

TABLE 1. LEVEE SAFETY ISSUES & RECOMMENDATIONS

<i>EAST and WEST LEVEES</i>						
Project Feature	Impact at 100-year Event? (ie - FEMA Certification Impact)		Impact at SPF Event?		ISSUE	RECOMMENDATION
	Impact?	Probable Failure Mode	Impact?	Probable Failure Mode		
DART Bridge, East Levee	Probable	Underseepage	Yes	Through Seepage Underseepage Slope Stability Breach	Severe erosion around each pier has occurred due to drainage from the bridge deck. Levee is severely degraded by bridge piers that penetrate approximately 1400-feet of levee crest.	Repair erosion immediately utilizing procedure described in PI. The impacts of this bridge on the protective works will be addressed as part of the rehabilitation of the floodway approved under WRDA 2007.
Gate Closures, East Levee	No	---	Yes	Breach	The sills of both gate closures have been removed.	Repairs to the sills need to be made immediately. Trial erection of closures needs to be performed.
Jail Construction, East Levee	Probable	Underseepage	Yes	Underseepage	Shortened seepage path resulting from basement excavation in close proximity to the levee toe. Jail contractor indicated that the basement excavation uncovered a large volume of waste material.	Obtain design documents for the jail facility (original facility and the new expansion) and evaluate the impacts of this encroachment on the protective works. Once impacts are determined, design and implement appropriate remedial actions to offset negative impacts on the levee.
Woodall Rodgers Bridge (aka - Margaret Hunt Hill Bridge)	Probable	Through Seepage Underseepage Slope Stability Accessibility	Yes	Through Seepage Underseepage Slope Stability Accessibility	Construction of the piers revealed large amounts of sand under and adjacent to the levee. Encroachment with essentially zero clearance above the levee crest prevents access and O&M.	The impacts of this bridge on the protective works need to be evaluated and <u>addressed immediately before construction of the deck begins</u> Additional field investigations are required to determine extent of problematic sand layers and to design appropriate remediation.
Encroachments & Penetrations Associated with Power Lines & Other Utilities	Probable	Through Seepage Underseepage Slope Stability	Probable	Through Seepage Underseepage Slope Stability	Hundreds of levee penetrations for power lines and other utilities exist throughout the floodway.	Each encroachment needs to be evaluated for impact on the protective works, to include O&M, surveillance and flood-fighting. Negative impacts that are identified should be mitigated without delay.
Bridges	Probable	Through Seepage Underseepage Slope Stability Breach Accessibility	Yes	Through Seepage Underseepage Slope Stability Breach Accessibility	The levees are degraded by bridge penetrations that allow preferential paths for seepage. Inadequate clearance at levee crest significantly restricts the ability to O&M, and perform surveillance and flood-fighting.	Encroachment impacts will be addressed as part of the rehabilitation of the floodway approved under WRDA 2007.
Crest Height	No	---	Yes	Overtopping	At least 47% (27,900') of the East Levee Crest is below SPF elevation. At least 42% (21,500') of the West Levee Crest is below SPF elevation.	Restoration of the crest to the SPF level will be addressed as part of the rehabilitation of the floodway approved under WRDA 2007.
Desiccation	Probable	Through Seepage Underseepage Slope Stability	Yes	Through Seepage Underseepage Slope Stability Breach	The levees are extensively cracked due to desiccation.	There are no easy corrections for desiccation cracking. Possible options include remove & replace, overbuild sections, and structural measures. Evaluate mitigation options, then perform a Cost Benefit Analysis to determine most viable corrective action.

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Vegetation	Yes	Conveyance Stability Seepage Erosion	Yes	Conveyance Stability Seepage Erosion	Vegetation growth is occurring in some locations along the toes of the levees. This threatens levee integrity and inhibits the ability to perform O&M, surveillance and flood-fighting.	Remove all vegetation (other than short grass cover) within 50-feet of the toes of the levee.
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RIVER CHANNELS (Elm Fork, West Fork, Trinity)						
Project Feature	Impact at 100-year Event? (ie - FEMA Certification Impact)		Impact at SPF Event?		ISSUE	RECOMMENDATION
	Impact?	Probable Failure Mode	Impact?	Probable Failure Mode		
Channel Instability	No	---	Probable	Stability	The river channel side slopes are oversteepened in places, indicating stability concerns.	Channel stability will be addressed as part of the rehabilitation of the floodway approved under WRDA 2007.
Erosion	No	---	Probable	Stability	Erosion threatens the stability of the channels. Erosion also threatens project access at the Belleview Outfall.	Eroded areas should be repaired as directed in the PI
Silt & Debris Removal	No	---	Yes	Overtopping	Silt and debris are reducing the capacity of the Floodway.	Silt & debris need to be removed. Removal of debris at channel constrictions such as bridges is especially important.
Vegetation	Yes	Conveyance Stability Seepage Erosion	Yes	Conveyance Stability Seepage Erosion	Vegetation growth is occurring in some locations along the channel. This reduces conveyance and inhibits the ability to perform O&M, surveillance and flood-fighting.	Remove all vegetation (other than short grass cover) within 50-feet of the top of river bank. Vegetation growing on the channel side slopes should be removed.
ROCHESTER LEVEE						
Gate Closure	No	---	Yes	Breach	The sill of one of the gate closures has been damaged.	Repairs to the closure need to be made immediately. Trial erection of closures at Rochester needs to be performed.
I-Wall	Probable	Stability	Probable	Stability	The sheet pile wall incorporated into one of the gate closures needs to be evaluated in accordance with current design criteria.	This wall will be evaluated, with any required modifications designed and constructed as part of the design of the DFE project,
MSE Wall	Probable	Through Seepage Underseepage Stability	Probable	Through Seepage Underseepage Stability	The MSE wall appears to be in active failure. Per EM 1110-2-2502, MSE walls are unsuitable for use as floodwalls.	As part of the design of the DFE project, mitigations to correct this wall will be designed and constructed.
CENTRAL WASTEWATER TREATMENT PLANT LEVEE						
Penetrations	Possible	Through Seepage Underseepage Stability	Probable	Through Seepage Underseepage Stability	Hundreds of penetrations have the potential to negatively impact performance at design flood levels	Need to determine if original levee design incorporated mitigations for these penetrations. If mitigations were not provided, additional investigations and analyses are required, and design of appropriate remediations needs to be undertaken. This effort will be accomplished as part of the design of the DFE project.