Appendix A

Hydrologic and Hydraulic Study

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Baton Rouge Lakes Hydrology & Hydraulic Report

FEMA Non-Disaster Hazard Mitigation Assistance Programs

East Baton Rouge Parish, Louisiana

CSRS #216194

Prepared by:

CSRS LLC

QUALITY CONTROL AND QUALITY ASSURANCE

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1. Introduction

1.1. Background

In 2016, the Baton Rouge Area Foundation initiated sponsorship for the Baton Rouge Lakes Master Plan. The goal of this plan is to provide a framework for restoring and transforming the Baton Rouge Lakes to create a safer, healthier, and more enjoyable environment around them. The Baton Rouge Lakes Master Plan was released to the public in December of 2016 and has since begun implementation.

CSRS LLC is a Project Advisor for the Master Plan which included aiding with planning level hydrodynamic modeling of the Baton Rouge Lakes drainage area. This watershed lies within East Baton Rouge Parish in Southern Louisiana. The Baton Rouge Lakes system falls within the Corporation Canal and Bayou Duplantier drainage areas (approx. 14.46 sq. mi.), which is a sub-watershed of Bayou Manchac. This sub-watershed eventually ties into Dawson Creek, Ward Creek, Bayou Manchac and Amite River systems downstream. *Figure 1* shows the drainage area extents. The existing conditions and updated Master Plan conditions (updated existing conditions for comparison with proposed conditions) were assessed during this model development.

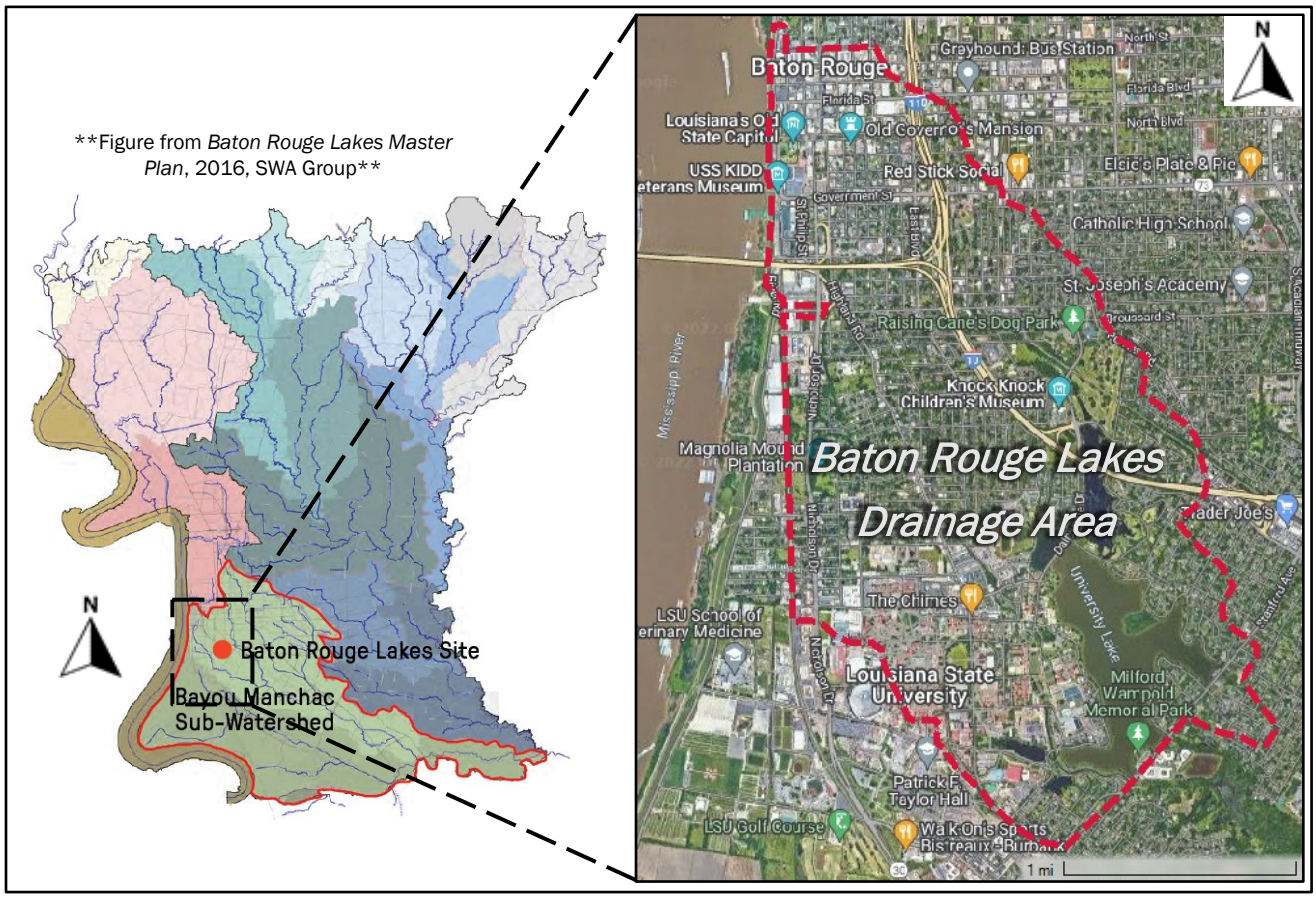

Figure 1: Baton Rouge Lakes Watershed Extents with Respect to BR Lakes Master Plan, 2016

The goal of the modeling is first to assess the headwater-driven scenario of the Baton Rouge Lakes Drainage Area. After this, preliminary proposed features were analyzed as mitigation solutions to flood-prone structures in the Drainage Area. This analysis will aid in obtaining federal funding through FEMA's Non-Disaster Hazard Mitigation Assistance Program. This analysis provides preliminary results that show effective flood mitigation for the area. It also presents the hydrologic and hydraulic analysis and mitigation strategy performed to assess the Baton Rouge Lakes drainage area and identify a solution to reduce the risk of flooding for streets, repetitive loss structures, and other flood-prone properties in the surrounding areas.

1.2. Flooding History

East Baton Rouge Parish has been fortunate throughout recorded flooding history but has suffered greatly in recent years. Two significant recent events caused major losses in the area. The first event was in August of 2016. During this event, Southeast Louisiana and Southwest Mississippi experienced 20 to 30 inches of rainfall between August 11th and August 13th. The Baton Rouge Lakes area experienced 10 inches of rainfall. The Comite and Amite River Basins experienced the greater precipitation depths, which contributed to flooding just south of the Baton Rouge Lakes due to the backwater effects. Google Earth imagery on August 13th indicates that all lakes contained water within their banks. Specifically, Lakeshore Drive, Stanford Avenue, July Street, and Dalrymple Drive did not experience overtopping during this event. The existing concrete lined channel along the east and south side of McKinley High School experienced water surface elevations above the crest of the concrete, but this did not cause flooding on adjacent roadways. The second event was in May of 2021. This event brought roughly 10 to 12 inches of rainfall but was mostly south of the Baton Rouge Lakes. Similar to the August 2016 event, this event brought on backwater effects just downstream of the Baton Rouge Lakes. CSRS does not have available imagery to confirm that the aforementioned concrete-lined channel and roadways did not overtop. The National Weather Service does not have this event listed in the past local weather events, so there is no available data to confirm that these roadways and channel did not overtop.

1.3. Modeling Approach

The first step in this modeling effort was data acquisition. This included collecting previous studies of the region, determining whether the data from the previous studies was useful for the new model, and defining any datum shifts that needed to be made.

Once data acquisition was complete, useful information was converted to geometric features in the hydraulic model. Before running any simulations, the hydrologic and hydraulic parameters were defined according to the methods described later in this report. HEC-HMS was used to model the hydrology and HEC-RAS was used to generate a full 2-dimensional (2D) unsteady flow hydraulic model. The models utilize U.S. customary units. The shallow water equations (via the Eulerian-Lagrangian Method) were used for hydraulic calculations. More details concerning this portion of the

approach are described later in the report. In order to quantify the flood risk reduction, a comparison was made between the final proposed conditions and the Baton Rouge Lakes Master Plan condition (updated existing conditions). Historical river gauge data is not available within the model boundaries, so a comparison to FEMA data for the region and GEC's available modeling data for the area was used to validate the model results.

After the hydrology and hydraulics were validated, several design storms were simulated under existing conditions. An updated existing condition model was created to represent the build-out scenario for the Baton Rouge Lakes Master Plan. Lastly, an iterative process was undertaken to determine the necessary proposed improvements to the Baton Rouge Lakes Watershed.

2. Data Acquisition

CSRS requested information from GEC regarding the Bayou Duplantier Watershed in 2018 prior to model development. GEC completed their *Baton Rouge Lakes Master Plan Data Report* in 2014. The full report can be found in *Appendix A.* This data report summarizes the data needs and resulting data collection results, which includes survey information for the lake's hydraulic control structures and bathymetry. GEC also completed their *Hydrologic Analysis and Preliminary Engineering Report* in 2017. The full report can be found in *Appendix B*. A 1-D HEC-RAS model was created to quantify the hydraulic conditions of the region. The report analyzes the current conditions of the Duplantier Watershed, including the effect of the Terrace Street Pump Station. This pump station serves to alleviate flooding south of Terrace Street and North of the Louisiana State University Campus. This report confirmed that the pump station is effective and suggests that the pump be upgraded to extend its serviceable life. GEC also provided the survey information that was used to develop their 1-D model for use in the HEC-RAS terrain.

CSRS also utilized available data from FEMA to aid in validation of the model. The first document is the Flood Insurance Rate Map (FIRM) 22033C0245E, which indicate the flood zones and base flood elevations for the region. The FIRM can be found in *Appendix C.* The second document is the Flood Insurance Study for East Baton Rouge Parish, Louisiana (FIS Number 22033CV000B). This document provides detailed water surface profile and flowrates for each major channel in the Parish. The pages related to Corporation Canal, Bayou Duplantier, and Dawson Creek can be found in *Appendix D.*

3. Hydrologic Model

HEC-HMS 4.8 was used to model the hydrology for the region. The LA DOTD Hydraulics Manual (2011) and HEC-HMS documentation (available through the US Army Corps of Engineers Hydrologic Engineering Center's website) were used to make model input decisions. The subbasin extents were determined based on the data from GEC and from available 2017 USGS LiDAR. The total drainage area includes 14.46 square miles. The Initial and Constant Loss Method was used to simulate the infiltration. Initial loss was set to 1-inch, constant rate was set to 0.02 inches per hour, and

impervious percentage was set to 0%. Model validation confirms that these inputs are appropriate. The following methods were not implemented in the model: discretization, canopy, surface, transform, and baseflow.

The Hypothetical Storm (SCS Storm) Method was used to create the meteorological models in HEC-HMS. Louisiana is within NRCS's Type III rainfall distribution region; therefore, SCS Type III was chosen for all simulation event meteorological models. This method assumes a 24-hour event. The point depth values were taken from the National Oceanic and Atmospheric Administration's (NOAA) Atlas 14 Precipitation Frequency Data Server. The centroid of each of the watershed was determined using GIS analysis. This centroid's coordinates were used to collect the point precipitation depth values for each the watershed based on the *NOAA Atlas 14 Raw Data,* which can be found in *Appendix E.* Based on the Department of Commerce's Technical Paper No. 40, an aerial reduction factor is not necessary given the drainage area's size. The 10-year, 25-year, and 100-year design storms were considered in this analysis. The excess precipitation from the hydrologic was used as an input into HEC-RAS to account for infiltration. *Figure 2, Figure 3, and Figure 4* show the comparison of the cumulative precipitation and the cumulative excess precipitation for the 10-year, 25-year, and 100-year events, respectively.

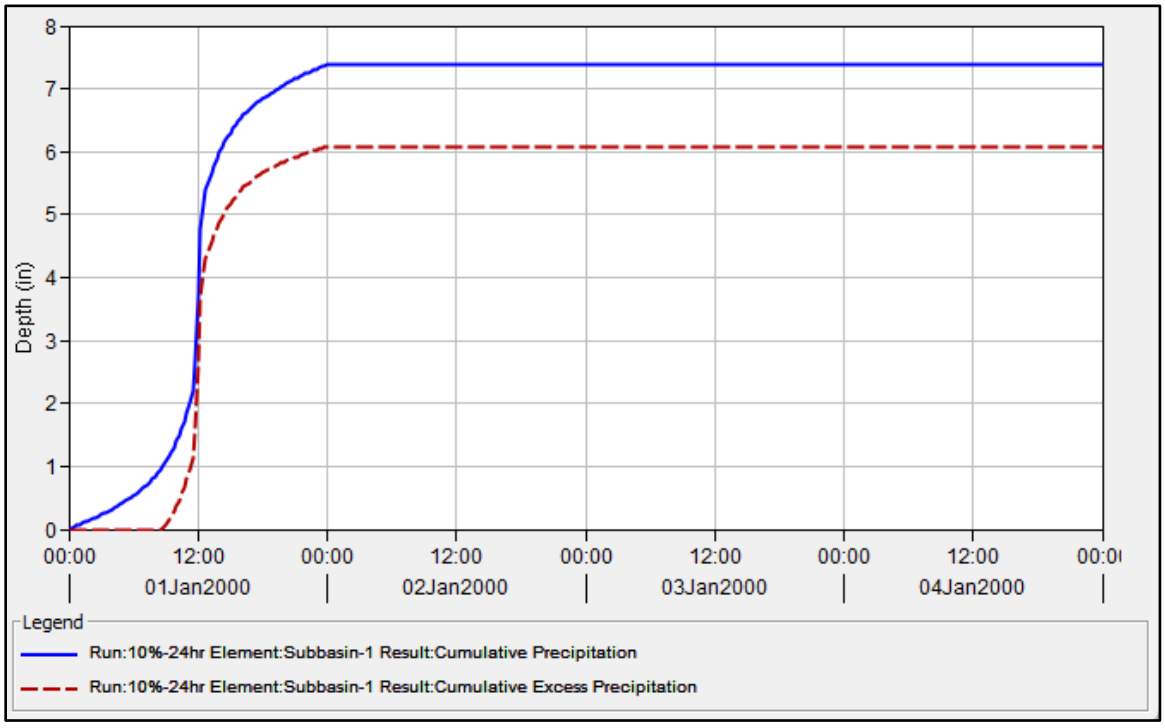

Figure 2: 10-Year Cumulative Precipitation Vs. Cumulative Excess Precipitation

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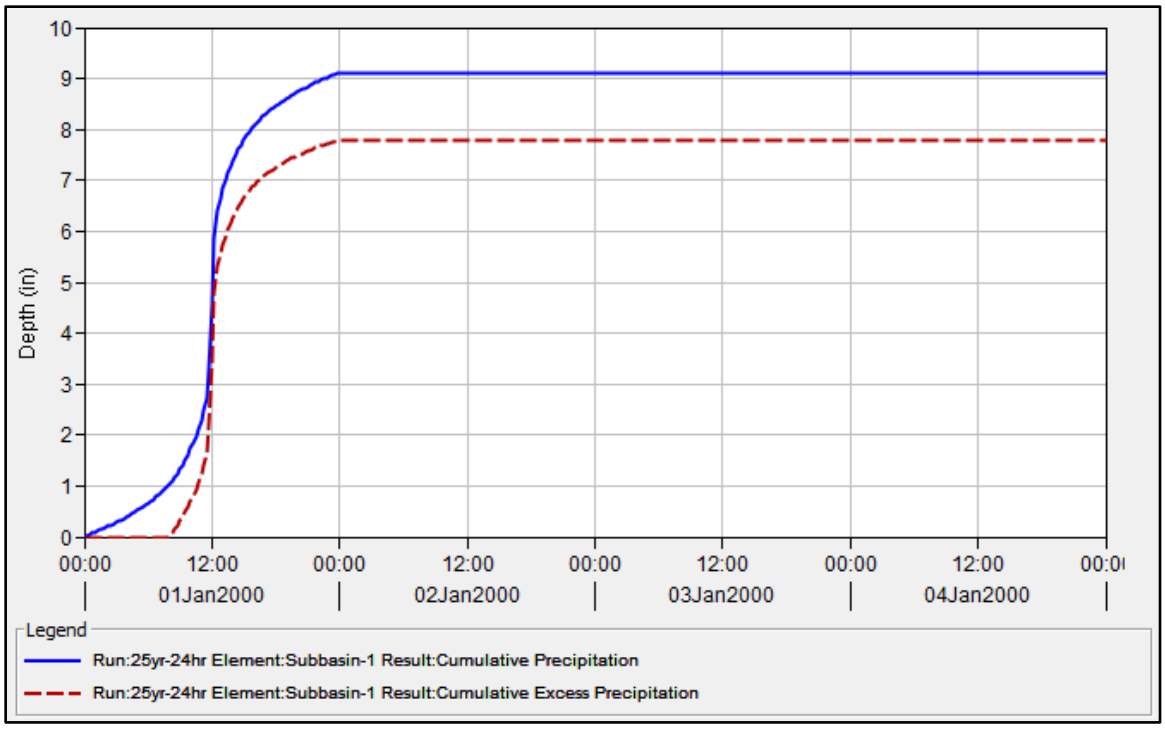

Figure 3: 25-Year Cumulative Precipitation Vs. Cumulative Excess Precipitation

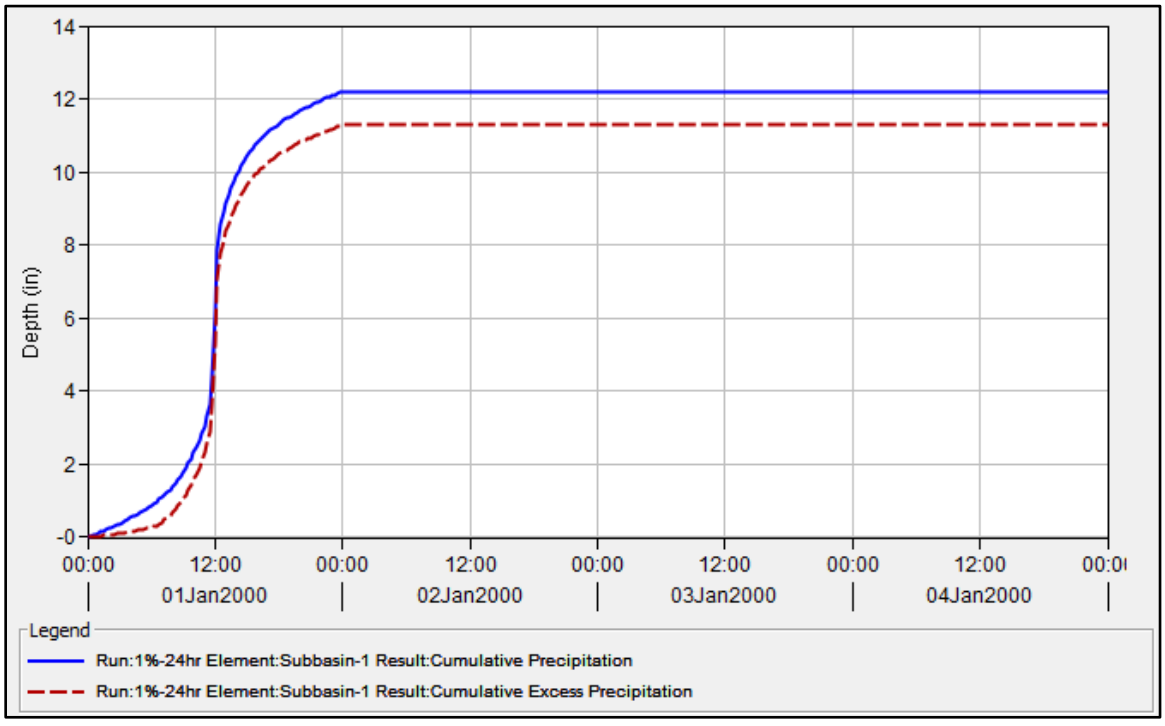

Figure 4: 100-Year Cumulative Precipitation Vs. Cumulative Excess Precipitation

4. Hydraulic Model

4.1. Application of Modeling Approach

After completion of data acquisition, the hydraulic structure data and bathymetric data were input into the HEC-RAS model. The hydraulic parameters were set next. This included creating unsteady flow files that incorporate the excess precipitation output from HEC-HMS and assigning the manning's roughness distribution for the region in RAS Mapper. Once these were defined, the HEC-RAS computation methods were adjusted and tested to determine the best fit for this region. After defining the computation methods to use, simulations were tested iteratively to determine stability issues and refine the model. Due to the lack of available gauge data in the model area, direct calibration of the model could not be performed. The model results were validated to available FEMA Flood Insurance Rate Maps and to GEC's model results.

4.2. Existing Conditions Model Inputs

The topography used in the HEC-RAS model is based on the 2017 USGS LiDAR dataset that was collected in NAD83 and NAVD 88. GEC's survey data was merged with the base LiDAR to create the final terrain survey for the model. The proposed features in the terrain are consolidated around only two lakes: Crest Lake and University Lake. See *Figure 5* for an aerial of the Existing Terrain used in the HEC-RAS model around these two lakes.

The 2D computational mesh has a base square cell size of 150 x 150 feet. The final mesh has approximately 17,000 cells. The mesh was developed to capture necessary high ground features and channel features.

Manning's roughness was defined for the 2D flow area based on the Nation Land Cover Database's available 2016 data. The base n-values were assigned according to the HEC-RAS guidance and adjusted within reason as needed.

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Hydraulic control structures for the ponds were input based on GEC's survey. Other major roadway constrictions that were not included in the survey were modeled as weir structures to better capture the hydraulic behavior near these roadways in overtopping scenarios. Lake control structures were revised to establish the updated existing conditions which represent the Baton Rouge Lakes Master Plan build-out. The changes are listed below:

- May Street Weir between City Park Lake and University Lake
    - Existing: invert of 21.7 FT, crest elevation between 25.9 FT and 26.7 FT, bottom width of 40 feet, top width of 40 feet
    - Updated Existing (Master Plan): invert of 18.3 FT, crest elevation between 25.9 FT and 26.7 FT (no change), bottom width of 65 feet, top width of 69 feet
- University Lake Outfall Weir through Stanford Avenue
    - Existing: double stage trapezoidal weir
        - Lower Stage Weir: invert of 20.6 FT, top elevation of 21.6 FT, bottom width of 15 feet, top width of 17 feet
        - Higher Stage Weir: invert of 21.6 FT, top elevation of 25.5 FT, bottom width of 54 feet, top width of 55.7 feet
        - 100-Year Weir Capacity: $Q = CLH^{1.5}$ (per HEC-RAS documentation)
            - $Q_{Lower} = (3)(15)(2.9)^{1.5} = 222\ CFS.$
            - $Q_{Higher} = (3)(54)(1.9)^{1.5} = 424\ CFS.$
            - $Q_{Total} = Q_{Lower} + Q_{Higer} = 222\ + 424, Q_{Total} = 647\ CFS.$
                - Where, C = weir coefficient, L = bottom width of weir [feet], H = upstream energy head above weir invert [feet] (100-year head = 23.5 FT)
    - Updated Existing (Master Plan): single stage weir with concrete box culvert
        - Weir: invert of 24 FT, crest elevation of 25.5 FT, bottom width of 61 feet, top width of 63 feet
        - Culvert: 10' x 1' Concrete Box with inverts 20.6 FT (upstream) and 20.4 FT (downstream), length of 50 feet

Except for the Terrace Street Pump Station location, the boundary of the model was set to normal depth to simulate the design storms during a headwater-driven scenario. This will better capture the true potential conveyance of the Baton Rouge Lakes system, opposed to the tailwater-driven modeling strategy that was applied to create the FEMA flood zones. The pump station location was set to a rating curve based on GEC's analysis.

Calibration regions were created for Corporation Canal and Bayou Duplantier with an n-value of 0.04 to improve model accuracy. *Table 1* shows the Manning's n-values chosen for each land cover classification in the final calibrated geometry outside of the calibration regions.

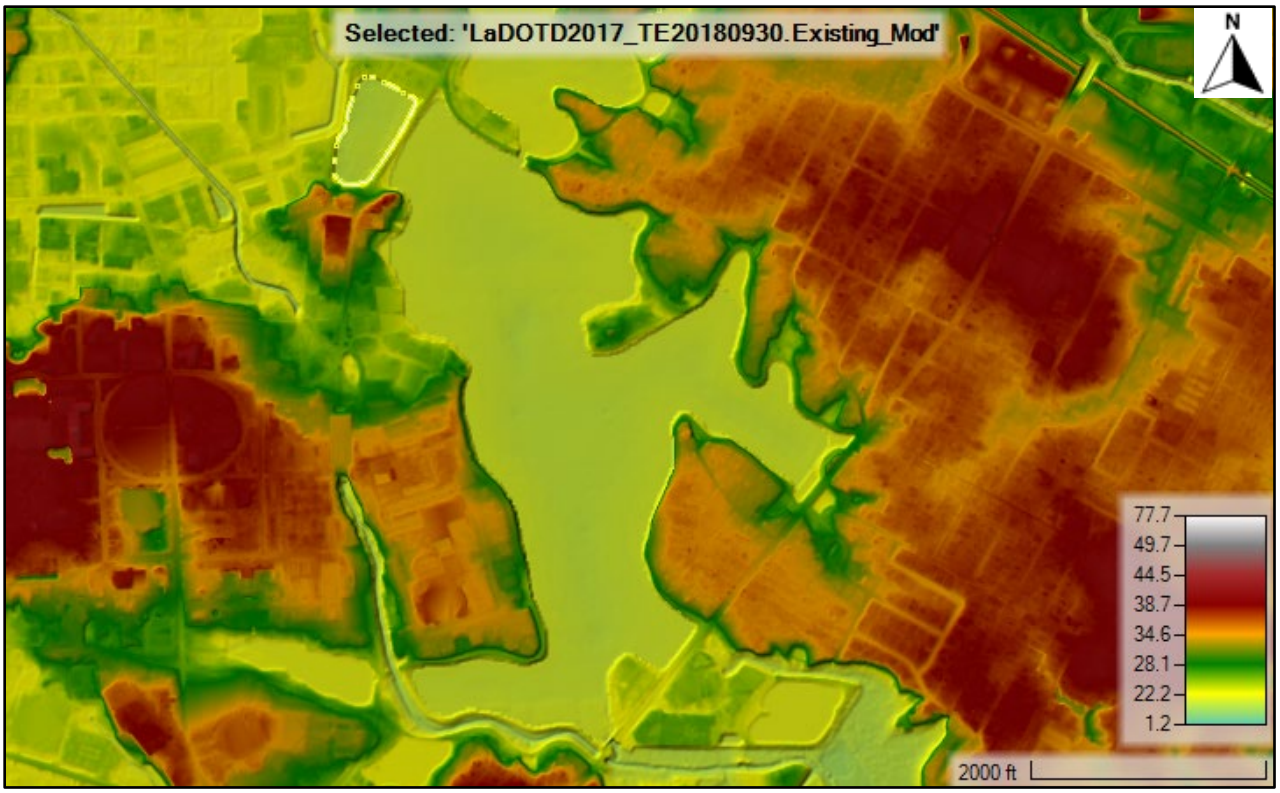

Figure 5: Existing Terrain for Crest Lake and University Lake

Table 1: Manning's n-value Variations for Final Geometry

Code Value	Land Cover Classification (NLCD)	Manning's n-value (roughness coefficient)
1	Buildings	3
11	Open Water	0.001
21	Developed, Open Space	0.04
22	Developed, Low Intensity	0.07
23	Developed, Medium Intensity	0.07
24	Developed, High Intensity	0.04
31	Barren Land	0.011
41	Deciduous Forest	0.36
42	Evergreen Forest	0.32
43	Mixed Forest	0.4
52	Shrub/Scrub	0.4
71	Grassland/Herbaceous	0.37
81	Pasture/Hay	0.33
82	Cultivated Crops	0.04
90	Woody Wetlands	0.09
95	Emergent Herbaceous Wetlands	0.18

4.3. Proposed Conditions Model Inputs

After examining updated existing conditions model results, proposed improvements were identified through an iterative process. To reduce the risk of flooding to help protect the community, including the severe repetitive and repetitive loss structures, the following improvements were identified:

1. Replacement of existing culverts between Corporation Canal and McKinley High School (McKinley Diversion)
    - Proposed 2 – 9'x7' Reinforce Concrete Box Culverts (830 FT long)
    - Proposed 2 junction boxes
2. Widening of the concrete lined channel between McKinley High School and Crest Lake
    - Proposed 25' bottom width, 3:1 side slope (approximately 9 FT Depth)
3. Installation of culverts to hydraulically connect the concrete lined channel and Crest Lake
    - Proposed 4 – 6'x6' Reinforce Concrete Box Culverts (120 FT long)
4. Replacement of culverts between Crest Lake and University Lake
    - Proposed 8 – 6'x4' Reinforce Concrete Box Culverts (100 FT long)
5. Alteration to University Lake's boundary with Corporation Canal
    - Proposed approximately 150 FT wide Corporation Canal channel
    - Proposed 1'x10' Reinforced Concrete Box Culvert (43 FT long)
6. Alteration to University Lake weir to Bayou Duplantier (2 Stage Retrofit Weir)
    - bottom width of 11.4 (1) and 25 feet (2); approx. 3:1 (1) and 10:1 (2) side slopes, 20.6 FT invert
7. Proposed Weir in Corporation Canal
    - bottom width of 32.5 feet, approx. 1:1 side slopes, 13.2 FT invert

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The total cost of the proposed alternative is estimated to be approximately $19,500,000. Please refer to Technical Memorandum Benefits Cost Analysis Methodology University Lakes Project for benefit cost specifics of the proposed alternative. *Figure 6* below shows FEMA Individual Assistance (IA) structures near LSU Lakes.

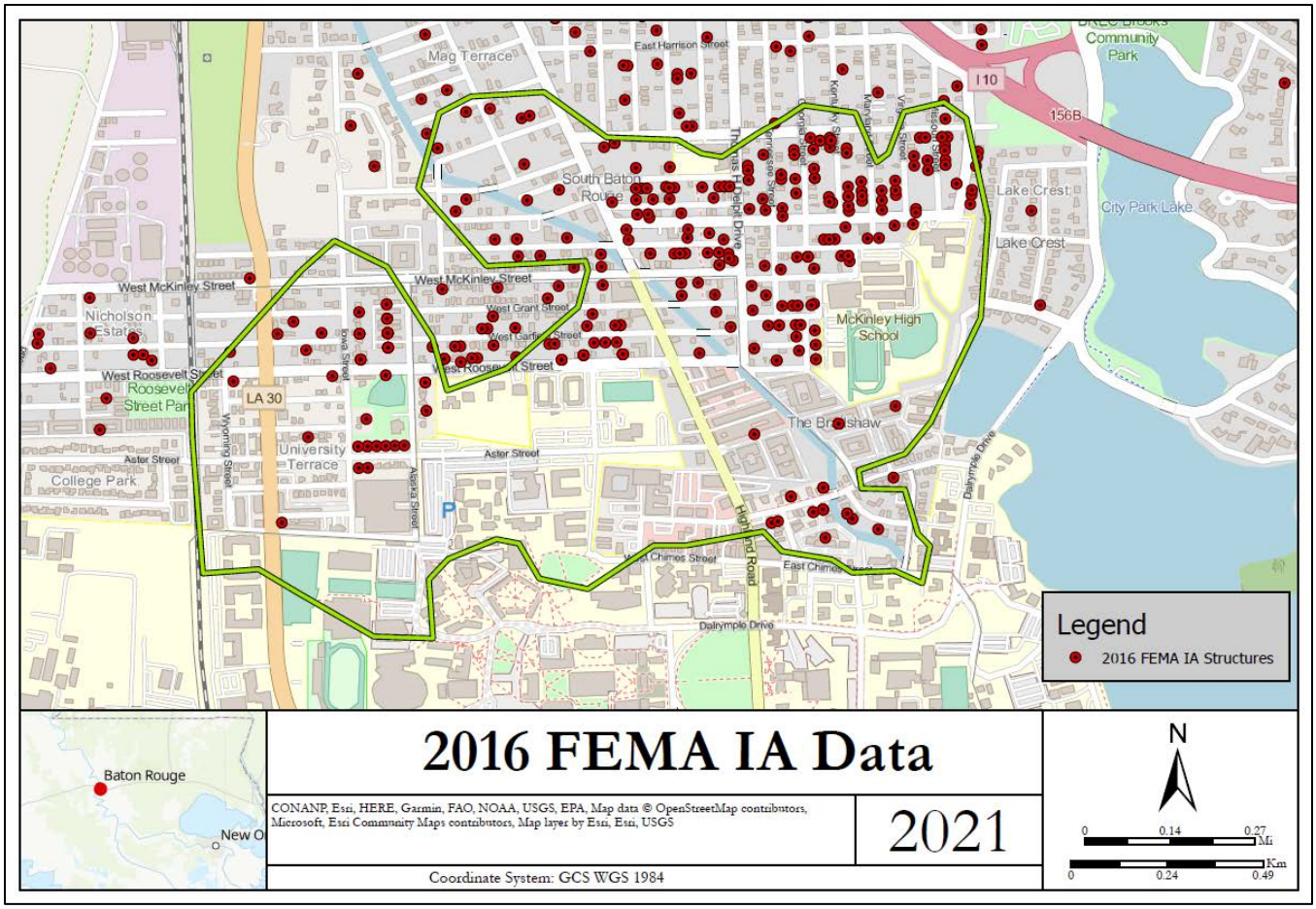

Figure 6: FEMA IA Structures near LSU's Lakes

The proposed conditions were modeled for the same three design storms (10-year, 25-year, and 100-year). No adjustments were made to the boundary conditions. The manning's values were also left the same as the updated existing conditions. The concrete channel-widening and Corporation Canal Retrofitting by University Lake were modeled directly in the terrain. All other proposed features, including the McKinley Diversion, were accounted for in RAS Geometry edits. See *Figure 7* for an aerial of the Proposed Terrain used in the HEC-RAS model around these two lakes. The proposed improvements are also labeled on this figure.

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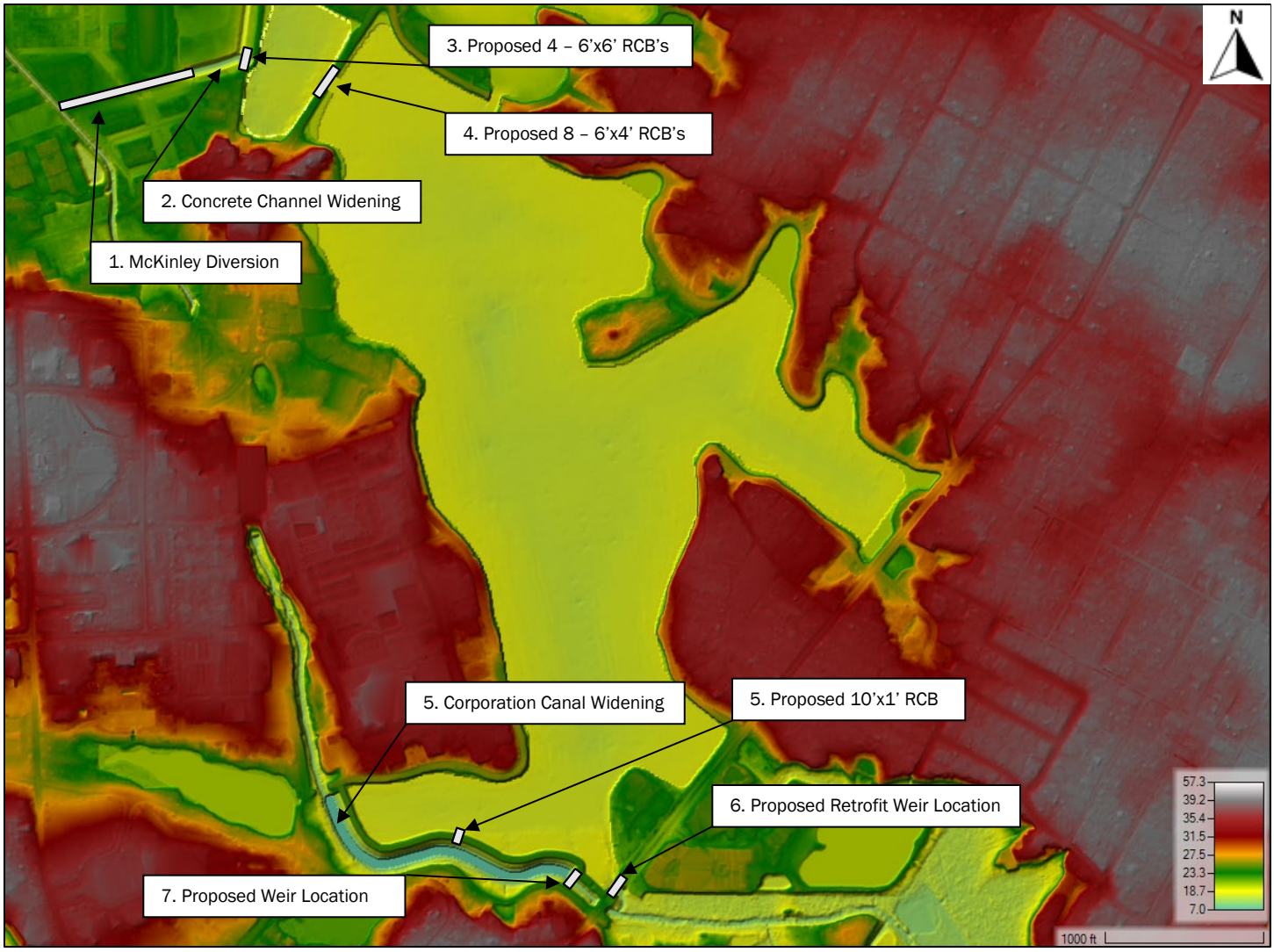

Figure 7: Proposed Terrain for Crest Lake and University Lake with Proposed Features Labeled

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5. Results

5.1. Validation of Existing Conditions

Since there is not available gauge data for the Baton Rouge Lakes Drainage Area, validation of the model was done through comparison with FEMA data and GEC's 2017 analysis. The available FEMA FIRM and FIS for the region indicates that the base flood elevation for the 100-year event is approximately 25 FT upstream of University Lake's outfall weir. GEC's 2017 analysis indicates the maximum 100-year water surface elevation upstream of University Lake's outfall weir is 24.5 FT. Since the models used to create FEMA's flood zones are tailwater-driven, CSRS did not attempt to generate a maximum 100-year water surface elevation of 25 FT in University Lake since the goal is to properly quantify the headwater-driven scenario for the Baton Rouge Lakes Drainage Area. It should be noted that GEC used the same FIS to assign the downstream boundary condition for their preliminary modeling. The original existing conditions and updated existing conditions show a max water surface elevation of 23.5 FT and 24 FT, respectively, upstream of University Lake's outfall weir. This is within a reasonable threshold when considering that CSRS's models are headwater-driven models, as previously described.

5.2. Flood Risk Mitigation

Flood risk was assessed for properties in the region based on the Benefit-Cost-Analysis (BCA) determined with the FEMA BCA Toolkit (v6.0). The methodology for this process is described in the University Lakes Project Technical Memorandum provided. Separate Benefit-Cost-Ratios (BCR's) were assessed for the 10-year, 25-year, and 100-year events.

The updated existing model aided in the determination and verification of flood-prone areas and the source of the flooding. It was determined that Corporation Canal's constriction through LSU's campus via a subsurface stretch of the Canal and the lack of connectivity with the LSU Lake's system are largely the causes of flooding. The proposed features were then investigated to find a solution for this flood risk. The final proposed geometric features described earlier in this report were modeled in the proposed geometry.

Figure 8, Figure 9, and Figure 10 show the benefited areas and the water surface benefit in feet for the 10-, 25-, and 100-year events, respectively. These figures show that there will be a significant benefit to many surrounding properties along with the shown IA structures along Corporation Canal.

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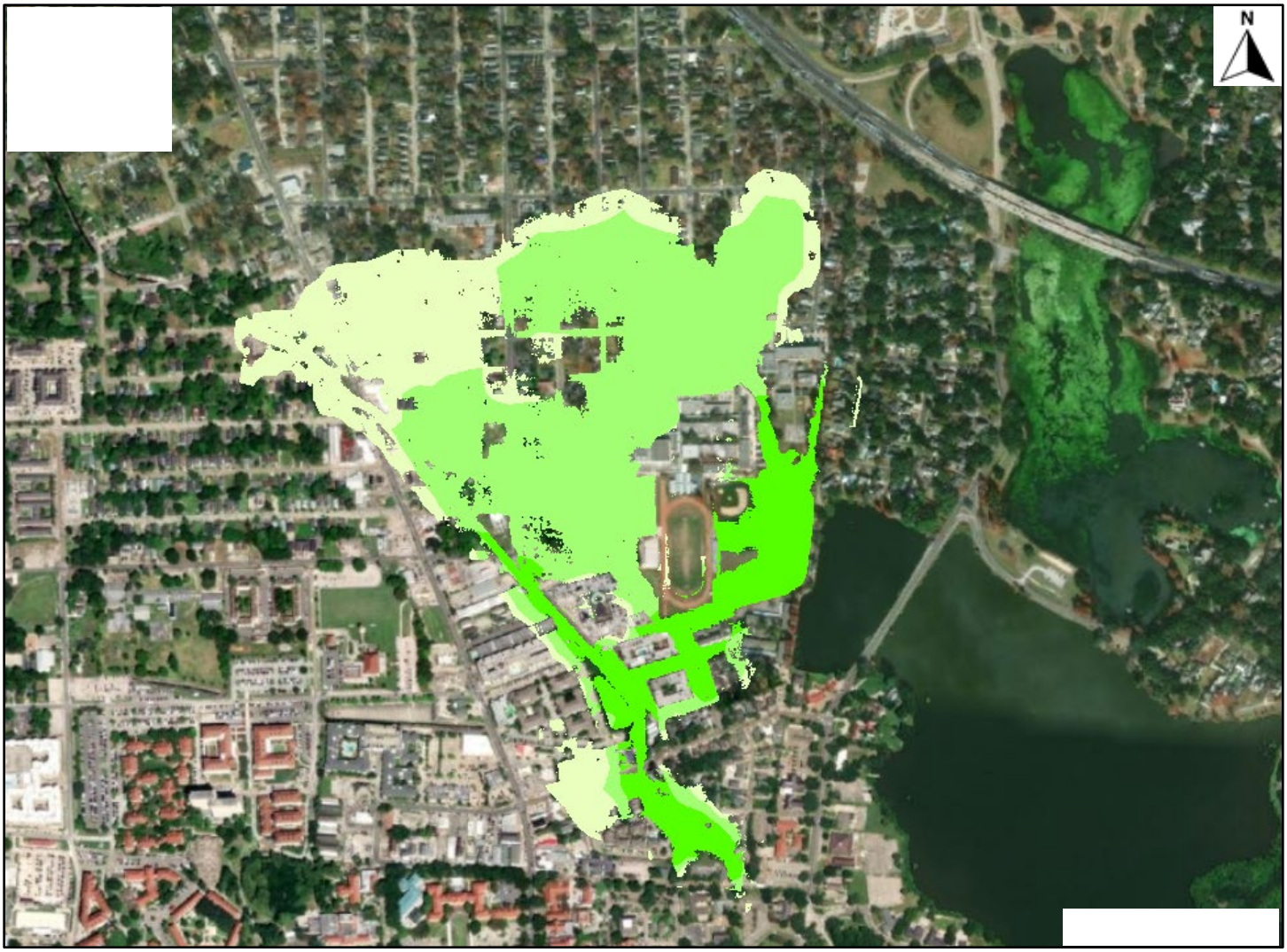

Figure 8: 10-Year Water Surface Benefit Map

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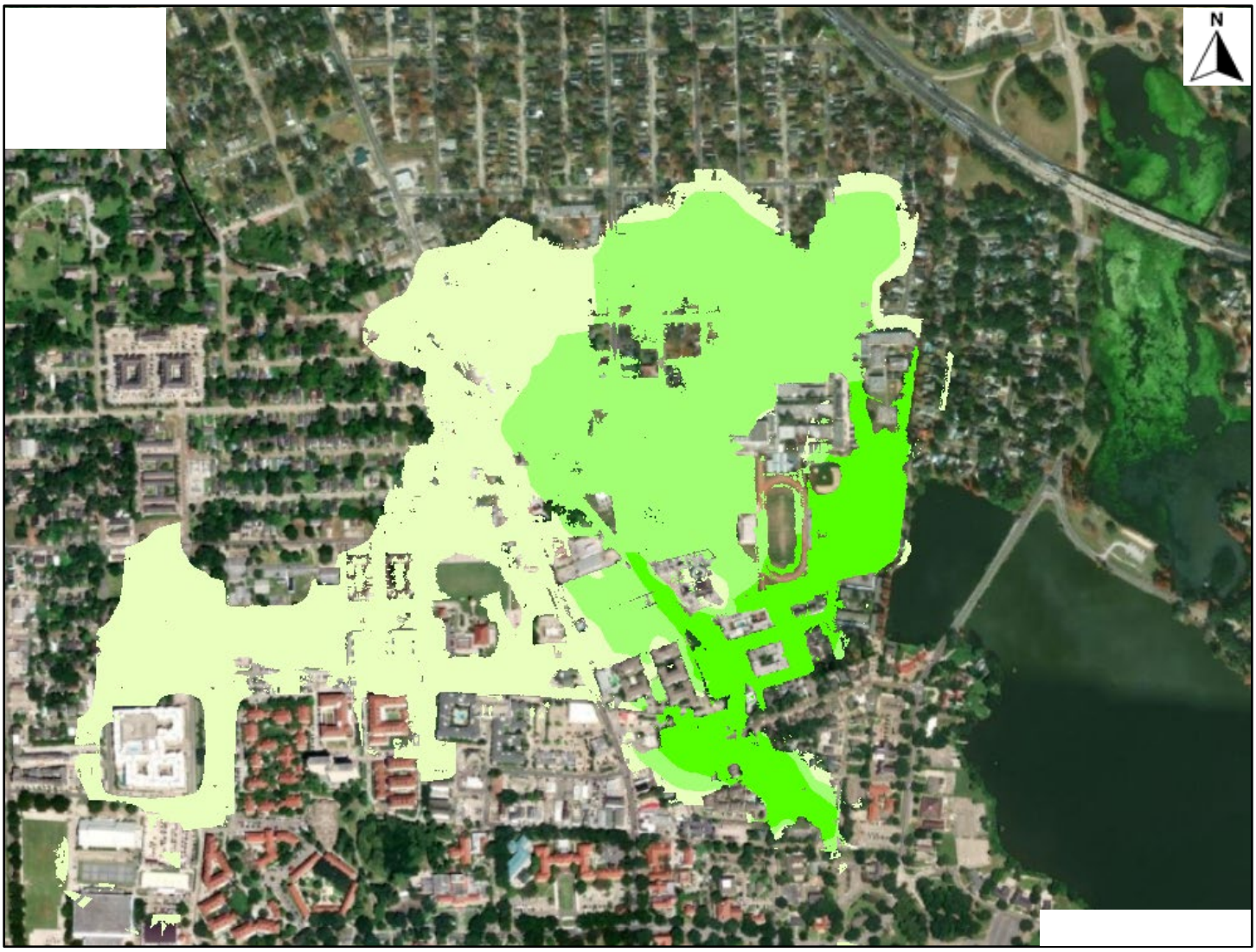

Figure 9: 25-Year Water Surface Benefit Map

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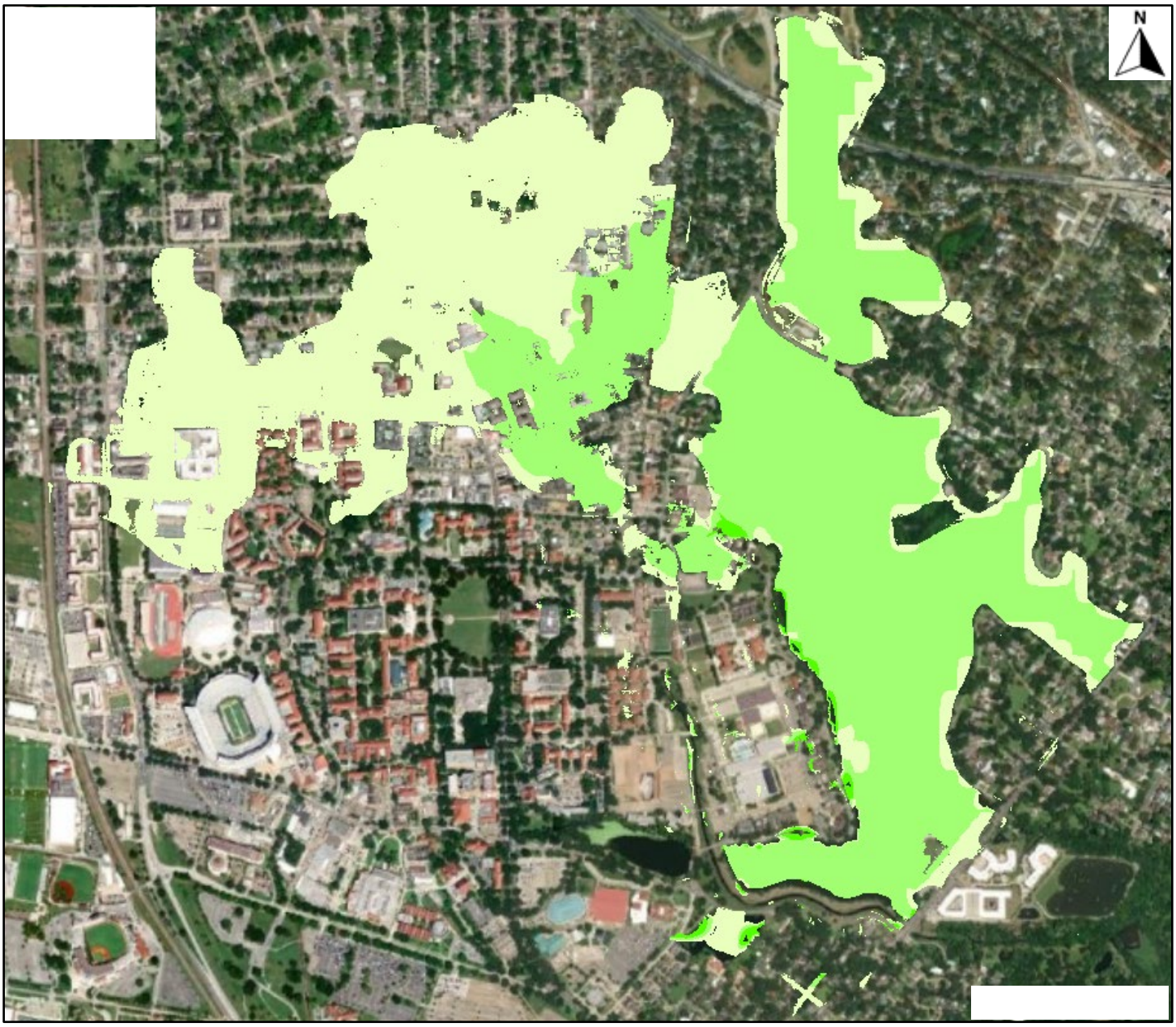

Figure 10: 100-Year Water Surface Benefit Map

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5.3. Critical Flow and Water Surface Locations

Comparisons between the updated existing conditions and the proposed conditions were made at critical locations in the model to better articulate the effects that the proposed conditions have on the model area. See *Figure 11* through *Figure 38* for flow hydrograph locations and water surface elevation locations throughout the model. The purpose of the following figures is the demonstrate the effects that the proposed features have at critical locations in the model. The results are displayed from upstream to downstream. Below is a key for the plan names noted on the plots:

- Updated Existing Conditions (Master Plan Build-Out)
    - 10-Year: set02c54
    - 25-Year: set02c55
    - 100-Year: set02c57
- Proposed Conditions (CSRS Preliminary Design)
    - 10-Year: set17c54
    - 25-Year: set17c55
    - 100-Year: set17c57

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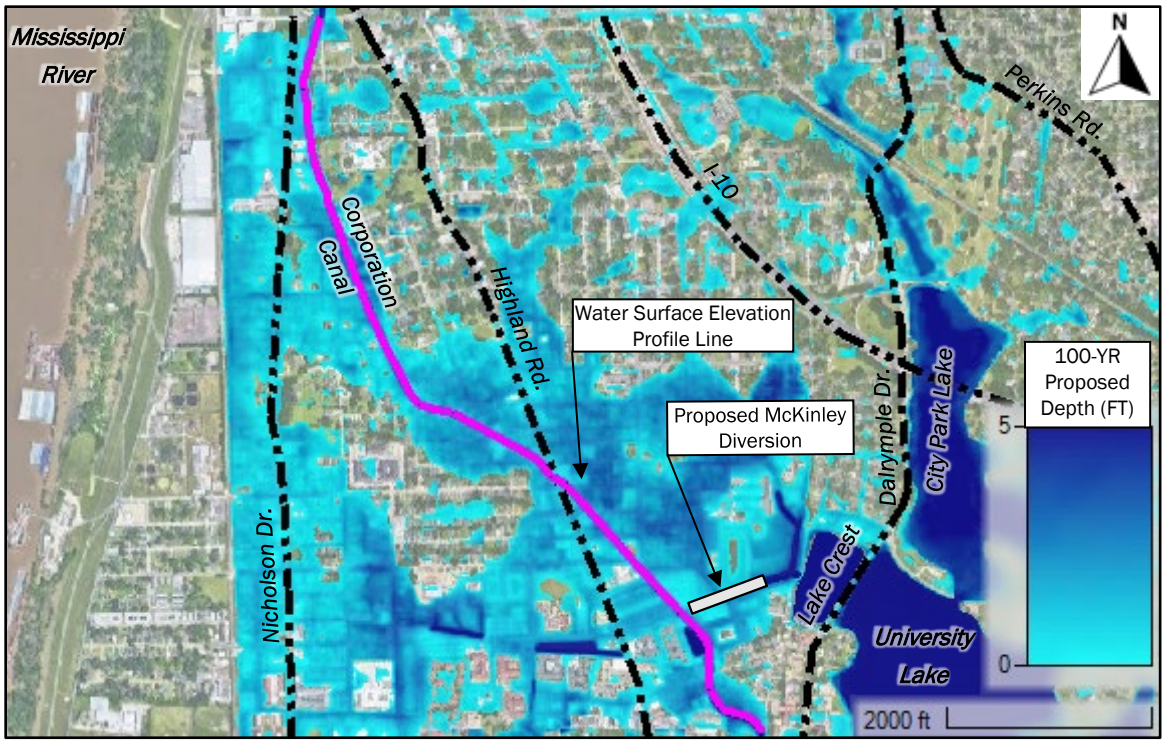

Figure 11: Corporation Canal Profile Line Location between Terrace Ave. Pump Station and LSU Campus

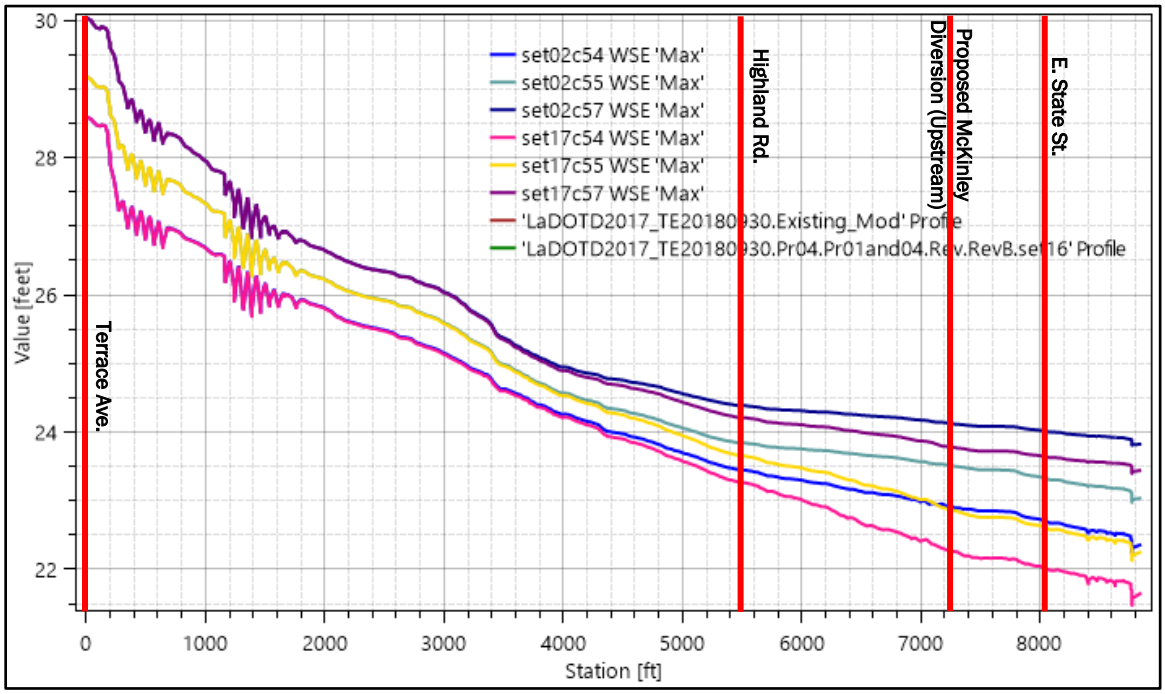

Figure 12: Corporation Canal Water Surface Profile between Terrace Ave. Pump Station and LSU Campus

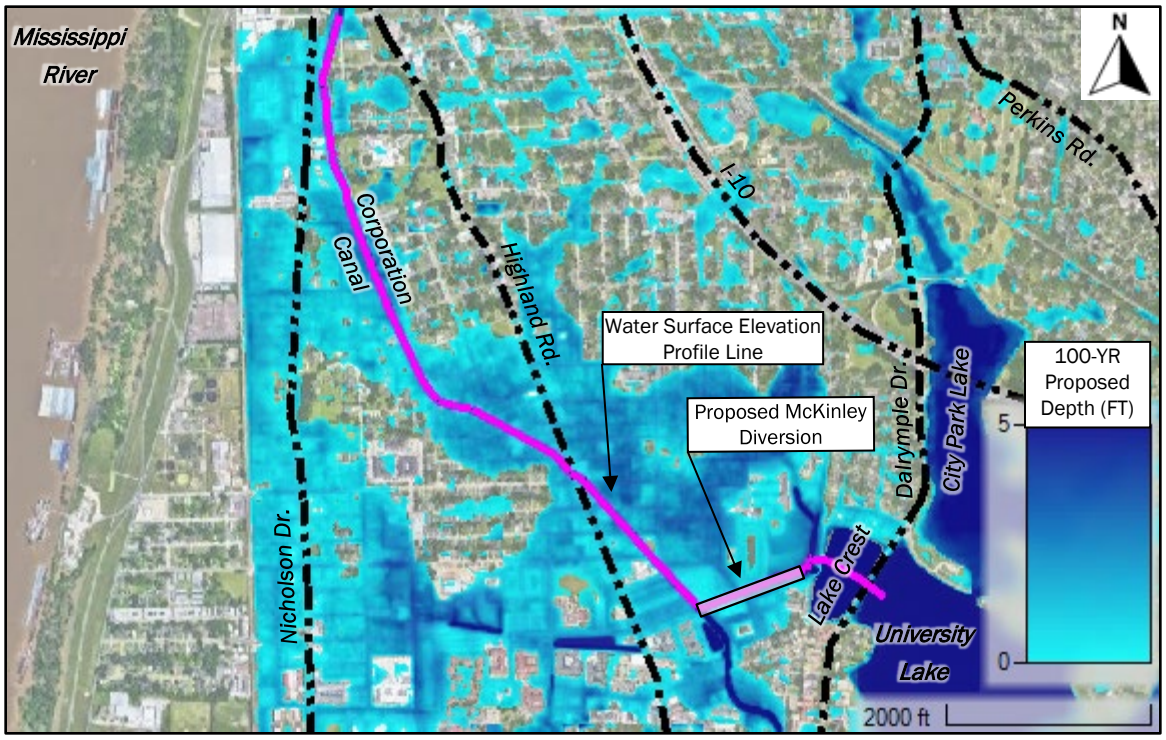

Figure 13: Corporation Canal Profile Line Location between Terrace Ave. Pump Station and University Lake

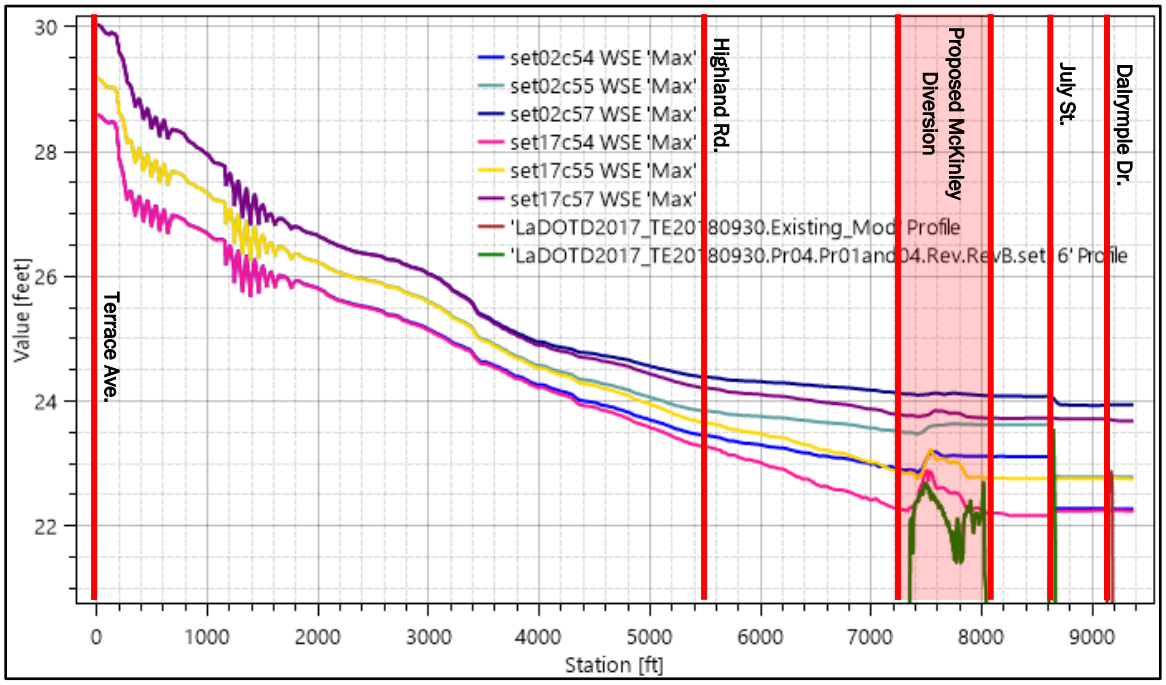

Figure 14: Corporation Canal Water Surface Profile between Terrace Ave. Pump Station and University Lake

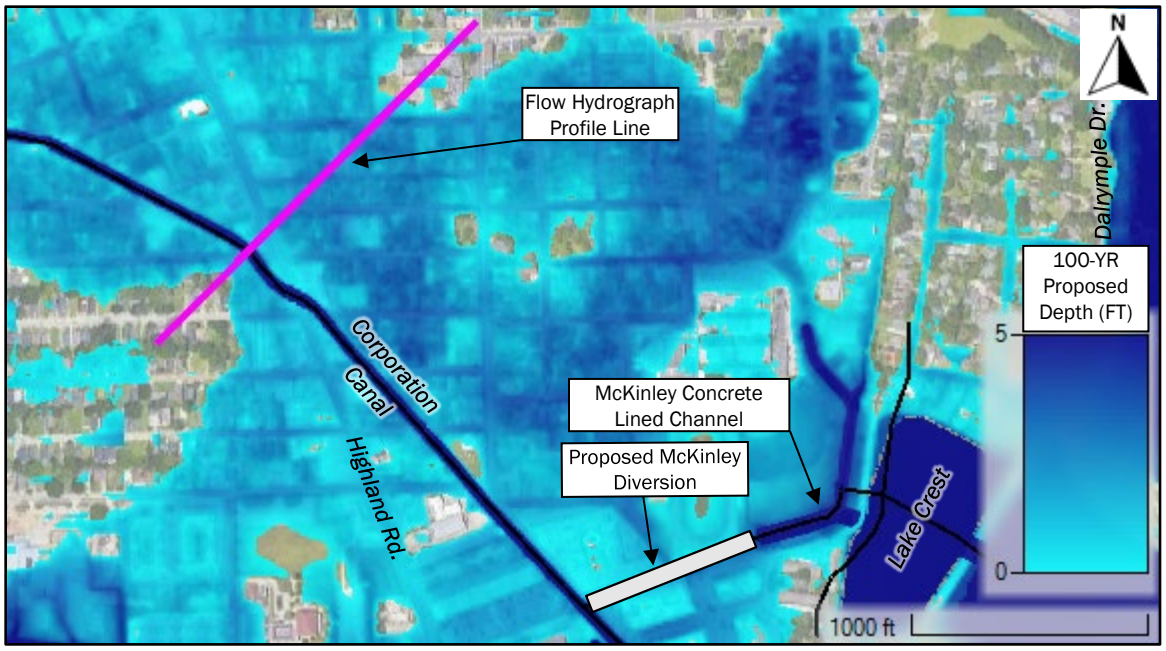

Figure 15: Corporation Canal Profile Line Location, Upstream of Proposed McKinley Diversion

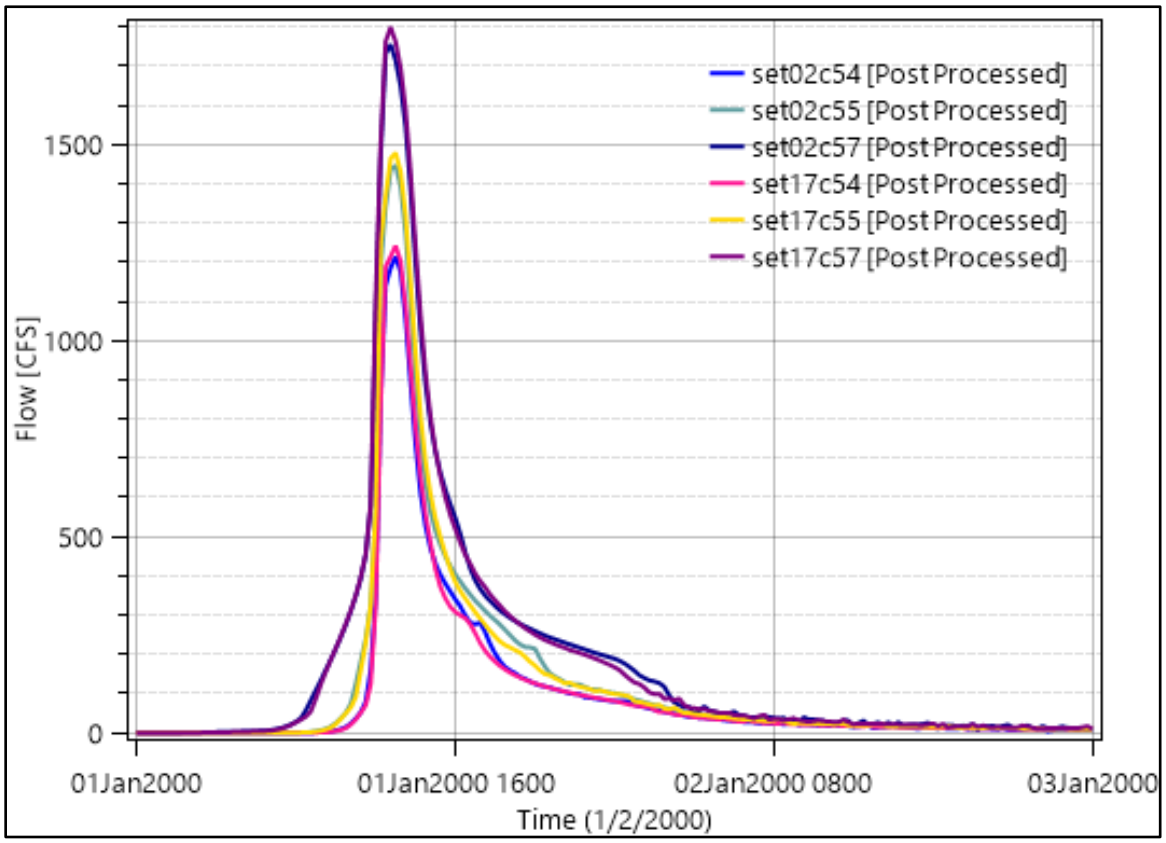

Figure 16: Corporation Canal Flow Hydrograph, Upstream of Proposed McKinley Diversion

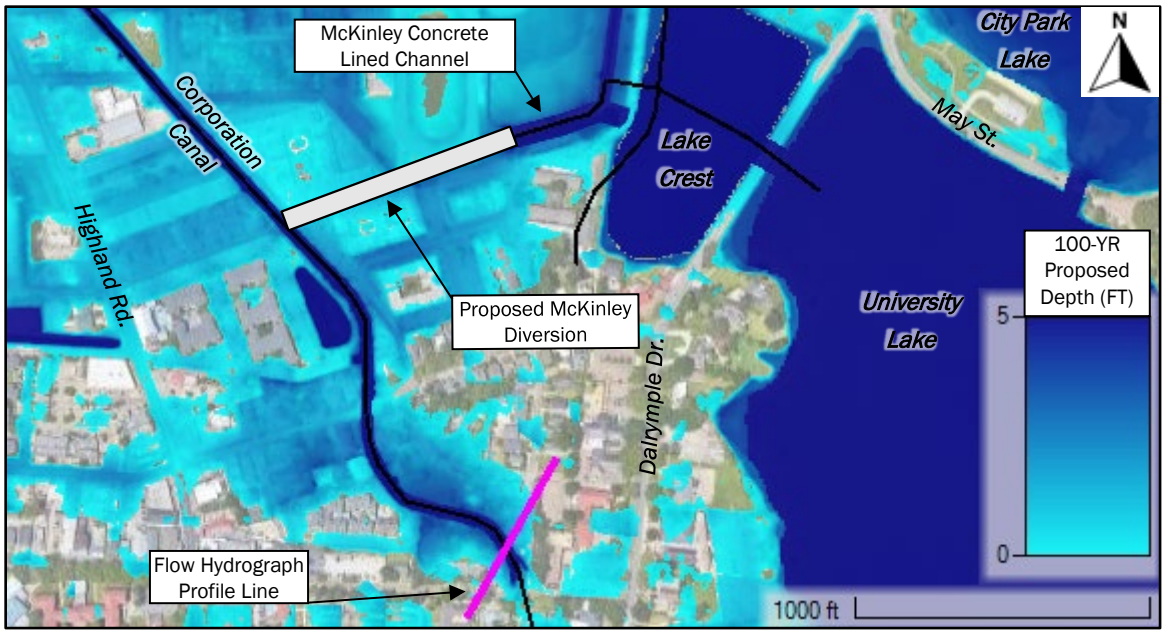

Figure 17: Corporation Canal Profile Line Location, Downstream of Proposed McKinley Diversion

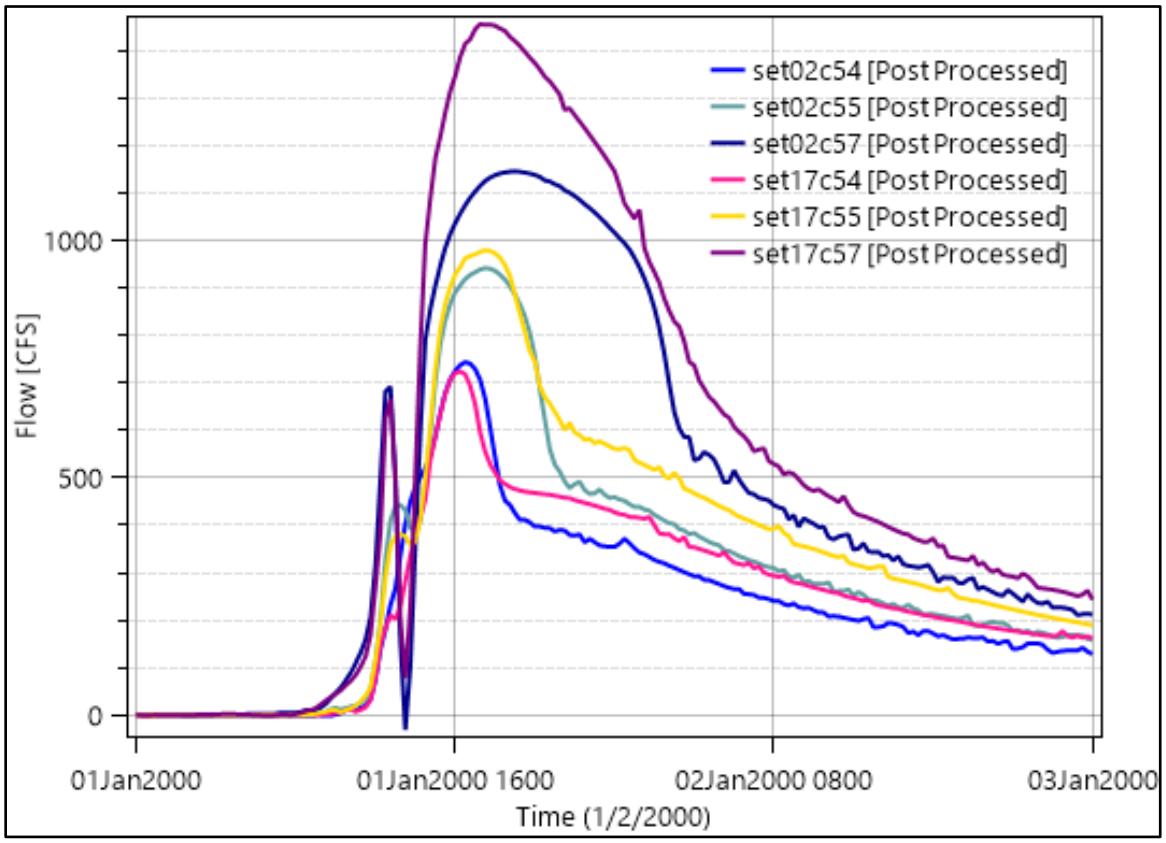

Figure 18: Corporation Canal Flow Hydrograph, Downstream of Proposed McKinley Diversion

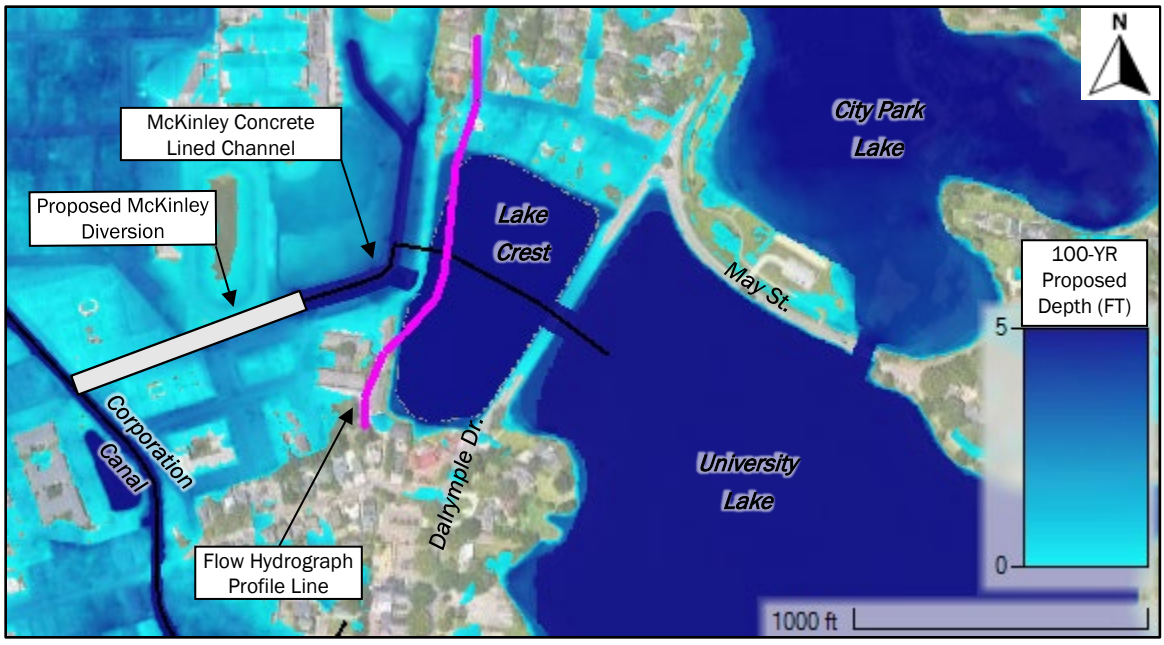

Figure 19: Crest Lake Profile Line Location, Downstream of Proposed McKinley Diversion

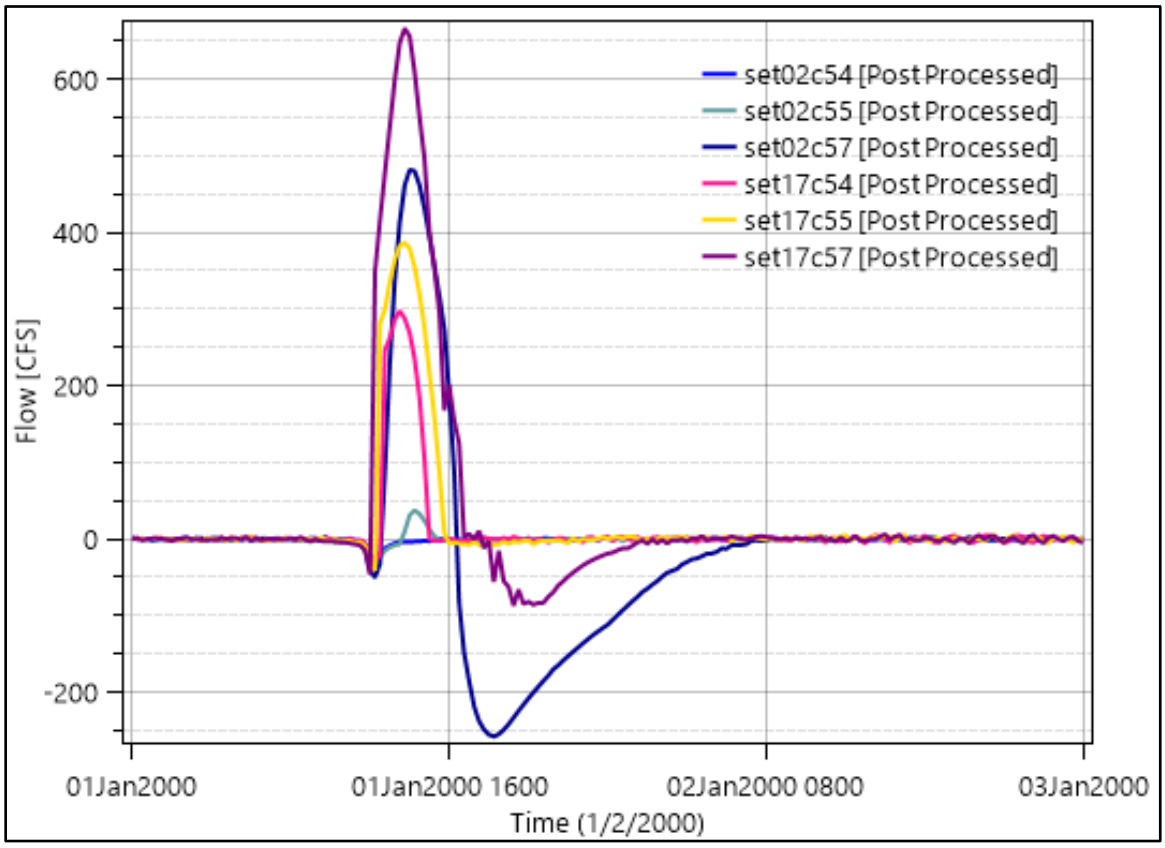

Figure 20: Crest Lake Flow Hydrograph, Downstream of Proposed McKinley Diversion

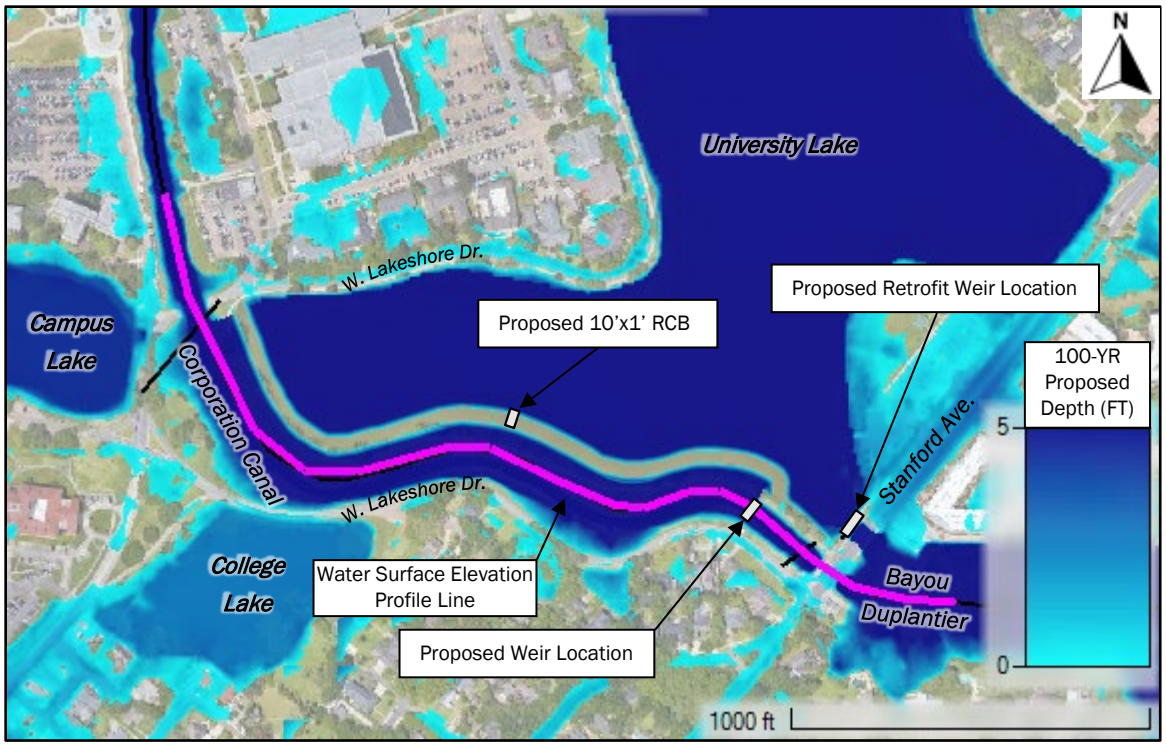

Figure 21: Corporation Canal Alterations Profile Line Location

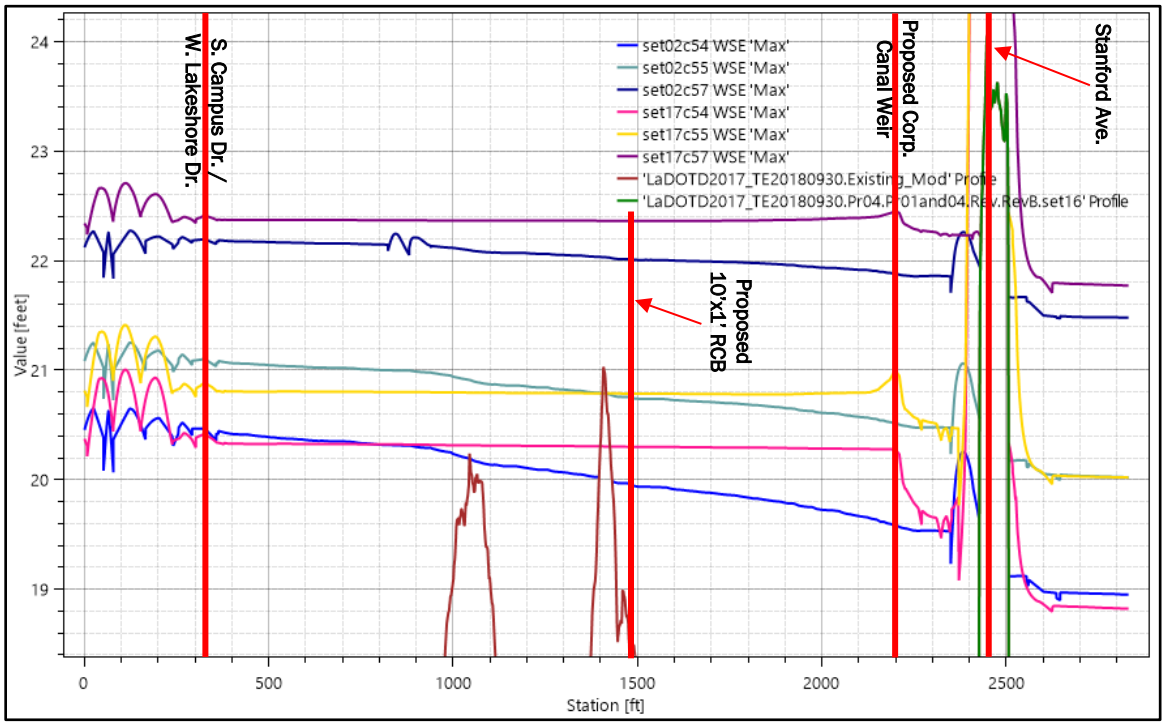

Figure 22: Corporation Canal Alterations Water Surface Profile

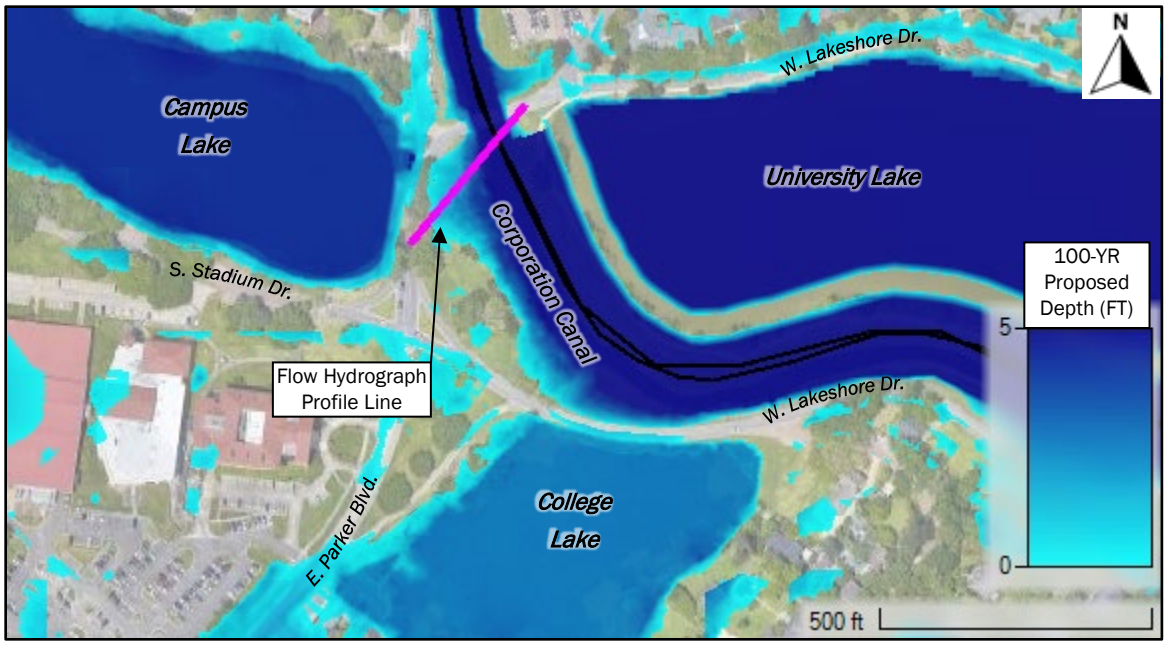

Figure 23: Corporation Canal Alterations Upstream Profile Line Location

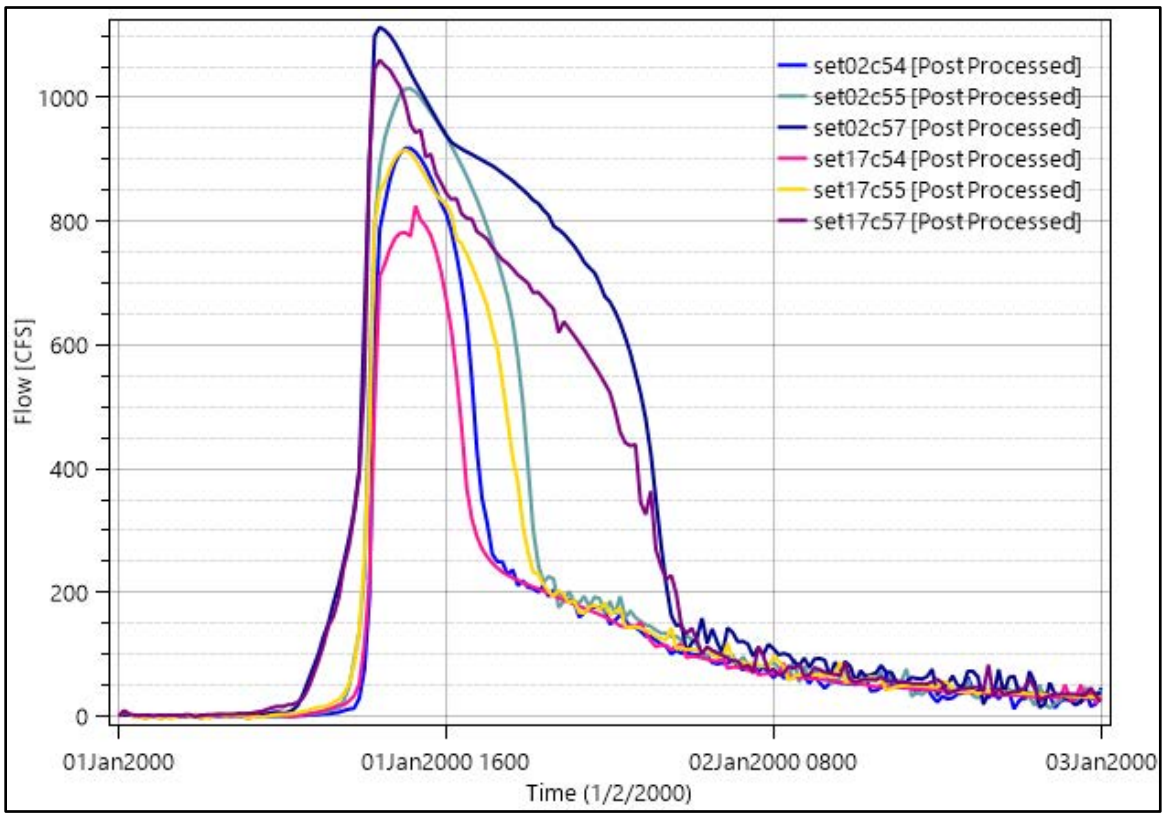

Figure 24: Corporation Canal Alterations Upstream Flow Hydrograph

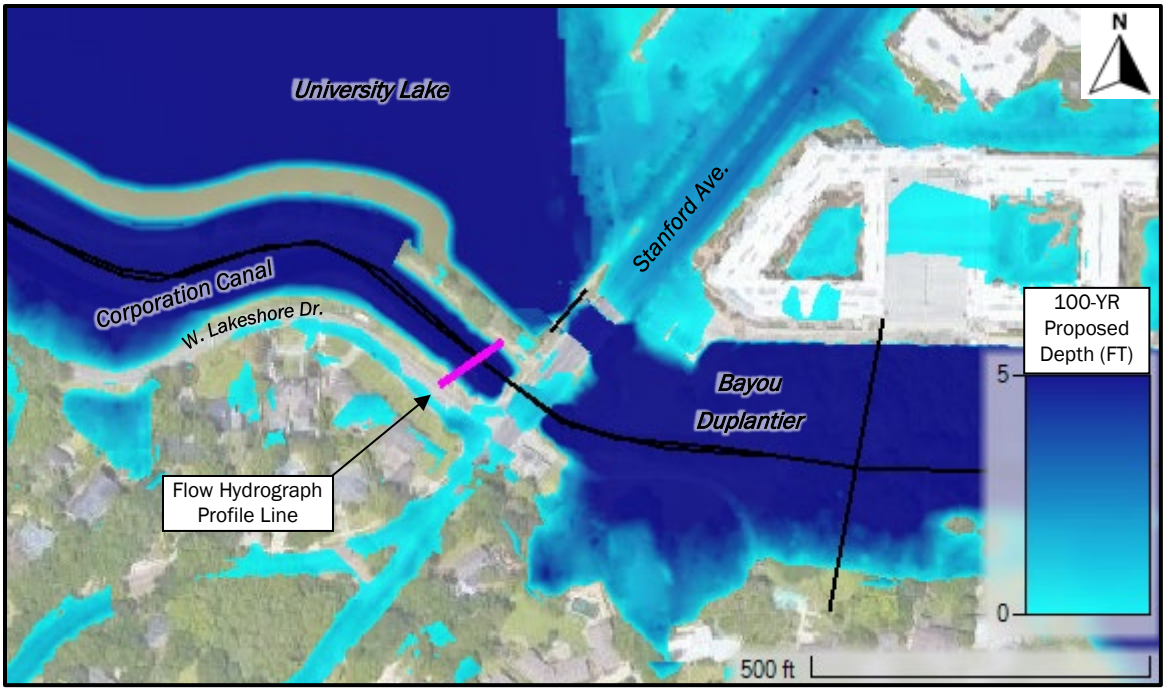

Figure 25: Corporation Canal Alterations Downstream Profile Line Location

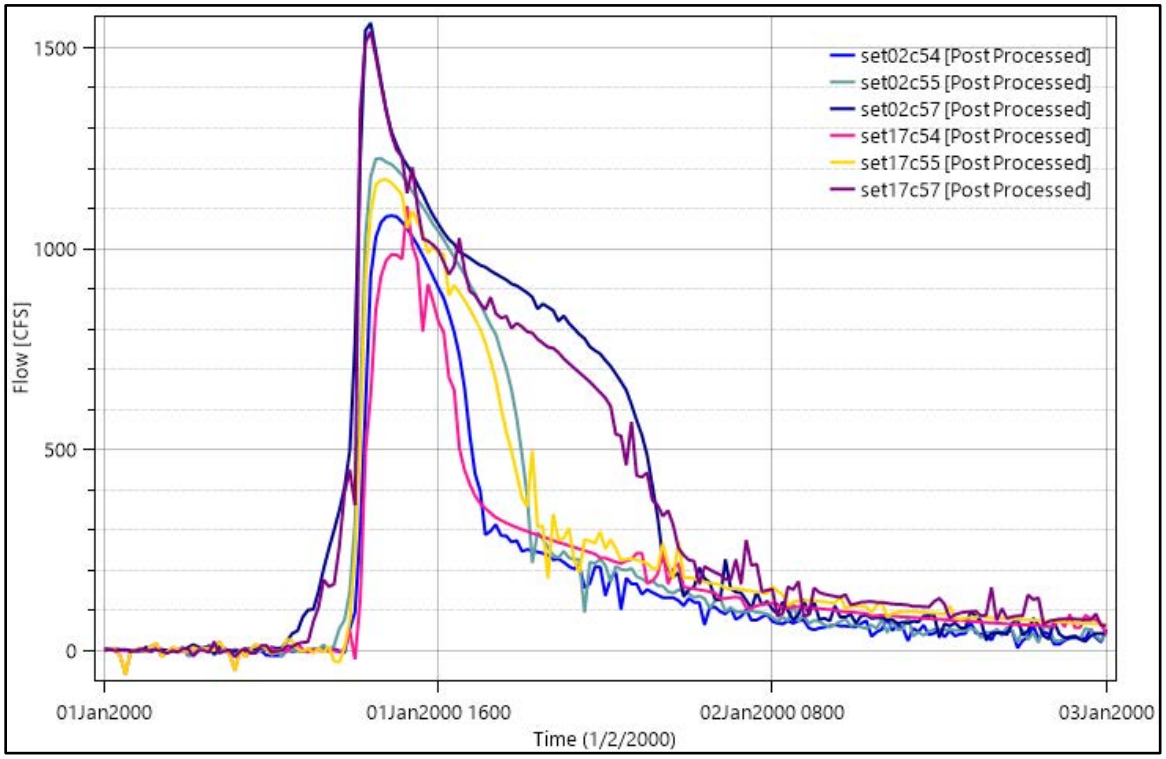

Figure 26: Corporation Canal Alterations Downstream Flow Hydrograph

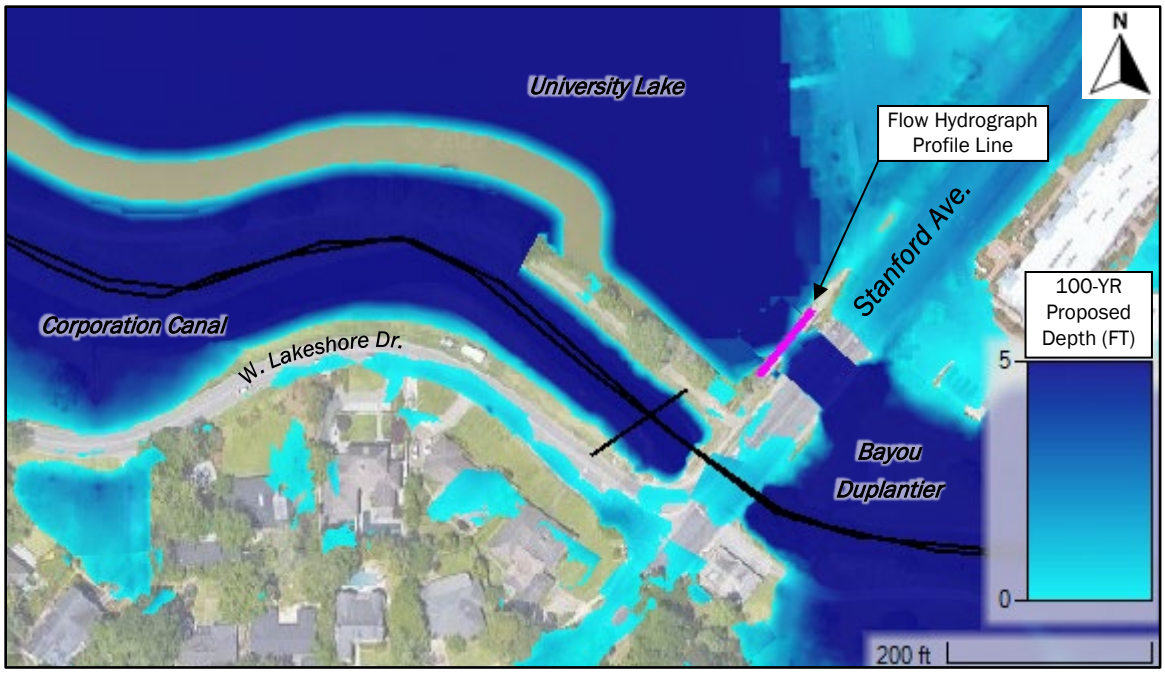

Figure 27: University Lakes Outfall Weir Profile Line Location

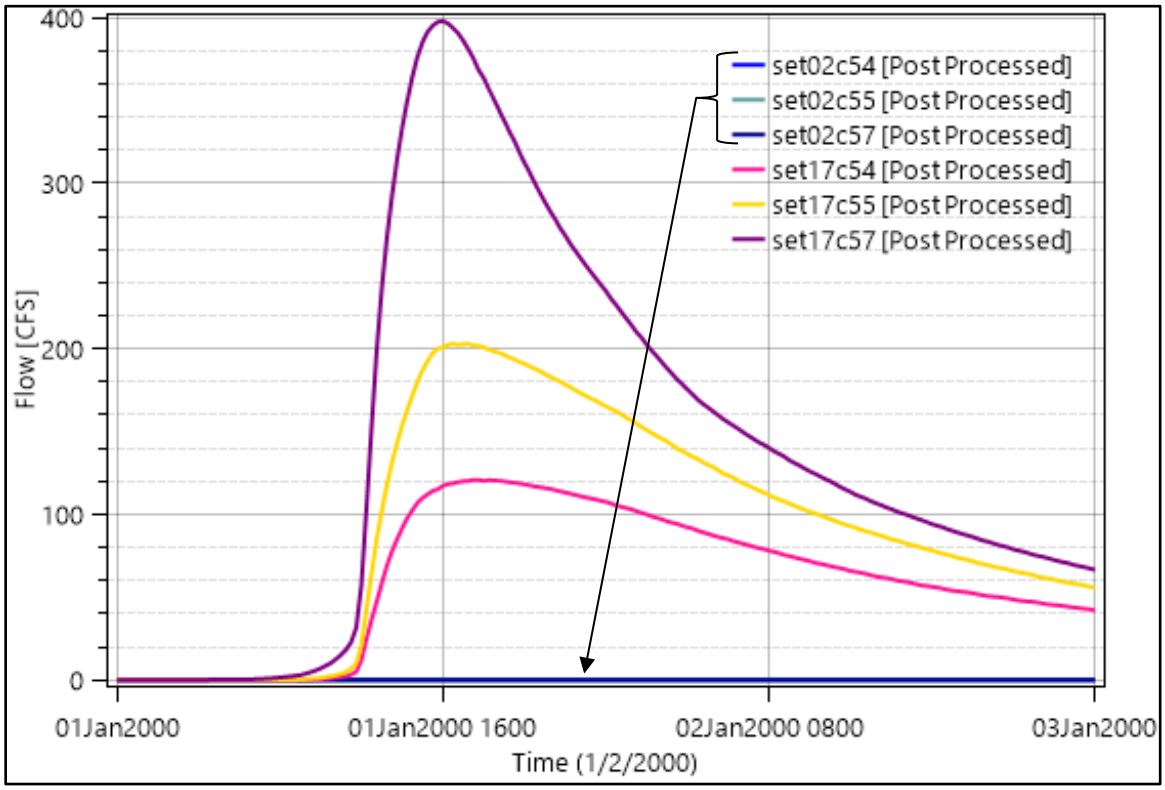

Figure 28: University Lakes Outfall Weir Flow Hydrographs

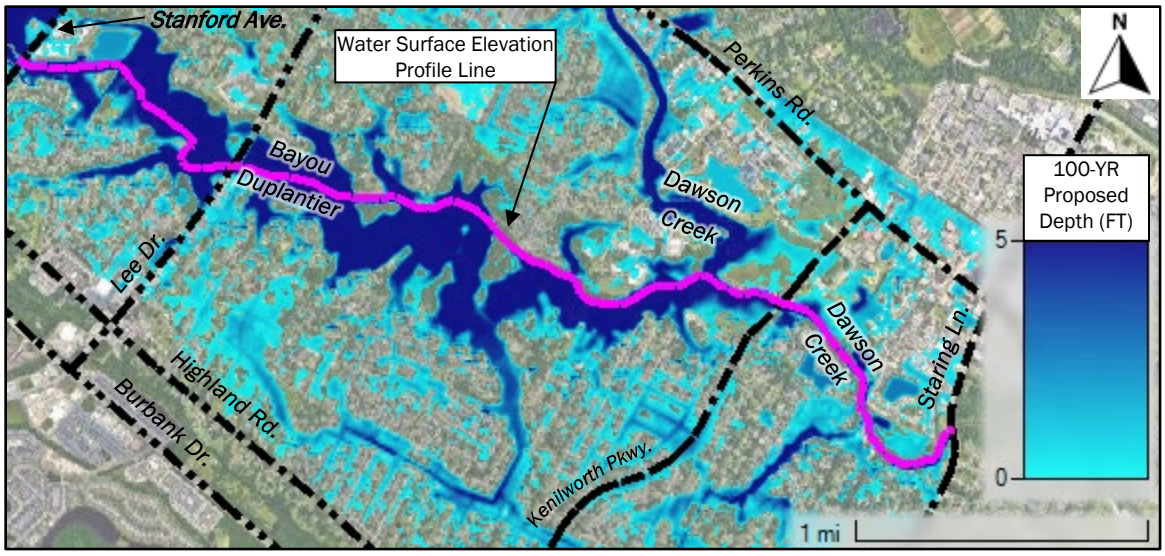

Figure 29: Bayou Duplantier/Dawson Creek Profile Line Location

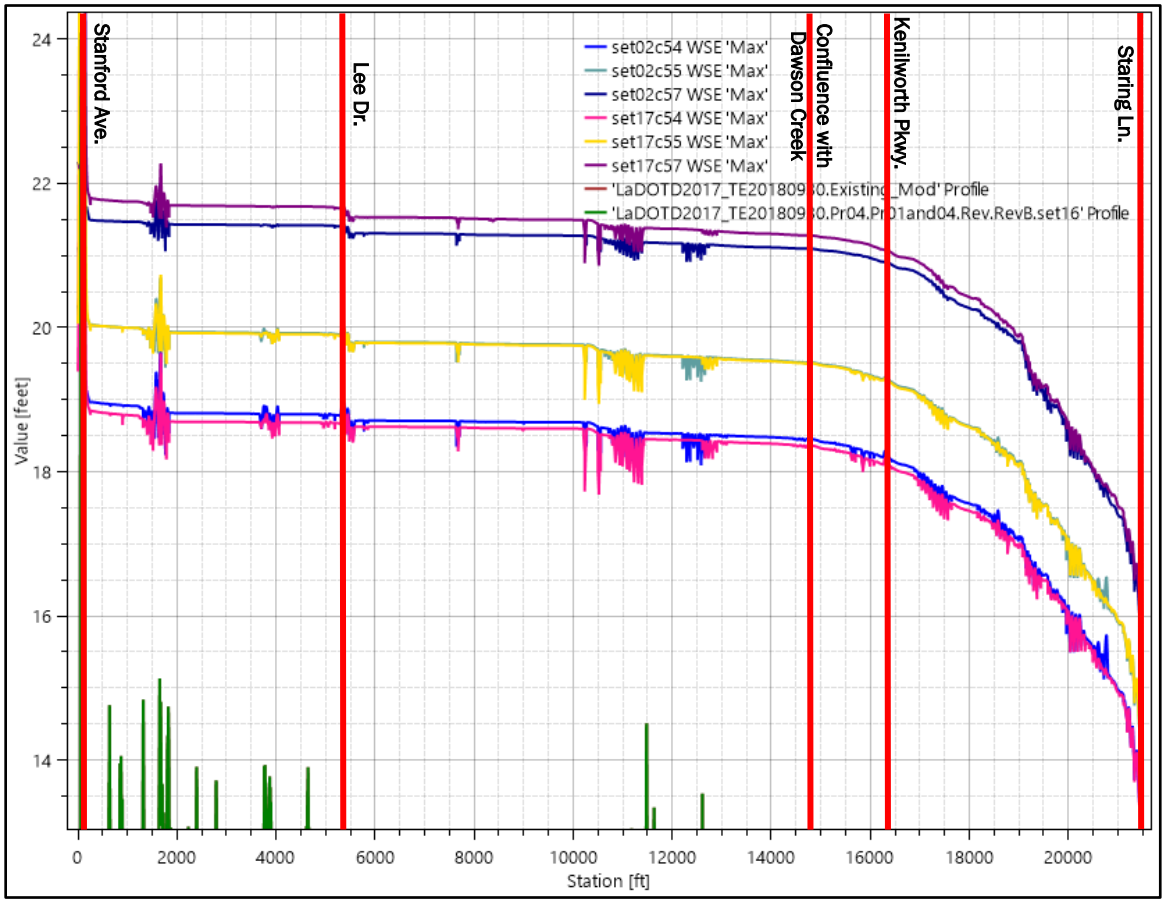

Figure 30: Bayou Duplantier/Dawson Creek Water Surface Profile

Figure 31 below shows the 100-year water surface difference map between the updated existing conditions and the proposed conditions. Water surface increases due to the proposed features are shown in shades of red while decreases are shown in green. Though this figure shows that there are increases downstream of Stanford Ave., the building footprints show no increased risk to buildings in this area. In other words, the increases in waters surface elevation downstream of Stanford Ave. are isolated to the floodplain of Duplantier Bayou and Dawson Creek. Please refer to the *McKinley Diversion and Corporation Canal Retrofit* Memorandum (provided to FEMA in January of 2021) for more information concerning flood risk assessment on a building-specific basis with consideration of finished floor elevations, which are not apparent in this figure.

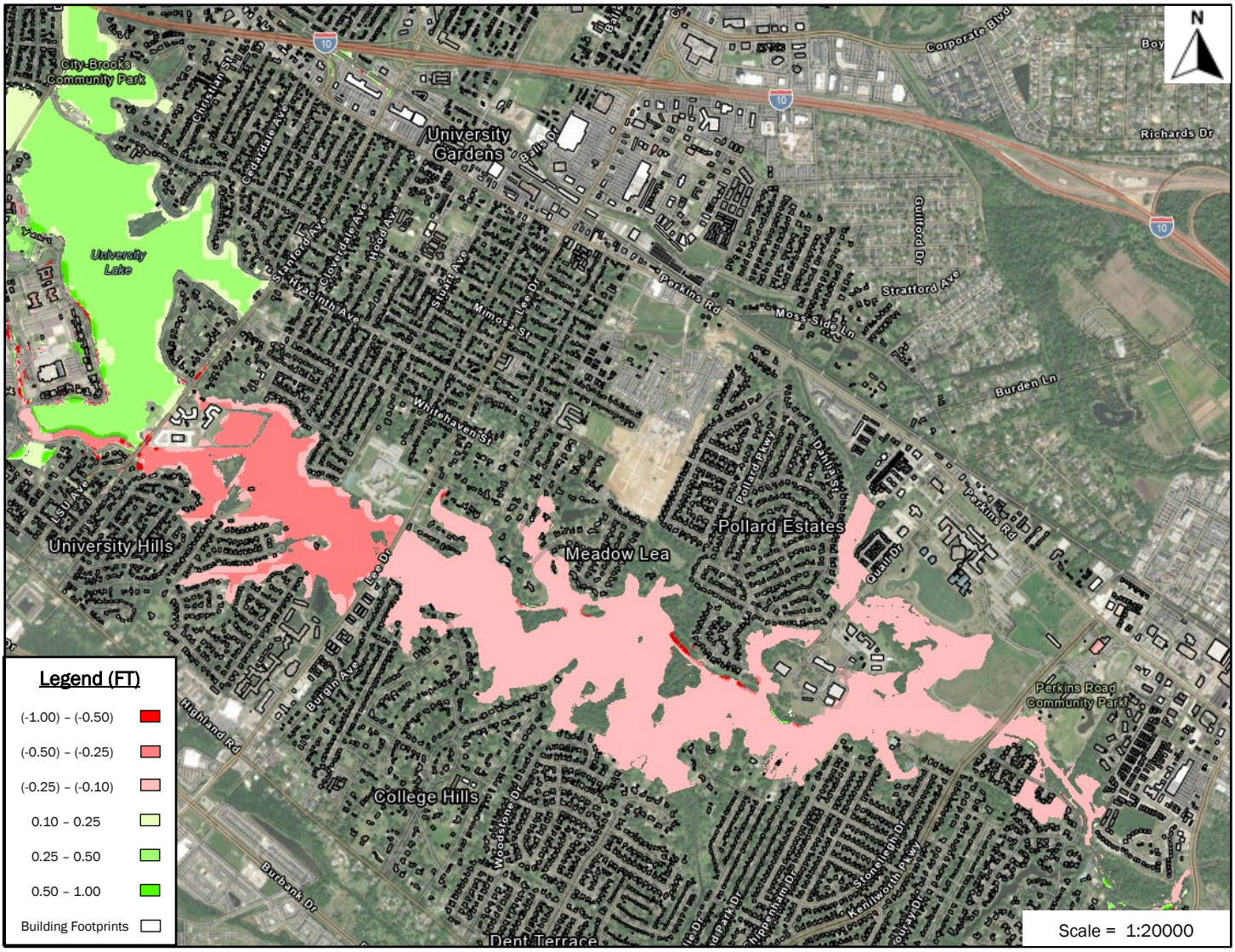

Figure 31: Bayou Duplantier and Dawson Creek 100-Year Water Surface Difference Map

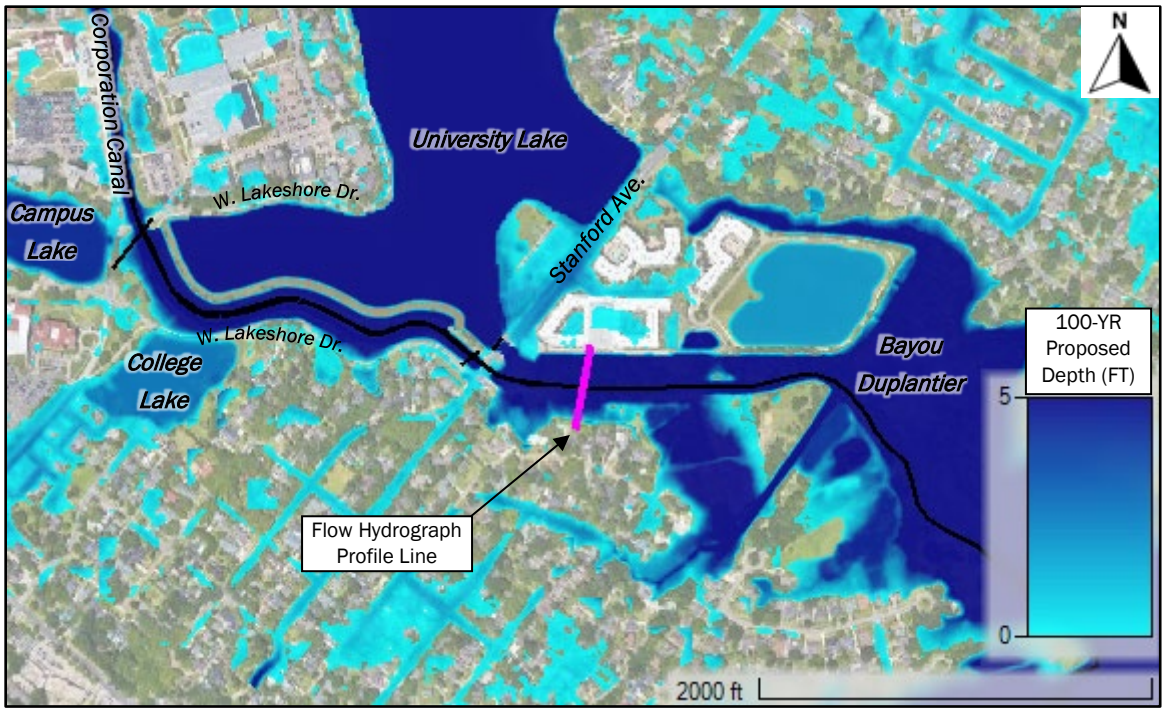

Figure 32: Bayou Duplantier Profile Line Location, Downstream of Stanford Ave.

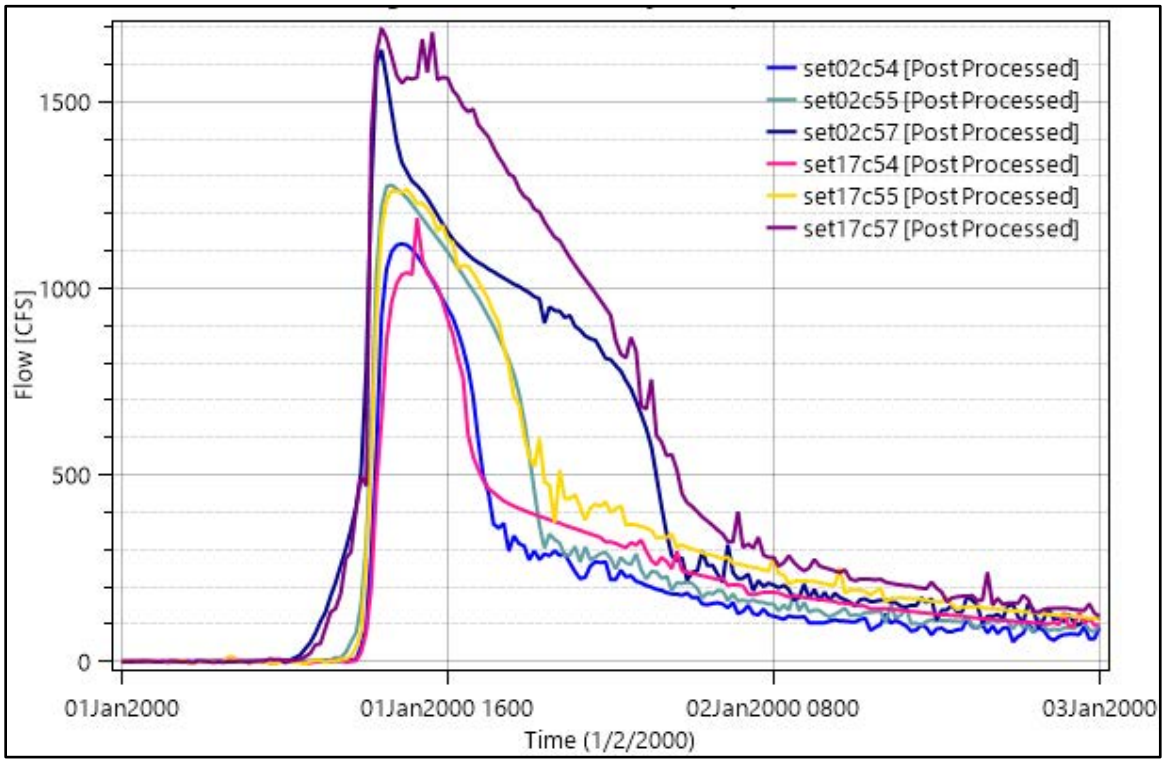

Figure 33: Bayou Duplantier Flow Hydrograph, Downstream of Stanford Ave.

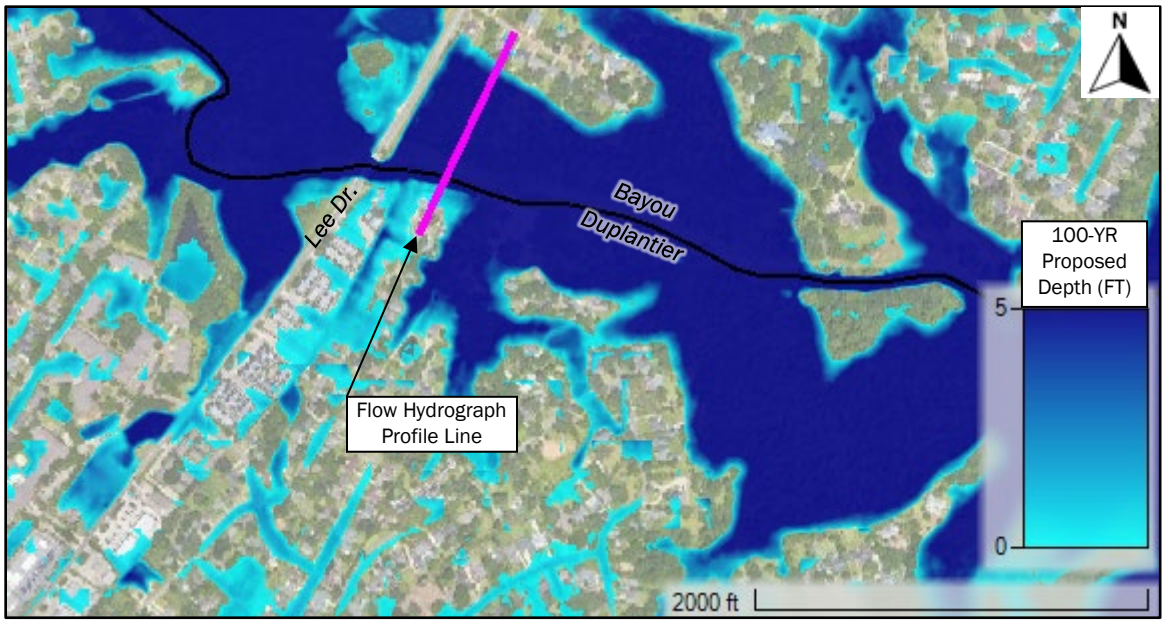

Figure 34: Bayou Duplantier Profile Line Location, Downstream of Lee Dr.

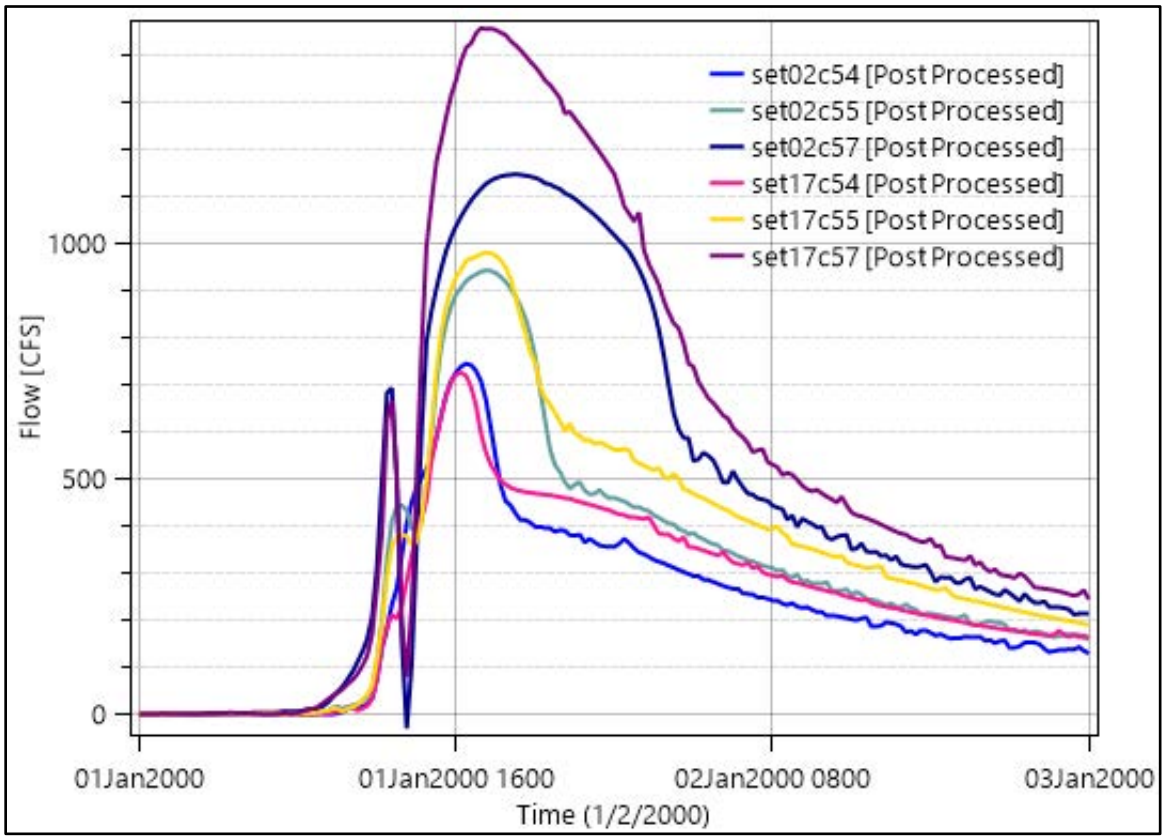

Figure 35: Bayou Duplantier Flow Hydrograph, Downstream of Lee Dr.

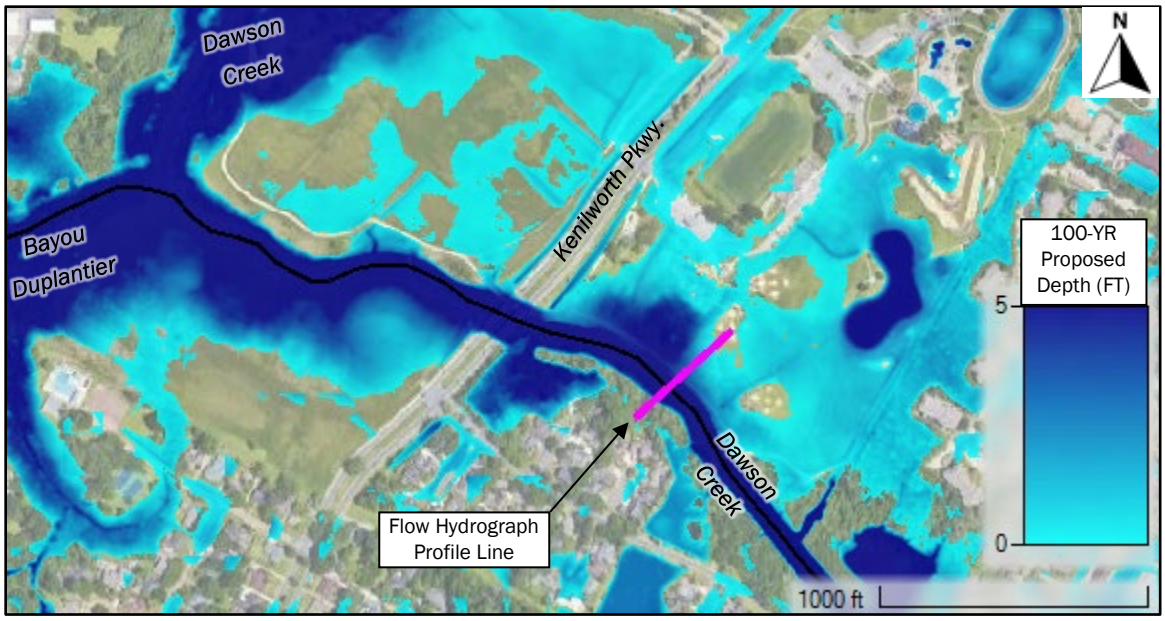

Figure 36: Dawson Creek Profile Line Location, Downstream of Kenilworth Pkwy.

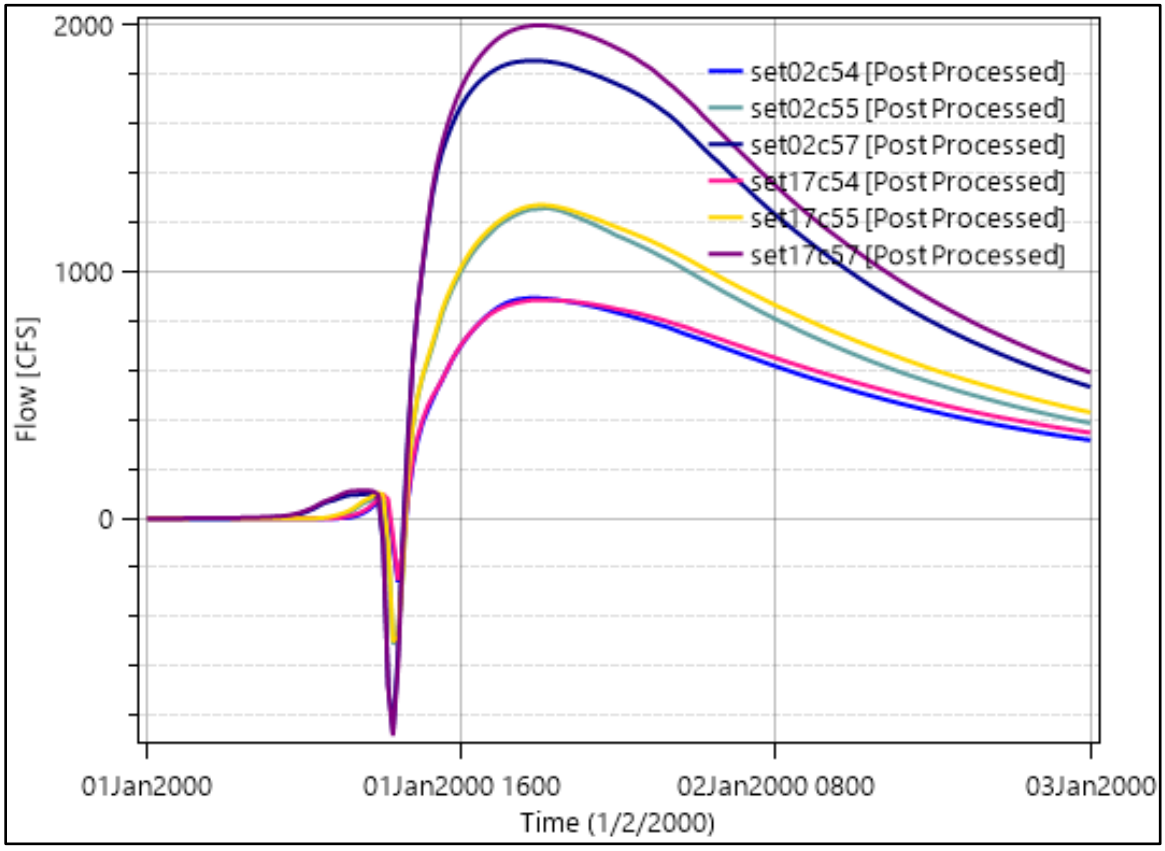

Figure 37: Dawson Creek Flow Hydrograph, Downstream of Kenilworth Pkwy.

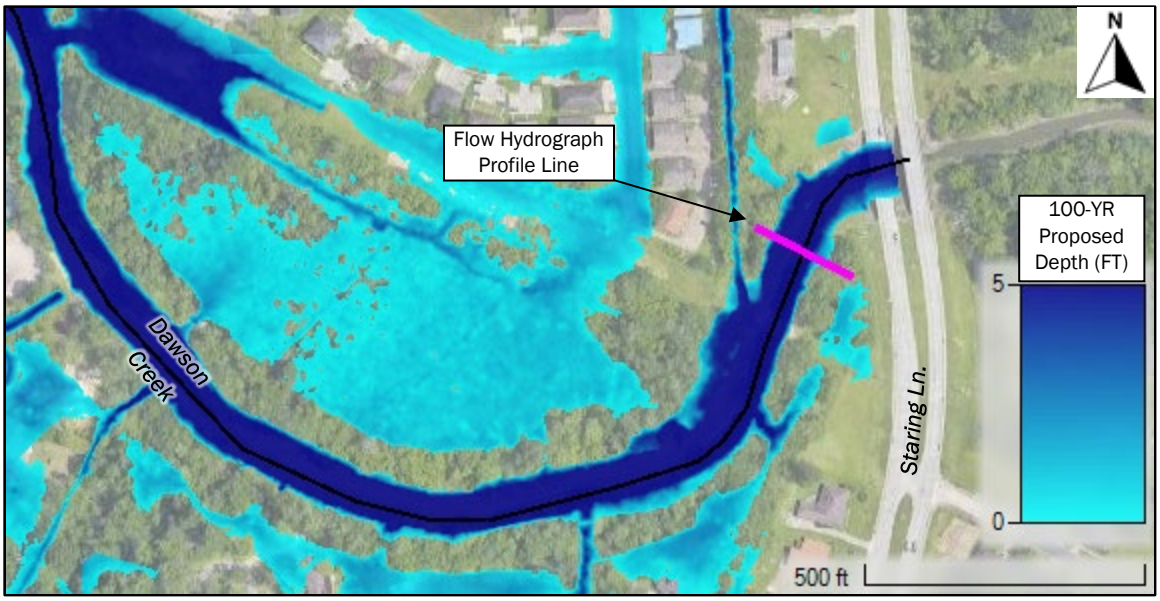

Figure 38: Dawson Creek Profile Line Location, Upstream of Staring Ln.

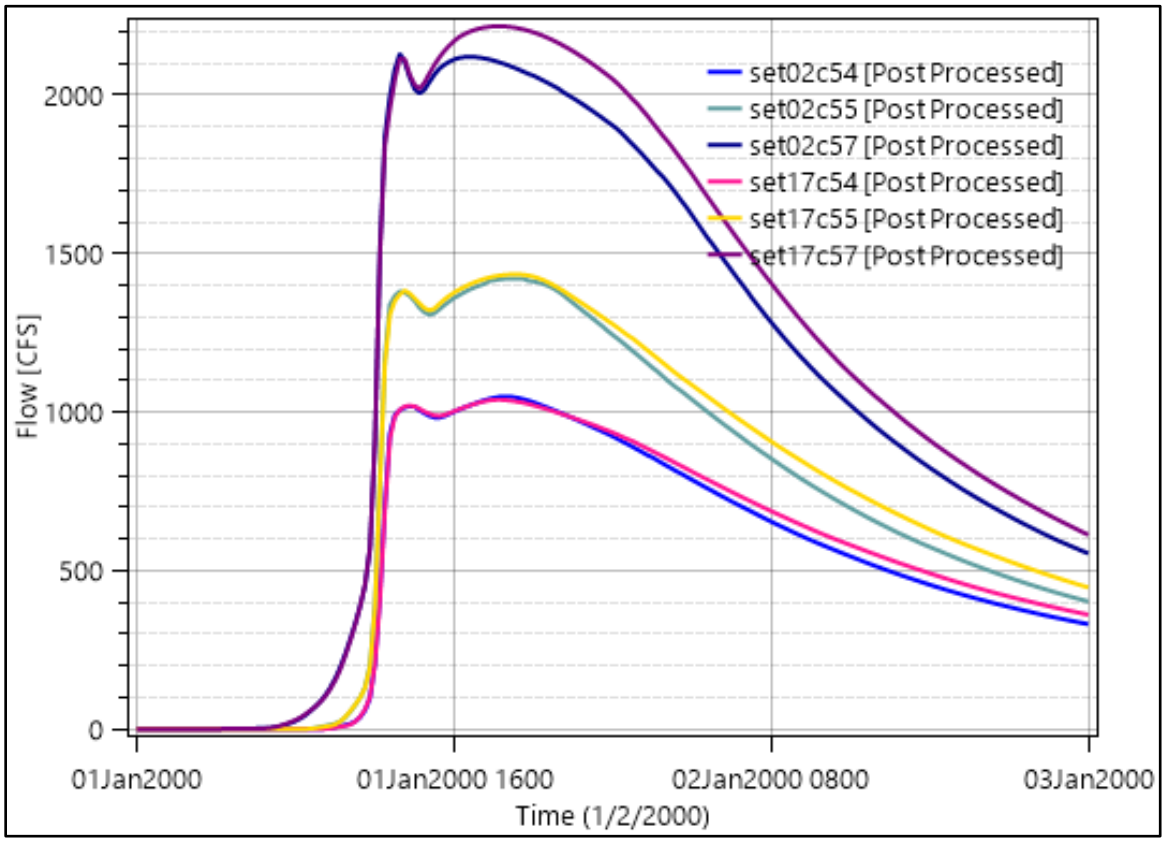

Figure 39: Dawson Creek Flow Hydrograph, Upstream of Staring Ln.

6. Summary and Recommendations

The goal of the modeling was to assess the headwater-driven scenario of the Baton Rouge Lakes Drainage Area and identify preliminary proposed features as a mitigation solution to flood-prone structures in the Drainage Area. Based on the results and the associated BCR shown in the FEMA Non-Disaster Hazard Mitigation Report, implementation of the proposed features that are described in this report would substantially reduce flood risk for a significant number of Baton Rouge residents in this area.

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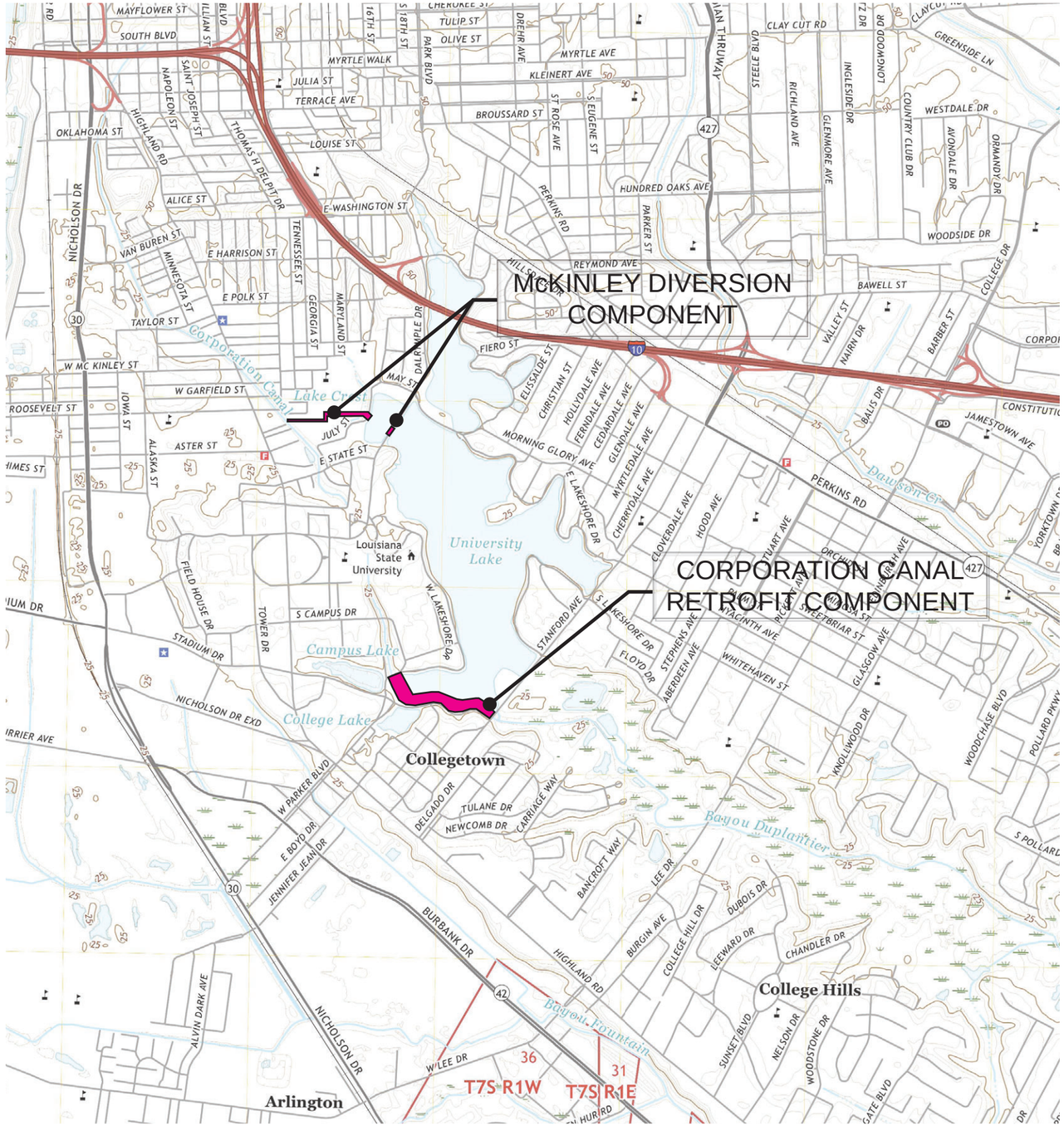

QUADRANGLE LOCATION

1	2	3
4		5
6	7	8

1 Walls
2 Scotlandville
3 Comite
4 Lobdell
5 Baton Rouge East
6 Addis
7 Plaquemine
8 Saint Gabriel

ADJOINING QUADRANGLES

ROAD CLASSIFICATION

Expressway
Secondary Hwy
Ramp
Local Connector
Local Road
4WD
Interstate Route
US Route
State Route

BATON ROUGE WEST, LA

2020

SCALE 1:24 000

1 0.5 0 KILOMETERS 1 2

1000 500 0 METERS 1000 2000

1 0.5 0 1

MILES

1000 0 1000 2000 3000 4000 5000 6000 7000 8000 9000 10000

FEET

CONTOUR INTERVAL 5 FEET
NORTH AMERICAN VERTICAL DATUM OF 1988

This map was produced to conform with the
National Geospatial Program US Topo Product Standard, 2011.
A metadata file associated with this product is draft version 0.6.18

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**LSU LAKES
McKINLEY DIVERSION
AND
CORPORATION CANAL
RETROFIT PROJECT
Baton Rouge, LA**

Client:

Revisions:

Key Plan:

Sheet Title:

**Project Area
USGS Topo Map
Baton Rouge, LA**

Date: December 2021
Project Number: 216194
Drawn By: OB / JB
Checked By: MM

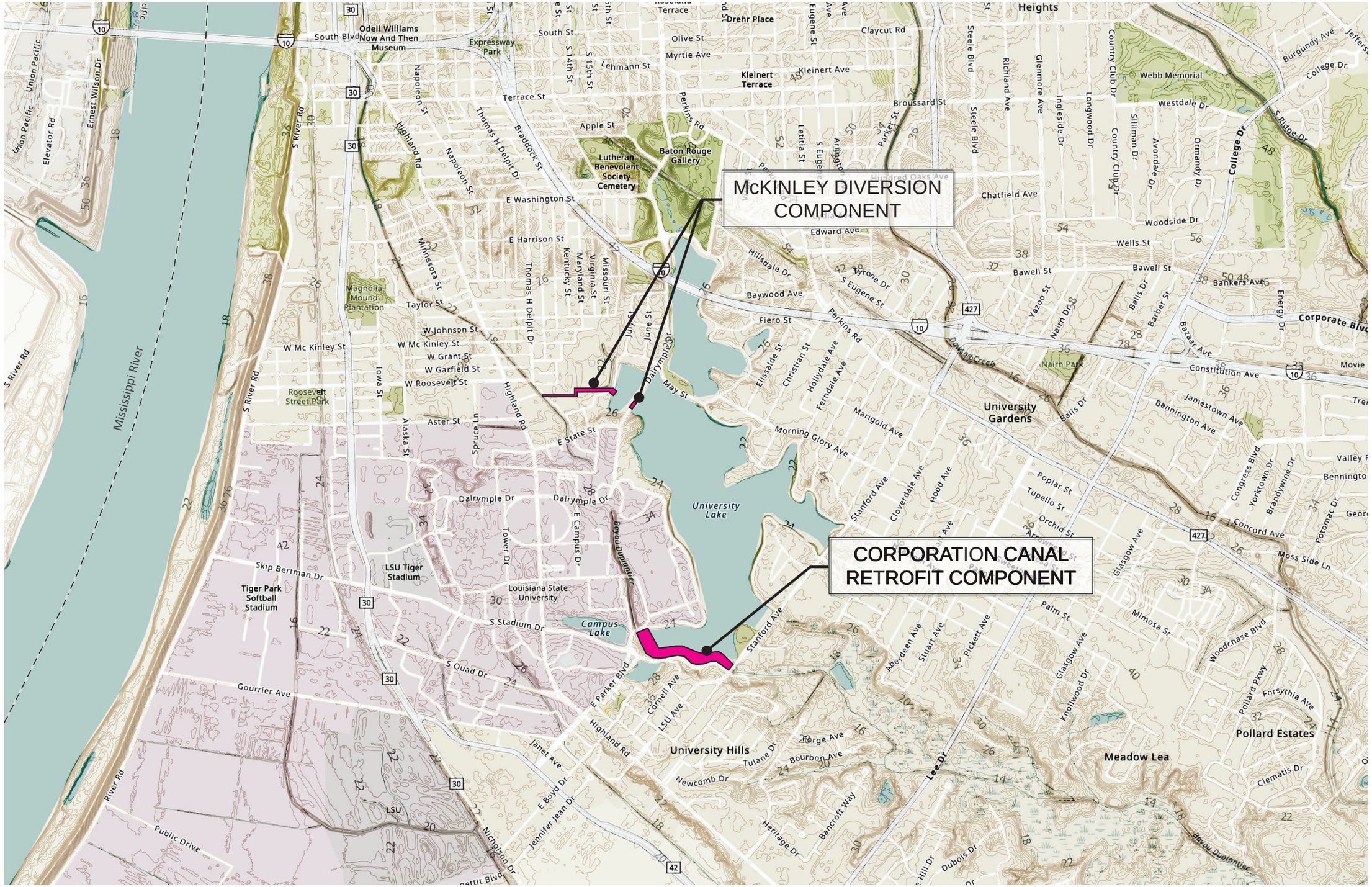
Sheet:

1 of 19

Sheet No:

Appendix B

Design Plans



2FT CONTOUR INTERVALS

N

0 500 1,000 2,000 Feet

SOURCE: EBRGIS; Louisiana Oil Spill Coordinator's Office; LSU Atlas; Department of Information Services; ArcGIS Map Service.
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Key Plan:

Sheet Title:

Project Area Topographic Map Baton Rouge, LA

Date:	December 2021
Project Number:	216194
Drawn By:	OB / JB
Checked By:	MM

Sheet:

2 of 19

Sheet No:

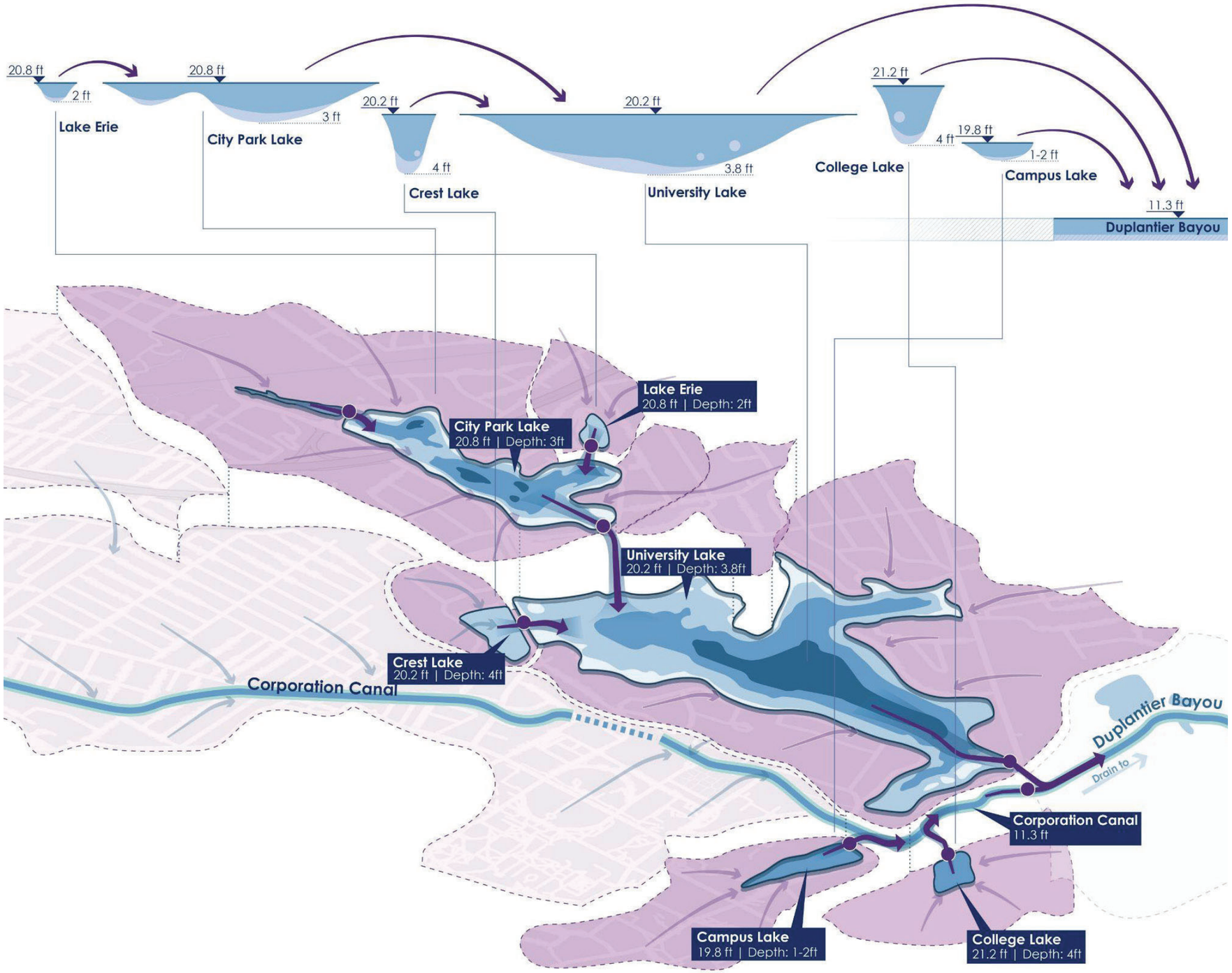

ILLUSTRATION DEVELOPED BY SASAKI ASSOCIATES

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RETROFIT PROJECT
Baton Rouge, LA**

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Key Plan:

Sheet Title:

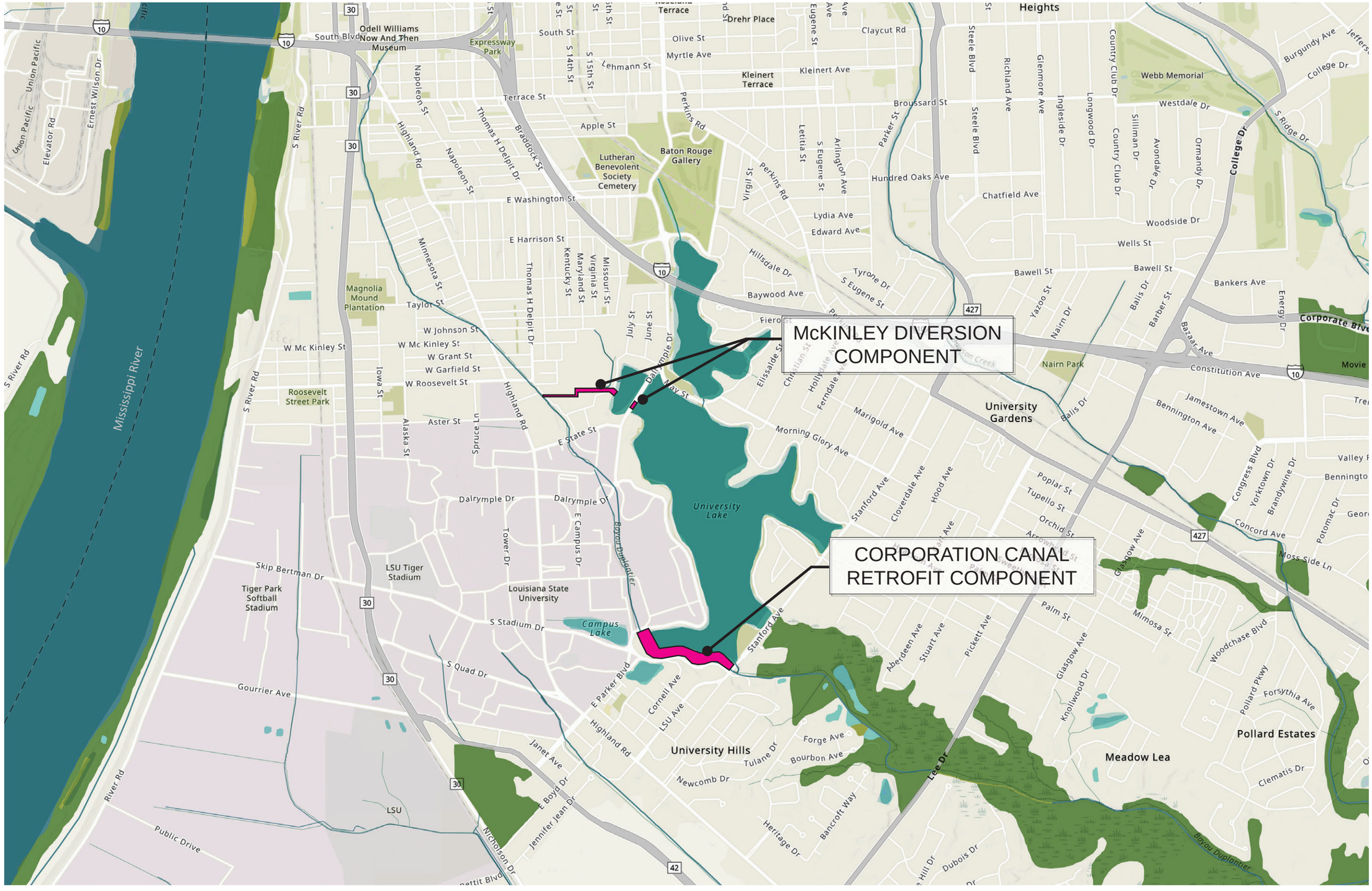
**Project Area
Lakes Hydrology
Baton Rouge, LA**

Date:	December 2021
Project Number:	216194
Drawn By:	OB / JB
Checked By:	MM

Sheet:

3 of 19

Sheet No:



WETLAND TYPE:

- FRESHWATER EMERGENT WETLAND
- FRESHWATER FORESTED/ SHRUB WETLAND
- FRESHWATER POND
- LAKE
- RIVERINE

SOURCE: National Wetlands Inventory - Wetlands (updated November 5, 2021) by U.S. Fish and Wildlife Service.
DISCLAIMER: This map is for general reference only. The US Fish and Wildlife Service is not responsible for the accuracy or correctness of the base data shown on this map. All wetlands related data should be used in accordance with the layer metadata found on the Wetlands Mapper website.

N

0 500 1,000 2,000 Feet

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Key Plan:

Sheet Title:

Project Area Wetland Map Baton Rouge, LA

Date:	December 2021
Project Number:	216194
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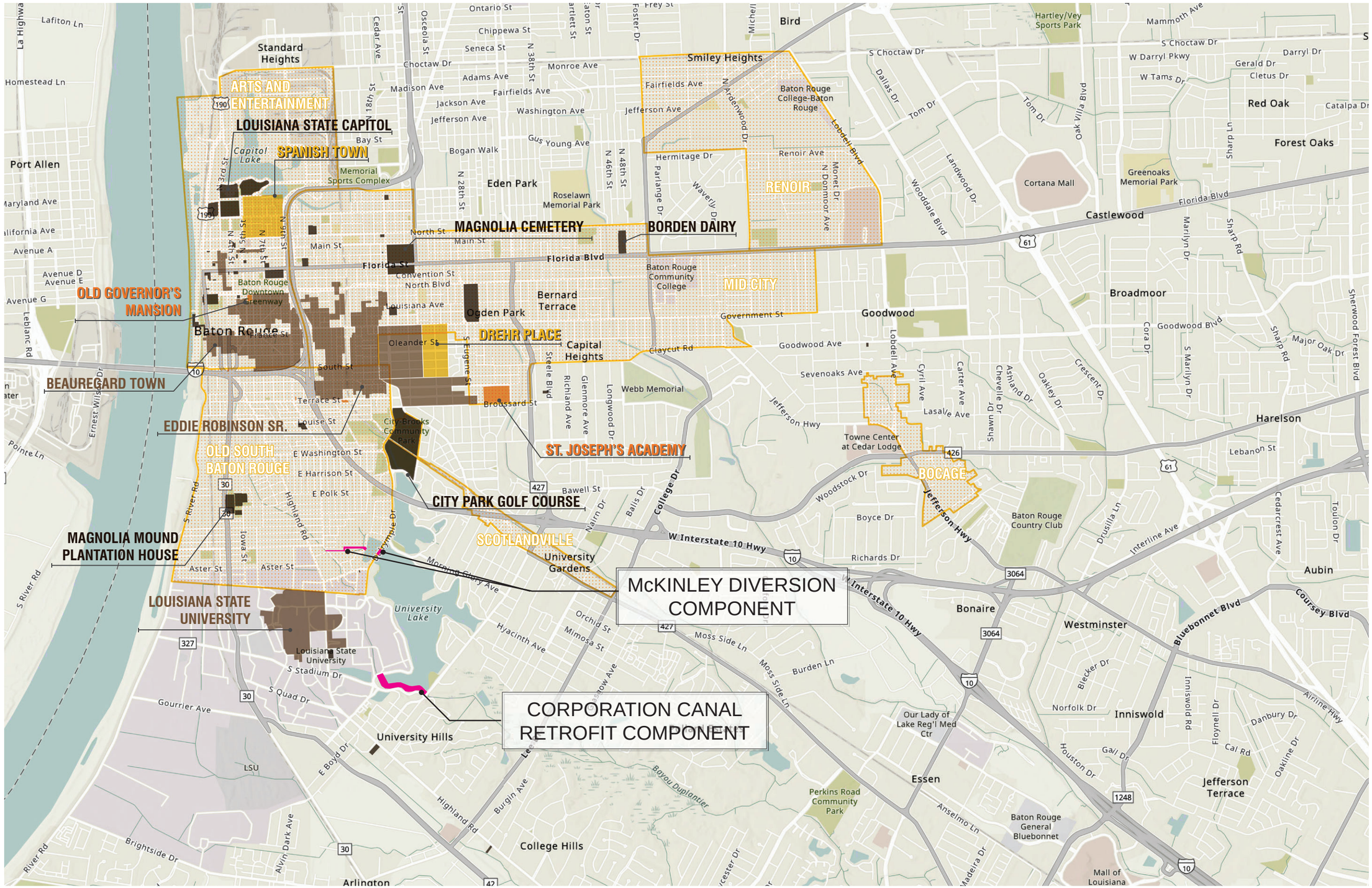
Sheet:	



HISTORIC AND CULTURAL PLACES:

- LOCAL DISTRICT
- LOCAL LANDMARK
- NATIONAL DISTRICT
- NATIONAL LANDMARK
- CULTURAL DISTRICT

0 1,500 3,000 6,000 Feet

SOURCE: EBRGIS; City-Parish Planning Commission; Department of Information Services. *https://maps.brla.gov/gis/rest/services/Cadastral/Historic/MapServer*

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Sheet Title:

Project Area Historic and Cultural Places Baton Rouge, LA

Date:	December 2021
Project Number:	216194
Drawn By:	OB / JB
Checked By:	MM

Sheet:

5 of 19

Sheet No:

FEMA FLOOD HAZARD ZONES:

- **WATER BODY**
- **ZONE A/AE** — 1% annual chance of flood hazard
- **ZONE X** — area with reduced flood risk due to levee
- **ZONE X** — area with minimal flood hazard

N

0 500 1,000 2,000 Feet

SOURCE: EBRGIS; City-Parish Planning Commission; Department of Information Services. *https://maps.brla.gov/gis*

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Key Plan:

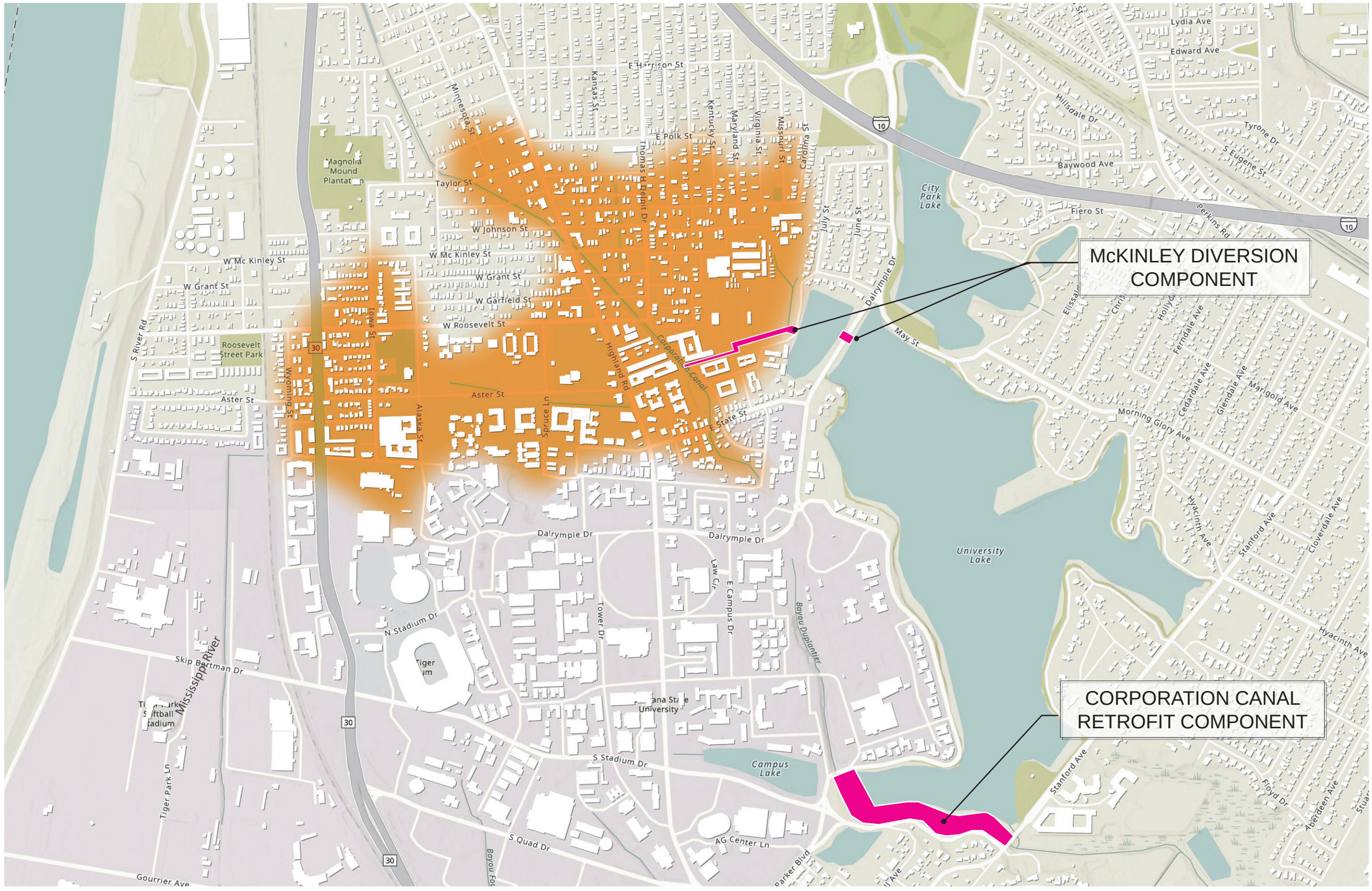
Sheet Title:

Project Area FEMA Flood Zones Baton Rouge, LA

Date:	December 2021
Project Number:	216194
Drawn By:	OB / JB
Checked By:	MM
Sheet:	

6 of 19

Sheet No:



PRIMARY BENEFIT AREA:
FLOOD RISK AND STRUCTURAL DAMAGE REDUCTION AREA

SOURCE: EBRGIS; City-Parish Planning Commission; Department of Information Services. *https://gismaps.brla.gov/maps/ebrgis::stormwater-management/explore?location=30.513885%2C-91.073300%2C11.12*
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N

0 500 1,000 2,000 Feet

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Client:

Revisions:

Key Plan:

Sheet Title:

Project Area Primary benefit area Baton Rouge, LA

Date:	December 2021
Project Number:	216194
Drawn By:	OB / JB
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Sheet:	

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RETROFIT PROJECT
Baton Rouge, LA**

Client:

Revisions:

Key Plan:

McKINLEY DIVERSION COMPONENT

CORPORATION CANAL RETROFIT COMPONENT

PRIMARY BENEFIT AREA

SECONDARY BENEFIT AREA:
UPSTREAM POLLUTANT LOAD CAPTURE AREAS

SOURCE: EBRGIS; City-Parish Planning Commission; Department of Information Services. *https://maps.brla.gov/gis*
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0 1,250 2,500 5,000 Feet

Sheet Title:
**Project Area
Secondary benefit area
Baton Rouge, LA**

Date:	December 2021
Project Number:	216194
Drawn By:	OB / JB
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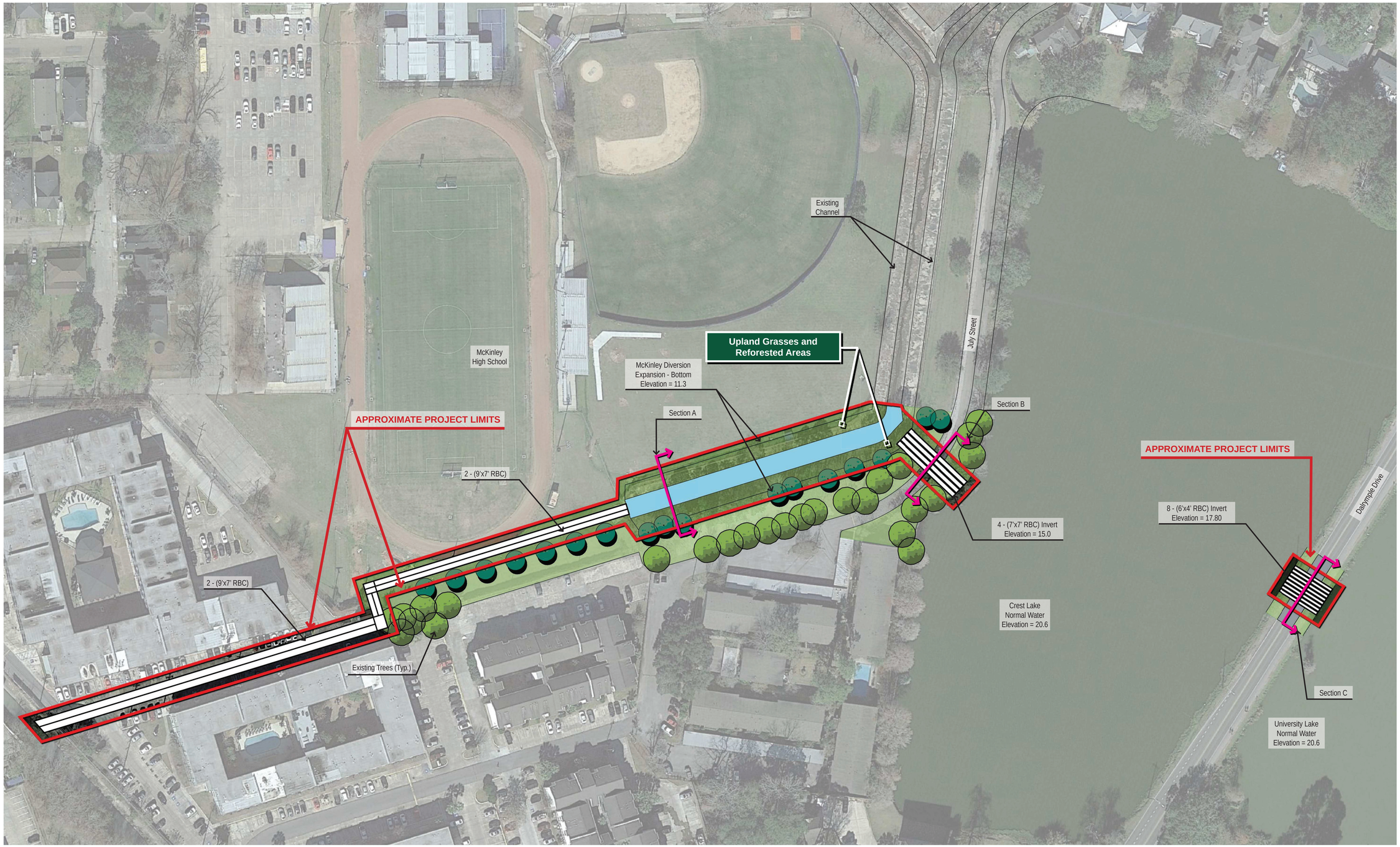
Sheet:	



N

Plan View

SCALE: 1" = 60'

0 60′ 120′ 180′

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Key Plan:

Sheet Title:

McKinley Diversion Plan View

Date: December 2021

Project Number: 216194

Drawn By: OB / JB

Checked By: MM

Sheet:

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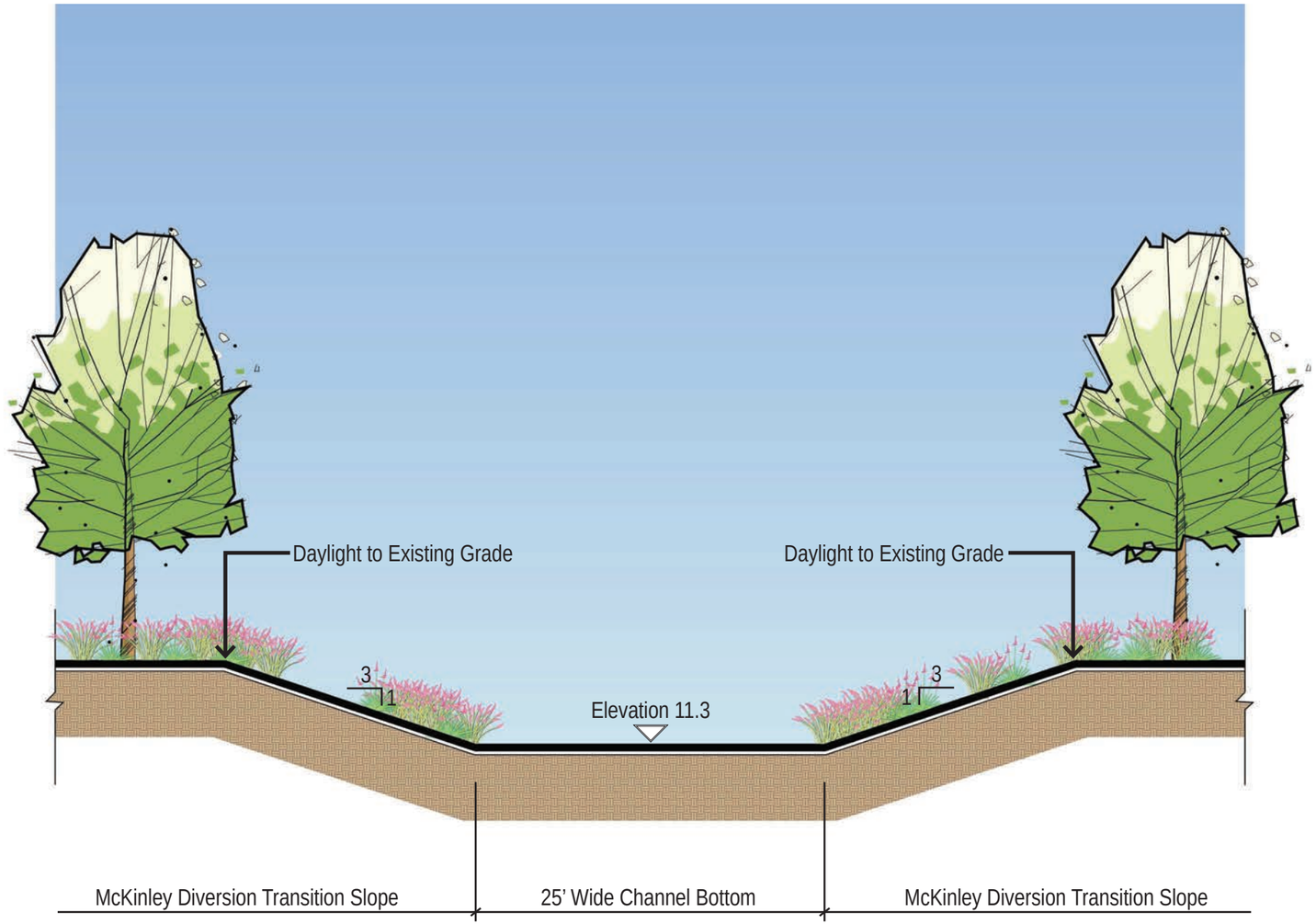
Sheet No:



Landscape Typology - Upland Grasses and Reforested Area

SECTION A

SCALE: 1" = 10'

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Revisions:

Key Plan:

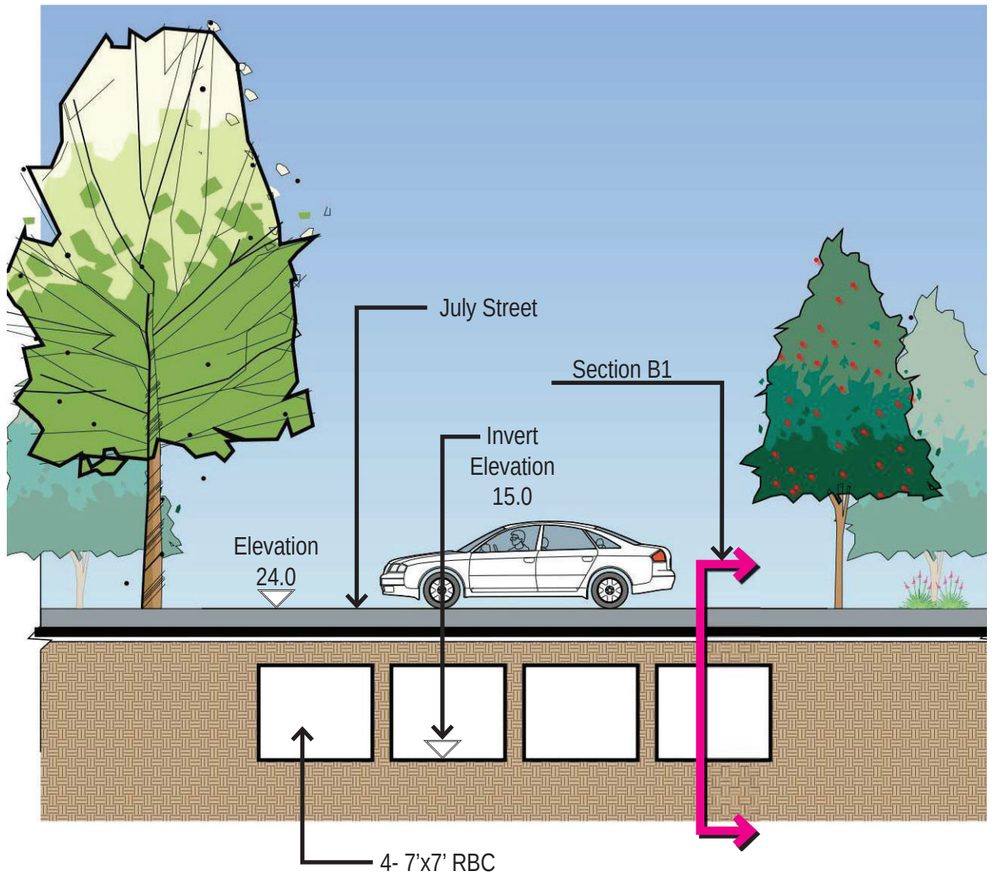
Sheet Title:
**McKinley Diversion
Cross Section**

Date:	December 2021
Project Number:	216194
Drawn By:	OB / JB
Checked By:	MM

Sheet:

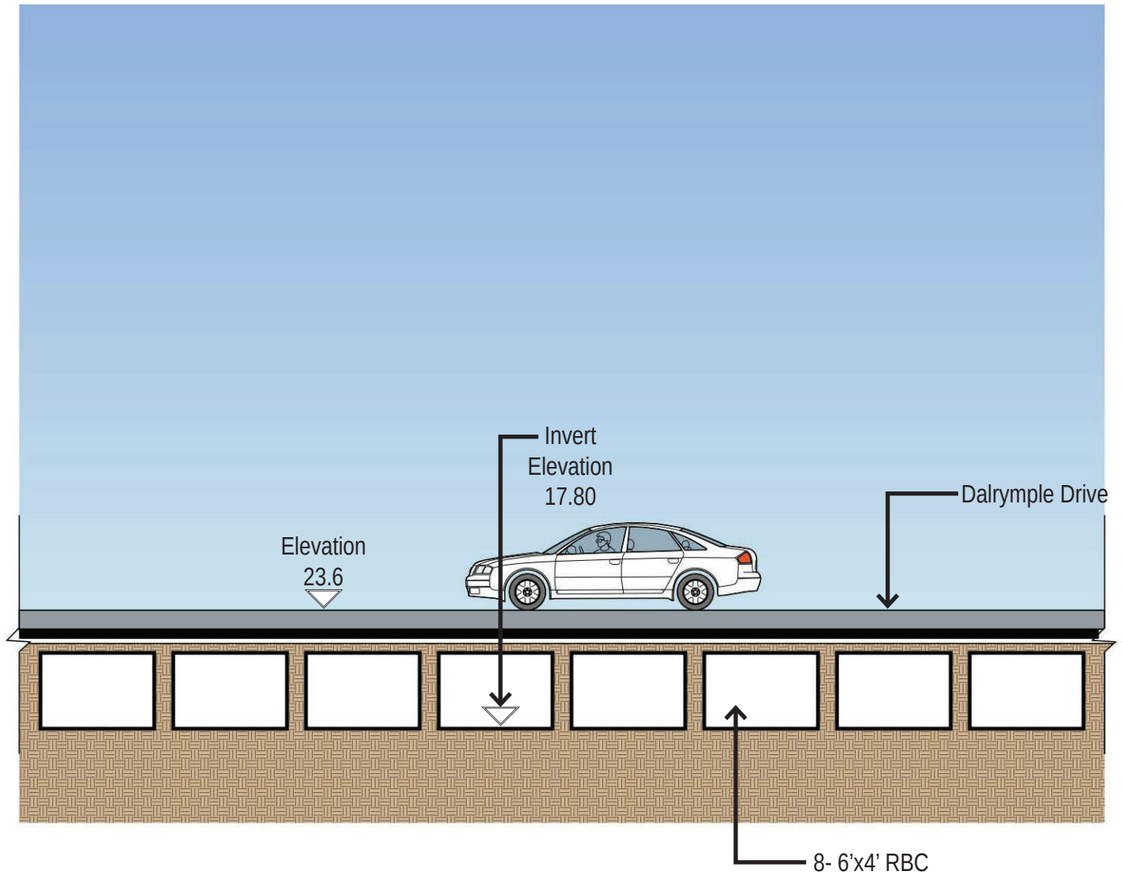
10 of 19

Sheet No:



SECTION B

SCALE: 1/8" = 1-0"



SECTION C

SCALE: 1/8" = 1-0"

CSRS
8555 United Plaza Blvd., Baton Rouge, LA 70809
Telephone: 225 769-0546 Fax: 225 767-0060
www.csrsinc.com

Project:

LSU LAKES
McKINLEY DIVERSION
AND
CORPORATION CANAL
RETROFIT PROJECT
Baton Rouge, LA

Client:

Revisions:

Key Plan:

Sheet Title:

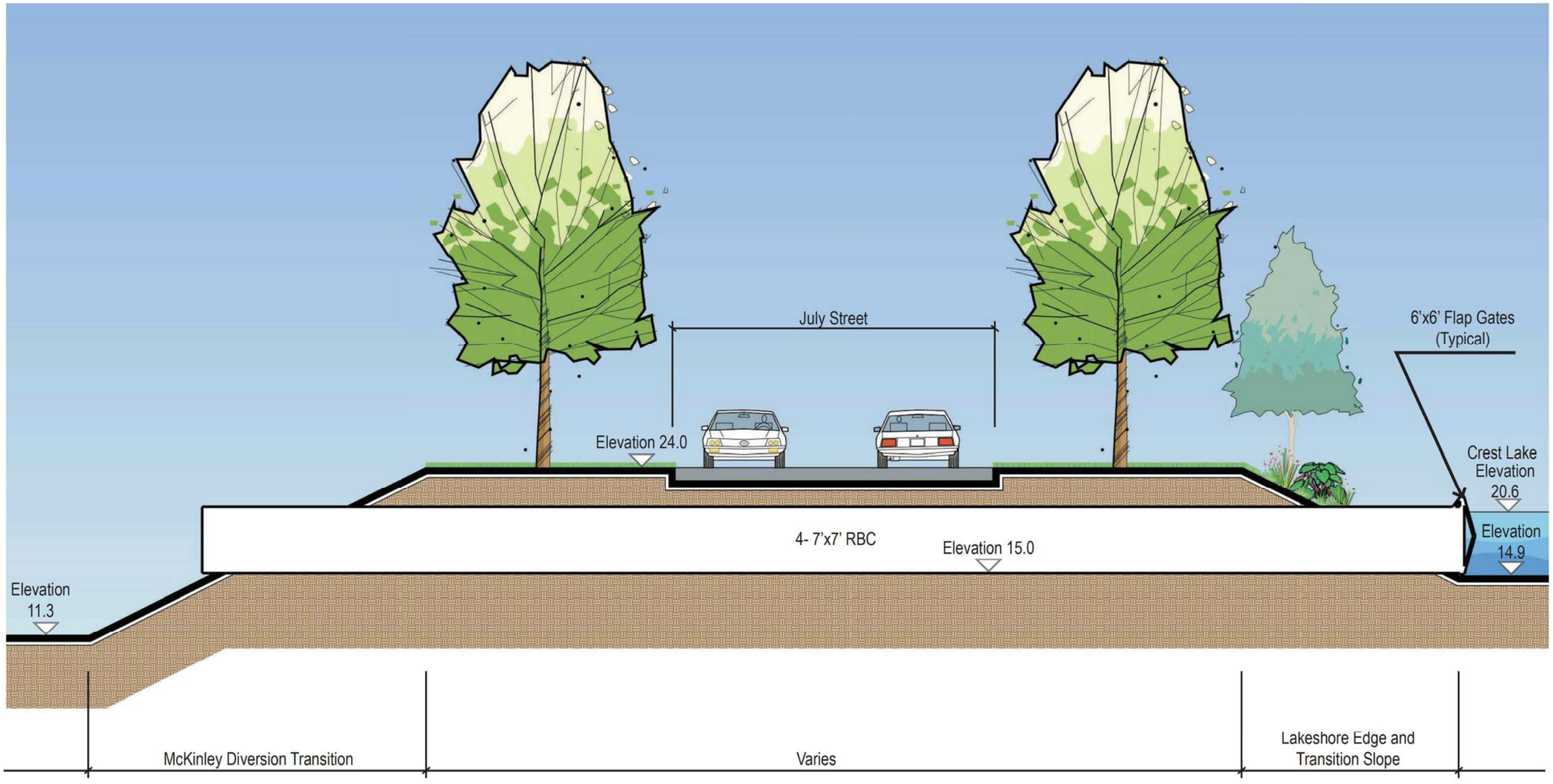
McKinley Diversion
Cross Section

Date:	December 2021
Project Number:	216194
Drawn By:	OB / JB
Checked By:	MM

Sheet:

11 of 19

Sheet No:



SECTION B1

SCALE: 1" = 10'

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Project:

**LSU LAKES
McKINLEY DIVERSION
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RETROFIT PROJECT
Baton Rouge, LA**

Client:

Revisions:

Key Plan:

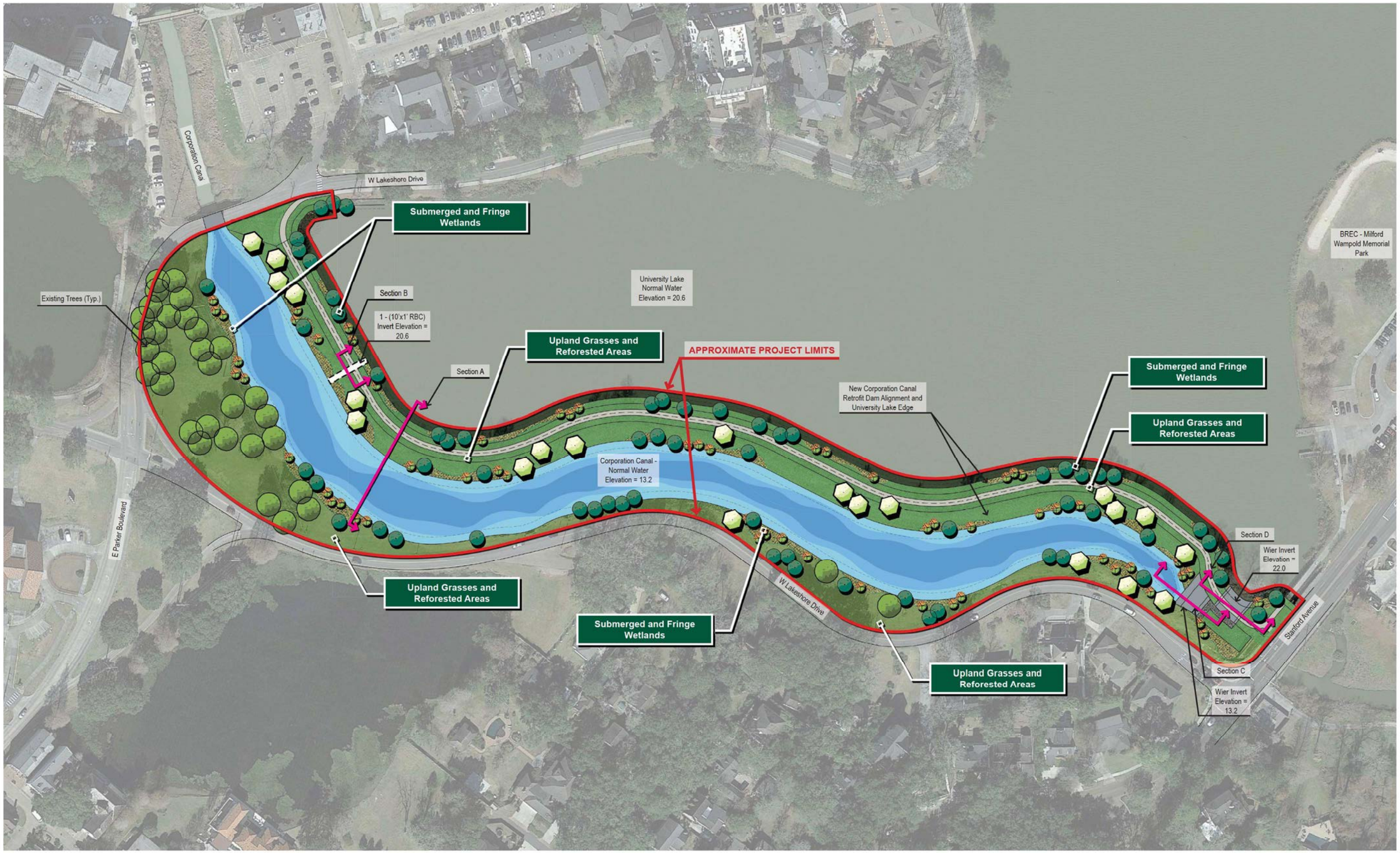
Sheet Title:
**McKinley Diversion
Cross Section**

Date:	December 2021
Project Number:	216194
Drawn By:	OB / JB
Checked By:	MM

Sheet:

12 of 19

Sheet No:



N

Plan View
SCALE: 1" = 80'
0 80' 160' 240'

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Project:

LSU LAKES McKINLEY DIVERSION AND CORPORATION CANAL RETROFIT PROJECT Baton Rouge, LA

Client:

Revisions:

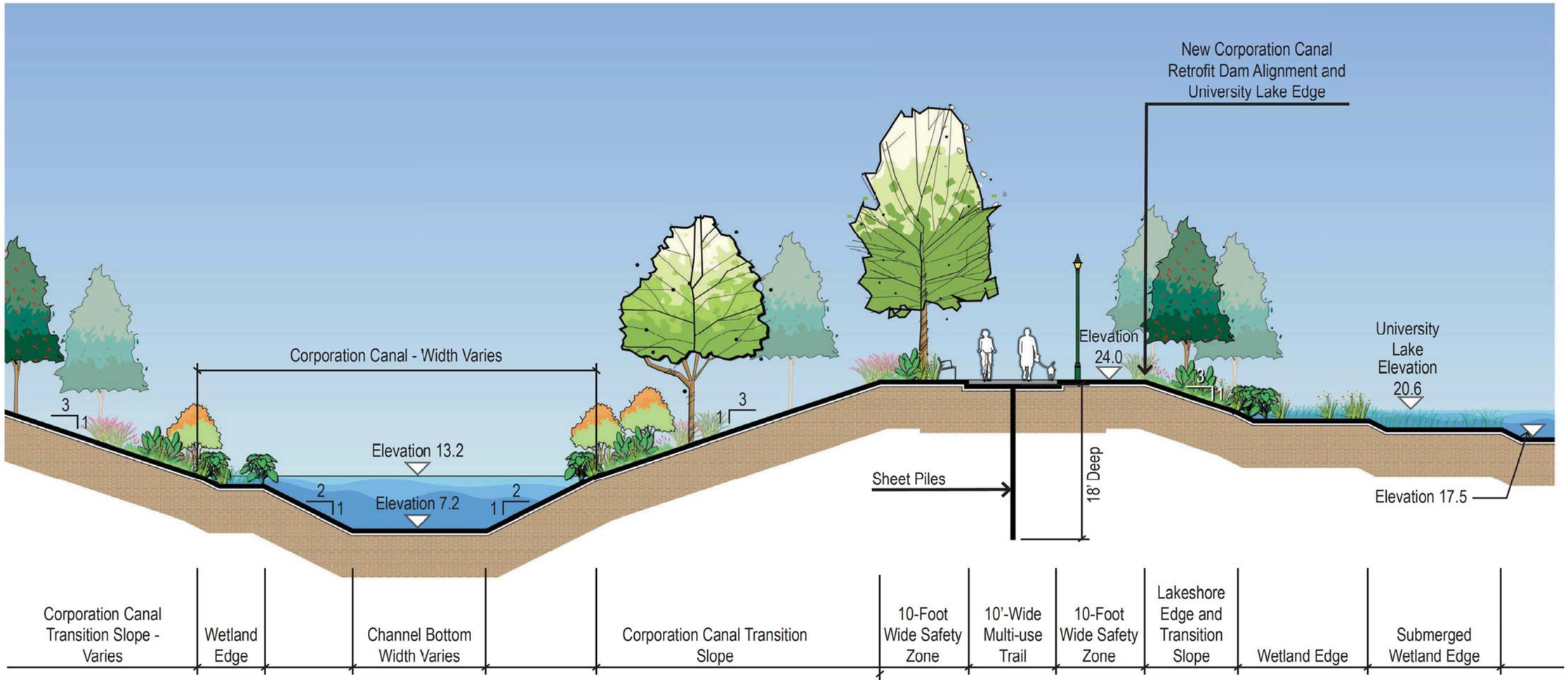
Key Plan:

Sheet Title:
Corporation Canal Retrofit Plan View

Date: December 2021
Project Number: 216194
Drawn By: OB / JB
Checked By: MM
Sheet:

13 of 19

Sheet No:



SECTION A

SCALE: 1" = 12'

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AND
CORPORATION CANAL
RETROFIT PROJECT
Baton Rouge, LA**

Client:

Revisions:

Key Plan:

Sheet Title:
**Corporation Canal
Retrofit
Cross Section**

Date: December 2021
Project Number: 216194
Drawn By: OB / JB
Checked By: MM

Sheet:

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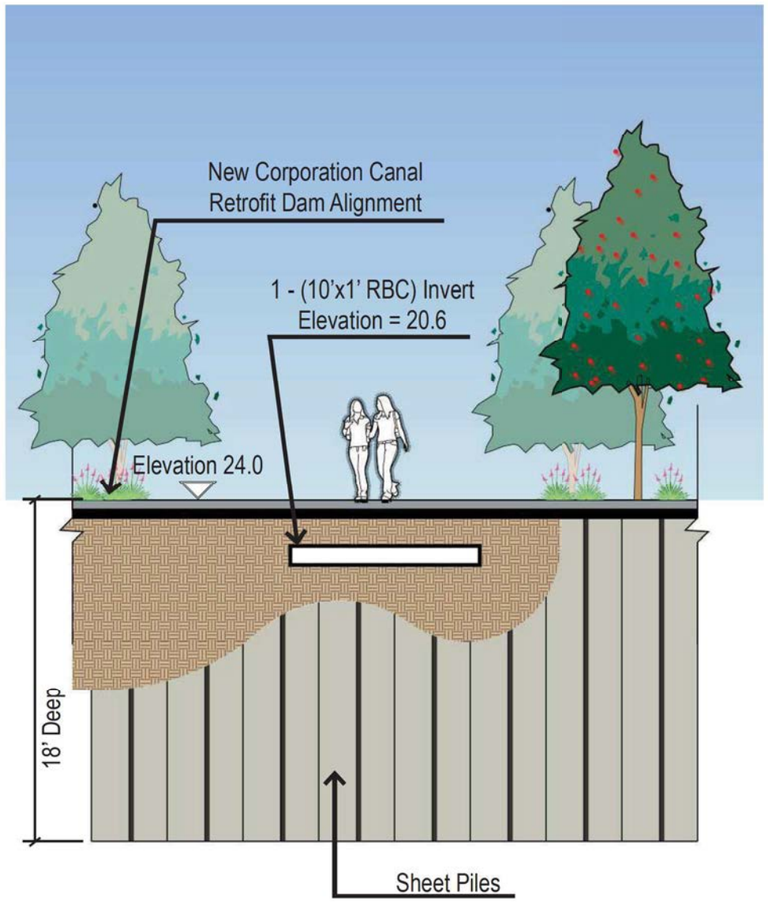
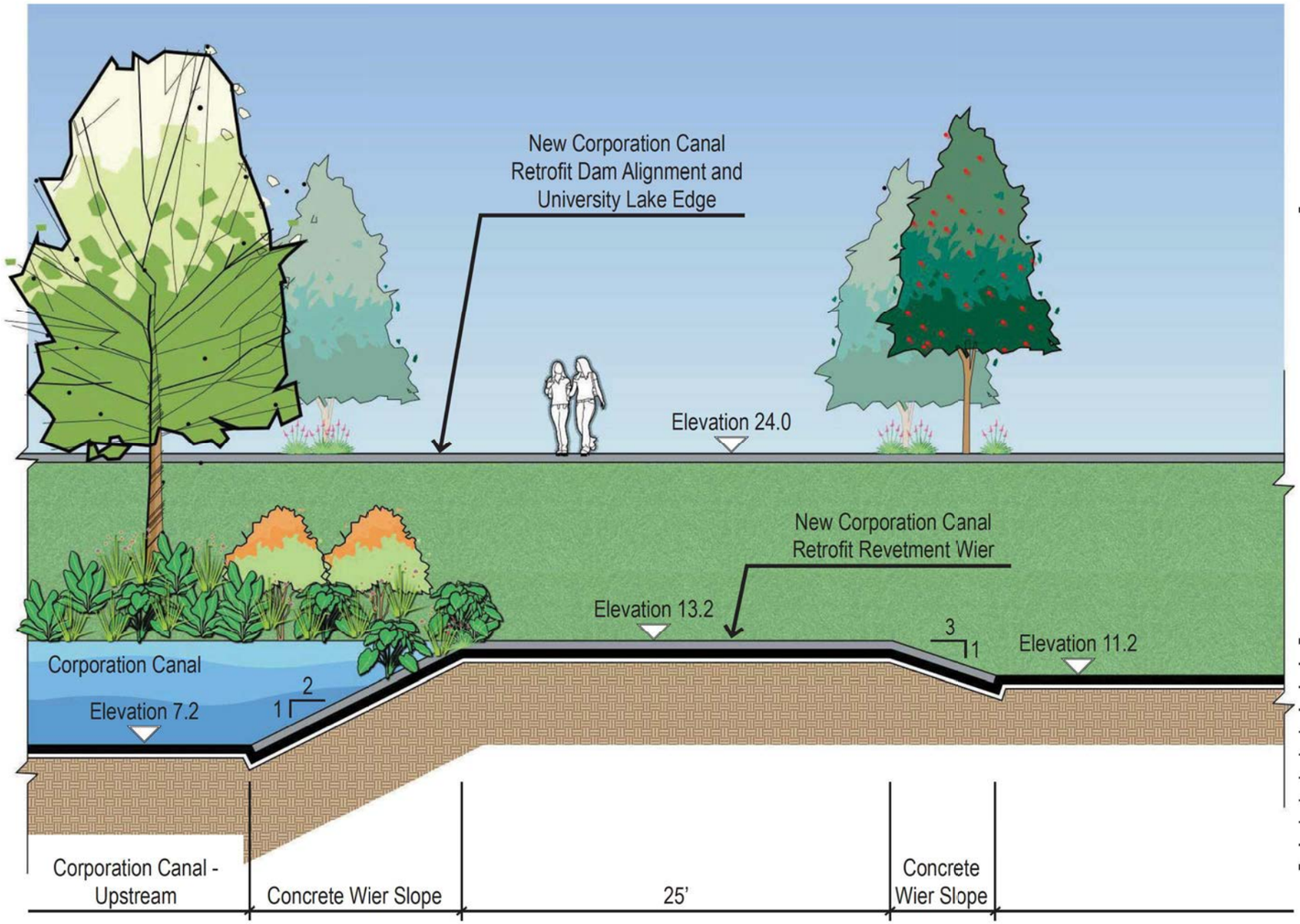
Sheet No:



SECTION B

SCALE: 1/8" = 1-0"



SECTION C

SCALE: 1/8" = 1-0"

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Project:

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Baton Rouge, LA**

Client:

Revisions:

Key Plan:

Sheet Title:
**Corporation Canal
Retrofit
Cross Section**

Date: December 2021
Project Number: 216194
Drawn By: OB / JB
Checked By: MM

Sheet:

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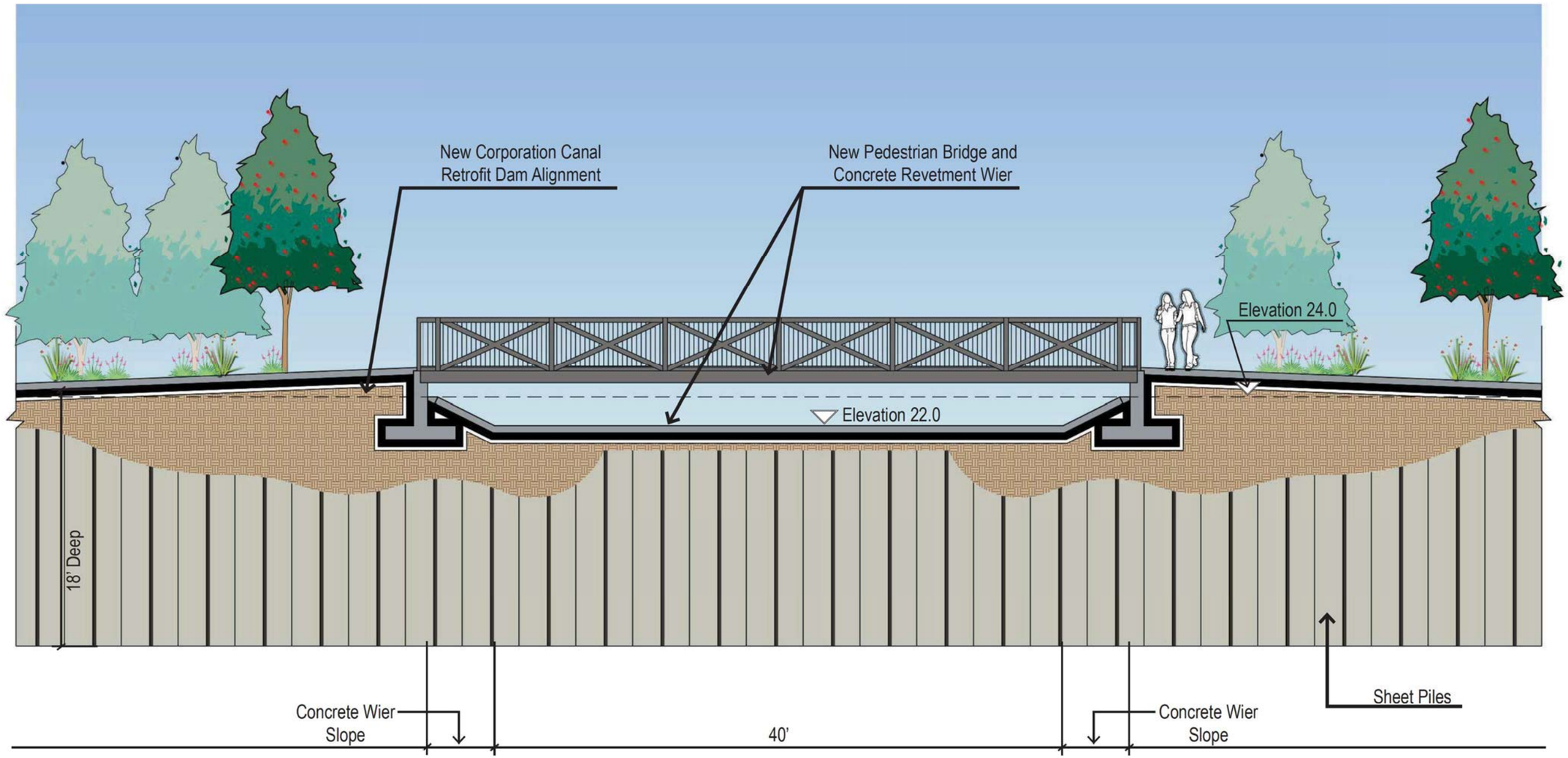
Sheet No:



SECTION D

SCALE: 1/8" = 1-0"

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Project:

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RETROFIT PROJECT
Baton Rouge, LA**

Client:

Revisions:

Key Plan:

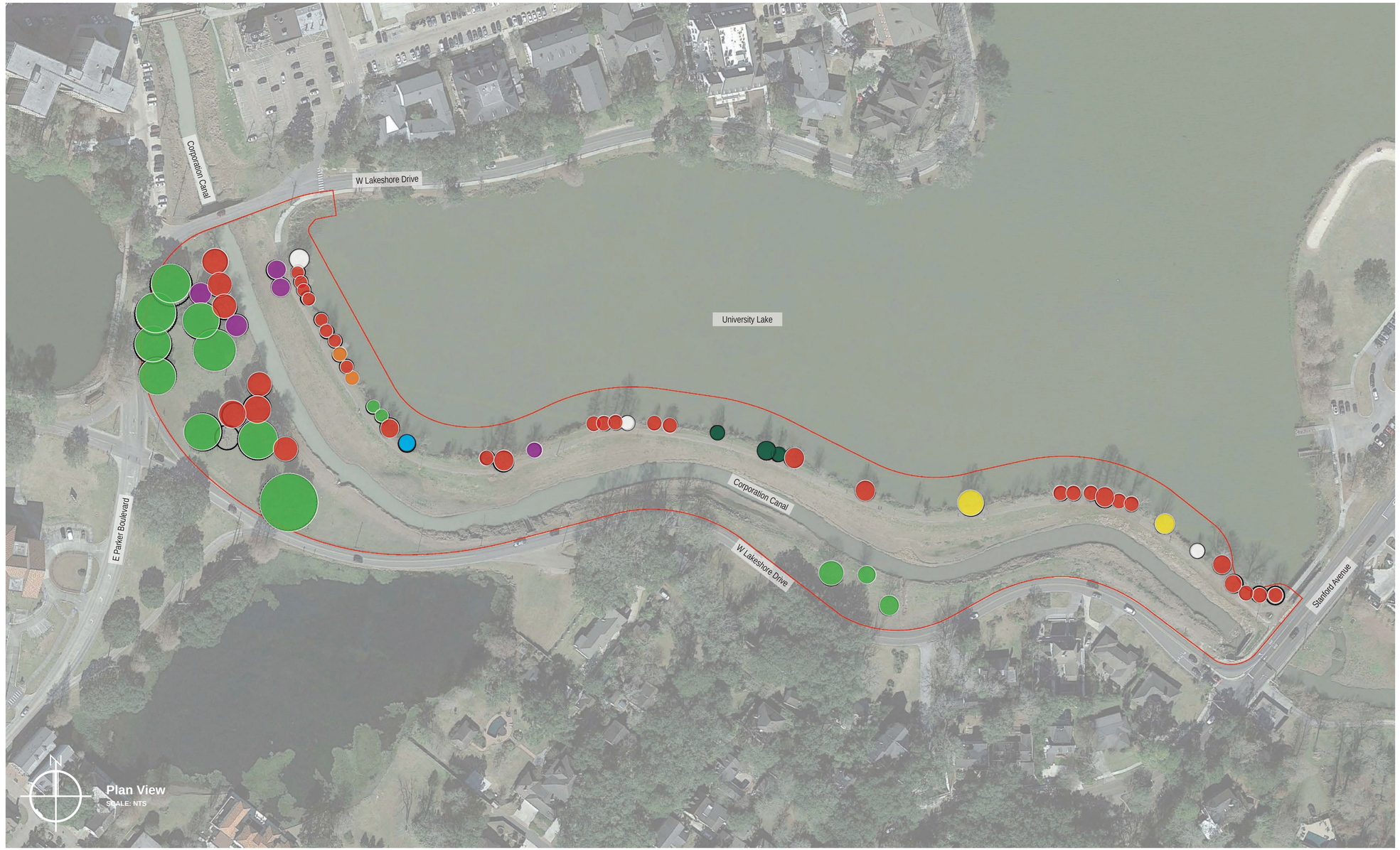
Sheet Title:
**Corporation Canal
Retrofit
Cross Section**

Date:	December 2021
Project Number:	216194
Drawn By:	OB / JB
Checked By:	MM

Sheet:

16 of 19

Sheet No:



Plan View
SCALE: NTS

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Project:

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Baton Rouge, LA

Client:

Revisions:

Key Plan:


Bald Cypress


Live Oak


Nuttall Oak


Willow Oak


Red Maple


Pin Oak


American Elm


Green Ash

Sheet Title:

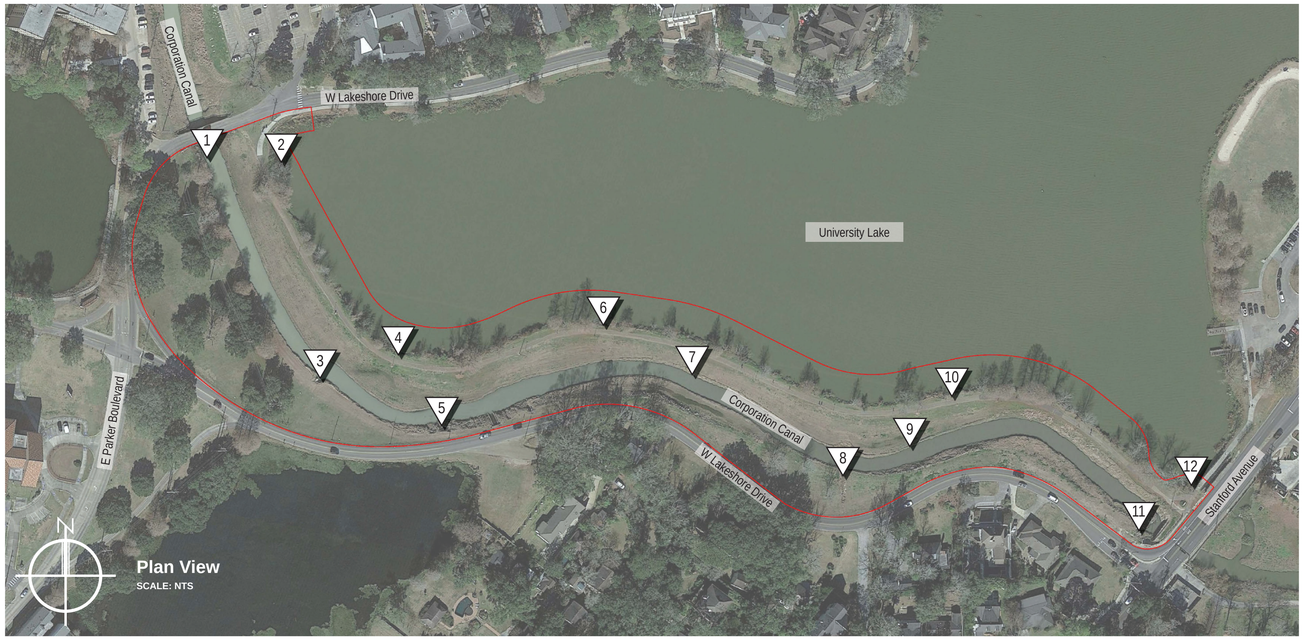
Corporation Canal Retrofit Existing Trees

Date: December 2021
Project Number: 216194
Drawn By: OB / JB
Checked By: MM

Sheet:

17 of 19

Sheet No:



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Project:

LSU LAKES McKINLEY DIVERSION AND CORPORATION CANAL RETROFIT PROJECT Baton Rouge, LA

Client:

Revisions:

Key Plan:

Sheet Title:

Corporation Canal Retrofit Existing Waterbody Conditions

Date: December 2021

Project Number: 216194

Drawn By: OB / JB

Checked By: MM

Sheet:

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Sheet No:

Precedents


Example Species:

Schizachyrium scoparium - little bluestem
Panicum virgatum - switchgrass
Rudbeckia maxima - giant coneflower



Upland Grasses

Example tree species

Quercus michauxii - swamp chestnut oak
Quercus nuttallii - nuttall oak
Ulmus americana - American elm
Betula nigra - river birch
Magnolia virginiana - sweetbay magnolia
Pinus palustris - longleaf pine



Example Understory Species:

Chionanthus virginicus - white fringe tree
Callicarpa americana - beautyberry
Lobelia cardinalis - cardinal flower
Osmunda regalis - royal fern
Osmunda cinnamomea - cinnamon fern





Reforested Areas

Nature Based Solutions:

Upland Grasses and Reforested Areas with native plantings and trees will assist to slow down, store, and treat runoff before entering McKinley Diversion and the Corporation Canal Retrofit corridor.

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Project:

LSU LAKES McKINLEY DIVERSION AND CORPORATION CANAL RETROFIT PROJECT Baton Rouge, LA

Client:

Revisions:

Key Plan:

Sheet Title:

Landscape Typology

Date: December 2021
Project Number: 216194
Drawn By: OB / JB
Checked By: MM
Sheet:

19 of 19

Sheet No:

Precedents


Example Species:

Iris virginica - blue flag iris
Iris fulva - copper iris
Juncus effuses - soft rush
Saurus cernuus - lizards tail
Pontederia cordata - pickerelweed





Fringe Wetlands

Precedents


Example Species:

Nuphar lutea - spatterdock
Nymphaea odorata - white water lily
Nymphaea mexicana - yellow water lily
Nelumbo lutea - american lotus
Cabomba caroliniana - carolina fanwort




Submerged Wetlands

Nature Based Solutions:

Fringe and Submerged Wetlands provide additional treatment of runoff, particularly for dissolved pollutants within the Corporation Canal Retrofit corridor.

Appendix C

FEMA 8-step Checklist

EXECUTIVE ORDER 11988/11990

FLOODPLAIN MANAGEMENT/WETLANDS – CHECKLIST (44 CFR Part 9)

APPLICANT:	Parish of East Baton Rouge
COUNTY/STATE:	East Baton Rouge Parish, LA
COORDINATES:	McKinley Diversion - Start: 30.420468, -91.175349; End: 30.421206, -91.171916 Crest Lake Culverts - 30.420479, -91.170727 Corporation Canal Retrofit - Start: 30.408760, -91.170348; End: 30.406989, -91.164981
PROPOSED ACTION:	East Baton Rouge Parish (Subgrantee) is proposing to use FMA funding to construct 1) the McKinley Diversion which includes replacement and upsizing of existing underground culverts, widening and deepening an existing open concrete-lined trapezoidal channel south of McKinley High School, addition of a new set of underground culverts to connect and divert water from Corporation Canal to Crest Lake, and replacement/upsizing of existing culverts connecting Crest Lake with University Lake under Dalrymple Drive; and 2) the Corporation Canal Retrofit involving widening of the canal, installation of sheet pile to support an existing multiuse trail on top of the earthen dam separating University Lake and the canal, culverts to connect University Lake to the canal, a flow control weir at the downstream end of the canal prior to entry into Bayou Duplantier, and retrofit of a revetment weir that controls the water elevation of University Lake at its downstream end to improve drainage to Bayou Duplantier.

APPLICABILITY: Actions which have the potential to affect floodplains/wetlands or their occupants, or which are subject to potential harm by location in floodplains/wetlands.

☒**YES** ☐**NO** The proposed action could potentially adversely affect the floodplain/wetlands.

Remarks: The 100-year recurrence interval water surface elevation would increase along the entire length of the Corporation Canal Retrofit project area and downstream of the retrofit weir in Bayou Duplantier. Despite this water surface elevation increase, that increase would be isolated to an undeveloped floodplain which would ensure the need to

preserve and restore the natural and beneficial values served by the Bayou Duplantier floodplain/wetlands. Further, short-term construction-related impacts caused by excavation and fill activities and removal of vegetation could occur.

☐**YES** ☒**NO** The proposed action could potentially be adversely affected by the floodplain/wetlands.

Remarks: Culverts, weirs, and canals modified/constructed would not be adversely affected by being located within floodplains/wetlands.

ACTION:

☐ **Review against 500 Year floodplain (for Critical Action)**

☒ **Review against 100 Year floodplain**

☐ **Not Applicable (for actions located in wetland only)**

STEP NO. 1 **Determine whether the proposed action is located in the 100-year floodplain (500-year floodplain for critical actions) and/or wetland; (44 CFR §9.7).**

Both the McKinley Diversion and Corporation Canal Retrofit project areas are located within an AE Zone, area of 100-yr flooding, per Flood Insurance Rate Map (FIRM) panels 22033C0245E, dated 05/02/2008.

A review of the National Wetland Inventory (NWI) online mapper, accessed on 01/15/2023, for both project areas indicates that they are not located within a designated wetland; however, the project would affect a designated wetlands along Bayou Duplantier.

STEP NO. 2 **Notify the public at the earliest possible time of the intent to carry out an action in a floodplain/wetland, and involve the affected and interested public in the decision-making process; (44 CFR §9.8)**

☐ Notice was provided as part of a disaster cumulative notice:

Newspaper: _____

Date: _____

☒ Project Specific Notice (e.g. EA, newspaper, public meeting, etc):

Type of Public Notice: Environmental Assessment

Date: DATE, 2024

STEP NO. 3 **Identify and evaluate practicable alternatives to locating the proposed action in a floodplain/wetland (including alternatives sites, actions and the "no action" option). (44 CFR §9.9)**

Alternative Options

☐**YES** ☒**NO** Is there a practicable alternative site location outside of the floodplain/wetland?

If yes, provide the site location:

☐**YES** ☒**NO** Is there a practicable alternative action outside of the floodplain/wetland that will not affect the floodplain/wetland?

If yes, describe the alternative action:

☐**YES** ☒**NO** Is the NO Action alternative the most practicable alternative?

If a practicable alternative exists outside the floodplain/wetland, FEMA must locate the action at the alternative site.

REMARKS

Alternative 1 - The “No Action” alternative would cause the risk to people and property from flooding upstream of the subsurface constriction of Corporation Canal to remain and additional construction, repairs, or mitigation efforts may be required in the future to address damage after flooding.

STEP NO. 4 **Identify the potential direct and indirect impacts associated with the occupancy or modification of floodplains/wetlands and the potential direct and indirect support of floodplain/wetlands development that could result from the proposed action; (44 CFR §9.10)**

☒**YES** ☐**NO** Is the proposed action in compliance with the NFIP (see 44 CFR Part 59 seq.)?

☐**N/A** Remarks:

☐**YES** ☒**NO** Does the proposed action increase the risk of flood loss?

☒**YES** ☐**NO** Will the proposed action result in an increased base discharge or increase the flood hazard potential to other properties or structures?

☒**YES** ☐**NO** Does the proposed action minimize the impact of floods on human health, safety and welfare?

☐**YES** ☒**NO** Will the proposed action induce future growth and development, which will potentially adversely affect the floodplain/wetland?

☒**YES** ☐**NO** Does the proposed action involve dredging and/or filling of a floodplain/wetlands?

☐**YES** ☒**NO** Will the proposed action result in the discharge of pollutants into the floodplain/wetlands?

☒**YES** ☐**NO** Does the proposed action avoid long and short-term adverse impacts associated with the occupancy and modification of floodplains/wetlands?

☐**N/A** Remarks:

☐**YES** ☒**NO** Will the proposed action result in any indirect impacts that will affect the natural values and functions of floodplains/wetlands?

☐**YES** ☒**NO** Will the proposed action forego an opportunity to restore the natural and beneficial values served by floodplains/wetlands?

☐**N/A** Remarks:

☒**YES** ☐**NO** Does the proposed action restore and/or preserve the natural and beneficial values served by floodplains/wetlands?

☐**N/A** Remarks:

☒**YES** ☐**NO** Will the proposed action result in an increase to the useful life of a structure or facility?

REMARKS: The proposed project would increase the base discharge into Bayou Duplantier; however, the Bayou Duplantier watershed is a natural, undeveloped area. The proposed project's purpose is to reduce risk to life, injury, and property during hazardous flood events.

STEP NO. 5 Minimize the potential adverse impacts and support to or within floodplains/wetlands to be identified under Step 4, restore and preserve the natural and beneficial values served by floodplains/wetlands; (44 CFR §9.11)

☒**YES** ☐**NO** Were flood hazard reduction techniques applied to the proposed action to minimize the flood impacts if site location is in the 100- or 500-Year floodplain/wetlands?

☐**N/A** Remarks:

☒**YES** ☐**NO** Were avoidance and minimization measures applied to the proposed action to minimize the short and long term impacts on the 100-Year floodplain/wetlands?

If no, identify measures required as a condition of the grant:

☐**N/A** Remarks:

☒**YES** ☐**NO** Were measures implemented to restore and preserve the natural and beneficial values of the floodplain/wetlands.

If no, identify measures required as a condition of the grant:

☐**N/A** Remarks:

☐**YES** ☒**NO** Is new construction or substantial improvement in a floodway, and new construction in a coastal high hazard area proposed?

If YES: Is the activity considered as functionally dependent use or a structure or facility which facilitates an open space use?

☐**YES** ☐**NO**

REMARKS:

Applicant must coordinate with the local floodplain administrator, obtain required permits prior to initiating work, and comply with any conditions of the permit to ensure harm to and from the floodplain is minimized. All coordination pertaining to these activities should be retained as part of the project file in accordance with the respective grant program instructions.

A Department of the Army permit under Section 404 of the Clean Water Act and/or Section 10 of the Rivers and Harbors Act will be required prior to commencement of construction of this project. The Parish must submit a jurisdictional wetland determination form with required information to USACE and obtain a Nationwide permit authorization or individual permit in accordance with Section 404 of the CWA.

A Water Quality Certification in accordance with Section 401 of the CWA will be obtained or documentation that one is not required for this project will be provided. All precautions will be observed to control nonpoint source pollution from construction activities.

It is recommended that the Parish contact the LDEQ Water Permits Division to determine if this proposed project requires a stormwater general permit for construction areas equal to or greater than one acre.

STEP NO. 6 **Reevaluate the proposed action to determine first, if it is still practicable in light of its exposure to flood hazards, the extent to which it will aggravate the hazards to others, and its potential to disrupt floodplain/wetlands values and second, if alternatives preliminarily rejected at Step 3 are practicable in light of the information gained in Steps 4 and 5. (44 CFR §9.9)**

☒**YES** ☐**NO** The action is still practicable at a floodplain/wetland site in light of the exposure to flood risk and ensuing disruption of natural values.

☒**YES** ☐**NO** The floodplain/wetlands site is the only practicable alternative.

☒**YES** ☐**NO** There is no potential for limiting the action to increase the practicability of previously rejected non-floodplain/wetlands sites and alternative actions.

☒**YES** ☐**NO** Minimization of harm to or within the floodplain/wetlands can be achieved using all practicable means.

☒**YES** ☐**NO** The action in a floodplain/wetland clearly outweighs the requirement of E.O. 11988/11990.

FEMA shall not act in a floodplain/wetland unless it is the only practicable location.

STEP NO. 7 **Prepare and provide the public with a finding and public explanation of any final decision that the floodplain/wetland is the only practicable alternative; and (44 CFR §9.12)**

☐ Check if the Initial Public Notice serves as the Final Public Notice or a Cumulative Final Public Notice was published. No condition required.

☒ Check if the condition was added to the REC indicating that "For actions located in the floodplain and/or wetlands, the applicant must issue a final public notice per 44 CFR Part 9.12(e) at least 15 days prior to the start of work. The final notice shall include the following: (1) A statement of why the proposed action must be located in an area affecting or affected by a floodplain or a wetland; (2) A description of all significant facts considered in making this determination; (3) A list of the alternatives considered; (4) A statement indicating whether the action conforms to applicable state and local floodplain protection standards; (5) A statement indicating how the action affects or is affected by the floodplain and/or wetland, and how mitigation is to be achieved; (6) Identification of the responsible official or organization for implementation and monitoring of the proposed action, and from whom further information can be obtained; and (7) A map of the area or a statement that such map is available for public inspection, including the location at which such map may be inspected and a telephone number to call for information."

STEP NO. 8 **Review the implementation and post - implementation phases of the proposed action to ensure that the requirements stated in Section 9.11 are fully implemented. Oversight responsibility shall be integrated into existing processes. (44 CFR §9.11)**

☒**YES** ☐**NO** Was Grant conditioned on review of implementation and post-implementation phases to ensure compliance of EO 11988?

Failure to comply with conditions enumerated in the Record of Environmental Consideration may jeopardize federal funding.

Appendix D

Solicitation of Views Responses, Permits, and Agency Correspondence

U.S. Department of Homeland Security
Federal Emergency Management Agency
FEMA-FMA 2019
Region VI - Louisiana Recovery Office
1500 Main Street
Baton Rouge, LA 70802

FEMA

July 12, 2023

MEMORANDUM TO: See Distribution

SUBJECT: Scoping Notification/Solicitation of Views;
LSU Lakes McKinley Diversion and Corporation Canal Retrofit
Environmental Assessment

East Baton Rouge Parish submitted a Flood Mitigation Assistance (FMA) grant application to the Federal Emergency Management Agency (FEMA), through the Louisiana Governor's Office of Homeland Security and Emergency Preparedness, requesting funding for LSU Lakes McKinley Diversion and Corporation Canal Retrofit project. The FMA Grant Program is authorized by Section 1366 of the National Flood Insurance Act of 1968 with the goal of reducing or eliminating claims under the National Flood Insurance Program.

Proposed Scope of Work

The proposed project entails replacing drainage infrastructure with upgraded systems to reduce flood hazards. The proposed drainage infrastructure improvements would consist of two components, the McKinley Diversion and the Corporation Canal Retrofit. The McKinley Diversion is located upstream of a constriction in the Corporation Canal, which was identified as the main cause of flooding, and the Corporation Canal Retrofit is downstream of this constricted area. The McKinley Diversion improvements would increase the volume of floodwater that could bypass the Corporation Canal above the constriction point and then rejoin Corporation Canal at the downstream end of the Corporation Canal Retrofit project area.

The first component, the McKinley Diversion, would replace and upgrade existing infrastructure between Corporation Canal and Crest Lake. Floodwater from the Corporation Canal would be diverted to a culvert to the southwest of the Tiger Manor Building 3 apartment building and the apartment building located at 3000 July Street. New culverts and an open channel would connect the McKinley Diversion to Crest Lake and the culverts between Crest Lake and University Lake would be replaced with new culverts. This would allow stormwater to be diverted from the Canal before it goes underground at the LSU campus. Stormwater from University Lake currently re-enters Corporation Canal as it transitions to Bayou Duplantier downstream of the campus. The McKinley Diversion would include the five segments described below.

- Segment 1: Beginning at the Corporation Canal, a parallel set of 9-foot by 7-foot reinforced concrete box (RCB) culverts would cross under July Street and extend under the parking area on the south side of the Tiger Manor Building 3 apartment building. After 470 feet, Segment 1 would end at a new junction box constructed to redirect the culvert 90 degrees to the north.

- Segment 2: This segment would include a parallel set of 9 -oot by 7-foot RCB culverts that would begin at a second junction box, approximately 60 feet north of the first junction box. Segment 2 would begin at the southwest corner of the McKinley High School property. After approximately 360 feet, Segment 2 would daylight to an existing open trapezoidal channel. Segments 1 and 2 would be connected by an approximately 60-foot-long parallel set of 9-foot by 7-foot RCB culverts.
- Segment 3: Proposed work in this segment would widen and deepen the existing trapezoidal channel located between McKinley High School and Crest Lake. The channel would be 25 feet wide at the bottom and approximately 79 feet wide at the top with 3:1 side slopes. The overall depth of the channel would be approximately 9 feet. The channel sides would be planted with upland grasses.
- Segment 4: To connect the McKinley Diversion to Crest Lake, four, new, 120-foot-long, 6-foot by 6-foot RCB culverts would be installed under July Street where it bends at Crest Lake and the channel turns north. The culverts would be fitted with 6-foot by 6-foot flap gates to prevent backflow from Crest Lake into the McKinley Diversion and Corporation Canal.
- Segment 5: The final McKinley Diversion segment would replace the existing culverts connecting Crest Lake to University Lake with eight 100-foot-long, 6-foot by 4-foot RCB culverts under Dalrymple Drive as it passes between the lakes

The Corporation Canal Retrofit component of the Proposed Action is downstream of the subsurface segment of the Canal and runs alongside University Lake between Stanford Avenue and West Lakeshore Drive. The Parish would retrofit the channel to improve channel hydraulics including the following activities:

- The existing 2,300-foot-long earthen dam that forms the boundary between University Lake and Corporation Canal from Stanford Avenue to West Lakeshore Drive would be modified to widen the channel from 100 to 150 feet at the top. Sheet piles installed approximately 18 feet below the surface would support the existing multi-use trail that runs along the canal between the canal and University Lake. The slopes on both sides of the multi-use trail to Corporation Canal and University Lake would be regraded to achieve a 3:1 angle.
- A 43-foot-long, 10-foot by 1-foot RCB culvert would be installed to connect University Lake and Corporation Canal with an invert elevation of 20.6 feet. The culvert would be located approximately 320 feet south of where Corporation Canal crosses under West Lakeshore Drive.
- A 25-foot-long concrete weir would be installed at the downstream end of the Corporation Canal Retrofit project area. This weir would control flow from Corporation Canal under Stanford Avenue to Bayou Duplantier. The invert elevation of the weir would be 13.2 feet, the entrance slope (upstream) would be 2:1, and the downstream slope would be 3:1. The weir would have a bottom width of 32.5 feet and approximately 1:1 side slopes.
- An existing 40-foot-wide concrete revetment weir would be retrofitted at the downstream end of the Corporation Canal Retrofit project area adjacent to Stanford Avenue, allowing flow from University Lake to Bayou Duplantier. The weir would have an invert elevation of 20.6 feet and would be constructed under an existing pedestrian bridge.
- The existing vegetation along the Corporation Canal and University Lake shorelines would be enhanced with submerged and fringe wetland plantings, including spatterdock, white water lily, yellow water lily, American lotus, and Carolina fanwort. Upland grasses and

native trees would be planted in higher elevations. Potential upland species would include little bluestem, switchgrass, and giant coneflower and potential tree species would include swamp chestnut oak, Nuttall oak, American elm, river birch, sweetbay magnolia, and longleaf pine. The existing 8-foot-wide gravel multi-use trail along the surface of the earthen dam separating Corporation Canal and University Lake would be widened to 10 feet.

To ensure compliance with the National Environmental Policy Act, Executive Orders, and other applicable federal regulations, we will be preparing an Environmental Assessment (EA) for this project. To assist us in the preparation of the EA, we request that your office review the attached figures for a determination of any formal consultation, regulatory permitting, or other authorization requirements.

Please respond within thirty (30) calendar days of the date of this scoping notification. If our office receives no comments by the close of the current 30-day period, we will assume that your agency does not object to the project as proposed.

Comments may be e-mailed to Tiffany.Spann@fema.dhs.gov or mailed to the attention of Tiffany Spann, Environmental/Historic Preservation, at the address above.

For questions regarding this matter, please contact Tiffany Spann, Lead Environmental Protection Specialist, at (504) 218-6800.

Tiffany Spann-Winfield
Environmental Liaison Officer

Distribution: LDEQ, USEPA, USFWS, LDWF, NRCS, USACE, LDNR, NOAA

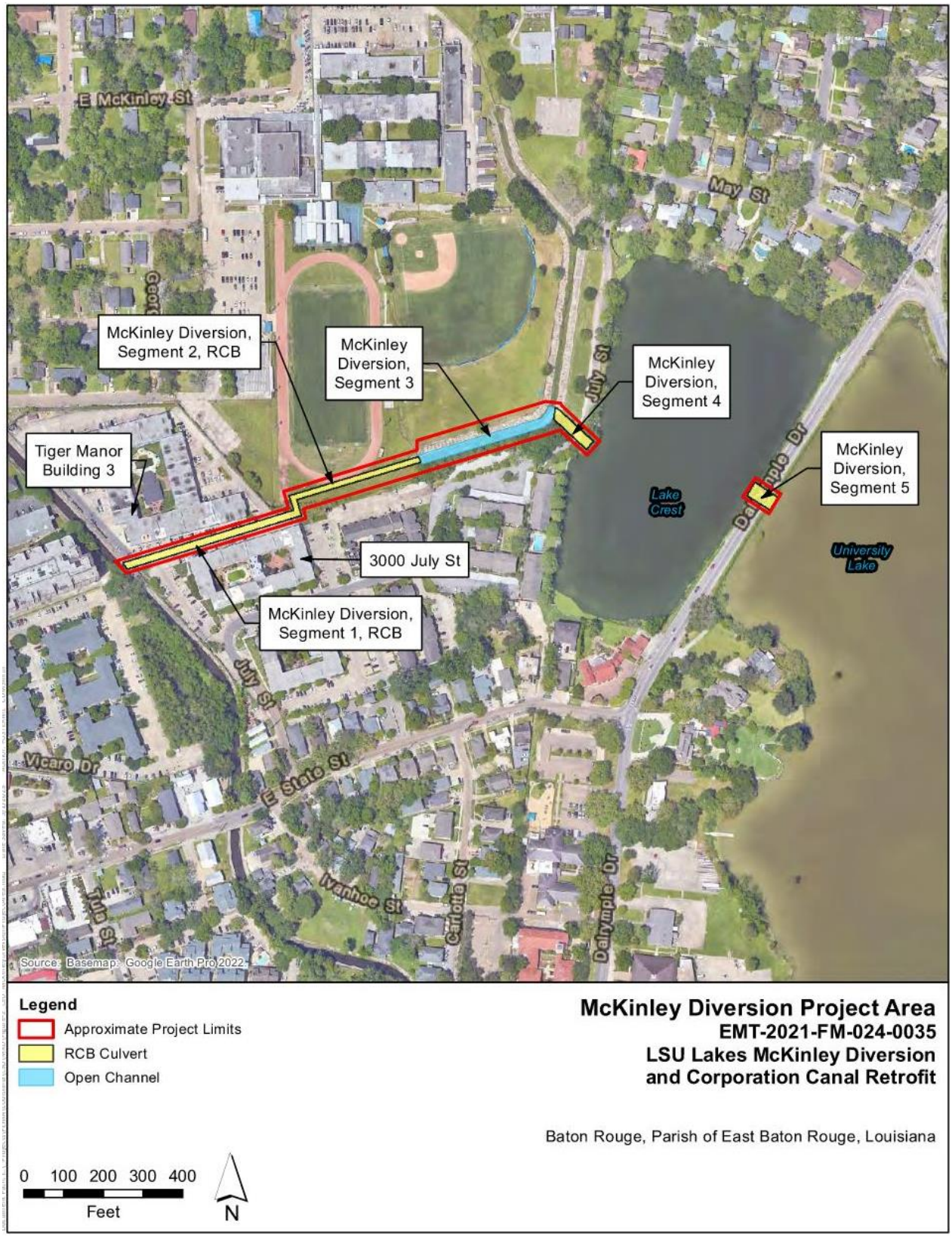


Figure 1. McKinley Diversion project area with all project elements highlighted

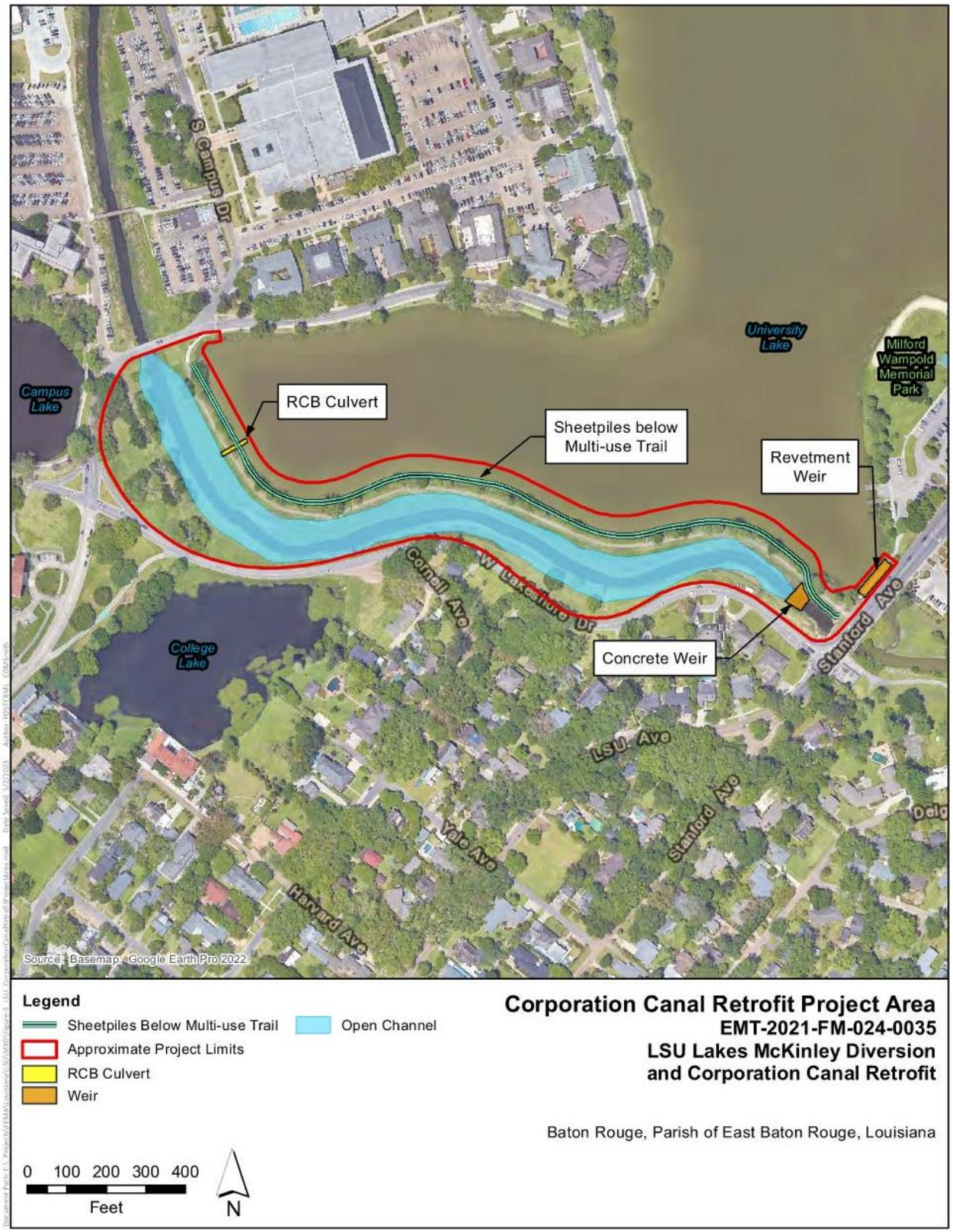


Figure 2. Corporation Canal Retrofit project area with all project elements highlighted

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Louisiana Ecological Services Field Office
200 Dulles Drive
Lafayette, LA 70506
Phone: (337) 291-3100 Fax: (337) 291-3139

In Reply Refer To: 07/08/2024 20:03:11 UTC
Project Code: 2024-0112862
Project Name: LSU Lakes McKinley Diversion and Corporation Canal Retrofit

Subject: List of threatened and endangered species that may occur in your proposed project location or may be affected by your proposed project

To Whom It May Concern:

The enclosed species list identifies threatened, endangered, and candidate species, as well as designated and proposed critical habitat that may occur within the boundary of your proposed project and may be affected by your proposed project. The Fish and Wildlife Service (Service) is providing this list under section 7 (c) of the Endangered Species Act (Act) of 1973, as amended (16 U.S.C. 1531 et seq.). Changes in this species list may occur due to new information from updated surveys, changes in species habitat, new listed species and other factors. Because of these possible changes, feel free to contact our office (337-291-3109) for more information or assistance regarding impacts to federally listed species. The Service recommends visiting the IPaC site or the Louisiana Ecological Services Field Office website (https://www.fws.gov/southeast/lafayette) at regular intervals during project planning and implementation for updated species lists and information. An updated list may be requested through the IPaC system by completing the same process used to receive the enclosed list.

The purpose of the Act is to provide a means whereby threatened and endangered species and the habitats upon which they depend may be conserved. Under sections 7(a)(1) and 7(a)(2) of the Act and its implementing regulations (50 CFR 402 et seq.), Federal agencies are required to utilize their authorities to carry out programs for the conservation of Federal trust resources and to determine whether projects may affect Federally listed species and/or designated critical habitat.

A Biological Assessment is required for construction projects (or other undertakings having similar physical impacts) that are major Federal actions significantly affecting the quality of the human environment as defined in the National Environmental Policy Act (42 U.S.C. 4332(2) (c)).

Bald eagles have recovered and were removed from the List of Endangered and Threatened Species as of August 8, 2007. Although no longer listed, please be aware that bald eagles are protected under the Bald and Golden Eagle Protection Act (BGEPA) (16 U.S.C. 668 et seq.).

The Service developed the National Bald Eagle Management (NBEM) Guidelines to provide landowners, land managers, and others with information and recommendations to minimize potential project impacts to bald eagles, particularly where such impacts may constitute "disturbance", which is prohibited by the BGEPA. A copy of the NBEM Guidelines is available at: https://www.fws.gov/migratorybirds/pdf/management/nationalbaldeaglenanagementguidelines.pdf

Those guidelines recommend: (1) maintaining a specified distance between the activity and the nest (buffer area); (2) maintaining natural areas (preferably forested) between the activity and nest trees (landscape buffers); and (3) avoiding certain activities during the breeding season. Onsite personnel should be informed of the possible presence of nesting bald eagles within the project boundary, and should identify, avoid, and immediately report any such nests to this office. If a bald eagle nest occurs or is discovered within or adjacent to the proposed project area, then an evaluation must be performed to determine whether the project is likely to disturb nesting bald eagles. That evaluation may be conducted on-line at: https://www.fws.gov/southeast/our-services/eagle-technical-assistance/. Following completion of the evaluation, that website will provide a determination of whether additional consultation is necessary. The Division of Migratory Birds for the Southeast Region of the Service (phone: 404/679-7051, e-mail: SEmigratorybirds@fws.gov) has the lead role in conducting any necessary consultation.

Activities that involve State-designated scenic streams and/or wetlands are regulated by the Louisiana Department of Wildlife and Fisheries and the U.S. Army Corps of Engineers, respectively. We, therefore, recommend that you contact those agencies to determine their interest in proposed projects in these areas.

Activities that would be located within a National Wildlife Refuge are regulated by the refuge staff. We, therefore, recommend that you contact them to determine their interest in proposed projects in these areas.

Additional information on Federal trust species in Louisiana can be obtained from the Louisiana Ecological Services website at: https://www.fws.gov/southeast/lafayette

We appreciate your concern for threatened and endangered species. The Service encourages Federal agencies to include conservation of threatened and endangered species into their project planning to further the purposes of the Act. Please include the Consultation Tracking Number in the header of this letter with any request for consultation or correspondence about your project that you submit to our office.

Attachment(s):

- Official Species List
- USFWS National Wildlife Refuges and Fish Hatcheries
- Bald & Golden Eagles
- Migratory Birds

OFFICIAL SPECIES LIST

This list is provided pursuant to Section 7 of the Endangered Species Act, and fulfills the requirement for Federal agencies to "request of the Secretary of the Interior information whether any species which is listed or proposed to be listed may be present in the area of a proposed action".

This species list is provided by:

Louisiana Ecological Services Field Office
200 Dulles Drive
Lafayette, LA 70506
(337) 291-3100

PROJECT SUMMARY

Project Code: 2024-0112862

Project Name: LSU Lakes McKinley Diversion and Corporation Canal Retrofit

Project Type: Flooding

Project Description: East Baton Rouge Parish submitted a Flood Mitigation Assistance (FMA) grant application to the Federal Emergency Management Agency (FEMA), through the Louisiana Governor's Office of Homeland Security and Emergency Preparedness, requesting funding for LSU Lakes McKinley Diversion and Corporation Canal Retrofit project. The FMA Grant Program is authorized by Section 1366 of the National Flood Insurance Act of 1968 with the goal of reducing or eliminating claims under the National Flood Insurance Program.

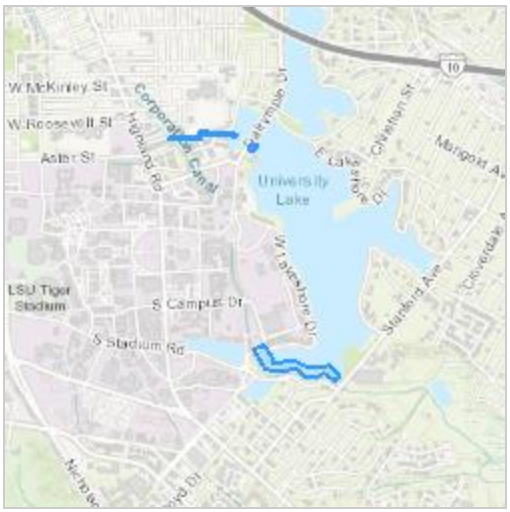
The proposed project entails replacing drainage infrastructure with upgraded systems to reduce flood hazards. The proposed drainage infrastructure improvements would consist of two components, the McKinley Diversion and the Corporation Canal Retrofit. The McKinley Diversion is located upstream of a constriction in the Corporation Canal, which was identified as the main cause of flooding, and the Corporation Canal Retrofit is downstream of this constricted area. The McKinley Diversion improvements would increase the volume of floodwater that could bypass the Corporation Canal above the constriction point and then rejoin Corporation Canal at the downstream end of the Corporation Canal Retrofit project area.

The first component, the McKinley Diversion, would replace and upgrade existing infrastructure between Corporation Canal and Crest Lake. Floodwater from the Corporation Canal would be diverted to a culvert to the southwest of the Tiger Manor Building 3 apartment building and the apartment building located at 3000 July Street. New culverts and an open channel would connect the McKinley Diversion to Crest Lake and the culverts between Crest Lake and University Lake would be replaced with new culverts. This would allow stormwater to be diverted from the Canal before it goes underground at the LSU campus. Stormwater from University Lake currently re-enters Corporation Canal as it transitions to Bayou Duplantier downstream of the campus.

The Corporation Canal Retrofit component of the Proposed Action is downstream of the subsurface segment of the Canal and runs alongside University Lake between Stanford Avenue and West Lakeshore Drive. The Parish would retrofit the channel to improve channel hydraulics.

Project Location:

The approximate location of the project can be viewed in Google Maps: https://www.google.com/maps/@30.40822785,-91.16857488828278,14z



Counties: East Baton Rouge County, Louisiana

ENDANGERED SPECIES ACT SPECIES

There is a total of 3 threatened, endangered, or candidate species on this species list.

Species on this list should be considered in an effects analysis for your project and could include species that exist in another geographic area. For example, certain fish may appear on the species list because a project could affect downstream species.

IPaC does not display listed species or critical habitats under the sole jurisdiction of NOAA Fisheries[1], as USFWS does not have the authority to speak on behalf of NOAA and the Department of Commerce.

See the "Critical habitats" section below for those critical habitats that lie wholly or partially within your project area under this office's jurisdiction. Please contact the designated FWS office if you have questions.

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1. NOAA Fisheries, also known as the National Marine Fisheries Service (NMFS), is an office of the National Oceanic and Atmospheric Administration within the Department of Commerce.

MAMMALS

NAME	STATUS
Tricolored Bat *Perimyotis subflavus* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/10515	Proposed Endangered

REPTILES

NAME	STATUS
Alligator Snapping Turtle *Macrochelys temminckii* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/4658	Proposed Threatened

INSECTS

NAME	STATUS
Monarch Butterfly *Danaus plexippus* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/9743	Candidate

CRITICAL HABITATS

THERE ARE NO CRITICAL HABITATS WITHIN YOUR PROJECT AREA UNDER THIS OFFICE'S JURISDICTION.

YOU ARE STILL REQUIRED TO DETERMINE IF YOUR PROJECT(S) MAY HAVE EFFECTS ON ALL ABOVE LISTED SPECIES.

USFWS NATIONAL WILDLIFE REFUGE LANDS AND FISH HATCHERIES

Any activity proposed on lands managed by the National Wildlife Refuge system must undergo a 'Compatibility Determination' conducted by the Refuge. Please contact the individual Refuges to discuss any questions or concerns.

THERE ARE NO REFUGE LANDS OR FISH HATCHERIES WITHIN YOUR PROJECT AREA.

BALD & GOLDEN EAGLES

Bald and golden eagles are protected under the Bald and Golden Eagle Protection Act[1] and the Migratory Bird Treaty Act[2].

Any person or organization who plans or conducts activities that may result in impacts to bald or golden eagles, or their habitats[3], should follow appropriate regulations and consider

implementing appropriate conservation measures, as described in the links below. Specifically, please review the "Supplemental Information on Migratory Birds and Eagles".

---

1. The Bald and Golden Eagle Protection Act of 1940.
2. The Migratory Birds Treaty Act of 1918.
3. 50 C.F.R. Sec. 10.12 and 16 U.S.C. Sec. 668(a)

There are likely bald eagles present in your project area. For additional information on bald eagles, refer to Bald Eagle Nesting and Sensitivity to Human Activity

For guidance on when to schedule activities or implement avoidance and minimization measures to reduce impacts to migratory birds on your list, see the PROBABILITY OF PRESENCE SUMMARY below to see when these birds are most likely to be present and breeding in your project area.

NAME	BREEDING SEASON
Bald Eagle *Haliaeetus leucocephalus* This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities. https://ecos.fws.gov/ecp/species/1626	Breeds Sep 1 to Jul 31
Golden Eagle *Aquila chrysaetos* This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities. https://ecos.fws.gov/ecp/species/1680	Breeds elsewhere

PROBABILITY OF PRESENCE SUMMARY

The graphs below provide our best understanding of when birds of concern are most likely to be present in your project area. This information can be used to tailor and schedule your project activities to avoid or minimize impacts to birds. Please make sure you read "Supplemental Information on Migratory Birds and Eagles", specifically the FAQ section titled "Proper Interpretation and Use of Your Migratory Bird Report" before using or attempting to interpret this report.

Probability of Presence (■)

Green bars; the bird's relative probability of presence in the 10km grid cell(s) your project overlaps during that week of the year.

Breeding Season (■)
Yellow bars; liberal estimate of the timeframe inside which the bird breeds across its entire range.

Survey Effort (|)

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 6
1201 ELM STREET, SUITE 500
DALLAS, TEXAS 75270

August 7, 2023

Ms. Tiffany Spann-Winfield
Deputy EHP Program Lead, Environmental Liaison Officer
FEMA-FMA 2019, Region VI - Louisiana Recovery Office
1500 Main Street / Baton Rouge, LA 70802

Dear Ms. Spann-Winfield:

We have received your July 12, 2023, letter requesting our evaluation of the potential environmental impacts which might result from the following project:

Propose LSU Lakes McKinley Diversion and Corporation Canal Retrofit, Funded By The Flood Mitigation Assistance/Federal Emergency Management Agency (FMA)/(FEMA), EMT-2021-FM-024-0035 /// General Area(s) Only: July Street, Segment 1-4: (30.421341, -91.172735), Dalrymple Drive, Segment 5: (30.421131, -91.170234), & W. Lakeshore Drive, Multi-Used Trail: (30.407558, -91.168005), Baton Rouge, East Baton Rouge Parish, LA 70808

The project funded by the Flood Mitigation Assistance/Federal Emergency Management Agency (FMA)/(FEMA), is located on the Southern Hills aquifer system which has been designated a sole source aquifer (SSA) by the EPA. Based on the information provided for the project, we have determined that the project, as proposed, should not have an adverse effect on the quality of the ground water underlying the project site.

This approval of the proposed project does not relieve the applicant from adhering to other State and Federal requirements, which may apply. This approval is based solely upon the potential impact to the quality of ground water as it relates to the EPA's authority pursuant to Section 1424(e) of the Safe Drinking Water Act.

EPA intends to evaluate and respond to all projects submitted for formal review or evaluation purposes within forty-five (45) calendar days, from the Stamped Date the project is received by the EPA. However, if EPA is unable to complete its review within that timeframe, no assumption of a determination of a lack of impacts can be made. EPA acknowledges our approval is not required by law for the project to proceed with funding.

If you did not include the parish, project description, project location, area map, plat or the federal funding agency, please do so in future SSA correspondence.

If you have any questions on this letter or the SSA program please contact me at (214) 665-8485.

Sincerely yours,

Omar T. Martinez, Coordinator
Sole Source Aquifer Program
Ground Water/UIC Section

cc: Jesse Means, LDEQ
Brandon Webb, Environmental Planner, CDM Smith

Date: August 7, 2023

FYI: We have moved and have a New Address & Mail Code, please see below.

Omar T. Martinez, Environmental Scientist
Sole Source Aquifer Program Coordinator
Ground Water/UIC Section (Mail Code: WDDG)
U.S. Environmental Protection Agency, Region 6
1201 Elm Street, Suite 500
Dallas, Texas 75270

DEPARTMENT OF THE ARMY
U.S. ARMY CORPS OF ENGINEERS, NEW ORLEANS DISTRICT
7400 LEAKE AVE
NEW ORLEANS, LA 70118-3651

September 17, 2023

Programs and Project Management Division
Lake Pontchartrain & Vicinity Branch

Tiffany Spann-Winfield
Environmental Liaison Officer
FEMA, Louisiana Recover Office
1500 Main Street
Baton Rouge, LA 70802

Dear Ms. Spann-Winfield:

This letter is in reference to your letter dated July 12, 2023 concerning the LSU Lakes McKinley Diversion and Corporation Canal Retrofit project on the LSU Campus in East Baton Rouge Parish, Louisiana.

We have reviewed your project as proposed and determined that a Department of the Army permit under Section 404 of the Clean Water Act and/or Section 10 of the Rivers and Harbors Act will be required. Please submit a permit application for processing before beginning your project. Information and signatures obtained from recent maps, aerial photographs, and local soil surveys concerning these sites are indicative of the occurrence of waters of the U.S., including wetlands. Department of the Army (DA) permits are required prior to the deposition or redistribution of dredged or fill material into waters of the U.S., including wetlands. This response does not constitute authorization to conduct the project.

A jurisdictional determination will be required to determine the extent of waters of the U.S. Please submit a jurisdictional determination request form to our office along with detailed field data concerning vegetation, soils, and hydrology that we require for all jurisdictional determinations. The fact that a jurisdictional determination has not been completed does not alleviate your responsibility to obtain the proper DA permits prior to working in jurisdictional areas, which include wetlands, occurring at the proposed project locations.

Please contact Ms. Lindsay Maloan of our Regulatory Branch by telephone at (504) 862-2227, or by e-mail: Lindsay.Maloan@usace.army.mil for questions concerning wetlands determinations or need for on-site evaluations. Questions concerning regulatory permit requirements may be addressed to Mr. John Herman by telephone at (504) 862-1581 or by email: john.m.herman@usace.army.mil.

Future correspondence concerning this matter should reference account number MVN-2023-00855-SM. This will allow us to more easily locate records of previous correspondence, and thus provide a quicker response.

Sincerely,

Brett H. Herr

Brett H. Herr, PE
Chief
Lake Pontchartrain and Vicinity Branch

JOHN BEL EDWARDS
GOVERNOR

ROBERT SHADOIN
SECRETARY

PO BOX 98000 | BATON ROUGE LA | 70898

Date	July 21, 2023
Name	Tiffany Spann-Winfield
Company	FEMA
Street Address	1500 Main Street
City, State Zip	Baton Rouge, La 70802
Project	LSU Lakes McKinley Diversion and Corporation Canal Retrofit
Project ID	
Invoice Number	23072106

Personnel of the Louisiana Wildlife Diversity Program (WDP) have reviewed the preliminary data for the captioned project.

The Wildlife Diversity Program database indicates that the Alligator Snapping Turtle (*Macrochelys temminckii*) occurs in the project area. This very large freshwater turtle is vulnerable (S3) in Louisiana and is PROPOSED THREATENED by the USFWS. Minimize disturbance and alteration of nesting habitat, particularly during nesting season (April – June). Nesting typically occurs close to river banks and lake shores. Minimize removal of log jams in streams, as woody debris provides cover and hunting areas used by this species. Stream alteration should be avoided to protect turtle habitat. If dredging is needed, material should be dumped away from potential turtle nesting sites or dumped prior to egg laying (May – early June). Please contact Keri Lejeune at 337-735-8676 for more information.

After careful review of our database, no other impacts to rare, threatened, or endangered species or critical habitats are anticipated for the proposed project. The Wildlife Diversity Program (WDP) has compiled data on rare, endangered, or otherwise significant plant and animal species, plant communities, and other natural features throughout the state of Louisiana. WDP reports summarize the existing information known at the time of the request regarding the location in question. The quantity and quality of data collected by the WDP are dependent on the research and observations of many individuals. In most cases, this information is not the result of comprehensive or site-specific field surveys; many natural areas in Louisiana have not been surveyed. This report does not address the occurrence of wetlands at the site in question. WDP reports should not be considered final statements on the biological elements or areas being considered, nor should they be substituted for on-site surveys required for environmental assessments. WDP requires that this office

be acknowledged in all reports as the source of all data provided here. If at any time WDP tracked species are encountered within the project area, please contact the WDP Data Manager at 225-763-3554. If you have any questions, or need additional information, please call 337-735-8734.

Sincerely,

for Carolyn Michon

Nicole Lorenz, Program Manager

Wildlife Diversity Program

JOHN BEL EDWARDS
GOVERNOR

THOMAS F. HARRIS
SECRETARY

State of Louisiana
DEPARTMENT OF NATURAL RESOURCES
OFFICE OF COASTAL MANAGEMENT

07/17/2023

FEDERAL EMERGENCY MANAGEMENT AGENCY
1500 MAIN STREET
BATON ROUGE, LA 70802

RE: P20230580, Solicitation of Views
FEDERAL EMERGENCY MANAGEMENT AGENCY
Description: LSU Lakes McKinley Diversion and Corporation Canal Retrofit. Replace drainage infrastructure with upgraded systems to reduce flood hazards. The proposed drainage infrastructure improvements would consist of two components, the McKinley Diversion and the Corporation Canal Retrofit. The McKinley Diversion is located upstream of a constriction in the Corporation Canal, which was identified as the main cause of flooding, and the Corporation Canal Retrofit is downstream of this constricted area. The McKinley Diversion improvements would increase the volume of floodwater that could bypass the Corporation Canal above the constriction point and then rejoin Corporation Canal at the downstream end of the Corporation Canal Retrofit project area.
Location: Lat 30-24-27.81N, Long 91-10-05.47W; Baton Rouge.
East Baton Rouge Parish, LA

Dear Tiffany Spann-Winfield:

You are hereby advised that your application for a Coastal Use Permit (CUP) has been determined to be administratively complete and review by the State for compliance with the Louisiana Coastal Resource Program (LCRP) and consistency with the federal Coastal Zone Management Act (CZMA) has begun. Additionally, it has been determined that your proposed activity is a use of state concern in accordance with Louisiana Revised Statute 49:214.25.

All correspondence and calls regarding this application should reference the Coastal Use Permit Number (P#) indicated above. Please note that all information concerning your application is in our database and is updated throughout the day as changes to the status of the application occur.
Your application can be found on our Webpage.

Should you have any questions, please check the online database or contact the assigned permit analyst: Emily Eley at (225) 342-7942 or Emily.Eley@la.gov. Be sure to reference the above Coastal Use Permit Number.

Sincerely,

CM

Permit Coordinator

cc: Martin Mayer, COE

FEDERAL EMERGENCY MANAGEMENT AGENCY

From: Spann, Tiffany
To: Webb, Brandon M.; Schexnayder, Jamie; Carroll, Annette
Subject: FW: DEQ SOV# 230821/0690 LSU Lakes McKinley Diversion and Corporation Canal Retrofit
Date: Wednesday, August 30, 2023 4:12:01 PM

From: Marissa Jimenez <Marissa.Jimenez@LA.GOV>
Sent: Wednesday, August 30, 2023 2:30 PM
To: Spann, Tiffany <Tiffany.Spann@fema.dhs.gov>
Cc: DEQ SOV <DEQSOV@LA.GOV>; Vivian (Aucoin) Johnson (DEQ) <Vivian.Johnson2@la.gov>
Subject: DEQ SOV# 230821/0690 LSU Lakes McKinley Diversion and Corporation Canal Retrofit

August 30, 2023

Tiffany Spann-Winfield, Lead Environmental Protection Specialist
FEMA-FMA 2019
Region VI - Louisiana Recovery Office
1500 Main Street, Baton Rouge, LA 70802
Tiffany.Spann@fema.dhs.gov

LSU Lakes McKinley Diversion and Corporation Canal Retrofit

RE: 230821/0690

GOHSEP-FEMA/FMA Funding
East Baton Rouge Parish

Dear Ms. Spann-Winfield:

The Air Planning and Assessment Division of the Office of Environmental Assessment has reviewed the information provided in your letter dated July 12, 2023, regarding the referenced project. Effective March 21, 2017, East Baton Rouge Parish was designated by EPA as an ozone attainment area with a maintenance plan under the 8-hour standard (81 FR 95051, December 27, 2016). As part of the ozone maintenance area, federal activities proposed in East Baton Rouge Parish may be subject to the State's general conformity regulations as promulgated under LAC 33:III.Chapter 14, Subchapter A, *Determining Conformity of General Federal Actions to State or Federal Implementation Plans*.

In order to determine if the proposed project in East Baton Rouge Parish is subject to the full requirements of the general conformity regulations, the project sponsor must first make a general conformity applicability determination. This determination can be made by summing the total of direct and indirect volatile organic compound (VOC) and nitrogen oxide (NOx) emissions caused by the project. If the net total of VOC and NOx emissions is determined to be less than the prescribed *de minimis* level of 100 tons per year per pollutant, then this action will comply with the conformity provisions of Louisiana's State Implementation Plan (SIP) and the Air Planning and Assessment Division will not object to implementation of the project.

Please email your general conformity applicability determination to SOVs@la.gov **within 14 days**. Should you have any questions regarding state rules and regulations pertaining to general conformity, please contact me at (225) 219-3482. Thank you for affording us the opportunity to comment on the proposed action.

Sincerely,

Vivian H. Johnson
Air Planning and Assessment Division
SOV#230821/0690

JEFF LANDRY
GOVERNOR

AURELIA S. GIACOMETTO
SECRETARY

STATE OF LOUISIANA
DEPARTMENT OF ENVIRONMENTAL QUALITY
OFFICE OF THE SECRETARY

February 2, 2024

Jamie Schexnayder, CFM, Environmental Protection Specialist
Environmental & Historic Preservation Department
Region VI - Louisiana Recovery Office
1500 Main Street, Baton Rouge, LA 70802
jamie.schexnayder@fema.dhs.gov

RE: 230821/0690

LSU Lakes McKinley Diversion and Corporation Canal Retrofit
GOHSEP-FEMA/FMA Funding
East Baton Rouge Parish

Dear Ms. Schexnayder:

The Louisiana Department of Environmental Quality (LDEQ) has received your request for comments on the above referenced project.

After reviewing your request, the Department has no objections based on the information provided in your submittal. However, for your information, the following general comments have been included. Please be advised that if you should encounter a problem during the implementation of this project, you should immediately notify LDEQ's Single-Point-of-contact (SPOC) at (225) 219-3640.

Please review all items below that may affect your project/s success:

1. Please take any necessary steps to obtain and/or update all necessary approvals and environmental permits regarding this proposed project.
2. **If the project concerns flood control in residential and business areas that modify infrastructure and/or drainage:**
    a. **Modeling for areas of interest, as well as both upstream and downstream connecting waterways, is preferred to evaluate potential impacts of increased flow on up/downstream flooding, hydrology, and water quality**
    b. **Receiving channels should be designed and sized with consideration of natural channel design methodologies and principles, as improper design can result in increased velocities and channel degradation (scouring), erosion, bank instability, and water quality degradation**
        i. **Increased stream velocities can jeopardize residential properties, pipelines, bridges, and other infrastructure, and may cause increased pollutant loads (e.g., sediment, metals, low oxygen levels) to waterways through channel(s) realignment and reestablishment of naturally vegetated banks, meanders, and original lengths and slopes for stabilization**
        ii. **Nature-based solutions should be considered to address these, and storm water issues, before entry to downstream waters**
            1. **https://watershed.la.gov/nature-based-solutions**
            2. **https://www.epa.gov/green-infrastructure/green-infrastructure-design-and-implementation**

   c. **Detention pond design and operating practices, including but not limited to high flow releases, can affect channels as described above**
   d. **Flood control projects should be evaluated in combination with other flood mitigation projects proposed or ongoing in the watershed**
3. **If the project involves bridge and/or lateral/inline structures (e.g., culverts, weirs, sluice/lift gates)**
   a. **Design to allow water to flow freely at the structure without restrictions during all flow regimes to preserve the natural functions of the stream channels, maintain appropriate channel dimensions, and flow regimes**
      i. **Consequences of improper design and maintenance can lead to debris build-up against structures restricting flow, leading to decreases in velocity, reaeration, and dissolved oxygen levels**
4. If your project results in a discharge to waters of the state, submittal of a Louisiana Pollutant Discharge Elimination System (LPDES) application may be necessary.
   a. The applicant must follow regional/local permitting requirements for sewage and storm water management
5. If the project results in a discharge of wastewater to an existing wastewater treatment system, that wastewater treatment system may need to modify its LPDES permit before accepting the additional wastewater.
6. All precautions should be observed to control nonpoint source pollution from construction activities. LDEQ has stormwater general permits for construction areas equal to or greater than one acre. It is recommended that you contact the LDEQ Water Permits Division at (225) 219-3590 to determine if your proposed project requires a permit.
7. If your project will include a sanitary wastewater treatment facility, a Sewage Sludge and Biosolids Use or Disposal Permit is required. An application form or Notice of Intent will need to be submitted if the sludge management practice includes preparing biosolids for land application or preparing sewage sludge to be hauled to a landfill. Additional information may be obtained on the LDEQ website at https://deq.louisiana.gov/page/sewage-biosolids or by contacting the LDEQ Water Permits Division at (225) 219- 3590.
8. If any of the proposed work is located in wetlands or other areas subject to the jurisdiction of the U.S. Army Corps of Engineers, you should contact the Corps directly regarding permitting issues. If a Corps permit is required, part of the application process may involve a water quality certification from LDEQ.
9. All precautions should be observed to protect the groundwater of the region.
10. Please be advised that water softeners generate wastewaters that may require special limitations depending on local water quality considerations. Therefore if your water system improvements include water softeners, you are advised to contact the LDEQ Water Permits to determine if special water quality-based limitations will be necessary.
11. Any renovation or remodeling must comply with LAC 33:III.Chapter 28, Lead-Based Paint Activities; LAC 33:III.Chapter 27, Asbestos-Containing Materials in Schools and State Buildings (includes all training and accreditation); and LAC 33:III.5151, Emission Standard for Asbestos for any renovations or demolitions.
12. If any solid or hazardous wastes, or soils and/or groundwater contaminated with hazardous constituents are encountered during the project, notification to LDEQ's Single-Point-of-Contact (SPOC) at (225) 219-3640 is required. Additionally, precautions should be taken to protect workers from these hazardous constituents.

13. **The proposed project is located within LDEQ water unit (LA040201_00). According to the 2022 LDEQ Water Quality Integrated Report this water unit is impaired for dissolved oxygen. According to LDEQ's Water Quality Management Plan, total maximum daily load pollution control allocations are in effect for fecal coliform. Control of nonpoint source pollution from construction should follow (6) above, as disturbance and sedimentation can worsen water quality.**
14. **If the project will involve the removal or disturbance of any soils which may have contaminant concentrations that exceed the Limiting Screening Option Standards established by the LDEQ Risk Evaluation/Corrective Action Program (RECAP) Regulation, these materials may be considered a waste and disposed of at a permitted facility, or might be managed as part of a Solid Waste Beneficial Use or Soil Reuse Plan in accordance with LAC 33:VII.Chapter 11. Alternately, a site-specific RECAP Evaluation might be conducted and submitted to the LDEQ.**
15. **If the project will involve the disturbance of any soils in former UST areas which may exceed the Screening Option Standards established by the LDEQ Risk Evaluation/Corrective Action Program (RECAP) Regulation, these materials may be considered a waste and disposed of at a permitted facility, or might be managed as part of a Solid Waste Beneficial Use or Soil Reuse Plan in accordance with LAC 33:VII.Chapter 11. Alternately, a site-specific RECAP Evaluation might be conducted and submitted to the LDEQ.**

    If any underground storage tanks are encountered during the project, they must be in compliance with the regulations found in LAC 33:XI of the Environmental Regulatory Code. If any contaminated soil or groundwater is encountered, the findings should be reported to LDEQ.

Currently, East Baton Rouge Parish is classified as a maintenance area with the National Ambient Air Quality Standards. However, since your general conformity determination shows that the proposed VOC and NOx emissions will be less than the *de minimis* levels, the Department has no objections to implementation of this project.

Please send all Solicitation of Views (SOVs) requests and questions to SOVs@la.gov.

Sincerely,

mcjimenez

Marissa Jimenez
Environmental Scientist Manager
Louisiana Department of Environmental Quality
Office of the Secretary

Appendix E

Draft FONSI and Public Notice

U.S. Department of Homeland Security
Federal Emergency Management Agency
Region 6
Louisiana Integration and Recovery Office
1500 Main Street
Baton Rouge, Louisiana 70802

DRAFT FINDING OF NO SIGNIFICANT IMPACT
LSU LAKES MCKINLEY DIVERSION AND CORPORATION CANAL RETROFIT
EAST BATON ROUGE PARISH, LOUISIANA
FLOOD MITIGATION ASSISTANCE PROGRAM
EMT-2021-FM-024-0035

BACKGROUND

The Parish of East Baton Rouge, the Subgrantee, through the Louisiana Governor's Office of Homeland Security and Emergency Preparedness (GOHSEP, Grantee), has requested federal funding through the Federal Emergency Management Agency's (FEMA) Flood Mitigation Assistance (FMA) program for the Louisiana State University (LSU) Lakes Mckinley Diversion and Corporation Canal Retrofit project. The project would improve drainage and reduce the risk and severity of flooding for streets, repetitive loss structures, and other flood-prone properties during and after major storm events.

Corporation Canal is part of an urban storm drain and open channel drainage system that inevitably flows into Bayou Duplantier. Although adjacent to the LSU Lakes, Corporation Canal is not hydrologically or hydraulically connected to those lakes. Modeling determined that a subsurface segment of the canal through the LSU campus constricts stormwater flow, which coupled with the lack of connectivity with the LSU Lakes system, is the predominant cause of flooding upstream and along Corporation Canal during extreme rainfall events.

The project is needed because the surrounding developed area is prone to repetitive flooding from heavy rainfall compounded by the interconnected nature of the overall hydraulic features within the area. For example, in August 2016, heavy rainfall flooded the project area including the neighborhoods to the north and northwest of LSU campus and the area near the Corporation Canal Retrofit project area. The project is needed to protect life and reduce the likelihood of future flood damage to property by improving the hydrologic connectivity of Corporation Canal to LSU Lakes and Bayou Duplantier.

The alternatives considered include: 1) the No Action alternative, and 2) the Proposed Action to fund replacement of drainage infrastructure with upgraded systems to reduce flood hazard risk and severity, improve channel hydraulics, and provide improved flood protection during storm events.

The Proposed Action would fund flood control improvements that incorporate assorted floodwater storage and diversion, low impact development and nature-based solutions, and stormwater

management interventions. West of Crest Lake and upstream of the subsurface section of Corporation Canal, construction of the McKinley Diversion component (Start: 30.420468, -91.175349; End: 30.421206, -91.171916) would a create a hydraulic connection from Corporation Canal to Crest Lake that would divert a portion of that canal's stormwater, bypassing the Corporation Canal constriction. Located mostly along the southern edge of McKinley High School, the McKinley Diversion involves replacement of existing drainage infrastructure with sets of reinforced concrete box (RCB) culverts of increased dimension, widening and deepening an existing open channel, and connecting that open channel to Crest Lake with four new RCB culverts. The McKinley Diversion would also increase the capacity of the existing culverts between Crest Lake and University Lake (30.420479, -91.170727).

The Corporation Canal Retrofit component (Start: 30.408760, -91.170348; End :30.406989, -91.164981) is downstream of the subsurface segment of the canal along the southern edge of University Lake. Corporation Canal would be widened, and sheet piles would be installed to support the existing multiuse trail that is on top of the earthen dam that forms the boundary between University Lake and the canal. An RCB culvert would be installed to connect University Lake and Corporation Canal and a flow control weir would be installed at the downstream end of the canal before it enters Bayou Duplantier. A revetment weir would be retrofitted at the downstream end of the Corporation Canal Retrofit project area to improve flow from University Lake to Bayou Duplantier.

An Environmental Assessment (EA) was prepared in accordance with FEMA Instruction 108-1-1 and the Department of Homeland Security Instruction 023-01-001-01, Rev. 1, pursuant to Section 102 of the National Environmental Policy Act of 1969 (NEPA), as implemented by regulations promulgated by the President's Council on Environmental Quality (40 Code of Federal Regulations [CFR], Parts 1500-1508). The purpose of the EA was to evaluate the potential impacts of the proposed project and alternatives, including a No Action alternative, on the physical and human environment, and to determine whether to prepare an Environmental Impact Statement (EIS) or Finding of No Significant Impact (FONSI).

FINDINGS

FEMA has evaluated the Proposed Action and alternatives for significant adverse impacts to geology, topography, and soils, air quality, climate change, water quality and resources, wetlands, floodplains, vegetation, fish and wildlife, federally-listed threatened or endangered species and critical habitats, historic and cultural resources, environmental justice, hazardous materials, noise, transportation, public services and utilities, and public health and safety. The results of these evaluations as well as consultations and input from other federal and state agencies are presented in the EA. FEMA determined that implementation of the Proposed Action would not result in significant impacts to the quality of the natural and human environment. The Proposed Action was not anticipated to have the potential for significant cumulative effects when combined with past, present, and reasonably foreseeable future actions in accordance with 44 CFR Part 10.8 (d)(3)(x).

CONDITIONS AND MITIGATION MEASURES

The following conditions must be met as part of the implementation of the project. Failure to comply with these conditions may jeopardize federal funds.

- All construction equipment would be required to meet current U.S. Environmental Protection Agency (EPA) emissions standards.

- Because minimal potential exists that species proposed to be listed or potentially designated critical habitat under the ESA could be affected by the Proposed Action, the Parish will notify FEMA 30-days prior to initiation of mobilization of construction equipment and/or proposed commencement of any construction work within the action area. If construction activities of the Proposed Action have not started before a Final Rule listing or designating Critical Habitat for the tri-colored bat or alligator snapping turtle has been promulgated by the USFWS, FEMA would commence informal consultation with USFWS for either species that would be listed.

- Obtain and comply with a Louisiana Pollutant Discharge Elimination System Stormwater General Permit for Large Construction Activities.

- A U.S. Army Corps of Engineers (USACE) permit under Section 404 of the Clean Water Act (CWA) and/or Section 10 of the Rivers and Harbors Act will be required prior to commencement of construction of this project. The Parish must submit a jurisdictional wetland determination form with required information to USACE and obtain a Nationwide permit authorization or individual permit in accordance with Section 404 of the CWA.

- Obtain a Water Quality Certification in accordance with Section 401 of the CWA or provide documentation that one is not required for this project. All precautions should be observed to control nonpoint source pollution from construction activities.

- Louisiana Department of Environmental Quality (LDEQ) requires stormwater general permits for construction areas equal to or greater than one acre. The Parish must contact the LDEQ Water Permits Division at (225) 219-3590 to determine if the proposed project requires a permit.

- Per 44 C.F.R. § 9.11(d)(6), no project may be built to a floodplain management standard that is less protective than what the community has adopted in local ordinances through their participation in the NFIP. The Parish is required to coordinate with the local floodplain administrator regarding floodplain permit(s) prior to the start of any activities. All coordination pertaining to these activities and compliance with any conditions must be documented and copies forwarded to GOHSEP and FEMA for inclusion in the permanent project files.

- The Parish would replant two new trees for every one removed.

- The Parish would monitor ground disturbance during the construction phase. Should any previously unknown historic, cultural, or archaeological remains or artifacts be discovered, all ground-disturbing activities at the location of the discovery shall cease and a 50-foot buffer

zone surrounding the location of discovery shall be avoided until required coordination has been completed. The Parish shall notify GOHSEP and FEMA, who will initiate the federal, state (SHPO), and Tribal coordination required to determine if the items warrant a recovery effort or if the site is eligible for listing in the National Register of Historic Places. The Parish will not proceed with work within the buffer zone until the SHPO completes review and all consultation as appropriate (Inadvertent Discovery Clause).

- If abandoned cemeteries, unmarked graves, or human remains are discovered during the permitted activity, the Parish would stop work immediately and comply with the Louisiana Unmarked Human Burial Sites Preservation Act (La. R.S. 8:671 et seq.). Within 24 hours of the discovery of unmarked human remains, the Parish will notify local law enforcement, FEMA, and the Louisiana Division of Archaeology (LDOA), within the Louisiana Department of Culture, Recreation and Tourism, Office of Cultural Development, to assess the nature and age of the human skeletal remains and will accompany local law enforcement personnel during all field investigations. If the appropriate local law enforcement official determines that the remains are not a crime scene, and the remains are more than 50 years old, LDOA has jurisdiction over the remains. In no instance will human remains be removed from the discovery site until jurisdiction is established. In cases where the LDOA assumes jurisdiction and the remains are determined to be American Indian, LDOA will consult with Tribes, FEMA, and the Parish to determine the appropriate course of action.

- If hazardous materials are discovered, generated, or used during implementation of the Proposed Action, they will be disposed in accordance with applicable federal, LDEQ, and local regulations. If any solid or hazardous wastes, or soils and/or groundwater contaminated with hazardous constituents are encountered during the project, notification to LDEQ's Single-Point-of-Contact at (225) 219-3640 is required. Additionally, precautions would be taken to protect workers from these hazardous constituents.

- If the project will involve the removal or disturbance of any soils, which may have contaminant concentrations that exceed the Limiting Screening Option Standards established by LDEQ Risk Evaluation/Corrective Action Program (RECAP) Regulation, these materials may be considered a waste and disposed of at a permitted facility, or might be managed as part of a Solid Waste Beneficial Use or Soil Reuse Plan in accordance with LAC 33:VII.Chapter 11. Alternately, a site-specific RECAP Evaluation might be conducted and submitted to LDEQ.

- Construction noise would be restricted to the hours between 7:00 a.m. and sunset on weekdays and Saturdays per Baton Rouge Code of Ordinances, Title 12, Chapter 2: Noise, Section 101.

- The Parish must comply with all local, state, and federal requirements related to sediment control, disposal of solid waste, control and containment of spills, and discharge of surface runoff and stormwater from the site.

- If deviations from the proposed scope of work result in substantial design changes, the need for additional ground disturbance, additional removal of vegetation, or any other unanticipated changes to the physical environment, the Parish must contact FEMA so that the revised project scope can be evaluated for compliance with NEPA and other applicable environmental laws.

CONCLUSION

Based upon the consideration of potential effects in the EA, consultations and input from other federal and state agencies and the public, and in accordance with FEMA's Directive 108-1-1, Presidential Executive Orders (EOs) addressing Environmental Justice (EO 12898), Floodplain Management (EO 11988), and Wetland Protection (EO 11990), and 40 CFR 1500-1508, FEMA has determined that implementation of the Proposed Action, with adherence to the conditions and mitigation measures outlined above and in the EA, would not result in significant adverse impacts to the quality of the natural and human environment. In addition, the Proposed Action does not appear to have the potential for significant cumulative effects when combined with past, present, and reasonably foreseeable future actions. As a result of this FONSI, an EIS will not be prepared (FEMA Instruction 108-1-144 [CFR Part 10.9]) and the Proposed Action as described in the EA may proceed.

APPROVALS

LaToya Leger-Taylor
Regional Environmental Officer
FEMA Region 6

Date

Marty Chester
Hazard Mitigation Assistance Non-Disaster Branch Chief
FEMA Region 6

Date

PUBLIC NOTICE
FEDERAL EMERGENCY MANAGEMENT AGENCY (FEMA)
NOTICE OF AVAILABLITY

DRAFT ENVIRONMENTAL ASSESSMENT
LSU LAKES MCKINLEY DIVERSION AND CORPORATION CANAL RETROFIT PROJECT
EMT-2021-FM-024-0035
EAST BATON ROUGE PARISH, LOUISIANA

Interested parties are hereby notified that the Federal Emergency Management Agency (FEMA) has prepared a draft Environmental Assessment (EA) and a draft Finding of No Significant Impact (FONSI) for proposed grant funding under FEMA's Flood Mitigation Assistance (FMA) program to enable construction of the Louisiana State University (LSU) Lakes McKinley Diversion and Corporation Canal Retrofit Project in Baton Rouge, East Baton Rouge Parish, Louisiana. East Baton Rouge Parish proposes to construct flood control improvements that incorporate assorted stormwater management interventions including storage and diversion, and low impact development and nature-based solutions, involving two project components located to the west and south of the LSU Lakes system and near the eastern edge of the LSU campus. The first component, the McKinley Diversion, is west of Crest Lake, along the southern edge of McKinley High School, and borders residential areas to the south and west (Start: 30.420468, -91.175349; End: 30.421206, -91.171916). The McKinley Diversion component includes replacement and upsizing of existing underground culverts that would divert water from Corporation Canal to an existing open concrete-lined trapezoidal channel between McKinley High School and Crest Lake and the addition of a new underground culvert connection to Crest Lake. Replacement and upsizing of culverts under Dalrymple Drive between Crest Lake and University Lake is also proposed (30.420479, -91.170727). The second component, the Corporation Canal Retrofit, is downstream of the McKinley Diversion and along the southwestern shore of University Lake between Stanford Avenue and West Lakeshore Drive (Start: 30.408760, -91.170348; End: 30.406989, -91.164981). It encompasses the current canal footprint at that location and an existing box culvert that conveys flow from Corporation Canal to Bayou Duplantier. The purpose of the proposed action is to reduce flood hazards associated with heavy rains in the LSU Lakes area, which include street flooding and flooding at repetitive loss structures and other flood-prone properties.

The purpose of the draft Environmental Assessment (EA) is to evaluate the potential impacts of the proposed action and alternatives on the human and physical environment in accordance with the National Environmental Policy Act of 1969 (NEPA), the Council for Environmental Quality (CEQ) regulations implementing NEPA (40 CFR Parts 1500 – 1508), the National Historic Preservation Act, Executive Order 11988, Executive Order 11990, and the implementing regulations of FEMA (44 CFR Parts 9 and 10).

Both components of this project are located within Zone AE with a Base Flood Elevation (BFE) of approximately 25 feet, within the 100-year flood plain. Most of the primary benefit area is in Zone AE with the balance in Zone X. Major flood risk in the primary benefit area is due to a constriction of Corporation Canal where it passes under LSU's campus, and the lack of connectivity between Corporation Canal and the LSU Lakes system.

The draft EA evaluates alternatives relative to applicable environmental laws. The alternatives evaluated include (1) no action; (2) the proposed action; and (3) buy-out or elevation of flood prone properties.

The draft FONSI is FEMA's finding that the Proposed Action would not have a significant effect on the human and natural environment. The draft EA and draft FONSI are available for review for until DATE, 2024, at the following locations:

- Baton Rouge City Hall, 222 St. Louis Street, Baton Rouge, LA
  - Monday through Friday from 8:00 am to 5:00 pm; and
- Carver Branch Library, 720 Terrace Avenue, Baton Rouge, LA
  - Monday through Thursday from 9:00 am to 8:00 pm.
  - Friday and Saturday from 9:00 am to 6:00 pm.
  - Sunday from 2:00pm to 6:00 pm.

This public notice will run in The Baton Rouge Advocate for five (5) days on DATES, 2024.

Electronic copies of these documents and Appendices can also be accessed on the FEMA website at https://www.fema.gov/emergency-managers/practitioners/environmental-historic/nepa-repository.

There will be a 30-day comment period beginning on DATE, 2024, and concluding on DATE, 2024, at 4:00 pm.

Comments on the draft EA may be emailed to fema-liro-ndg-bric-fema-ehp@fema-dhs.gov Subject line: LSU Lakes Diversion and Retrofit. Written comments also can be submitted via mail to:
DEPARTMENT OF HOMELAND SECURITY
FEMA EHP-LSU LAKES DIVERSION AND RETROFIT
1500 MAIN STREET
BATON ROUGE, LA 70802.

If no substantive comments are received, the draft EA will become final and a Finding of No Significant Impact (FONSI) will be issued for the project. Substantive comments will be addressed as appropriate in the final documents.