



Pearl River Basin, Mississippi, Federal Flood Risk Management Project



Appendix I – Alternative Project Descriptions June 2025

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Caney Creek Levee

A levee segment of up to 1.0 miles is proposed on the west bank of the Pearl River in south Jackson. It is likely that 1250 feet of this extent is limited in flow capacity due to the existence of Interstate 55, and therefore the levee would only be approximately 0.75 miles long. This levee would provide additional flood risk reduction for approximately 137 acres of residential area. This area is bounded on the upstream end of Caney Creek near Terry Road and extends downstream to Interstate 55. It is estimated this would reduce flood risk for 40 homes. The levee will range from natural high ground, to up to 9 feet high. Exact elevations will be set as the with-project 100-year flood event with 90 percent assurance levels in PED.



Figure 1-27. Caney Creek Levee Location, Existing Terrain, as compared to the 200-year Flood Elevations, with and without channel improvements

Typically, during a flood event on the Pearl River or its tributaries, rainfall also falls behind the levee. The rainfall runoff needs a way to leave the leveed area. The drainage area for local rainfall is less than 500 acres, and therefore it is assumed that much of the water can evacuate the system prior to peak stages on the Pearl River and its tributaries. There are five possible locations that will require interior gravity drainage structures along the Caney Creek Levee. For the purposes of this study, these structures will be 50 long, reinforced concrete pipes with a flap gate closure. The structures will utilize existing ditches, and they will require minor earthwork.

Principal features of the work include mobilizing and demobilizing, clearing and grubbing, removing and stockpiling any existing crushed stone surface, semi compacted levee embankment, traverses, adding new crushed stone surfacing, mowing, turfing, erosion control matting, and preventing storm water pollution. Constructing the project will require relocations and/or improvements to various utilities and infrastructure (e.g. existing roadways or similar).

Contractor furnished borrow areas will not be permitted. All borrow areas will be acquired by the NFI as part of its LERRD requirement and furnished by the Government to the contractor. Some small areas could be more appropriate for the construction of a short floodwall, typically an I or T wall, due to space constraints, though further analysis would be required.

Construction of the project will require relocations and/or improvements to various utilities and infrastructure (e.g. existing roadways or similar), and the creation of new habitat mitigation areas to offset losses within the project area.

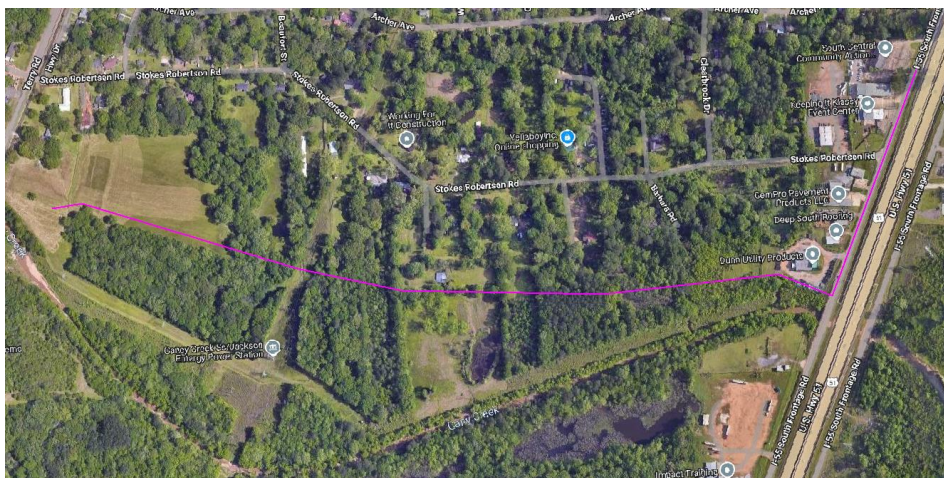


Figure 1-28. Proposed Caney Creek Levee (Purple line)

Borrow Plan (All Levees)

A borrow plan has not been developed at this stage of the analysis. It is conceivable that there is enough borrow material from the material excavated but it is unknown at this time if the material is suitable for constructing levees. Should the excavated material be determined to be unsuitable, borrow material would need to be identified for construction of any levees. There is potential borrow sources within proximity of the project area (10-mile radius). Reference Figure 3-8 for potential source. Borrow opportunities would be further investigated during PED and a supplemental NEPA document would be prepared at that time.

Operations and Maintenance (All Levees)

Operations and Maintenance will be implemented for each constructed feature to USACE Standards. The district commander is responsible for developing an OMRR&R manual for each project and separable element constructed under a separate project partnership agreement (PPA), or functional portion of a project or separable element, reporting the status of the manual through the project management system as required by ER 5-7-1(FR). Normally, the Engineering Division will be assigned the overall responsibility for preparing a draft OMRR&R manual with appropriate inputs from other disciplines and, in consultation with the project sponsor, furnishing the draft manual to the project manager for coordination with the project sponsor, and preparing the final OMRR&R manual for approval. For a functional portion, the OMRR&R manual is an interim manual pending completion of the entire project or separable element. The major subordinate commander is responsible for review and approval of the manual. The project sponsor, normally through a permanent committee consisting of or headed by an official usually called the "superintendent" is responsible for carrying out the provisions of the OMRR&R manual. The OMRR&R manual will include coverage of all OMRR&R subjects required by the PPA and existing regulations, in detail sufficient to ensure proper OMRR&R accomplishment by the project sponsor. Project sponsors, subject to review and approval of the district commander, may prepare supplements to the manual.

Habitat Mitigation

All alternatives incur some level of forested wetlands or uplands impacts. In addition to the forested wetlands and uplands impacts, Alternative D1 also impacts riverine habitat while Alternative E1 also results in lacustrine impacts but not riverine. Figure ?? shows the general locations for each potential habitat mitigation area.

Habitat Mitigation would be achieved by implementing Corps constructed mitigation projects and/or purchasing of mitigation bank credits. Further planning and analysis would be completed during PED to determine which strategies, stand alone, or combined, would fully compensate for habitat impacts.

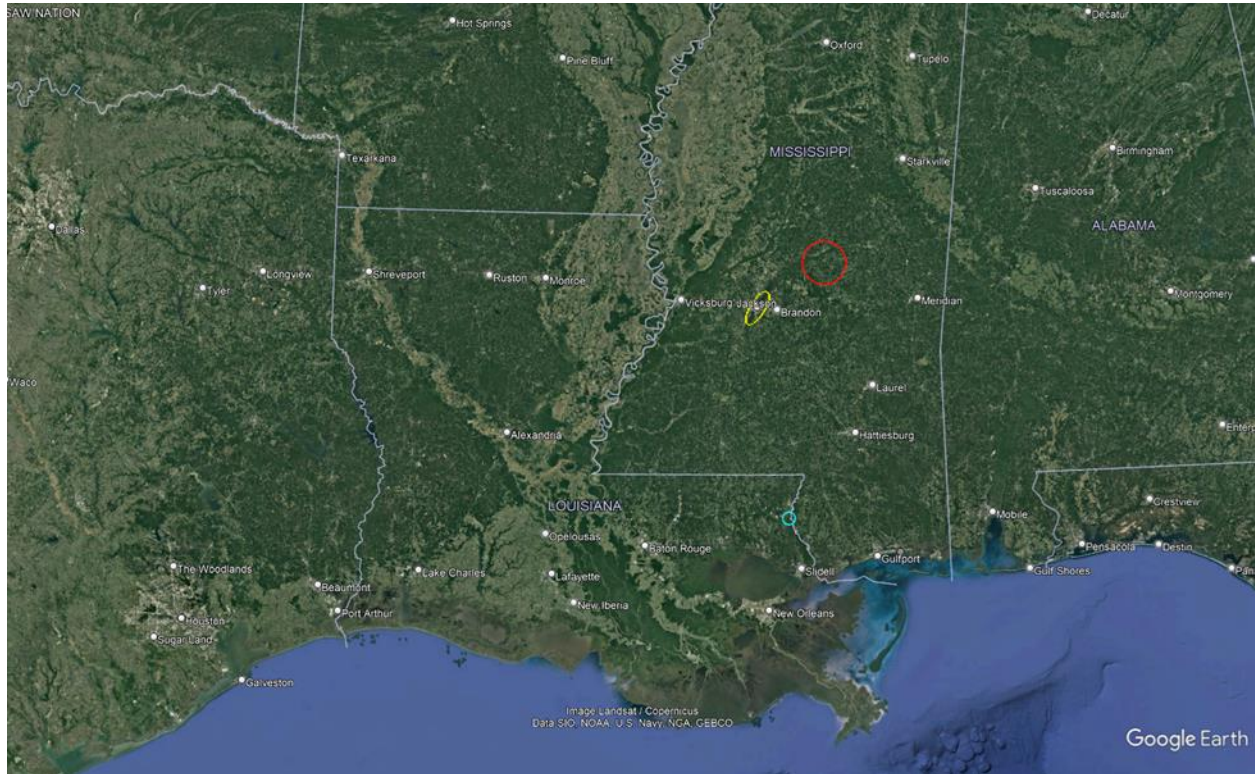


Figure 1-29 – Locations of FRM project and potential Lacustrine Mitigation (yellow), Potential forested wetlands and uplands Mitigation (red), Potential Riverine Mitigation (blue)

Replacement Of Obsolete Aquatic Barrier(s) with rock chute(s) (Pool's Bluff sill and/or Bogue Chitto sill)

Riverine habitat restoration may be included by replacement of obsolete aquatic barrier(s) with a rock chute downstream of FRM project . Although not the proposed measure, this was used for planning purposes as existing data is available . Replacement of a sill(s) by means of excavation and placement of fill on site, along with the construction of a rock chute(s) is being considered to mitigate for riverine impacts due to implementation of Alternative D1. The rock chute(s) will utilize riprap to prevent incisions working up the affected stream, reduce the amount of sediment that is introduced into the project via incision

and upstream sediment transportation, as well as maintain a portion of the upstream water levels currently maintained by the sill. If height of sediment behind structure requires a rock check over the effective height of standalone rip rap, then sheet pile will be needed in addition to riprap for the construction of the rock chute(s). Estimated with of sill removal is about 415 linear feet across the river. Estimations were taken from the rural Green River Kentucky dam removal efforts, where the Green River Lock 6 and Barren River Lock 1 have been recently removed. Green River Lock 5 is currently being removed. Estimations for the rock chute was taken from the recent Hickahala rock check design.

Table 4.a: Pertinent Data for the Green and Barren Rivers Locks and Dams

L&D No.	year built	mi above mouth	lock			pool	
			width	length	lift	upper	lower
Green 1	1956	9.1	84.0	600.0	11.8	349.1	337.3
Green 2	1956	63.1	84.0	600.0	14.0	363.1	349.1
Green 3	1836	108.5	35.8	137.5	17.3	380.4	363.1
Green 4	1839	149.0	35.8	138.0	16.4	396.8	380.4
Green 5	1934	168.1	56.0	360.0	15.2	412.0	396.8
Green 6	1906	181.7	36.0	145.0	9.2	421.2	4112.0
Barren 1	1934	15.0	56.0	360.0	15.2	412.0	396.8
Rough 1	1897	7.0	27.0	123.0	9.9	373.3	363.4

Figure 1-30. Green River System Dam Removal Study (2004)

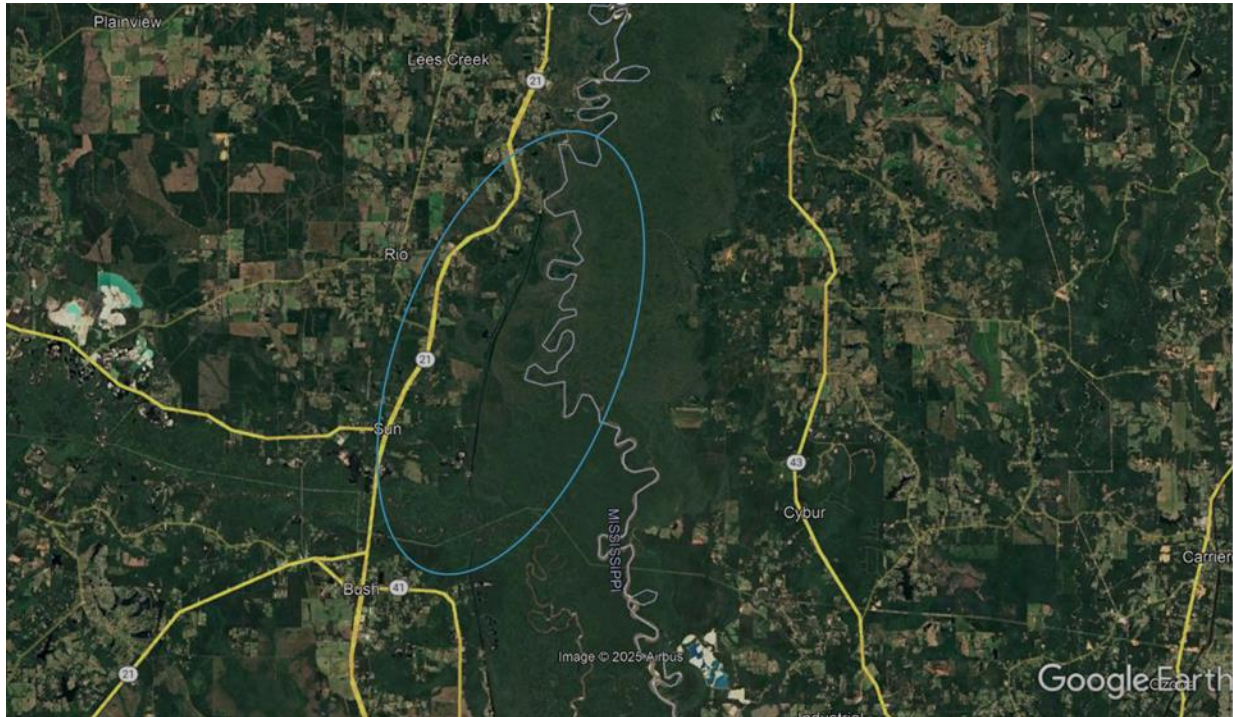


Figure 1-31 Location of potential riverine mitigation sites

Creation of Oxbows and Ponds (Mitigation)

The creation of oxbow lakes and/or ponds within the newly excavated area would mitigate for lacustrine impacts due to the implementation of Alternative E1. These lakes would be excavated 5 feet below the floodplain lowering depth (El. 247) with 1 vertical to 3 horizontal sloped borders. No clay layer will be added to pond bottoms. Modeling tests indicate that this feature impacts Water Surface Elevations by less than 0.1 foot.

Table1-9. Oxbow and Fishponds for Lacustrine Habitat

Pond/Oxbow	Area Acres	Additional Depth, (Beyond Excavation to El. 252)	Additional Volume Ac-Ft	Length of Armoring(feet)
NE Oxbow (1)	12	5	60	1350
LeFleur's (2)	17.5	5	87.5	2600
Pond 1 (3)	8.9	5	44.5	600
Pond 2 (4)	8.2	5	41	0
Southeast Oxbow (5)	41.8	5	209	1335
South Oxbow (6)	16.9	5	84.5	2450



Figure 1-32. Oxbow/Ponding Features 1 and 2



Figure 1-33. Oxbow/Ponding Features 3 and 4



Figure 1-34. Oxbow/Ponding Features 5 and 6

Additional restoration of habitat may be included in the project by means of protection, enhancement, or creation of instream habitat (shoals, gravel bars, woody debris, sand bars), and reforestation of the riparian buffer along the Pearl River within the Project area. USFWS recommended these potential restoration measures (not mitigation) for Alternative E1 justified under ESA section 7(a)(1).

Forested Wetlands and Uplands Mitigation

The Non-Federal Interest (NFI) has identified lands (Figure ?) that could be used to satisfy all, or a portion of, the forested wetlands and uplands mitigation needs. These lands are within the Pearl River basin and are available for acquisition. Some strategies that may be considered for this mitigation project are described below. These, and other yet to be identified strategies may be considered in any combination to achieve full compensation for impacts to each habitat type. Further planning and analysis would be completed during later phase(s) to determine which strategies, stand alone or combined, would fully compensate for habitat impacts. Preliminary estimates have been determined using various assumptions. See Table ? for preliminary acres required for forested wetlands and uplands mitigation. Mitigation needs and strategies would be revisited in subsequent phases and optimized to reflect more accurate calculations. Additionally, project specific planting, management, monitoring, and adaptive management plans would need to be developed in subsequent phase(s).

Table 1-10. Acres of forested wetlands and uplands Habitat
A1
D1
E1

Purchase of mitigation bank credits. Commercial mitigation banks sell credits for mitigation work performed at an approved mitigation site. This feature would not require any construction activities by the USACE. The USACE would simply purchase as many credits as possible to satisfy all or a portion of the mitigation needs for a specific habitat type.

- Construction of a habitat restoration project. Habitat restoration could be accomplished by establishing desired in-kind habitat within areas that were historically of the same habitat. This could be accomplished by removal of undesirable species and planting of native species.
- Construction of a habitat enhancement project. Habitat enhancement could be accomplished by performing various prescribed treatments such as reduction of invasive species to no more than 5% coverage and select removal of undesirable species followed by planting of required native species.
- Construction of a habitat preservation project. Preservation would consist of no prescribed treatment other than purchasing and perpetually protecting land of suitable in-kind habitat and monitoring to ensure the species integrity of these areas.

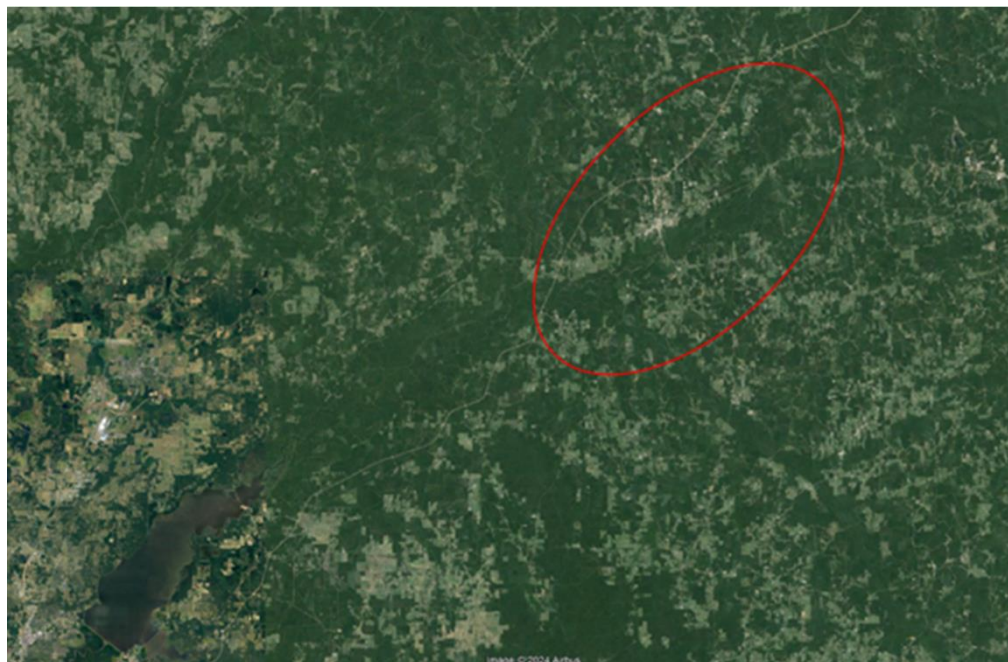


Figure 1-35 General location of potential forested wetlands and uplands mitigation sites

1.3 Alternative Combination Thereof Plans Set (D1 and E1)

At the request of the NFI, an investigation into additional flood reduction within the Duttoville area was completed. This information is provided as a possible future inclusion to the selected plan but is not incorporated into the full cost-benefit and mitigation analyses.

Duttoville is a historical community founded by Fr. Dutto in the 1800's which operated as an independent village until it's annex by the City of Jackson just after the year 1900. Duttoville is also locally known as Doodaville, Doudaville, and Doodleville. The image below is an approximate area outlined in orange of the maximum extent at the time of the annex.



Figure 1-36 Approximate Extent of the Duttoville Village at time of Annexation into the City of Jackson

Focus was limited to the area most frequently flooded portion of Duttoville. The image below shows the focus area in orange, with the 25-year flood event shown in blue.

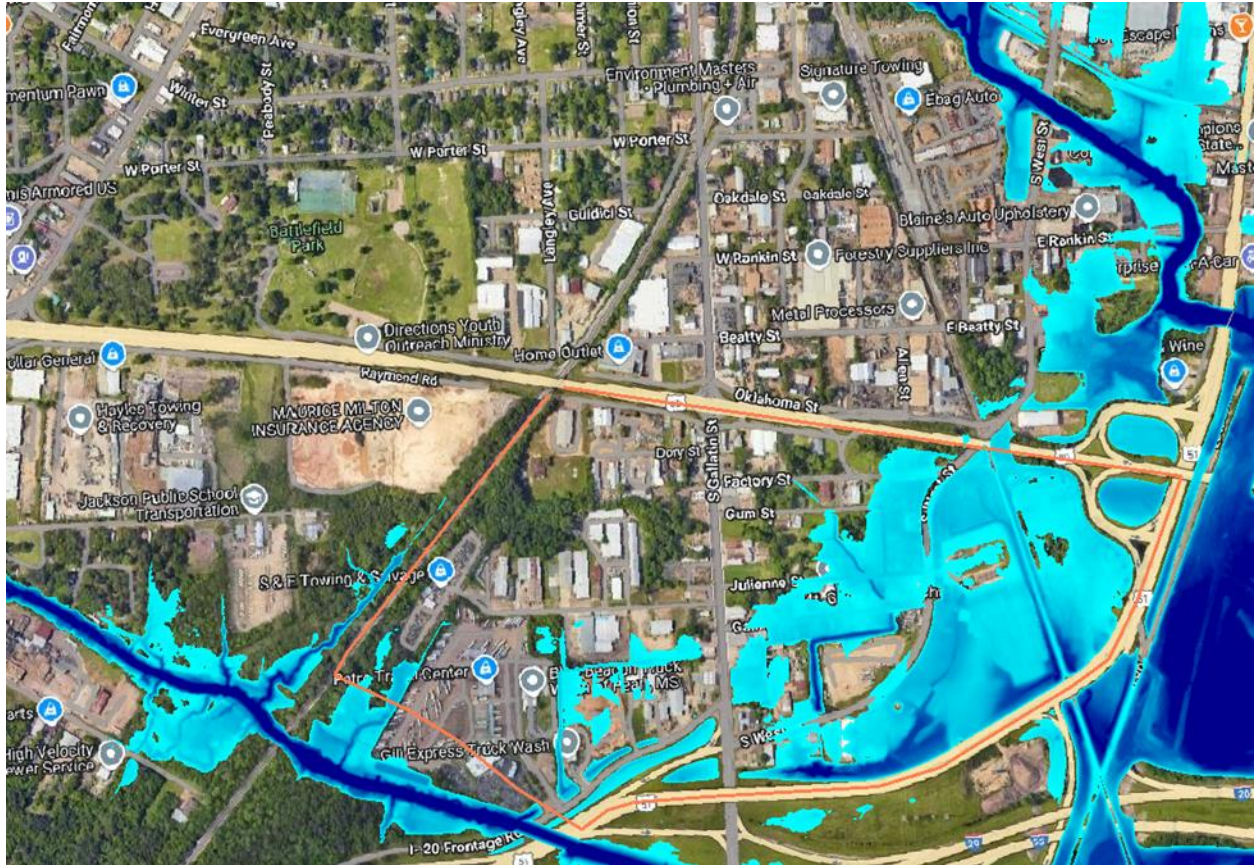


Figure 1-37 Areas of Duttoville with Reoccurring Flood Impacts

Significant portions of the line of protection needed for the focused Duttoville area includes highway and railway embankments. Roads/Railroads need to be included as project segments for a single line of protections to meet requirements as a new federal system. To accomplish this, agreements to inspect features with owner and a study of these features would be required. Elevations associated with the orange line in the figure above are represented in the figure below. There is significant variability within elevations associated with roadways and railways. While most roadways are significantly above the 100-year flood elevations, there are areas that do not meet this level of protection. (See station 50+00 in the figure below.) Therefore, only a 25-to-50-year level of protection is proposed.

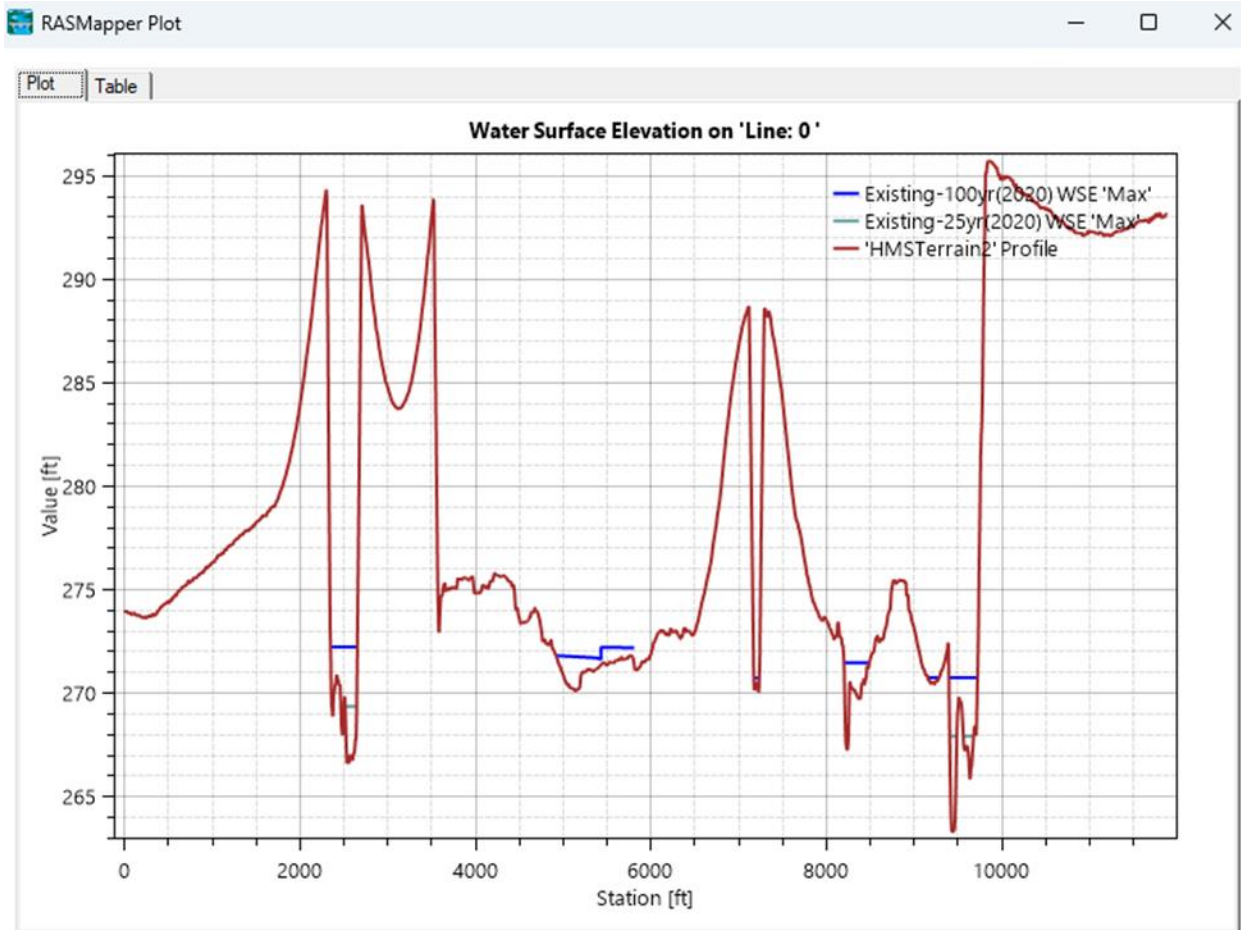


Figure 1-38 Water Surface Elevation on Line 0

Terrain under line of protection starting at intersection of HWY 80 and railroad and circling clockwise. Blue line indicated 100-year flood elevations; Green line indicates 25-year flood elevations.

There are culverts on existing road/railroad along this alignment which allow water to back into the area of concern. Additional design and coordination with railway and roadway operators would be required to finalize specific structure type in order to meet specific operator guidance. This could range from a flap/slucice/slide gate extension to a short levee segment with a structure to limit backflow at the structure location. There will be additional study involved to get to a full line of protection which would include roads and railways. An example of an added gate is shown on the image below.



Figure 1-39 Example of Gates added to existing structures.

Water also flows into this area of concern from the Town Creek Basin to the Lynch Creek Basin. This occurs where State Street and a railroad cross under Highway 80. A Closure structure would be added to this low spot. This structure be a sandbag flood fight closure when only protecting to 270, but above this elevation a structural closure type would be required. The image below shows the closure location and terrain elevations. The road starts near station 1+50, then a railway, then a lower ditch area.

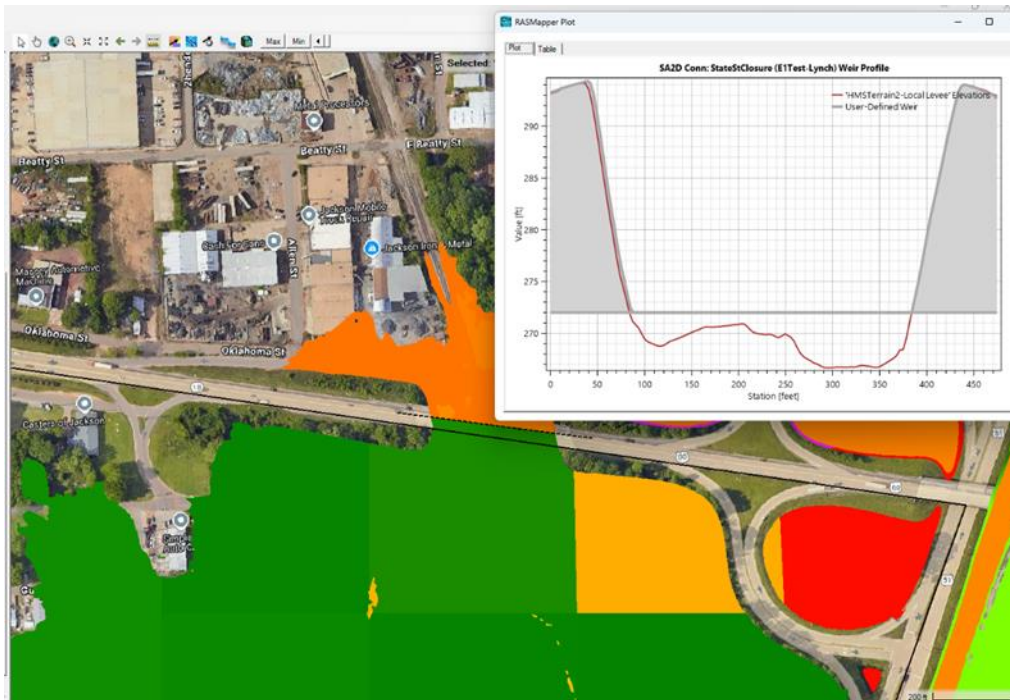


Figure 1-40 Water moving underneath HWY 80 at Railroad and State Street

Water enters the area of concern through the Lynch Creek near the Petro Travel center, just north of I-20. The line of protection in this area would have to have a structural component. The low areas to either side of the travel center would likely need a levee/gate feature. No tie in between the two low areas is expected, but, if necessary, any levee feature would go through the travel center parking lot and would not interact with any structures. The green line in the image below is approximately the level of protection required without cleanout for a 25-year event and the blue line is the level of protection needed with a channel cleanout. This would be two small levee type items, or one small levee, and a gates structure. Maximum combined levee/gate/floodwall length for this area would be less than 1,000 feet.

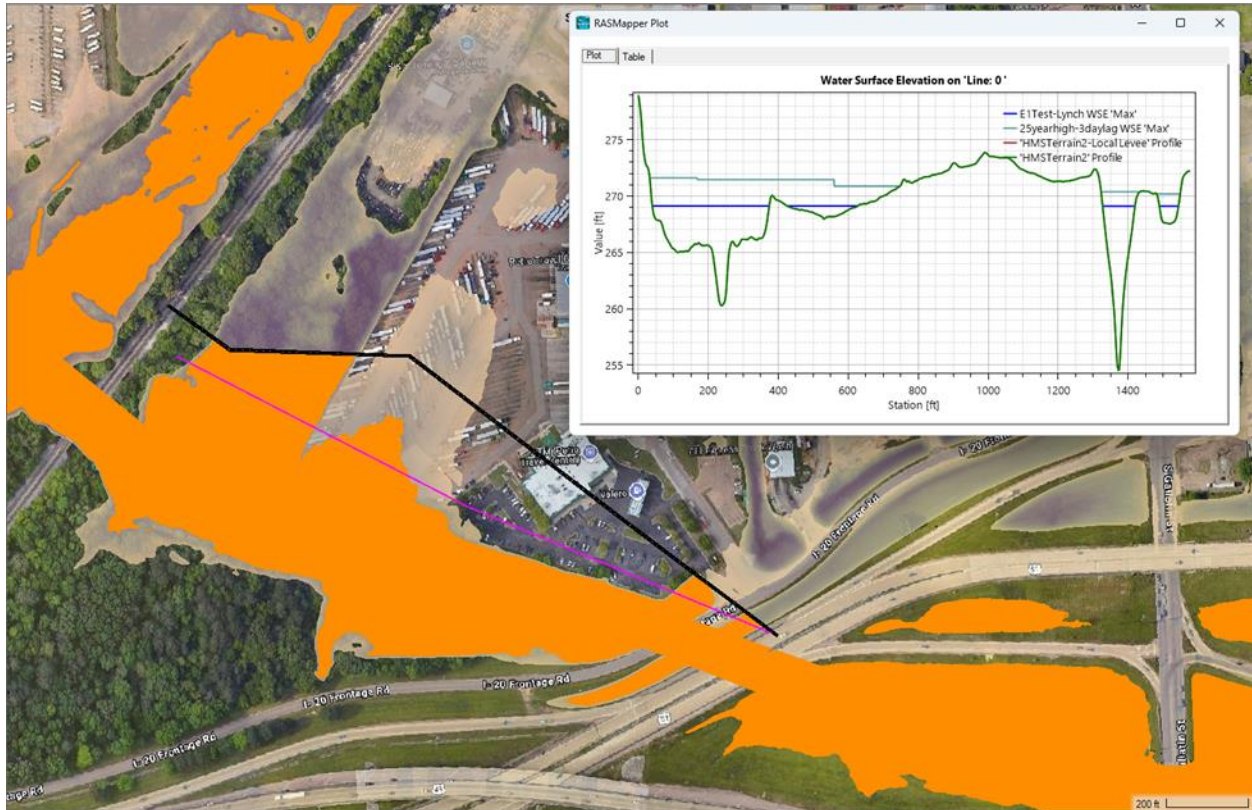


Figure 1-41 Line of Protection along Lynch Creek near Travel Center

Additional flood reduction can be realized through channel cleanout. Estimated reduction for a given event is shown in the picture below. Blue is without project and red/orange is with project. The black polygon is the area of channel reduction area.

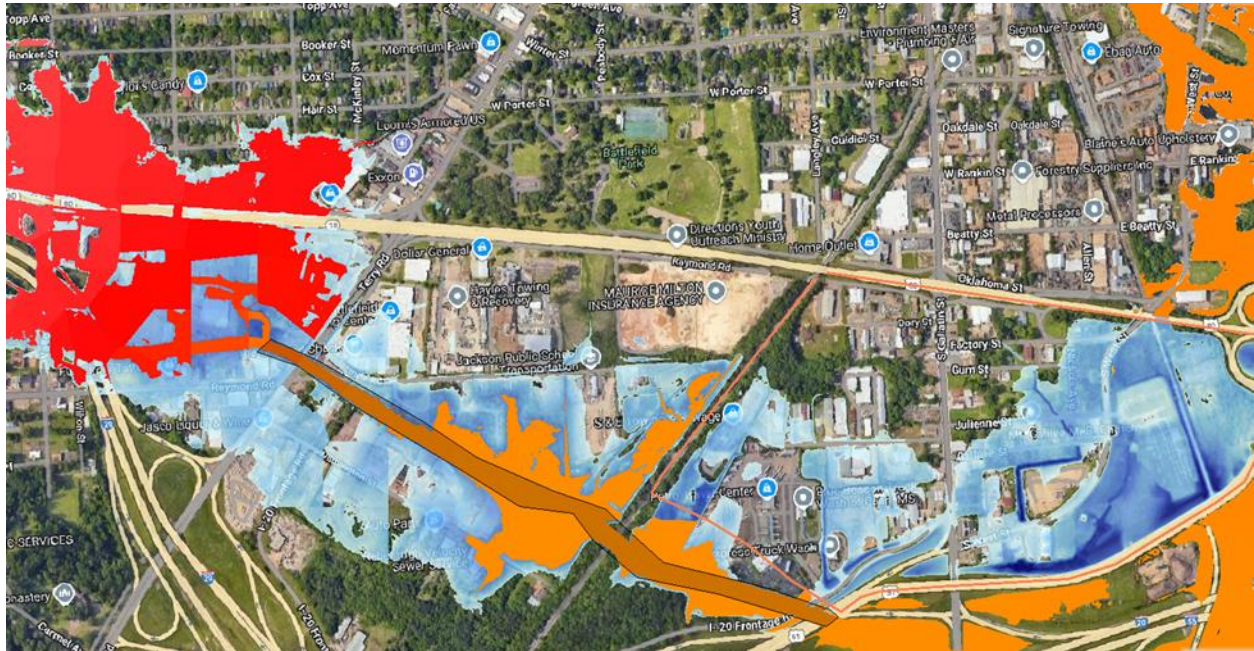


Figure 1-42 Area of targeted Channel Cleanout, and Maximum expected flood reduction at the 25-year return interval.