIDEN EXIST.  
CHANNEL

Improvement Group 3		
Improvement	25-year	100-year
Channel Improvements	\$ 488,700	\$ 503,200













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

HAHNVILLE 1 WATERSHED

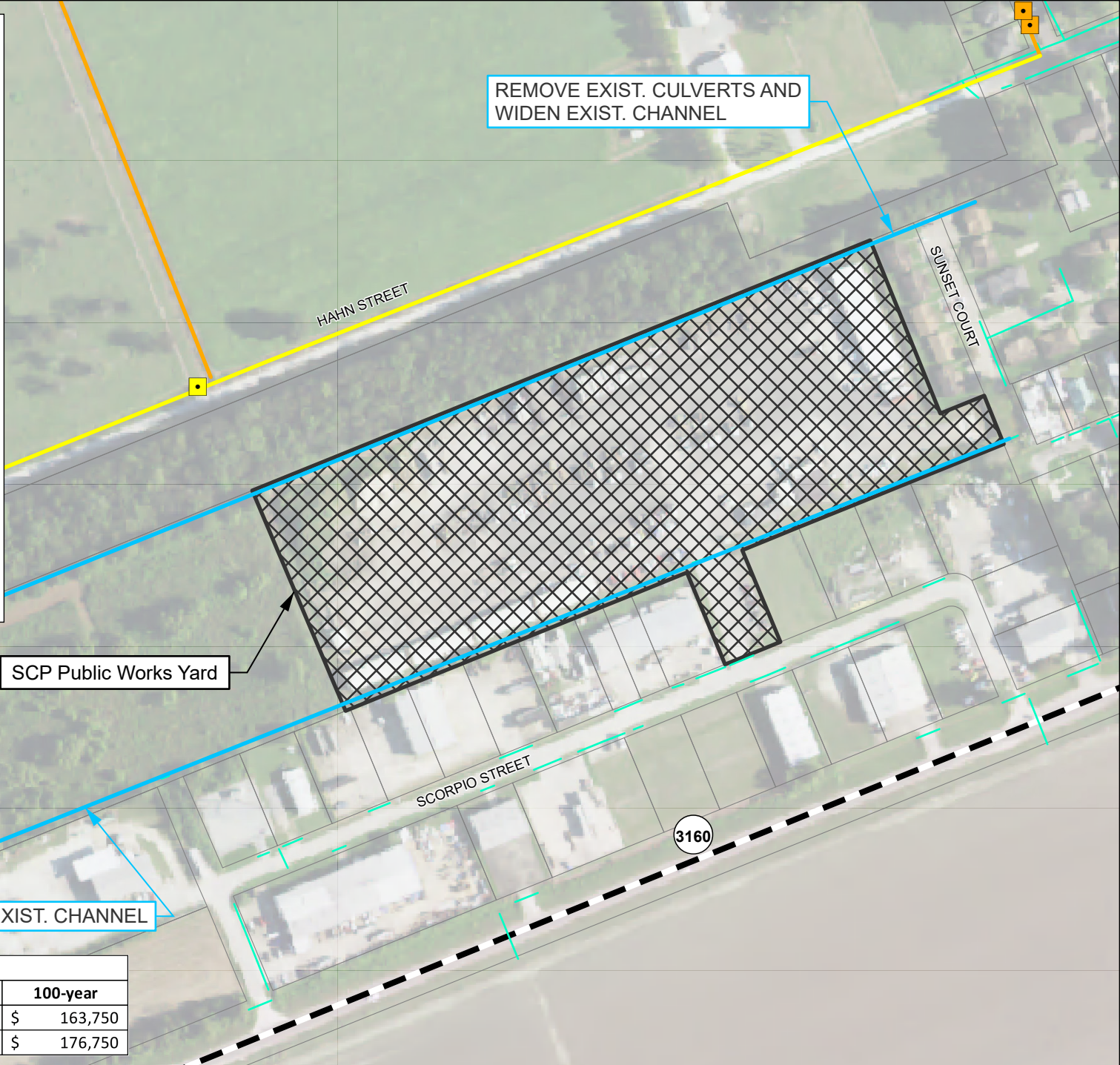


# Legend

-  Proposed Culvert Location (IG Color)
-  Culvert Replacement Location (IG Color)
-  Channel Improvements (IG Color)
-  Existing Railroad Culvert Location
-  Existing Subsurface Culvert
-  Proposed Development
-  Existing Servitudes
-  Parcel Boundary
-  SCP Parcel Boundary
-  Hahnville 1 Study Area

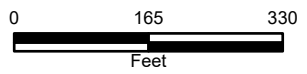
## Improvement Groups

-  IG1 - King Street
-  IG2 - Hahn Street
-  IG3 - River Park Drive
-  IG4 - Sunset Court



### Improvement Group 4

Improvement	25-year	100-year
Channel Improvements (Sunset Court)	\$ 151,100	\$ 163,750
Channel Improvements (Scorpio Street)	\$ 162,100	\$ 176,750













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

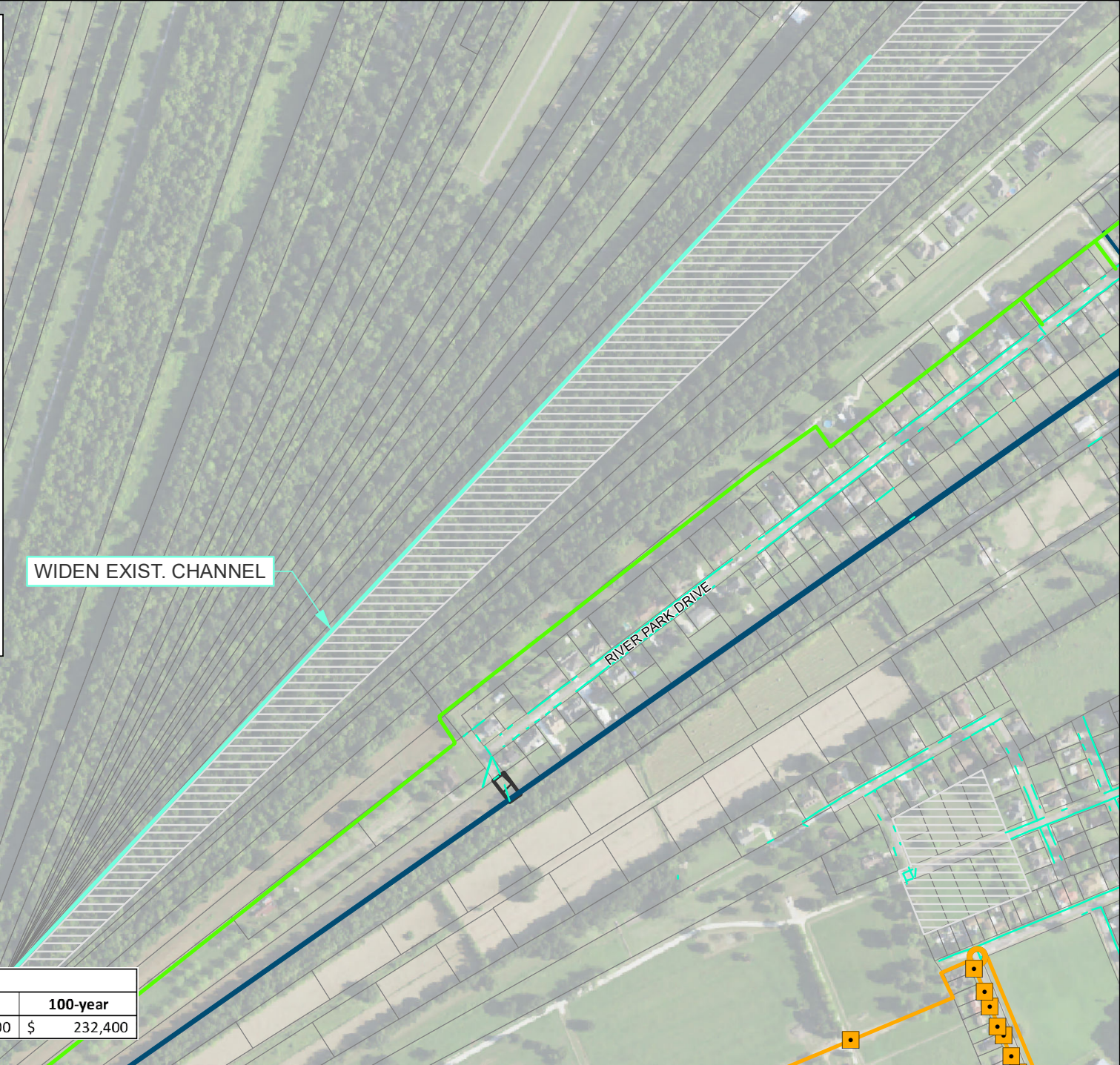
HAHNVILLE 1 WATERSHED

# Legend

-  Proposed Culvert Location (IG Color)
-  Culvert Replacement Location (IG Color)
-  Channel Improvements (IG Color)
-  Existing Railroad Culvert Location
-  Existing Subsurface Culvert
-  Proposed Development
-  Existing Servitudes
-  Parcel Boundary
-  SCP Parcel Boundary
-  Hahnville 1 Study Area

## Improvement Groups

-  IG1 - King Street
-  IG2 - Hahn Street
-  IG3 - River Park Drive
-  IG4 - Sunset Court
-  IG5 - River Road Estates West Channel



Improvement Group 5		
Improvement	25-year	100-year
Channel Improvements	\$ 200,800	\$ 232,400













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

HAHNVILLE 1 WATERSHED

# Legend

-  Proposed Culvert Location (IG Color)
-  Culvert Replacement Location (IG Color)
-  Channel Improvements (IG Color)
-  Existing Railroad Culvert Location
-  Existing Subsurface Culvert
-  Proposed Development
-  Existing Servitudes
-  Parcel Boundary
-  SCP Parcel Boundary
-  Hahnville 1 Study Area

## Improvement Groups

-  IG1 - King Street
-  IG2 - Hahn Street
-  IG3 - River Park Drive
-  IG4 - Sunset Court
-  IG5 - River Road Estates West Channel
-  IG6 - River Road Estates East Channel

WIDEN EXIST. CHANNEL

RIVER PARK DRIVE

Improvement Group 6		
Improvement	25-year	100-year
Channel Improvements	\$ 211,200	\$ 242,800













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

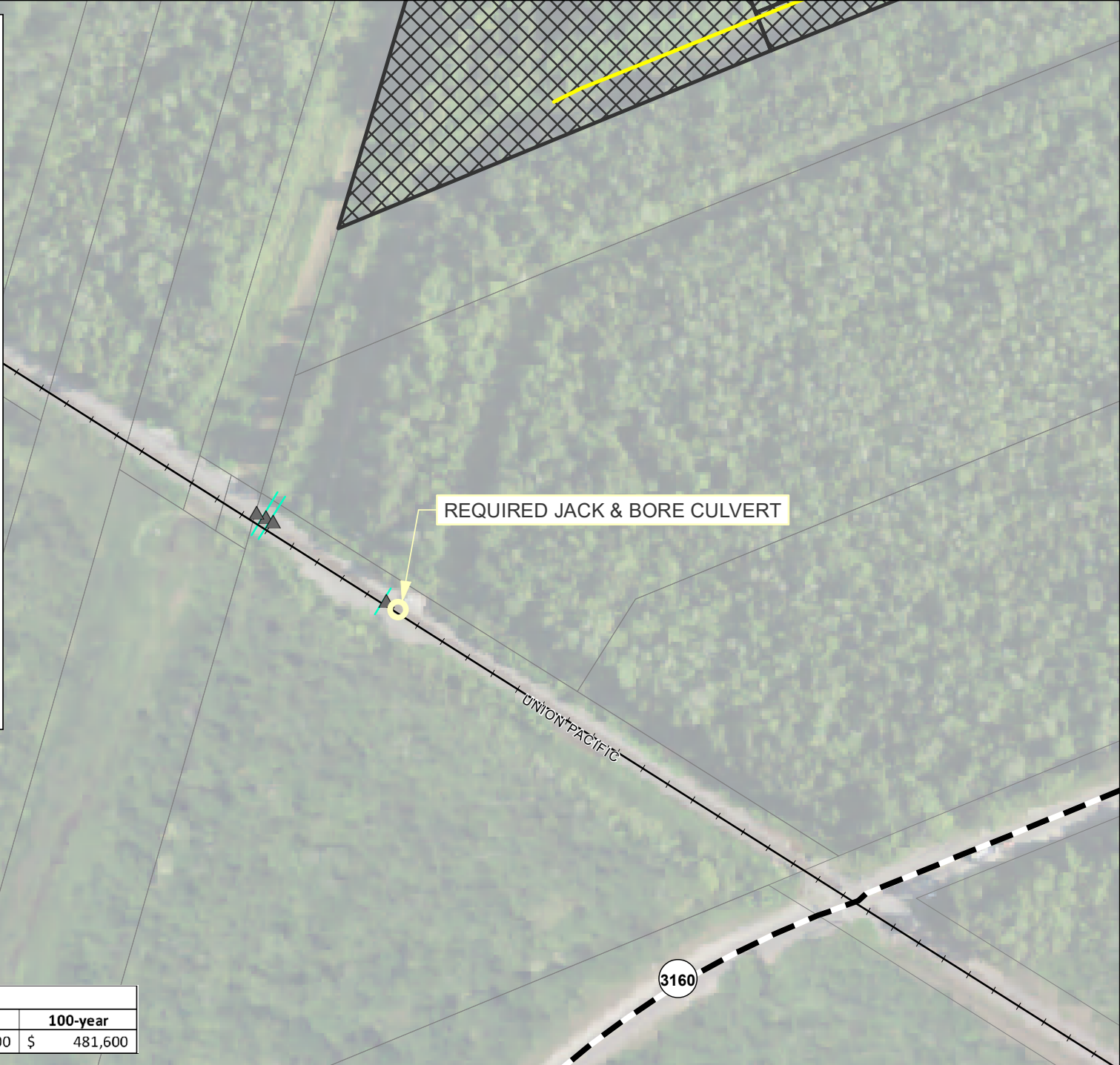
HAHNVILLE 1 WATERSHED

# Legend

-  Proposed Culvert Location (IG Color)
-  Culvert Replacement Location (IG Color)
-  Channel Improvements (IG Color)
-  Existing Railroad Culvert Location
-  Existing Subsurface Culvert
-  Proposed Development
-  Existing Servitudes
-  Parcel Boundary
-  SCP Parcel Boundary
-  Hahnville 1 Study Area

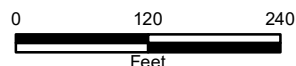
## Improvement Groups

-  IG1 - King Street
-  IG2 - Hahn Street
-  IG3 - River Park Drive
-  IG4 - Sunset Court
-  IG5 - River Road Estates West Channel
-  IG6 - River Road Estates East Channel
-  IG7 - Jack and Bore (East)



### Improvement Group 7











Improvement	25-year	100-year
Jack and Bore Culvert	\$ 481,600	\$ 481,600



NOTES:  
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## EXHIBIT ES-9 – IMPROVEMENT GROUP 7 PROPOSED DRAINAGE SYSTEM IMPROVEMENTS HAHNVILLE 1 WATERSHED

# Legend

-  Proposed Culvert Location (IG Color)
-  Culvert Replacement Location (IG Color)
-  Channel Improvements (IG Color)
-  Existing Railroad Culvert Location
-  Existing Subsurface Culvert
-  Proposed Development
-  Existing Servitudes
-  Parcel Boundary
-  SCP Parcel Boundary
-  Hahnville 1 Study Area

## Improvement Groups

-  IG1 - King Street
-  IG2 - Hahn Street
-  IG3 - River Park Drive
-  IG4 - Sunset Court
-  IG5 - River Road Estates West Channel
-  IG6 - River Road Estates East Channel
-  IG7 - Jack and Bore (East)
-  IG8 - Jack and Bore (West - 1)



Improvement Group 8		
Improvement	25-year	100-year
Jack and Bore Culvert	\$ 487,100	\$ 487,100













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

HAHNVILLE 1 WATERSHED

# Legend

-  Proposed Culvert Location (IG Color)
-  Culvert Replacement Location (IG Color)
-  Channel Improvements (IG Color)
-  Existing Railroad Culvert Location
-  Existing Subsurface Culvert
-  Proposed Development
-  Existing Servitudes
-  Parcel Boundary
-  SCP Parcel Boundary
-  Hahnville 1 Study Area

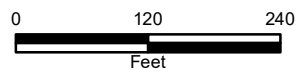
## Improvement Groups

-  IG1 - King Street
-  IG2 - Hahn Street
-  IG3 - River Park Drive
-  IG4 - Sunset Court
-  IG5 - River Road Estates West Channel
-  IG6 - River Road Estates East Channel
-  IG7 - Jack and Bore (East)
-  IG8 - Jack and Bore (West - 1)
-  IG9 - Jack and Bore (West - 2)



### Improvement Group 9

Improvement	25-year	100-year
Jack and Bore Culvert	\$ 488,100	\$ 488,100













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

HAHNVILLE 1 WATERSHED

# Legend

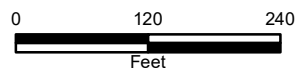
-  Proposed Culvert Location (IG Color)
-  Culvert Replacement Location (IG Color)
-  Channel Improvements (IG Color)
-  Existing Railroad Culvert Location
-  Existing Subsurface Culvert
-  Proposed Development
-  Existing Servitudes
-  Parcel Boundary
-  SCP Parcel Boundary
-  Hahnville 1 Study Area

## Improvement Groups

-  IG1 - King Street
-  IG2 - Hahn Street
-  IG3 - River Park Drive
-  IG4 - Sunset Court
-  IG5 - River Road Estates West Channel
-  IG6 - River Road Estates East Channel
-  IG7 - Jack and Bore (East)
-  IG8 - Jack and Bore (West - 1)
-  IG9 - Jack and Bore (West - 2)
-  IG10 - Jack and Bore (West - 3)










Improvement Group 10		
Improvement	25-year	100-year
Jack and Bore Culvert	\$ 496,400	\$ 496,400

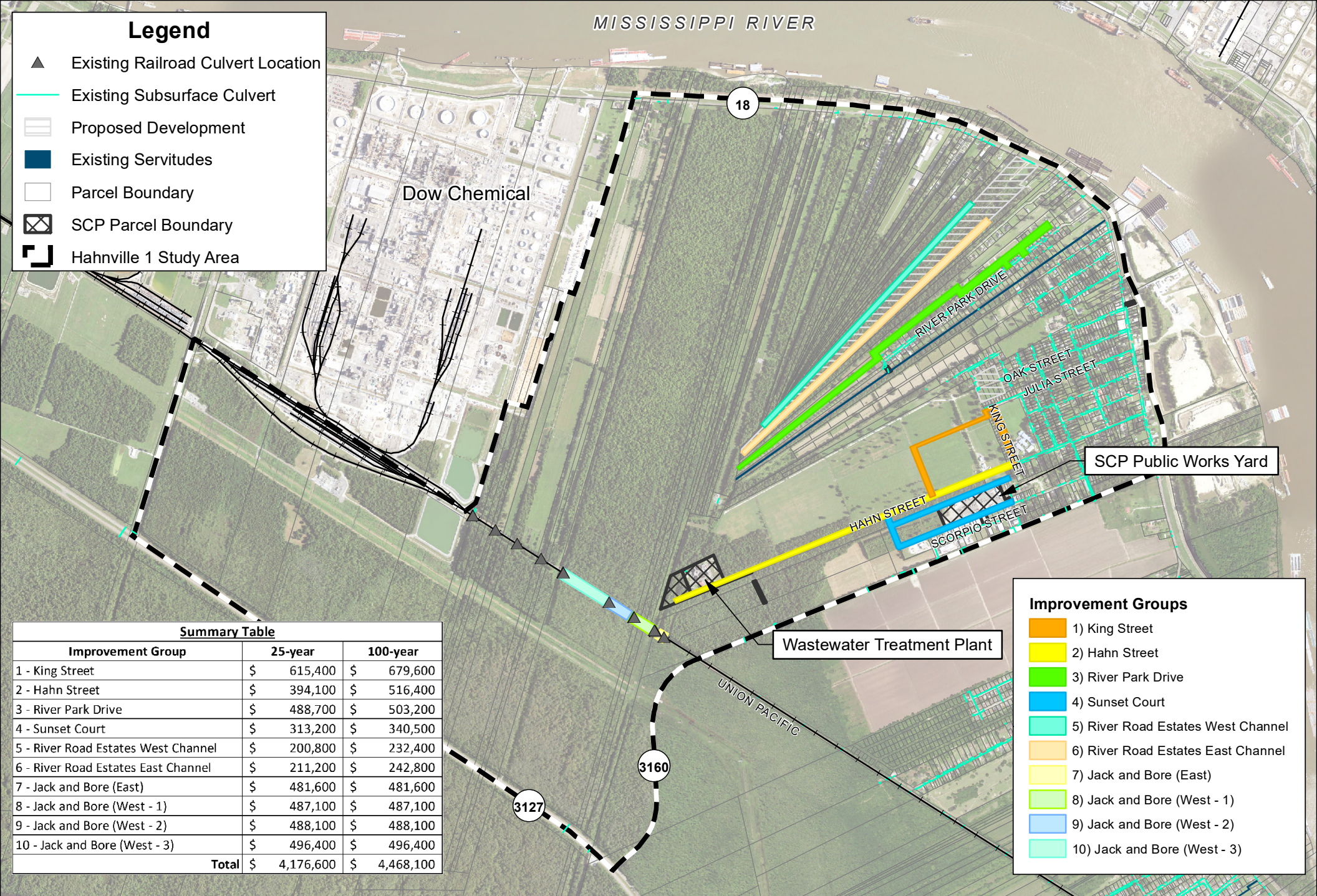


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## EXHIBIT ES-12 – IMPROVEMENT GROUP 10 PROPOSED DRAINAGE SYSTEM IMPROVEMENTS HAHNVILLE 1 WATERSHED

**Legend**











-  Existing Railroad Culvert Location
-  Existing Subsurface Culvert
-  Proposed Development
-  Existing Servitudes
-  Parcel Boundary
-  SCP Parcel Boundary
-  Hahnville 1 Study Area

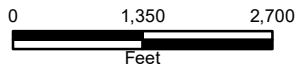


**Summary Table**

Improvement Group	25-year	100-year
1 - King Street	\$ 615,400	\$ 679,600
2 - Hahn Street	\$ 394,100	\$ 516,400
3 - River Park Drive	\$ 488,700	\$ 503,200
4 - Sunset Court	\$ 313,200	\$ 340,500
5 - River Road Estates West Channel	\$ 200,800	\$ 232,400
6 - River Road Estates East Channel	\$ 211,200	\$ 242,800
7 - Jack and Bore (East)	\$ 481,600	\$ 481,600
8 - Jack and Bore (West - 1)	\$ 487,100	\$ 487,100
9 - Jack and Bore (West - 2)	\$ 488,100	\$ 488,100
10 - Jack and Bore (West - 3)	\$ 496,400	\$ 496,400
<b>Total</b>	<b>\$ 4,176,600</b>	<b>\$ 4,468,100</b>

**Improvement Groups**

-  1) King Street
-  2) Hahn Street
-  3) River Park Drive
-  4) Sunset Court
-  5) River Road Estates West Channel
-  6) River Road Estates East Channel
-  7) Jack and Bore (East)
-  8) Jack and Bore (West - 1)
-  9) Jack and Bore (West - 2)
-  10) Jack and Bore (West - 3)



**NOTES:**

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**EXHIBIT ES-13 – IMPROVEMENT GROUPS SUMMARY**

**PROPOSED DRAINAGE SYSTEM IMPROVEMENTS**

**HAHNVILLE 1 WATERSHED**