Appendix H
Cost

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Appendix H. Cost

1 COST ESTIMATE SUMMARY

1.1 GENERAL

The scope of this study is to complete a general reevaluation of the University City portion of the authorized project for the River Des Peres river system in University City, Missouri. It is a single-purpose study for flood risk reduction. This reevaluation will result in a report that will either update and confirm the authorized project or make a new recommendation. The study will evaluate and compare the benefits, costs, and impacts (positive or negative) of alternatives including the No Action Alternative. The study will identify whether an economically justified plan exists to reduce economic damages and life safety risk due to flooding. This report also incorporates the requirements of the National Environmental Policy Act (NEPA) to evaluate the proposed alternatives.

USACE proposes to address problems related to life-safety risks and economic damages associated with flood events generated from the River Des Peres river system in University City. The main life-safety risks include direct life loss, flooding of critical infrastructure, flooding of evacuation routes, and health concerns with flooded structures. Economic damages addressed include direct structure inundation (structure, content and vehicles), traffic disruption, and other associate emergency costs.

The following objectives have been developed for this GRR: 1) reduce life-safety risk due to flooding (including inundation of structures & public infrastructure) in University City over the 50-year period of analysis and 2) reduce economic damage due to flooding in University City over the period of analysis.

The structural alternatives that were evaluated for cost purposes were a combination of these three features:

- Detention Basin 3
- Detention Basin 4
- Levee/Floodwall 2a

Economics developed the preliminary nonstructural alternative costs. These were reviewed by cost engineering for content and consistency. Cost Engineering developed estimates for the Nonstructural Only (Alternative 6) and DB4 & Nonstructural Alternative (Alternative 8) Plans using parametric costs. The Nonstructural Only (Refined TSP) plan includes a combination of non-residential floodproofing, residential filling basements, and buyout of 75 structures. The DB4 & Nonstructural Alternative plan consists of Detention Basin 4 and nonstructural plan for 47 structures. The NED plan is Detention Basin 4 only.

A detailed cost estimate, abbreviated risk analysis, and construction schedule were developed for the recommended plan: Detention Basin 4.

1.2 BASIS OF COST ESTIMATE

The cost estimate has been prepared based on current concept designs and site specific information available to date.

Quantities were developed based on a conceptual model and provided directly from MVS Engineering and Construction Branch. For the earthwork quantities, the Civil Engineer developed a proposed terrain of the detention basin design and then used a tool in OpenRoads Designer to calculate the differences between the existing terrain and the proposed terrain. The other quantities (the culvert, the concrete weir structure, utility relocations, etc.) were all drawn in OpenRoads Designer and then the lengths and areas were measured, and the values were entered into the quantity spreadsheet. Information from OpenRoads included at the end of this appendix. There is a possibility quantities may increase during construction but cost impacts would be considered minimal and is captured in the abbreviated risk analysis as a possible risk with moderate impacts.

Cost estimate was developed using MCACES. Mobilization and demobilization was assumed to be 5% of the construction cost. Disposal quote was received from 370 Crossing Clean Landfill in Bridgeton, MO. The wage rates were developed using Davis Bacon, Heavy & Highway construction for St. Louis County, MO MO20210001 06/17/2022. The MII 2022 Equipment Region 5 was used for equipment rates. The 2022 Cost Book was used, and a 10% material escalation was applied due to inflation and supply chain issues.

1.3 CONTINGENCIES

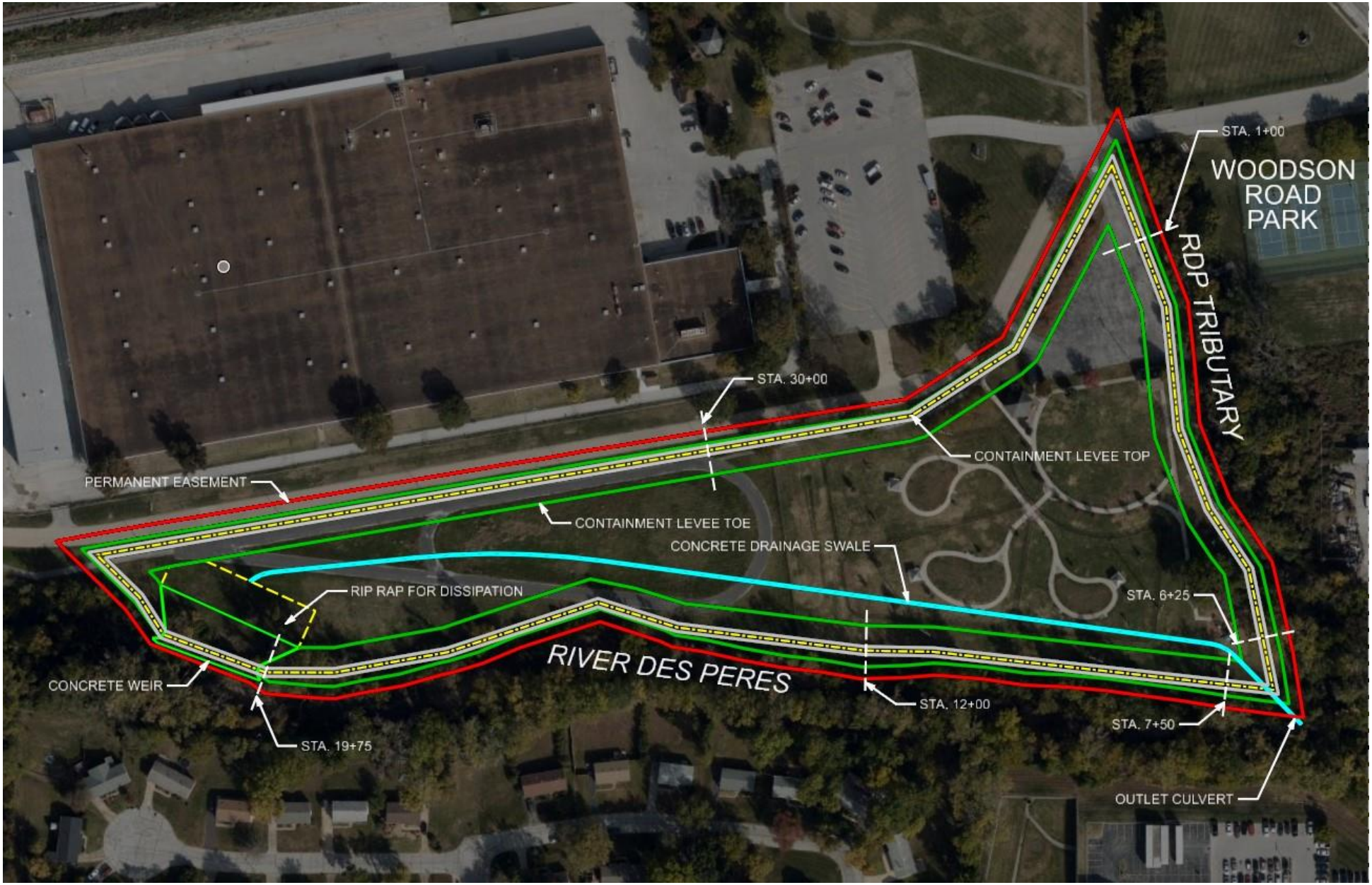
The Abbreviated Risk Analysis process indicated a 34.0% construction contingency based on associated project risks for Detention Basin 4.

1.4 PLANNING, ENGINEERING, AND DESIGN (PED)

Planning, engineering and design costs are based on historical data of similar projects in the St. Louis District. Recommended percentages by the cost MCX were taken into consideration as well. 18% of the construction cost was used to determine the PED costs.

1.5 CONSTRUCTION MANAGEMENT

Construction Management costs are based on historical data of similar projects in the St. Louis District. Recommended percentages by the cost MCX were taken into consideration as well. 10% of the construction cost was used to determine the CM costs.



River Des Peres – Detention Basin 4

STA. 1+00 – Corner Along the Tributary to River Des Peres

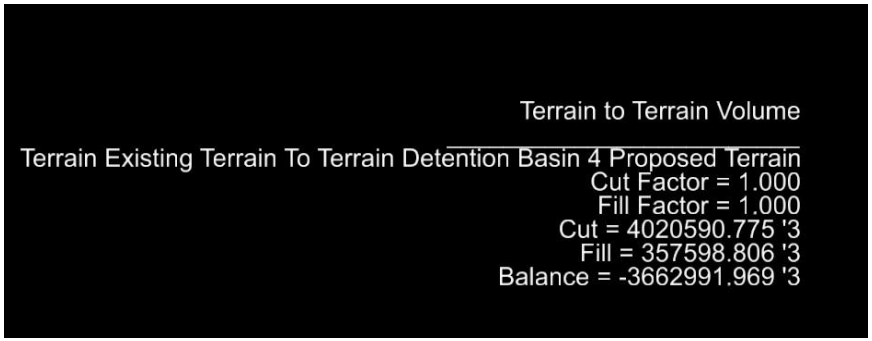
STA. 6+25 – Near the Outlet Culvert

STA. 7+50 – Near the Outlet Culvert

12+00 – High Point Along River Des Peres

STA. 19+75 – Near the Weir Control Structure

STA. 30+00 – Backside of Basin Along Roadway



Quantities from OpenRoads

WALLA WALLA COST ENGINEERING MANDATORY CENTER OF EXPERTISE

COST AGENCY TECHNICAL REVIEW

CERTIFICATION STATEMENT

For Project No. 490029

MVS – University City Branch, River Des Peres, Missouri
General Reevaluation Report (GRR)
Flood Risk Management Study

The University City Branch, River Des Peres Flood Risk Management Study, as presented by St Louis District, has undergone a successful Cost Agency Technical Review (Cost ATR), performed by the Walla Walla District Cost Engineering Mandatory Center of Expertise (Cost MCX) team. The Cost ATR included study of the project scope, report, cost estimates, schedules, escalation, and risk-based contingencies. This certification signifies the products meet the quality standards as prescribed in ER 1110-2-1150 Engineering and Design for Civil Works Projects and ER 1110-2-1302 Civil Works Cost Engineering.

As of October 20, 2022, the Cost MCX certifies the estimated total project cost:

FY23 Project First Cost: $13,507,000
Fully Funded Amount: $15,282,000

Cost Certification assumes Efficient Implementation (Funding). It remains the responsibility of the District to correctly reflect these cost values within the Final Report and to implement effective project management controls and implementation procedures including risk management through the period of Federal Participation.

2022.10.20
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Michael P. Jacobs, PE, CCE
Chief, Cost Engineering MCX
Walla Walla District

****** TOTAL PROJECT COST SUMMARY ******

PROJECT: **River Des Peres GRR**
PROJECT NO: P2 490029
LOCATION: University City, MO

DISTRICT: **MVS St. Louis District** **PREPARED:** **10/18/2022**
POC: **CHIEF, COST ENGINEERING, Brandon Lewis**

This Estimate reflects the scope and schedule in report; University City Branch, River Des Peres, Missouri General Reevaluation Report (GRR) with Integrated Environmental Assessment (EA) - A Flood Risk Management Study

Civil Works Work Breakdown Structure		ESTIMATED COST				PROJECT FIRST COST (Constant Dollar Basis)						TOTAL PROJECT COST (FULLY FUNDED)			
						Program Year (Budget EC): 2023									
						Effective Price Level Date: 1 OCT 22									
WBS NUMBER	Civil Works Feature & Sub-Feature Description	COST ($K)	CNTG ($K)	CNTG (%)	TOTAL ($K)	ESC (%)	COST ($K)	CNTG ($K)	**TOTAL ($K)**	Spent Thru: **1-Oct-21** ($K)	**TOTAL FIRST COST** ($K)	INFLATED (%)	COST ($K)	CNTG ($K)	FULL ($K)
A	*B*	*C*	*D*	*E*	*F*	*G*	*H*	*I*	*J*		*K*	*L*	*M*	*N*	*O*
02	RELOCATIONS	$585	$191	32.7%	$776	9.7%	$642	$210	$852	$0	$852	14.7%	$737	$241	$977
03	RESERVOIRS	$5,526	$1,807	32.7%	$7,333	9.7%	$6,064	$1,983	$8,046	$0	$8,046	14.7%	$6,957	$2,275	$9,232
	CONSTRUCTION ESTIMATE TOTALS:	$6,111	$1,998		$8,109	9.7%	$6,706	$2,193	$8,898	$0	$8,898	14.7%	$7,693	$2,516	$10,209
01	LANDS AND DAMAGES	$2,269	$0	0.0%	$2,269	10.5%	$2,507	$0	$2,507	$0	$2,507	9.0%	$2,732	$0	$2,732
30	PLANNING, ENGINEERING & DESIGN	$1,100	$184	16.7%	$1,284	4.1%	$1,145	$191	$1,336	$0	$1,336	10.5%	$1,266	$211	$1,477
31	CONSTRUCTION MANAGEMENT	$611	$125	20.4%	$736	4.1%	$636	$130	$766	$0	$766	12.8%	$718	$146	$864
	PROJECT COST TOTALS:	$10,091	$2,307	22.9%	$12,397		$10,994	$2,514	**$13,507**	$0	**$13,507**	13.1%	$12,408	$2,873	$15,282

ESTIMATED TOTAL PROJECT COST: **$15,282**

_____ **CHIEF, COST ENGINEERING, Brandon Lewis**

_____ **PROJECT MANAGER, Matt Jones**

_____ **CHIEF, REAL ESTATE, Lynn Hoerner**

_____ **CHIEF, PLANNING, xxx**

_____ **CHIEF, ENGINEERING, David Busse**

_____ **CHIEF, OPERATIONS, xxx**

_____ **CHIEF, CONSTRUCTION, xxx**

_____ **CHIEF, CONTRACTING,xxx**

_____ **CHIEF, PM-PB, xxxx**

_____ **CHIEF, DPM, xxx**

****** TOTAL PROJECT COST SUMMARY ******

****** CONTRACT COST SUMMARY ******

PROJECT: River Des Peres GRR
LOCATION: University City, MO
DISTRICT: MVS St. Louis District
POC: CHIEF, COST ENGINEERING, Brandon Lewis
PREPARED: 10/18/2022
This Estimate reflects the scope and schedule in report; University City Branch, River Des Peres, Missouri General Reevaluation Report (GRR) with Integrated Environmental Assessment (EA) - A Flood Risk Management Study

Civil Works Work Breakdown Structure		ESTIMATED COST				PROJECT FIRST COST (Constant Dollar Basis)				TOTAL PROJECT COST (FULLY FUNDED)				
		Estimate Prepared: / Effective Price Level:			28-Sep-22 / 1-Oct-21	Program Year (Budget EC): / Effective Price Level Date:			2023 / 1 OCT 22					
WBS NUMBER	Civil Works Feature & Sub-Feature Description	COST ($K)	CNTG ($K)	RISK BASED CNTG (%)	TOTAL ($K)	ESC (%)	COST ($K)	CNTG ($K)	TOTAL ($K)	Mid-Point Date	INFLATED (%)	COST ($K)	CNTG ($K)	FULL ($K)
A	*B*	*C*	*D*	*E*	*F*	*G*	*H*	*I*	*J*	*P*	*L*	*M*	*N*	*O*
	Detention Basin 4													
02	RELOCATIONS	$585	$191	32.7%	$776	9.7%	$642	$210	$852	2028Q2	14.7%	$737	$241	$977
03	RESERVOIRS	$5,526	$1,807	32.7%	$7,333	9.7%	$6,064	$1,983	$8,046	2028Q2	14.7%	$6,957	$2,275	$9,232
	CONSTRUCTION ESTIMATE TOTALS:	$6,111	$1,998	32.7%	**$8,109**		$6,706	$2,193	$8,898			$7,693	$2,516	$10,209
01	LANDS AND DAMAGES	$2,269	$0	0.0%	$2,269	10.5%	$2,507	$0	$2,507	2026Q2	9.0%	$2,732	$0	$2,732
30	PLANNING, ENGINEERING & DESIGN													
2.0%	Project Management	$122	$20	16.7%	$143	4.1%	$127	$21	$148	2027Q1	9.8%	$140	$23	$163
1.0%	Planning & Environmental Compliance	$61	$10	16.7%	$71	4.1%	$64	$11	$74	2027Q1	9.8%	$70	$12	$81
8.0%	Engineering & Design	$489	$82	16.7%	$570	4.1%	$509	$85	$594	2027Q1	9.8%	$559	$93	$652
1.0%	Reviews, ATRs, IEPRs, VE	$61	$10	16.7%	$71	4.1%	$64	$11	$74	2027Q1	9.8%	$70	$12	$81
0.5%	Life Cycle Updates (cost, schedule, risks)	$31	$5	16.7%	$36	4.1%	$32	$5	$37	2027Q1	9.8%	$35	$6	$41
0.5%	Contracting & Reprographics	$31	$5	16.7%	$36	4.1%	$32	$5	$37	2027Q1	9.8%	$35	$6	$41
3.0%	Engineering During Construction	$183	$31	16.7%	$214	4.1%	$191	$32	$223	2028Q2	12.8%	$215	$36	$251
1.0%	Planning During Construction	$61	$10	16.7%	$71	4.1%	$64	$11	$74	2028Q2	12.8%	$72	$12	$84
0.5%	Adaptive Management & Monitoring	$31	$5	16.7%	$36	4.1%	$32	$5	$37	2028Q2	12.8%	$36	$6	$42
0.5%	Project Operations	$31	$5	16.7%	$36	4.1%	$32	$5	$37	2027Q1	9.8%	$35	$6	$41
31	CONSTRUCTION MANAGEMENT													
9.0%	Construction Management	$550	$112	20.4%	$662	4.1%	$573	$117	$689	2028Q2	12.8%	$646	$132	$778
0.5%	Project Operation:	$31	$6	20.4%	$37	4.1%	$32	$6	$38	2028Q2	12.8%	$36	$7	$43
0.5%	Project Management	$31	$6	20.4%	$37	4.1%	$32	$6	$38	2028Q2	12.8%	$36	$7	$43
	CONTRACT COST TOTALS:	$10,091	$2,307		$12,397		$10,994	$2,514	**$13,507**			$12,408	$2,873	**$15,282**

River Des Peres TSP Estimate

Estimated by	
Designed by	
Prepared by	Michelle Puzach
Preparation Date	1/31/2022
Effective Date of Pricing	1/31/2022
Estimated Construction Time	Days

Date	Author	Note
7/27/2022		The scope of this study is to complete a general reevaluation of the University City portion of the authorized project for the River Des Peres river system in University City, Missouri. It is a single-purpose study for flood risk reduction. This reevaluation will result in a report that will either update and confirm the authorized project or make a new recommendation. The study will evaluate and compare the benefits, costs, and impacts (positive or negative) of alternatives including the No Action Alternative. The study will identify whether an economically justified plan exists to reduce economic damages and life safety risk due to flooding. This report also incorporates the requirements of the National Environmental Policy Act (NEPA) to evaluate the proposed alternatives.USACE proposes to address problems related to life-safety risks and economic damages associated with flood events generated from the River Des Peres river system in University City. The main life-safety risks include direct life loss, flooding of critical infrastructure, flooding of evacuation routes, and health concerns with flooded structures. Economic damages addressed include direct structure inundation (structure, content and vehicles), traffic disruption, and other associate emergency costs.The following objectives have been developed for this GRR: 1) reduce life-safety risk due to flooding (including inundation of structures & public infrastructure) in University City over the 50-year period of analysis and 2) reduce economic damage due to flooding in University City over the period of analysis.The structural alternatives that were evaluated for cost purposes were a combination of these three features:Detention Basin 3Detention Basin 4Levee/Floodwall 2aEconomics developed the preliminary nonstructural alternative costs. These were reviewed by cost engineering for content and consistency. Cost Engineering developed estimates for the Nonstructural Only (Alternative 6) and DB4 & Nonstructural Alternative (Alternative 8) Plans using parametric costs. The Nonstructural Only (Refined TSP) plan includes a combination of non-residential floodproofing, residential filling basements, and buyout of 75 structures. The DB4 & Nonstructural Alternative plan consists of Detention Basin 4 and nonstructural plan for 47 structures. The NED plan is Detention Basin 4 only. A detailed cost estimate, abbreviated risk analysis, and construction schedule were developed for the recommended plan: Detention Basin 4.

Description	Quantity	UOM	ProjectCost
Summary Cost			**7,821,752.06**
			585,081.87
02 RELOCATIONS	**1**	**EA**	**585,081.87**
			5,525,670.19
03 RESERVOIRS	**1**	**EA**	**5,525,670.19**
			1,100,000.00
30 PLANNING, ENGINEERING, AND DESIGN	**1**	**EA**	**1,100,000.00**
			611,000.00
31 CONSTRUCTION MANAGEMENT	**1**	**EA**	**611,000.00**

Abbreviated Risk Analysis

Project (less than $40M): **River Des Peres** **Alternative: Detention Basin 4**

Project Development Stage/Alternative: **Feasibility (Recommended Plan)**

Risk Category: **Moderate Risk: Typical Project Construction Type** **Meeting Date: 2/7/2022**

Total Estimated Construction Contract Cost = $ 6,110,752

	CWWBS	Feature of Work	Estimated Cost		% Contingency	$ Contingency	Total
	01 LANDS AND DAMAGES	Real Estate	$ 2,759,281		0%	$ -	$ 2,759,281
1	03 RESERVOIRS	**Demolition**	$ 355,032		21%	$ 73,076	$ 428,109
2	03 RESERVOIRS	**Excavation**	$ 3,487,275		26%	$ 898,289	$ 4,385,564
3	03 RESERVOIRS	**Disposal Fee**	$ 540,419		30%	$ 159,732	$ 700,151
4	03 RESERVOIRS	**Containment Levee**	$ 239,679		63%	$ 151,138	$ 390,817
5	03 RESERVOIRS	**Weir Control Structure**	$ 554,377		95%	$ 527,408	$ 1,081,785
6	03 RESERVOIRS	**Establishment of Turf**	$ 58,888		21%	$ 12,121	$ 71,009
7	02 RELOCATIONS	**Relocate Utilities/Dog Park Improvements**	$ 585,082		21%	$ 120,428	$ 705,509.57
8			$ -		0%	$ -	$ -
9			$ -		0%	$ -	$ -
10			$ -		0%	$ -	$ -
11			$ -		0%	$ -	$ -
12	All Other	**Remaining Construction Items**	$ 290,000	*5.0%*	19%	$ 53,965	$ 343,965
13	30 PLANNING, ENGINEERING, AND DESIGN	**Planning, Engineering, & Design**	$ 1,099,935		17%	$ 184,183	$ 1,284,118
14	31 CONSTRUCTION MANAGEMENT	**Construction Management**	$ 611,075		20%	$ 124,469	$ 735,544
XX	FIXED DOLLAR RISK ADD (EQUALLY DISPERSED TO ALL, MUST INCLUDE JUSTIFICATION SEE BELOW)					$ -	

Totals					
Real Estate	$ 2,759,281	0%	$ -	$ 2,759,281.23	
Total Construction Estimate	$ 6,110,752	32.7%	$ 1,996,158	$ 8,106,910	
Total Planning, Engineering & Design	$ 1,099,935	16.7%	$ 184,183	$ 1,284,118	
Total Construction Management	$ 611,075	20.4%	$ 124,469	$ 735,544	
Total Excluding Real Estate	**$ 7,821,763**	**29.5%**	**$ 2,304,809**	**$ 10,126,572**	
		Base	**50%**	**80%**	
Confidence Level Range Estimate ($000's)		$7,822k	$9,205k	$10,127k	

* 50% based on base is at 5% CL.

Fixed Dollar Risk Add: (Allows for additional risk to be added to the risk analsyis. Must include justification. Does not allocate to Real Estate.	

River Des Peres Detention Basin 4

Feasibility (Recommended Plan)

Abbreviated Risk Analysis

Meeting Date: 7-Feb-22

Risk Level

	Negligible	Marginal	Moderate	Significant	Critical
Very Likely	2	3	4	5	5
Likely	1	2	3	4	5
Possible	0	1	2	3	4
Unlikely	0	0	1	2	3

Risk Register

Risk Element	Feature of Work	Concerns	PDT Discussions & Conclusions (Include logic & justification for choice of Likelihood & Impact)	Impact	Likelihood	Risk Level
Project Management & Scope Growth				**Maximum Project Growth**		**75%**
PS-1	Demolition	• Potential for scope growth, added features?	Design is in preliminary stages. Potential for added features during P&S to address issues not currently being assessed.	Negligible	Likely	1
PS-2	Excavation	• Potential for scope growth, added features?	Design is in preliminary stages. Potential for added features during P&S to address issues not currently being assessed.	Marginal	Likely	2
PS-3	Disposal Fee	• Potential for scope growth, added features?	Design is in preliminary stages. Potential for added features during P&S to address issues not currently being assessed.	Marginal	Likely	2
PS-4	Containment Levee	• Potential for scope growth, added features?	Design is in preliminary stages. Potential for added features during P&S to address issues not currently being assessed. Exploration has not been done yet on the material properties at this location. Seepage and stability considerations still need to be determined. Scour protection: amount, location, extent, size, type not yet determined.	Significant	Likely	4
PS-5	Weir Control Structure	• Potential for scope growth, added features?	Design is in preliminary stages. Potential for added features during P&S to address issues not currently being assessed. Exploration has not been done yet on the material properties at this location. Need for a pile founded foundation is possible. Transition between weir and embankment currently unknown, may require sheet pile for transition.	Significant	Very LIKELY	5
PS-6	Establishment of Turf	• Potential for scope growth, added features?	Design is in preliminary stages. Potential for added features during P&S to address issues not currently being assessed.	Negligible	Likely	1
PS-7	Relocate Utilities/Dog Park Improvements	• Potential for scope growth, added features?	Design is in preliminary stages. Potential for added features during P&S to address issues not currently being assessed.	Negligible	Likely	1
PS-12	Remaining Construction Items	• Potential for scope growth, added features?	Design is in preliminary stages. Potential for added features during P&S to address issues not currently being assessed.	Negligible	Likely	1
PS-13	Planning, Engineering, & Design	• Potential for scope growth, added features?	Design is in preliminary stages. Potential for added features during P&S to address issues not currently being assessed.	Marginal	Possible	1
PS-14	Construction Management	• Potential for scope growth, added features?	Design is in preliminary stages. Potential for added features during P&S to address issues not currently being assessed.	Marginal	Possible	1
Acquisition Strategy				**Maximum Project Growth**		**30%**

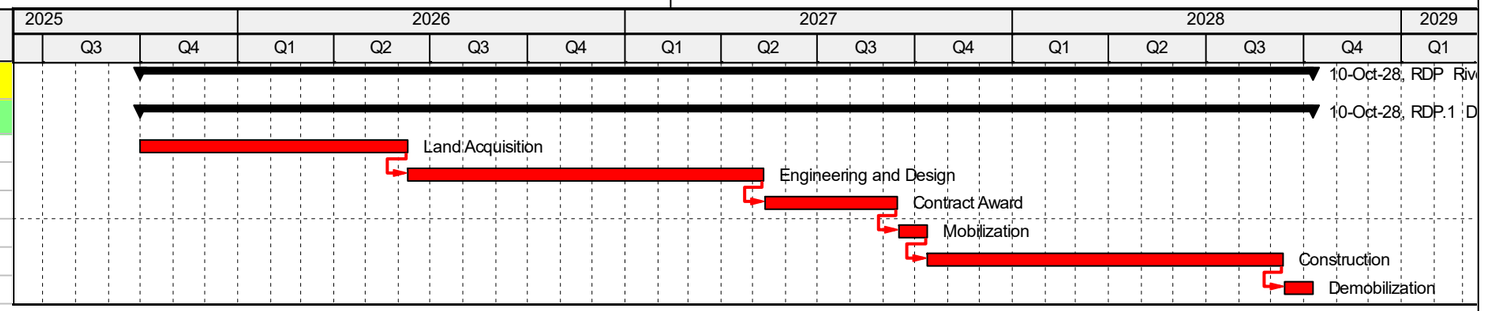
AS-1	Demolition	• Contracting plan firmly established? • 8a or small business likely?	Acquisition strategy not yet determined, but the project is too large to be considered for 8A set aside.	Negligible	Possible	0
AS-2	Excavation	• Contracting plan firmly established? • 8a or small business likely?	Acquisition strategy not yet determined, but the project is too large to be considered for 8A set aside.	Negligible	Possible	0
AS-3	Disposal Fee	• Contracting plan firmly established? • 8a or small business likely?	Acquisition strategy not yet determined, but the project is too large to be considered for 8A set aside.	Negligible	Possible	0
AS-4	Containment Levee	• Contracting plan firmly established? • 8a or small business likely?	Acquisition strategy not yet determined, but the project is too large to be considered for 8A set aside.	Negligible	Possible	0
AS-5	Weir Control Structure	• Contracting plan firmly established? • 8a or small business likely?	Acquisition strategy not yet determined, but the project is too large to be considered for 8A set aside.	Negligible	Unlikely	0
AS-6	Establishment of Turf	• Contracting plan firmly established? • 8a or small business likely?	Acquisition strategy not yet determined, but the project is too large to be considered for 8A set aside.	Negligible	Unlikely	0
AS-7	Relocate Utilities/Dog Park Improvements	• Contracting plan firmly established? • 8a or small business likely?	Acquisition strategy not yet determined, but the project is too large to be considered for 8A set aside.	Negligible	Unlikely	0
AS-12	Remaining Construction Items	• Contracting plan firmly established? • 8a or small business likely?	Acquisition strategy not yet determined, but the project is too large to be considered for 8A set aside.	Negligible	Unlikely	0
AS-13	Planning, Engineering, & Design	• Contracting plan firmly established? • 8a or small business likely?	Acquisition strategy is not expected to affect PED.	Negligible	Possible	0
AS-14	Construction Management	• Contracting plan firmly established? • 8a or small business likely?	Acquisition strategy is not expected to affect CM.	Negligible	Possible	0
Construction Elements				**Maximum Project Growth**		**25%**
CON-1	Demolition	• Accelerated schedule or harsh weather schedule? • High risk or complex construction elements, site access, in-water?	Site access will be complicated with this detention basin location directly off of a main road. Congestion and traffic may slow down the many trucks that will be required to haul material from the site. Addressed in Cost Estimate Assumptions.	Negligible	Unlikely	0
CE-2	Excavation	• Accelerated schedule or harsh weather schedule? • High risk or complex construction elements, site access, in-water?	Site access will be complicated with this detention basin location directly off of a main road. Congestion and traffic may slow down the many trucks that will be required to haul material from the site. Addressed in Cost Estimate Assumptions.	Negligible	Unlikely	0
CE-3	Disposal Fee	• Accelerated schedule or harsh weather schedule? • High risk or complex construction elements, site access, in-water?	Site access will be complicated with this detention basin location directly off of a main road. Congestion and traffic may slow down the many trucks that will be required to haul material from the site. Addressed in Cost Estimate Assumptions.	Negligible	Unlikely	0
CE-4	Containment Levee	• Accelerated schedule or harsh weather schedule? • High risk or complex construction elements, site access, in-water?	Site access will be complicated with this detention basin location directly off of a main road. Congestion and traffic may slow down the many trucks that will be required to haul material from the site. Addressed in Cost Estimate Assumptions.	Negligible	Unlikely	0
CE-5	Weir Control Structure	• Accelerated schedule or harsh weather schedule? • High risk or complex construction elements, site access, in-water?	Site access will be complicated with this detention basin location directly off of a main road. Congestion and traffic may slow down the many trucks that will be required to haul material from the site. Addressed in Cost Estimate Assumptions.	Negligible	Unlikely	0

CE-6	Establishment of Turf	• Accelerated schedule or harsh weather schedule? • High risk or complex construction elements, site access, in-water?	Site access will be complicated with this detention basin location directly off of a main road. Congestion and traffic may slow down the many trucks that will be required to haul material from the site. Addressed in Cost Estimate Assumptions.	Negligible	Unlikely	0
CE-7	Relocate Utilities/Dog Park Improvements	• Accelerated schedule or harsh weather schedule? • High risk or complex construction elements, site access, in-water?	Site access will be complicated with this detention basin location directly off of a main road. Congestion and traffic may slow down the many trucks that will be required to haul material from the site. Addressed in Cost Estimate Assumptions.	Negligible	Unlikely	0
CE-12	Remaining Construction Items	• Accelerated schedule or harsh weather schedule? • High risk or complex construction elements, site access, in-water?	Site access will be complicated with this detention basin location directly off of a main road. Congestion and traffic may slow down the many trucks that will be required to haul material from the site. Addressed in Cost Estimate Assumptions.	Negligible	Unlikely	0
CE-13	Planning, Engineering, & Design	• Accelerated schedule or harsh weather schedule? • High risk or complex construction elements, site access, in-water?	Site access will not affect PED.	Negligible	Unlikely	0
CE-14	Construction Management	• Accelerated schedule or harsh weather schedule? • High risk or complex construction elements, site access, in-water?	Site access complications may increase the need for construction management. Additional shifts may be required.	Moderate	Possible	2
Specialty Construction or Fabrication				**Maximum Project Growth**		**65%**
SC-1	Demolition	N/A		Negligible	Unlikely	0
SC-2	Excavation	N/A		Negligible	Unlikely	0
SC-3	Disposal Fee	N/A		Negligible	Unlikely	0
SC-4	Containment Levee	N/A		Negligible	Unlikely	0
SC-5	Weir Control Structure	N/A		Negligible	Unlikely	0
SC-6	Establishment of Turf	N/A		Negligible	Unlikely	0
SC-7	Relocate Utilities/Dog Park Improvements	N/A		Negligible	Unlikely	0
SC-12	Remaining Construction Items	N/A		Negligible	Unlikely	0
SC-13	Planning, Engineering, & Design	N/A		Negligible	Unlikely	0
SC-14	Construction Management	N/A		Negligible	Unlikely	0
Technical Design & Quantities				**Maximum Project Growth**		**30%**
T-1	Demolition	• Level of confidence based on design and assumptions? • Possibility for increased quantities due to loss, waste, or subsidence?	Quantities are based off preliminary design and rough estimates. Possible to increase as design and testing is done.	Marginal	Possible	1

T-2	Excavation	• Level of confidence based on design and assumptions? • Possibility for increased quantities due to loss, waste, or subsidence?	Quantities are based off preliminary design and rough estimates. Possible to increase as design and testing is done.	Moderate	Possible	2
T-3	Disposal Fee	• Level of confidence based on design and assumptions? • Possibility for increased quantities due to loss, waste, or subsidence?	Quantities are based off preliminary design and rough estimates. Possible to increase as design and testing is done. If hazardous material is found in soil, disposal costs would increase dramatically.	Significant	Possible	3
T-4	Containment Levee	• Level of confidence based on design and assumptions? • Possibility for increased quantities due to loss, waste, or subsidence?	Quantities are based off preliminary design and rough estimates. Possible to increase as design and testing is done. If none of the material excavated is able to be reused for the containment levee and material needs to be purchased, this could increase the cost. Overbuild needed to account for settling not included in original quantities.	Significant	Likely	4
T-5	Weir Control Structure	• Level of confidence based on design and assumptions? • Possibility for increased quantities due to loss, waste, or subsidence?	Quantities are based off preliminary design and rough estimates. Possible to increase as design and testing is done.	Moderate	Possible	2
T-6	Establishment of Turf	• Level of confidence based on design and assumptions? • Possibility for increased quantities due to loss, waste, or subsidence?	Quantities are based off preliminary design and rough estimates. Possible to increase as design and testing is done.	Negligible	Likely	1
T-7	Relocate Utilities/Dog Park Improvements	• Level of confidence based on design and assumptions? • Possibility for increased quantities due to loss, waste, or subsidence?	Quantities are based off preliminary design and rough estimates. Possible to increase as design and testing is done.	Negligible	Likely	1
T-12	Remaining Construction Items			Negligible	Unlikely	0
T-13	Planning, Engineering, & Design	• Level of confidence based on design and assumptions? • Possibility for increased quantities due to loss, waste, or subsidence?	Quantities will be refined as design develops. No additional cost for PED for this item.	Negligible	Unlikely	0
T-14	Construction Management	• Level of confidence based on design and assumptions? • Possibility for increased quantities due to loss, waste, or subsidence?	Quantities will be refined as design develops. No additional cost for CM for this item.	Negligible	Unlikely	0
Cost Estimate Assumptions				**Maximum Project Growth**		**35%**
EST-1	Demolition	• Site accessibility, transport delays, congestion?	Site access will be complicated with this detention basin location directly off of a main road. Congestion and traffic may slow down the many trucks that will be required to haul material from the site.	Marginal	Likely	2
EST-2	Excavation	• Site accessibility, transport delays, congestion?	Site access will be complicated with this detention basin location directly off of a main road. Congestion and traffic may slow down the many trucks that will be required to haul material from the site.	Marginal	Likely	2
EST-3	Disposal Fee	• Site accessibility, transport delays, congestion?	Site access will be complicated with this detention basin location directly off of a main road. Congestion and traffic may slow down the many trucks that will be required to haul material from the site.	Marginal	Likely	2
EST-4	Containment Levee	• Site accessibility, transport delays, congestion?	Site access will be complicated with this detention basin location directly off of a main road. Congestion and traffic may slow down the many trucks that will be required to haul material from the site.	Marginal	Likely	2
EST-5	Weir Control Structure	• Site accessibility, transport delays, congestion?	Site access will be complicated with this detention basin location directly off of a main road. Congestion and traffic may slow down the many trucks that will be required to haul material from the site.	Marginal	Likely	2
EST-6	Establishment of Turf	• Site accessibility, transport delays, congestion?	Site access will be complicated with this detention basin location directly off of a main road. Congestion and traffic may slow down the many trucks that will be required to haul material from the site.	Marginal	Likely	2
EST-7	Relocate Utilities/Dog Park Improvements	• Site accessibility, transport delays, congestion?	Site access will be complicated with this detention basin location directly off of a main road. Congestion and traffic may slow down the many trucks that will be required to haul	Marginal	Likely	2

EST-12	Remaining Construction Items	• Site accessibility, transport delays, congestion?	Site access will be complicated with this detention basin location directly off of a main road. Congestion and traffic may slow down the many trucks that will be required to haul material from the site.	Marginal	Likely	2
EST-13	Planning, Engineering, & Design	• Site accessibility, transport delays, congestion?	Site access will not affect PED.	Negligible	Unlikely	0
EST-14	Construction Management	• Site accessibility, transport delays, congestion?	Site access complications may increase the need for construction management. Additional shifts may be required. Addressed in Construction Elements.	Negligible	Unlikely	0
External Project Risks				**Maximum Project Growth**		**40%**
EX-1	Demolition	• Political influences, lack of support, obstacles?	This may be difficult to get real estate for. Public may not be supportive. Could delay the project or cause changes in design.	Marginal	Possible	1
EX-2	Excavation	• Political influences, lack of support, obstacles?	This may be difficult to get real estate for. Public may not be supportive. Could delay the project or cause changes in design.	Marginal	Possible	1
EX-3	Disposal Fee	• Political influences, lack of support, obstacles?	This may be difficult to get real estate for. Public may not be supportive. Could delay the project or cause changes in design.	Marginal	Possible	1
EX-4	Containment Levee	• Political influences, lack of support, obstacles?	This may be difficult to get real estate for. Public may not be supportive. Could delay the project or cause changes in design.	Marginal	Possible	1
EX-5	Weir Control Structure	• Political influences, lack of support, obstacles?	This may be difficult to get real estate for. Public may not be supportive. Could delay the project or cause changes in design.	Marginal	Possible	1
EX-6	Establishment of Turf	• Political influences, lack of support, obstacles?	This may be difficult to get real estate for. Public may not be supportive. Could delay the project or cause changes in design.	Marginal	Possible	1
EX-7	Relocate Utilities/Dog Park Improvements	• Political influences, lack of support, obstacles?	This may be difficult to get real estate for. Public may not be supportive. Could delay the project or cause changes in design.	Marginal	Possible	1
EX-12	Remaining Construction Items	• Political influences, lack of support, obstacles?	This may be difficult to get real estate for. Public may not be supportive. Could delay the project or cause changes in design.	Marginal	Possible	1
EX-13	Planning, Engineering, & Design	• Political influences, lack of support, obstacles?	This may be difficult to get real estate for. Public may not be supportive. Could delay the project or cause changes in design.	Marginal	Likely	2
EX-14	Construction Management	• Political influences, lack of support, obstacles?	This may be difficult to get real estate for. Public may not be supportive. Could delay the project or cause changes in design.	Marginal	Likely	2

Activity ID	Activity Name	Original Duration	Start	Finish
RDP	**River Des Peres**	790	01-Oct-25	10-Oct-28
RDP.1	**Detention Basin 4**	790	01-Oct-25	10-Oct-28
A1000	Land Acquisition	180	01-Oct-25*	09-Jun-26
A1010	Engineering and Design	240	10-Jun-26	11-May-27
A1020	Contract Award	90	12-May-27	14-Sep-27
A1030	Mobilization	20	15-Sep-27	12-Oct-27
A1040	Construction	240	13-Oct-27	12-Sep-28
A1050	Demobilization	20	13-Sep-28	10-Oct-28



Actual Work
Remaining Work
Critical Remaining Work
Milestone
Summary

TASK filter: All Activities

River Des Peres

9/23/2021

Detention Basin 3

ITEM	ESTIMATED AMOUNT	
Lands and Damages	$12,650,000	
Real Estate Federal Admin Costs	$91,440	
Mobilization and Demobilization	$690,000	
Demolition		
Building Demolition	$3,881,000	
Site Demolition	$1,150,000	
Building/Pavement Disposal Fee	$170,448	
Excavation	$6,840,460	
Soil Disposal Fee	$1,402,610	
Containment Levee	$15,200	
Weir Control Structure		
Concrete Wing Walls	$42,250	
Concrete Swale	$17,472	
Rip Rap	$35,040	
Bedding Stone	$14,625	
Concrete Weir	$160,000	
Culvert	$85,030	
Establishment of Turf	$66,600	
Construction SUBTOTAL:	$14,570,735	
E & D :	$2,620,000	18%
S & A :	$1,460,000	10%
Contingency:	$5,222,000	28%
Lands and Damages:	$12,741,440	
Subtotal:	$36,614,175	
Escalate to FY23 Price Level:	$3,566,221	9.74%
TOTAL COST:	**$40,180,396**	

River Des Peres

9/23/2021

Detention Basin 4

ITEM	ESTIMATED AMOUNT	
Lands and Damages	$2,057,220	
Real Estate Federal Admin Costs	$91,440	
Mobilization and Demobilization	$200,000	
Demolition		
Building Demolition	$31,100	
Site Demolition	$253,000	
Building/Pavement Disposal Fee	$13,568	
Excavation	$2,784,430	
Soil Disposal Fee	$527,332	
Containment Levee	$198,750	
Weir Control Structure		
Concrete Wing Walls	$84,500	
Concrete Swale	$38,220	
Rip Rap	$31,350	
Bedding Stone	$20,400	
Concrete Weir	$224,000	
Culvert	$87,400	
Establishment of Turf	$39,960	
Construction SUBTOTAL:	$4,534,010	
E & D :	$816,000	18%
S & A :	$453,000	10%
Contingency:	$1,915,000	33%
Lands and Damages:	$2,148,660	
Subtotal:	$9,866,670	
Escalate to FY23 Price Level:	$961,014	9.74%
TOTAL COST:	**$10,827,683**	

River Des Peres

9/23/2021

Levee/Floodwall 2A

ITEM	ESTIMATED AMOUNT	
Lands and Damages	$5,400,000	
Real Estate Federal Admin Costs	$270,000	
Mobilization and Demobilization	$930,000	
Levee	$98,175	
Automatic Flood Gates	$4,390,000	
Floodwall		
Structural Excavation	$640,000	
Structural Backfill	$895,440	
Concrete	$1,816,416	
Reinforcing Steel	$1,401,000	
Concrete Formwork	$2,340,000	
Sheet Piles	$6,246,950	
Waterstop	$282,000	
Joint Filler	$120,000	
Pavement & Sidewalks	$371,000	
Construction SUBTOTAL:	$19,530,981	
E & D :	$3,516,000	18%
S & A :	$1,953,000	10%
Contingency:	$10,500,000	42%
Lands and Damages:	$5,670,000	
Subtotal:	$41,169,981	
Escalate to FY23 Price Level:	$4,009,956	9.74%
TOTAL COST:	**$45,179,937**	

River Des Peres

12/1/2021

Non-Structural Portion, DB4 & Nonstructural Alternative

ITEM	ESTIMATED AMOUNT		
	Real Estate	**Construction Cost**	
Real Estate for Non-Residential Floodproofing	$1,800,000		
Non-Residential Floodproofing		$2,670,000	
Real Estate for Residential Floodproofing	$4,296,000		
Residential Floodproofing		$2,784,000	
Real Estate for Residential Buyout	$2,357,000		
Residential Buyout		$463,000	
Real Estate Federal Admin Cost	$845,300		
RE SUBTOTAL:	$9,298,300		
CONSTRUCTION SUBTOTAL:		$5,917,000	
E & D :		$1,065,000	18%
S & A :		$592,000	10%
Contingency:		$3,711,000	49%
Subtotal:	$20,583,300		
Escalate to FY23 Price Level:	$2,004,813		9.74%
TOTAL COST:	**$22,588,113**		

River Des Peres

12/1/2021

Non-Structural Only

ITEM	ESTIMATED AMOUNT		
	Real Estate	Construction Cost	
Real Estate for Non-Residential Floodproofing	$4,000,000		
Non-Residential Floodproofing		$5,093,000	
Real Estate for Residential Floodproofing	$3,698,000		
Residential Floodproofing		$1,626,000	
Real Estate for Residential Buyout	$5,168,000		
Residential Buyout		$847,000	
Real Estate Federal Admin Cost	$1,286,600		
RE SUBTOTAL:	$14,152,600		
CONSTRUCTION SUBTOTAL:		$7,566,000	
E & D :		$1,362,000	18%
S & A :		$757,000	10%
Contingency:		$4,746,000	49%
Subtotal:	$28,583,600		
Escalate to FY23 Price Level:	$2,784,043		9.74%
TOTAL COST:	**$31,367,643**		