

APPENDIX E
PLAN FORMULATION APPENDIX

Augusta Rocky Creek, Georgia
Flood Risk Management
Section 205 Feasibility Study
Augusta-Richmond County, Georgia

APPENDIX E
PLAN FORMULATION
Augusta Rocky Creek, Georgia
Flood Risk Management
Section 205 Feasibility Study

1.0 Overview

The 2016 Augusta Rocky Creek Flood Risk Management (FRM) Continuing Authorities Program (CAP) Section 205 Feasibility Study leveraged the knowledge gained from the 2005 Augusta, Georgia Investigations Draft Feasibility Report.

Specific, Measurable, Attainable, Risk-Informed, and Timely (SMART) Planning prescribes three to five alternatives as sufficient for comparing alternatives and identifying a recommended plan. The 2005 Draft Feasibility Report examined, in detail, 17 structural management measures and two non-structural management measures. An initial screening evaluation of these alternatives revealed that most of them would likely not be selected as the recommended plan because of engineering, environmental, or economic shortcomings or lack of effectiveness toward reducing flood risk. Hence, thirteen of these management measures were eliminated from further consideration. The seven remaining management measures were used to develop 20 alternatives in the 2005 study.

To minimize the duration and cost of the 2016 Augusta Rocky Creek FRM CAP Section 205 Feasibility Study, Savannah District used information from the 2005 Augusta, Georgia Investigations Draft Feasibility Report on the best management measures and the NED plan to formulate the alternatives for this (2016) study. As a result, four future with-project condition alternatives were developed and evaluated in the 2016 Augusta Rocky Creek FRM CAP Section 205 Draft Feasibility Study using two of the management measures from the 2005 Augusta, Georgia Investigations Draft Feasibility Report NED plan: the Rosedale Dam Detention Area and the Kissingbower Buyout with a Recreational Park.

2.0 2005 Augusta, Georgia Draft Feasibility Study: Management Measures

The 2005 Augusta, Georgia Feasibility Study authorized in Section 414 of the 1996 Water Resources Development Act (WRDA), 104th Congress 2d Session, Public Law 104-303, evaluated a broad range of potential management measures to reduce damages from flooding in the Rocky Creek Basin. These measures ranged from structural (those that physically alter the flows) to non-structural measures (those that do not physically alter the floodplain but reduce damages by means of management techniques such as removing structures, elevating structures, flood-proofing of

structures, insurance against damage, and other means). The management measures that were studied and documented in the 2005 Draft Feasibility Report are as follows:

2.1 Structural Management Measures

- Gravel Pit Road Culvert / Bridge – This plan included replacing the existing pair of 72-inch reinforced concrete pipes with large box culverts or a prefabricated concrete arch bridge. A box culvert design would require four 8-foot X 10-foot culverts placed side by side. A bridge design would include two 7-foot X 20-foot prefabricated concrete bridges.
- Norfolk and Southern Railroad #2 – This plan included expanding the size of the channel beneath the existing bridge. The bridge would either be replaced or the existing bridge could be improved.
- Nixon Street Levee - The Nixon Street Levee is an earthen structure that will be constructed between Mike Padgett Highway and Doug Barnard Parkway. The levee would be approximately 5,100 feet long with a maximum height of 9.5 feet, and an average height of 5.5 feet. The levee would run along Nixon Street and turn 90 degrees at Mike Padgett Highway for the last 650 feet. The levee would cross two railroads and a couple of dirt roads. The levee will tie into the railroad embankments and the dirt roads will ramp up and over the levee.
- Chester Street Levee – This plan would consist of a new earthen structure that would be constructed along Chester Street to prevent overflow of this area adjacent to Rocky Creek. The levee would be approximately 1,440 feet long with an average height of 7.5 feet. This levee does not cross any existing roads and would tie into Mike Padgett Highway at the downstream end.
- Lombard Detention Basin - The proposed Lombard Detention Structure is located just east of Deans Bridge Road. The structure would include the construction of a sheet pile or concrete retaining wall that spans Rocky Creek. Each end of the retaining wall will tie into earth berms that would extend to the existing grade at the top of the structure elevation. The top elevation of the structure would be at elevation 145.0. Normal creek flow would be unimpeded through a 20-foot wide notch in the retaining wall. This notch would be set at the bottom of the channel or approximately elevation 134.7. The retaining wall would also have a 58-foot notch at elevation 143.0 that would be used at five-year event and greater. The top of the structure would be kept at a minimum, at elevation 145.0, to prevent additional local flooding immediately upstream during larger storm events, and it would be overtopped by flooding from storms greater than the 5-year event. The earth berms would have a 10-foot crest width with side slopes of 1V:2H on each side and at the junction of the retaining wall.
- Dean's Bridge Improvements - The areas beneath the bridges at Deans Bridge and Peach Orchard Road have accumulated substantial sediment and vegetation over the years. To avoid these two areas from being restrictions, 1 to 3 feet of excavation would be required beneath both bridges. The bridge decks are high enough that the excavation can be accomplished with small track mounted equipment.

- Rozella Berm - One of the areas identified as having flooding problems is north of Regency Mall on the opposite side of Gordon Highway. This plan consisted of constructing a 1,800-foot berm along the south side of Gordon Highway and excavate a bench on the south side of Rocky Creek floodplain. The location of the berm and excavation are shown on Figure C-6-11 in the Engineering Appendix. The berm would be relatively small with maximum height 4.5 feet.
- Rozella Road Detention Basin - The proposed Rozella Detention Structure is located just west of Gordon Highway and north of Regency Mall. The structure would include the construction of a sheet pile or concrete retaining wall that spans Rocky Creek. Each end of the retaining wall would tie into earth berms that will extend to existing grade at the top of structure elevation. The top elevation of the structure would be at elevation 167.0. Normal creek flow would flow unimpeded through a 6-foot wide notch in the retaining wall. This notch would be set at the bottom of the channel or approximately elevation 153.8. The retaining wall would also have a 30-foot notch at elevation 162.0. The notch would be used starting at the future conditions two-year event, with the entire structure being overtopped at events greater than the five-year event. The earth berms would have a 10-foot crest width with side slopes of 1V:2H on each side and at the junction of the retaining wall.
- Wheelless Road Culverts. Some of the original hydraulic model runs indicated that the bridge opening at Wheelless Road was a restriction during the design storm. This plan would install several culverts beneath the road adjacent to the bridge. This would include the addition of a small overflow basin, drain pipes under the existing road, and a concrete culvert on the opposite side of the road.
- Milledgeville Road Culvert / Bridge Replacement - The bridge considered for replacement is located where Milledgeville Road crosses Rocky Creek. The construction would include removal of the existing three 10-foot by 8-foot box culverts. The culverts would be replaced by a standard T-beam supported bridge (Georgia Department of Transportation design). Based on evaluation of the hydraulic models, the benefits of a larger opening at Milledgeville Road creek crossing would provide only minimal flood reduction benefits.
- Wheelless Road Detention Basin - The proposed Wheelless Detention Structure is located adjacent to Wheelless Road near the intersection with Milledgeville Road. The structure would include the construction of a sheet pile or concrete retaining wall that spans Rocky Creek. Each end of the retaining wall will tie into earth berms that will extend to existing grade at the top of structure elevation. The top elevation of the structure would be at elevation 178.0. Normal creek flow would be unimpeded through a 6-foot wide notch in the retaining wall. This notch would be set at the bottom of the channel or approximately elevation 166.0. The retaining wall will also have a 30-foot notch at elevation 174.0 that will be utilized at events starting at the two-year storm. The entire structure will be overtopped by storms greater than the two-year event. The earth berms would have a 10-foot crest width with side slopes of 1V:2H on each side and at the junction of the retaining wall.
- North Leg Road Culvert Replacement - The proposed North Leg culvert replacement is located where North Leg Road crosses Rocky Creek. The construction

would include replacement of the existing 9-foot by 10-foot culvert with a new 12-foot by 12-foot culvert. The new culvert would be embedded approximately one-foot into the creek bed to provide a more natural channel bottom.

- North Leg Road Detention Basin- The proposed North Leg Detention Structure is located adjacent to North Leg Road near the intersection with Milledgeville Road. The structure would include the construction of a sheet pile or concrete retaining wall that spans Rocky Creek.
- Rosedale Detention Area - The Rosedale Dam (downstream of Bobby Jones Expressway) is an existing earth dam that was breached at the creek channel many years ago. The dam is located between Milledgeville Road and Gordon Highway upstream of North Leg Road. Renovations to the existing dam would include placing a reinforced concrete box culvert through the breach in the creek bed for normal creek flow. The breach would then be filled to elevation 232.0-foot to form a notch for all flows between the 10- and 500-year flood events. At no time would the entire structure be overtopped. The crest and downstream slope at the notch will be covered with articulated concrete blocks (ACB) for slope protection. The entire structure would require clearing and grubbing and establishment of grass cover.
- Noland Connector Detention Basin – This plan is located adjacent to Noland Connector just upstream (west) of Bobby Jones Expressway. The structure would include the construction of a sheet pile or concrete retaining wall that spans Rocky Creek. Each end of the retaining wall will tie into earth berms that will extend to the existing grade at the top of structure elevation. The top elevation of the structure would be at elevation 260.0. Normal creek flow would be unimpeded through a 3-foot wide notch in the retaining wall.
- Barton Chapel Road Culvert Replacement - The proposed Barton Chapel Road culvert replacement is located where Barton Chapel Road crosses Rocky Creek. The construction would include removal of the existing reinforced concrete pipe, corrugated metal pipe, and concrete junction boxes that are located beside and beneath Barton Chapel Road. The existing drainage structures would all be replaced by new concrete box culverts. Barton Chapel Road would need to be closed during construction. The new culvert would be embedded approximately one-foot into the creek bed to provide a more natural channel bottom.
- Channel Improvements along Rocky Creek – This plan included excavating a trapezoidal channel through approximately 19,600 linear feet (3.7 miles) of the Rocky Creek channel. Based on several factors including the number of parcels/property owners involved, the amount of excavation required, and the anticipated adverse impacts to the local ecosystem, the channel improvements were determined to be both economically and environmentally undesirable.

2.2 Non-Structural Management Measures

- Kissingbower Road Non-Structural Alternative – Non-structural measures for this area located across from the Regency Mall would consist of purchasing five properties and demolishing all five structures. Development of a recreational park on the site of the purchased structures would also be included in this alternative.
- Barton Chapel Road Trailer Park – This alternative would consist of a buyout of manufactured homes that are affected by flooding. Of the 27 mobile homes in the Barton Chapel Mobile Home Country Club, 14 of them are impacted by the 100-year flood event.

3.0 Screening of Management Measures Considered in 2005 Draft Report

Table 1 summarizes the results of the 2005 screening of the management measures.

Table 1. Screening of Management Measures Considered

Management Measures	Effects	Eliminated from Further Consideration	Selected for Formulation of Alternatives
1.No Action		N/A	Yes
Structural			
2.Gravel Pit Road Culvert/Bridge	Nominal Flood Reduction	Yes	No
3.Norfolk & Southern Railroad #2	Nominal Flood Reduction	Yes	No
4.Nixon St Levee	Flood Risks Reduced	No	Yes
5.Chester St Levee	Negligible Flood Reduction	Yes	No
6.Lombard Detention Basin	Flood Risks Reduced	No	Yes
7.Dean's Bridge Improvements	Negligible Flood Reduction	Yes	No
8.Rozella Berm	Negligible Flood Reduction	Yes	No
9. Rozella Rd Detention Basin	Flood Risks Reduced	No	Yes
10. Wheelles Rd Culverts	Negligible Flood Reduction	Yes	No
11.Milledgeville Rd Culvert/Bridge Replacement	Negligible Flood Reduction	Yes	No
12. Wheelless Rd Detention Basin	Flood Risks Reduced	No	Yes
13. North Leg Rd Culvert Replacement	Negligible Flood Reduction	Yes	No
14. North Leg Rd Detention Basin	large warehouse & several stores removed – too small of a basin	Yes	No
15. Rosedale Detention Dam Area	Flood Risks Reduced	No	Yes
16. Noland Connector Detention Basin	Real Estate is no longer available- a large industrial building is newly built in area of proposed pond.	Yes	No
17. Barton Chapel Rd Culvert Replacement	Negligible Flood Reduction	Yes	No
18.Channel improvement along Rocky Cr.	Negligible Flood Reduction	Yes	No
Non-Structural			
1.Kissingbower	Flood Impacts Reduced	No	Yes
2.Barton Chapel Rd Trailer Park	Nominal Flood Reduction – minimal upstream drainage	Yes	No

*Negligible means very little benefit

*Nominal means it has some benefits, but not enough, relative to cost.

4.0 Screening of Management Measures Considered in 2016 Draft Report

As Table 1 above shows, thirteen management measures were eliminated and 7 management measures (including the No Action Alternative) remained for further analysis. The 7 final management measures in the 2005 Draft Feasibility Report were No Action; Nixon Street Levee; Lombard Detention Basin; Rozella Road Detention Basin; Wheelless Road Detention Basin; Rosedale Dam Detention Area; and Kissingbower Buyouts. They were re-examined during development of the Project Management Plan (PMP) for the 2016 Section 205 Study.

No Action Alternative

In the No Action Alternative, severe flooding would continue in the future in the Rocky Creek Basin without alterations or additions to flood risk management. Flooding would result in substantial losses to property. Subsequently, property values would be expected to decrease in the vicinity. Properties on Kissingbower Road that have been subjected to past damage from flooding would continue to deteriorate with future storm events. Homes located within the floodplain would continue to represent an incompatible land use. Significant changes from the existing condition are not expected without implementation of additional flood risk management measures. The No Action Alternative is not a practicable option. It was included in the 2016 Augusta Rocky Creek FRM Feasibility Study to serve as the basis for comparing with-project condition alternatives.

Nixon Street Levee

The 2005 Draft Report concluded that the Nixon Street Levee would provide the highest Benefit-to-Cost (BCR) ratio of all the remaining six management measures. In combination with the Rosedale Dam Detention Area, the Nixon Street Levee produced the highest average annual net benefits of all the remaining structural alternatives. However, the original placement of the Nixon Street Levee crossed the former Southern Wood Piedmont (SWP) facility, where wood-treating operations were conducted from 1923 until 1988. Operations at the facility were regulated under a Resource Conservation and Recovery Act (RCRA) Corrective Action. As originally designed, the levee would have intersected the southeast portion of the designated Hazardous, Toxic and Radioactive Waste (HTRW) site, destroying a portion of the remediation system. In 2012, the PDT identified an alternative location which was thought to be free of HTRW contamination. The location would adversely impact jurisdictional wetlands and would require a wetland mitigation plan, requiring significant additional costs. While the location is not within the identified HTRW SWP site, contamination concerns exist due to the close proximity. Because of this, the Nixon Street Levee was considered an impracticable alternative and was not considered in the 2016 Augusta Rocky Creek Flood Risk Management Draft Feasibility Study.

Lombard Detention Basin

The Lombard Detention Basin as a stand-alone alternative in the 2005 Draft Report would provide net benefits of \$92,000 and a BCR of 5.4-to-1. It was also combined together with the other five management measures and would provide net benefits of \$358,000 and a BCR of 1.39-to-1. A review of aerial imagery shows that between 1999 and 2014 the footprint of residential areas near the detention basin area remained the same. However, since the 2005 Draft Report, 40 houses have been constructed on Gatewood Drive and Guy Way. Those roads were in place in 1999, but the houses were not yet developed. The new houses on Guy Way and Gatewood Drive are outside the 145-foot contour elevation, which represents the top of the detention structure elevation, and do not appear to be built in the detention basin area. Although the footprint of the Lombard Detention Basin area appears to have remained intact, it was not selected as an alternative for analysis in the 2016 Augusta Rocky Creek Flood Risk Management Study.

Rozella Road Detention Basin

The Rozella Road Detention Basin as a stand-alone alternative in the 2005 Draft Report would provide net benefits of \$90,000 and a BCR of 2.15-to-1. The Rozella Road Detention Basin would consist of a 34.3-acre detention basin with a capacity of 178.6 acre-feet and require the purchase of 28 parcels with houses on each property. A review of the county tax assessor's online database revealed that they were constructed in the 1950s. Cultural resources investigations would be required to identify and evaluate the buildings for the National Register of Historic Places. For these reasons, this alternative was not considered in the 2016 Augusta Rocky Creek Flood Risk Management Study.

Wheeless Detention Basin

The Wheeless plan consisted of a 21.5-acre detention basin with a capacity of 64.7 acre-feet. A review of 2014 aerial imagery showed recent construction in the vicinity of this proposed measure. Extensive residential construction occurred north of Milledgeville Road on Kennedy Circle and Sasser Drive from 2010 to 2013. New development in the floodplain adjacent to the footprint of the detention area increases risk of collateral damage that may require protection from nuisance flooding. Additionally, this alternative would require buyout and acquisition of 4 commercial automotive properties that may have HTRW issues. Because of this, the Wheeless Detention Basin alternative was not considered in the 2016 Augusta Rocky Creek Flood Risk Management Study.

Rosedale Detention Dam Area

The Rosedale Detention Dam Area as a stand-alone alternative or management measure in the 2005 Draft Report provided net benefits of \$76,000 and a BCR of 2.3-to-1. This alternative was a 14.2-acre detention basin with a capacity of 94.4 acre-feet. A review of aerial imagery showed that minimal construction had taken place in the vicinity of the proposed measure location and sufficient acreage still existed to construct this detention basin. New construction since 2005 is limited to a warehouse and church. Neither of these would be affected by this management measure nor alter the

effectiveness of this management measure. This management measure was carried forward for analysis in the 2016 Augusta Rocky Creek Flood Risk Management Study.

Kissingbower Road Buyout with Recreational Park

This non-structural management measure would remove existing structures and restore the land to the floodplain. This management measure would require the acquisition of five privately owned parcels and demolition of three buildings. A review of 2014 aerial imagery and the county tax assessor's database showed that no new development had occurred on these parcels or in the vicinity. The dates of construction for the buildings are listed as the 1950s. Cultural resources investigations would be required to identify and evaluate the buildings for the National Register of Historic Places. This management measure was carried forward for analysis in the 2016 Augusta Rocky Creek Flood Risk Management Study.

4.1 Summary

After evaluating in detail the seven management measures in the 2005 report, only one structural and one non-structural management measure were accepted for further analysis in the 2016 study. The structural measure was the Rosedale Dam Detention Area and the non-structural measure was the Kissingbower Buyout with Recreational Park. These two management measures were included in the PMP for the current study and four alternatives were derived from these two management measures.