

MID-AMERICA REGIONAL COUNCIL
LITTLE BLUE RIVER WATERSHED FEASIBILITY STUDY – PHASE TWO

AGREEMENT

PARTIES: **City of Lee’s Summit, MO (City) and Mid-America Regional Council, (“MARC”)**

R E C I T A L S:

1. Dramatic changes in the Little Blue River’s basin conditions related to urbanization and other factors are causing increased frequency of flooding and rapid erosion that threatens the large federal investment and other significant public infrastructure, as well as the protected communities and installations. If continued unchecked, the adverse effects of the transforming watershed will cause significant deterioration to the federal flood-protection projects, increasing damage to critical infrastructure, wildlife habitat and public recreation investment. A comprehensive watershed study is required to unite the communities and agencies in the leveraging of resources for the protection of federal investment, infrastructure, habitat conservation, and storm water management allowing for increased economic benefits to the area.
2. The United States Army Corps of Engineers (“Corps”) has authorization to conduct a comprehensive Little Blue River Watershed Feasibility Study in partnership with local communities that determines the causes and potential solutions to demonstrated watershed impacts. The authorization provides for federal support for one-half of study costs. The other half of study costs will be contributed by local partners (“Stakeholders”).
3. In the first phase of this project, completed on March 31, 2022, the Corps developed a Project Management Plan, or a detailed scope of work, schedule and budget for the overall initiative. Phase One was carried out in coordination with local Stakeholders. Phase Two will implement the scope of work developed in Phase One with similar levels of stakeholder coordination, participation, and agreement.
4. The Project leverages substantial resources from a variety of Stakeholders. The following cities, counties and agencies have agreed to participate in Phase Two of the Little Blue River Feasibility Study:
 - Cities of Belton, Blue Springs, Grandview, Independence, Kansas City, Lee’s Summit and Raytown in Missouri
 - Jackson County, Missouri,
 - Mid-America Regional Council, and
 - United States Army Corps of Engineers, Kansas City District.
5. The Stakeholders requested that MARC serve as the official “Non-Federal Sponsor” to enter into an agreement with the Corps to conduct the study. MARC will coordinate and facilitate Stakeholder support, participation, and contributions to the upcoming study.

Further, MARC will help assure that the Stakeholders' needs are addressed during the study, including but not limited to the following:

- Long-term viability of federal infrastructure investments
- Reliable flood protection along the Little Blue River and its tributaries
- Stable tributary channels, riverbanks and bed elevation, and
- Natural habitat and ecosystem protection and restoration.

PURPOSE: The City of Lee's Summit, Missouri is interested in participating in the implementation of the Project Management Plan developed during Phase One of the Little Blue River Feasibility Study ("Project").

PROJECT COST Total project costs, along with costs for Phases One and Two are shown for all participating communities in Attachment A.

For the City, the total project cost for Phases One and Two is \$346,998. Cost for Phase Two is \$344,998.

The overall project budget of \$3,000,000 is shown in Attachment B.

- USACE – Implementation of the Project in partnership with participating communities - \$3,000,000, of which one-half will be paid with federal resources and one-half will be paid by participating communities, including \$57,011 of in-kind contributions.
- MARC – Phase Two Management, Facilitation and Administration Cost - \$70,000.

EFFECTIVE The parties mutually agree to Articles I, II, and III in accordance with this Agreement from the 1st day of September 2022 until the 29th day of September 2025. This agreement may be renewed thereafter to provide continued funding for the Project as mutually determined by the Corps and Stakeholders.

ARTICLE I

City of Lee's Summit, Missouri AGREES:

1. To fund their portion of the Project for Phase Two for an amount not to exceed a total of \$344,998, with payment due on or before June 15, 2023.
2. To work with other partner agencies to identify \$57,011 of in-kind contributions to this project.
3. To provide MARC at least sixty (60) day notice of its intent to no longer participate in the Project.

ARTICLE II

MARC AGREES:

1. To provide project management and stakeholder facilitation.
2. To contract with the Corps to implement the project management plan (see Attachment C). The Corps will contribute \$1,475,000 in federal funds to the project in Phase Two.
3. MARC will collect funds from the city and other stakeholders, and disburse \$1,327,989 in funds to the Corps.
4. MARC will retain \$70,000 to administer and facilitate the project.

ARTICLE III

BOTH PARTIES MUTUALLY AGREE:

1. That this Agreement and all contracts entered into under provisions of this Agreement shall be binding upon the City and MARC; and
2. That no third-party beneficiaries are intended to be created by this Agreement, nor do the parties herein authorize anyone not a party to this Agreement to maintain a suit for damages pursuant to the terms or provisions of this Agreement.

IN WITNESS WHEREOF: the parties hereto have caused this Agreement to be signed by their authorized officers on the day and year first above written.

Mid-America Regional Council

City of Lee's Summit, Missouri

David Warm
Executive Director

William A. Baird
Mayor

Date

Date

Attachment A: Budget schedule for local government contributions*

Community	Phase One Contribution (\$)	Phase Two Contribution (\$)	Work in-kind (\$)	Total Contribution (\$)
Belton	1,749	45,139	TBD	46,888
Blue Springs	2,596	10,000	TBD	12,596
Grandview	2,913	75,188	TBD	78,101
Independence	13,333	344,162	TBD	357,495
Kansas City, MO	11,009	284,198	TBD	295,208
Jackson County	9,469	244,444	TBD	253,913
Lee's Summit	2,000	344,998	TBD	346,998
Raytown	1,931	49,859	TBD	51,791
Total	\$45,000	\$1,397,989	\$57,011 (TBD)	\$1,500,000

*Contribution amount based on square miles in the watershed.

Attachment B. Total Project Budget

Project Income

Local government contributions

Phase One	\$ 45,000
Phase Two	\$1,397,989
Local match, in-kind (TBD)	\$ 57,011
Total	\$1,500,000

Federal contribution

Phase One	\$ 25,000
Phase Two	\$1,475,000
Total	\$1,500,000

Total project income \$3,000,000

Project expenses

Corps Phase One

Local contributions	\$ 25,000
Federal contributions	\$ 25,000
MARC Administrative/Management Expenses	\$ 20,000
Total Phase One	\$ 70,000

Corps Phase Two

Local contributions	\$1,327,989
Federal contributions	\$1,475,000
MARC Administrative/Management Expenses	\$ 70,000
Local in-kind match (TBD)	\$ 57,011

Total project expenses \$3,000,000

Attachment C: Project implementation plan



Draft Project Management Plan Little Blue River Flood Risk Management Study February 2022

Project/P2 No.: 496089

Updated: N/A



**US Army Corps
of Engineers** ®
Kansas City District



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- Attachment B – Communication Plan
- Attachment C – Work Break Down Structure by Discipline
- Attachment D – Quality Management Plan
- Attachment E – Data Management Plan

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EXECUTIVE SUMMARY

The Project Management Plan (PMP) provides a summary of tasks required to complete the feasibility study and includes schedule and cost information, as well as documents revisions / updates to the PMP over the course of the study.

The scope and scale of tasks within the PMP are developed based on the decisions to be made during the study and the Project Delivery Team's (PDT's) use of available management and decision-making tools, such as Decision Management Plans (DMPs) and Risk Registers (RRs).

The PMP is a living document, revised as key study decisions are made that shape the tasks and level of detail of the study, no less frequently than each milestone in the study. The first PMP developed will, by necessity, have less detail on tasks to be completed after initial decision points and milestones, including the selection of a tentatively selected plan / recommended plan. As the PMP is revised, it will provide updates of tasks that have been completed to date and additional tasks required to complete the feasibility study analysis and report.

Sponsor and U.S. Army Corps of Engineers (USACE) acceptance of the task descriptions, and time and cost estimates addressed in this PMP constitute agreement of the PMP overall, with the understanding that more detail will be provided for future tasks and milestones as the study progresses.

The information contained in this PMP will also be used to update appropriate budgetary and other related documents for the Little Blue River Flood Risk Management Study.

1.0 Introduction and Background

This Project Management Plan (PMP) and Scope of Work (SOW) for the Little Blue River Flood Risk Management Study address flood risk management and ecosystem restoration for the Little Blue River Watershed within the vicinity of Kansas City, Missouri. There is a multipurpose for the Little Blue Flood Risk Management (FRM) Study. The first of which is to analyze whether the changing conditions of the basin are negatively impacting the LBR FRM System (2 Federal Reservoirs, 3 Levee Districts, 15-mile Federal channel) to effectively mitigate flood risk and threat to life safety in the basin. The second purpose of the study is to explore areas within the Little Blue River Watershed where environmental restoration is desired and to be implemented. The overall goal of the study is to explore ways to enhance the Little Blue River Watershed by creating resiliency through best management practices that will lower flood risk, restore natural features, and promote sustainable development into the future. The final deliverable from this study will be a comprehensive feasibility assessment, with an integrated environmental assessment as required by the National Environmental Policy Act of 1969, as amended. The feasibility report will recommend alternatives for a solution that addresses flood risk management and a solution that addresses ecosystem restoration.

The feasibility study will encompass a comprehensive analysis of the Little Blue River Watershed, with the emphasis on finding solutions to reduce flood risk, risk to life, ecosystem restoration, and other benefits to recreation, water quality, and quality of life. The report itself will take a fifty (50) year outlook into the basin and project future conditions within the basin, considering current trends. It will then compare that outlook against measures/alternatives that are plausible to address the project's objectives. Measures can be structural, nature-based, nonstructural, or a mix. The alternatives will be screened for effectiveness, efficiency, acceptability, and completeness. A thorough benefit/cost analysis will be conducted for the final array of alternatives; that evaluation will consider cost effectiveness, benefits to regional economic development, life safety, environmental quality, and other evaluation criteria identified by the project team, the sponsors. The study will result in a recommended plan for construction, under federal authorization. Note, that the implementation of the project is not automatic, and would need specific authorization. However, the study will lead to a recommendation, with the possibility of multiple recommendations that could be implemented by the sponsors or through other Federal programs.

1.1. Background

The Little Blue River is a tributary of the Missouri River located in Cass and Jackson Counties of the U.S. State of Missouri. The watershed drains 224 square miles from a network of tributaries, covering a variety of land uses. Over the past forty (40) years, the watershed has experienced urbanization and an increase in runoff from impervious surfaces. Changes within the basin due to increased development, sedimentation, aggradation, degradation, erosion, and climate change have resulted in decreased system performance, new flood risk areas, and the need to identify additional FRM alternatives. Recent rain events, general observations, and recent studies indicate an increase in flood risk and loss of life due to these altered conditions. The original assumptions made for the flood risk management system may need to be revised to match current challenges.

Additionally, urbanization and the loss of natural function of the Little Blue River Watershed has resulted in the degradation to land and aquatic habitat throughout the basin. Development along the mainstem and surrounding the tributaries have resulted in fractured riparian habitat, loss of natural wetland and floodplain habitat, erosion, sedimentation of water bodies, and degradation to the water quality for the tributaries and lakes within the watershed.

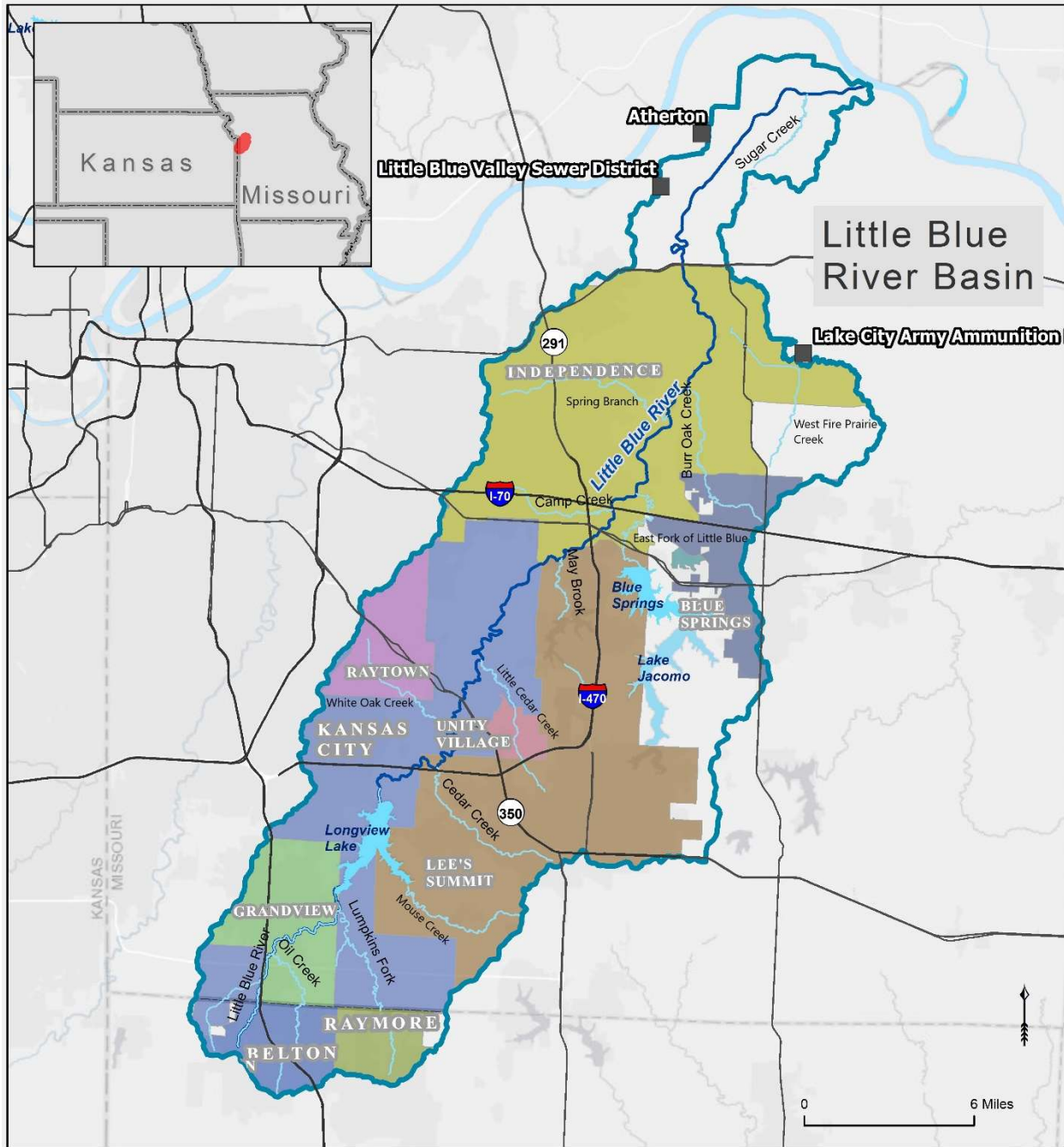


Figure 1: Little Blue River Watershed Political Boundaries & Tributaries

1.2. Authority

The Little Blue River Flood Risk Management Study was authorized using the Resolution of the Senate Committee on Environment and Public Works for the Little Blue River Basin, Missouri, 108th Congress, 2nd Session, June 23, 2004.

The resolution reads:

“That the Secretary of the Army is required to review the report of the Chief of Engineers on the Little Blue River, Vicinity of Kansas City, Missouri published as House Document 169, 90th Congress, First Session, and other pertinent reports, to determine whether any modifications of the recommendations contained therein are advisable at the present time in the interest of flood damage reduction, environmental ecosystem restoration and protection, and other related beneficial purposes in the Little Blue River Basin.”

The Little Blue River Flood Risk Management Study was authorized under the Corps of Engineers’ flood risk management business line. However, this study will be multipurpose in intent, examining solutions to flood risk management and ecosystem restoration, coupled with ancillary benefits to recreation, water quality, and quality of life benefits for the residents of the basin.

1.3. Investigations Study Guidance

The Feasibility Study Process: Key Decision & Product Milestones

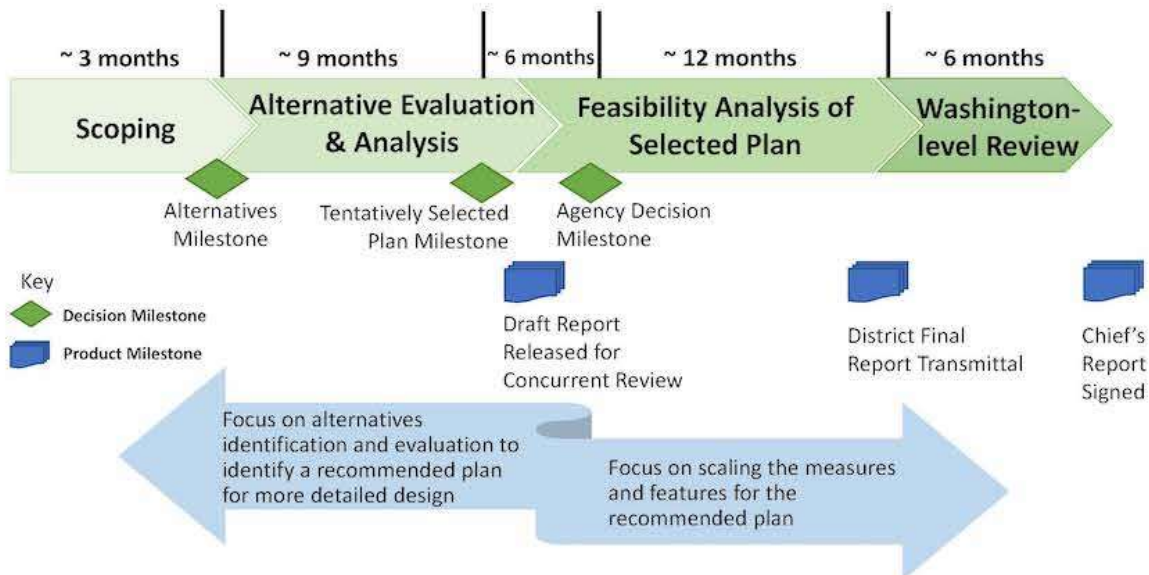


Figure 2: USACE Feasibility Study Process



Figure 3: USACE Planning Process

	Feasibility	Preconst. Engineering and Design (PED)	Construction	O&M
Typical Duration	3 Years	2 Years	3 Years	Project Life
Federal Share of Costs	50% ▲ <i>FCSA</i>	65% ▲ <i>DESIGN AGREEMENT</i>	65% ▲ <i>PARTNERSHIP AGREEMENT</i>	0

▲ *Authorization in WRDA*

Figure 4: Corps of Engineers Project Development Process

1.4. Non-federal Sponsors

The Little Blue River Flood Risk Management Study will be supported by the Mid-America Regional Council, along with the support of the following sub-partners: City of Belton; City of Blue Springs; City of Grandview; City of Independence; City of Kansas City, Missouri; City of Lee’s Summit; City of Raytown; and Jackson County, Missouri. Additional coordination may include the Atherton Levee District, the Blue Mills Levee District, and the Lake City Army Ammunition Plant. These three (3) members are not considered cost-share partners.

Table 1: Little Blue River FRM Non-Federal Sponsor List

Name	Agency	Email
Tom Jacobs	Mid-America Regional Council	tjacobs@MARC.org
Synthia Isah	Mid-America Regional Council	sisah@MARC.org
Greg Rokos	City of Belton	grokos@belton.org
Chris Sandie	City of Blue Springs	csandie@bluespringsgov.com
Doug Wesselschmidt	City of Grandview	DWesselschmidt@grandview.org
Brad Phelps	City of Independence	bphelps@indepmo.org
Tom Kimes	City of Kansas City, Missouri	tom.kimes@kcmo.org
George Binger	City of Lee’s Summit	George.Binger@cityofls.net
Jose Leon	City of Raytown	josel@raytown.mo.us
Brian Nowotny	Jackson County, Missouri	bpnwotny@jacksongov.org

2.0 Governance Structure

2.1. Executive Committee

The Executive Committee will give oversight to the study progress and address any issues or concerns that may arise between the Corps of Engineers, Kansas City District, and the study partners.

Table 2: Executive Committee

Name	Role	Email
Tom Jacobs	Mid-America Regional Council	tjacobs@MARC.org
Jeff Tripe	Plan Formulation Section Chief	Jeffry.A.Tripe@usace.army.mil
Jennifer Switzer	Planning Branch Chief	Jennifer.L.Switzer@usace.army.mil

2.2. Project Delivery Team

The Project Delivery Team (PDT) consists of USACE staff involving the necessary disciplines needed to fulfil the scope of the Little Blue River FRM study. Additionally, if project support is requested from contractors, those individuals would be considered a part of the PDT. As necessary, this team roster will be updated to reflect any changes and/or additional appointments to the project team.

Table 3: Project Delivery Team

Name	Role	Email
John Lunn	Project Manager/Planner	John.W.Lunn@usace.army.mil
Adam Jones	Technical Lead – H&H Engineer	Adam.Q.Jones@usace.army.mil
Allen Chestnut	H&H Engineer	Allen.J.Chestnut@usace.army.mil
Daniel Cady	Project Management Support	Daniel.W.Cady@usace.army.mil
Dominique Knowles	GIS	Dominique.A.Knowles@usace.army.mil
James Mehnert	Geotech Engineer	James.F.Mehnert@usace.army.mil
John Shelley	Regional Sediment Manager	John.Shelley@usace.army.mil
Julie MacLachlan	Communication Planner	Julie.A.Maclachlan@usace.army.mil

Name	Role	Email
Lindsey Scott	Project Management Support	Lindsey.W.Scott@usace.army.mil
Mackenzie Kenney	H&H Engineer	Mackenzie.L.Kenney@usace.army.mil
Michael Matthews	Cost Engineer	Michael.W.Mathews@usace.army.mil
Noah Colby-George	Economist	Noah.Colby-George@usace.army.mil
Richard Skinker	Environmental Specialist	Richard.A.Skinker@usace.army.mil
Robert Browning	Senior Economist	Robert.L.Browning.II@usace.army.mil
Seth Thomas	Real Estate Specialist	Seth.A.Thomas@usace.army.mil
Tim Meade	Tribal Liaison	Timothy.M.Meade@usace.army.mil
Ted London	Civil Engineer	Ted.A.London@usace.army.mil
Tracy Brown	GIS	Tracy.L.Brown@usace.army.mil

2.3. USACE Vertical Team

The USACE Vertical Team will provide oversight and review for key, feasibility milestones. The Vertical Team will work collaboratively with the Project Delivery Team as solutions are developed throughout the plan formulation process.

Table 4: Vertical & Review Teams

Review Team		
Name	Role	Email
Charyl Barrow	FRM-PCX Regional Manager	Charyl.F.Barrow@usace.army.mil
Eric Thaut	FRM-PCX Director	Eric.W.Thaut@usace.army.mil
Greg Miller	ECO-PCX Director	Gregory.B.Miller@usace.army.mil
TBD	ECO-PCX Regional Manager	TBD
Jeffrey Lin	HQUSACE Planner	Jeffrey.P.Lin@usace.army.mil

Review Team		
Sierra Keenan	Agency Technical Review Lead	Sierra.L.Keenan@usace.army.mil
Northwestern Division		
Name	Role	Email
Brad Thompson	Chief of Planning	Bradley.E.Thompson@usace.army.mil
Charles Hanneken	Planning Team Lead	Charles.D.Hanneken@usace.army.mil
Christina Austin-Smith	Office of Counsel	Christina.A.Austin-Smith@usace.army.mil
Cristy Chavez-Ortiz	Program Manager	Cristy.O.Chavez-Ortiz@usace.army.mil
Glen Bellew	Levee Safety Program Manager	Glen.M.Bellew@usace.army.mil
Jesse Granet	Environmental Specialist	Jesse.J.Granet@usace.army.mil
Jeremy Weber	District Support Planner	Jeremy.J.Weber@usace.army.mil
Kimberly Ohman	Real Estate	Kimberly.H.Ohman@usace.army.mil
Lev Blumenstein	Office of Counsel	Lev.G.Blumenstein@usace.army.mil
Richard Smith	Dam Safety Program Manager	Richard.E.Smith@usace.army.mil
Thomas Topi	Economist	Thomas.Topi@usace.army.mil

3.0 Overall Study Goals

The overall goal of the Little Blue River Flood Risk Management Study is to explore opportunities to improve and enhance the quality of life within the Little Blue River Watershed and the affected communities by researching and evaluating measures that will lower flood risk, restore land and aquatic habitat, and build resiliency.

3.1. Flood Risk Management Goals

- Take a **system-wide approach** to recommend management measures that will lower flood risk of the Little Blue River (LBR), mainstem, and all affected areas.
- **Identify existing flood risk and problem areas in the LBR basin, forecast future with and without project conditions over the planning period, and develop measures/alternatives to address identified problems in the basin with actions that provide resilience.**
- Determine the relationship between current and future development patterns and the probability of flooding in the LBR basin.
- Build upon regional land use and stormwater management practices that will enhance the level of flood protection in the basin, while restoring natural features.
- Maintain and build upon the status of the watershed as a regional asset that carries benefits to water resources; environment; recreation; local, regional, national commerce; and the overall quality of life for the basin residents.
- **Recommend potential modifications/additions to LBR FRM features to enhance the level of protection and promote general welfare of investments in LBR basin's natural and built environments.**
- Ensure that the flood risk management benefits and ancillary benefits to recreation, water quality, environmental stewardship, and quality of life are dispersed equitably across the watershed. Recommended actions should be considerate of social factors including environmental justice.

3.2. Ecosystem Restoration Goals

- Restore the Little Blue River channel and corridor, including native habitat and aquatic ecosystem.
- **Protect the river-side infrastructure that is at risk** (i.e., trails, trail bridges, other recreational infrastructure, existing Corps flood risk mitigation devices, and City bridges and stormwater infrastructure).
- Establish resilience and sustainability by focusing on long term opportunities to protect and/or restore habitat, natural corridors, and open space in the watershed into and around Longview Lake, as urbanization continues to encroach on the natural areas.

4.0 Problems & Opportunities

4.1. Problems

4.1.1. Flood Risk Management Problems

Primary

- Increased flood risk and associated economic damages to structures the Little Blue River watershed.
- Increase in the probability of life loss due to a flooding event.
- Potential loss of capacity for the 1% AEP (100-Year) channel modification of the Little Blue River (federal channel).
- Increased sedimentation in basin impoundments from increased erosion, loss of riparian corridor, and increased surface water runoff.

Secondary

- Localized flooding, erosion, and ecosystem concerns in the basin.
- Negative impacts to basin ecology, water quality, recreation, and quality of life.

4.1.2. Ecosystem Restoration Problems

TBD

4.2. Opportunities

4.2.1. Flood Risk Management Opportunities

- Collaboration among multiple jurisdictions/agencies to approach flood risk management from a watershed approach/perspective.
- Identify modifications or additions to the existing LBR system through structural, nonstructural, nature based, and regulatory actions to decrease flood risk and potential loss of life in the basin.
 - Identify alternatives to address erosion, degradation, and capacity issues within the existing Federal FRM system.
 - Identify new alternatives and measures to supplement and address system wide performance of the existing FRM system.
 - Identify non-structural and regulatory actions that provide FRM benefits and allow for sustainable and resilient economic development.
 - Provide ancillary benefits to socioeconomic, recreational, water quality, and ecosystem restoration with proposed FRM alternatives.
- Provide current flood risks and opportunities for implementation of best management measures/practices to local partners, public officials, and governing bodies.

- Address local concerns in the basin including streambank degradation and erosion, reduced water quality, increased stormwater runoff, loss of environmental habitat, and impacts to recreational features through potential spin-off studies.
- Engage with the public and advocacy groups on topics relating to water resource management within the basin (i.e., environmental stewardship, stormwater management, development in flood zones, floodplain management, etc.).
- Assess potential flood risk concerns of LCAAP and Blue Mills/Atherton levees by including them as stakeholders in the study. Provide analysis of level of protection provided by levees.

4.2.2. Ecosystem Restoration Opportunities

TBD

DRAFT

5.0 Objectives & Constraints

5.1. Flood Risk Management Objectives

Primary

- Reduce the risk for loss of life from flooding along the Little Blue River mainstem.
- Reduce the economic damages from flooding along the Little Blue River mainstem.
- Increase resilience within the Little Blue River watershed by selecting measures that will account for a comprehensive analysis of benefits and enhance basin conditions.

Secondary

- Reduce the risk for loss of life from flooding along tributaries to the Little Blue River.
- Reduce the economic damages from flooding along tributaries to the Little Blue River.
- Provide ancillary benefits to the environment, water quality, recreation, regional economic development, and overall quality of life within the Little Blue River basin.

5.2. Ecosystem Restoration Objectives

TBD

5.3. Constraints & Critical Assumptions

The following constraints and critical assumptions were identified during scoping:

- 10% AEP discharge must be greater than 800 cubic feet per second (ER1165-2-21)
- 1% AEP discharge must be greater than 1800 cubic feet per second (ER1165-2-21)
- Drainage area must be greater than 1.5 square miles (ER1165-2-21)
- USACE cannot consider justifying new Federal project benefits from protecting new or substantially improved structures built in the 1% floodplain after 1 July 1991 with a 1st floor elevation less than 1% AEP event. (Sec. 308, WRDA 1990, P.L. 101-640)
- FEMA Regulatory Floodway restriction on management measures
- Avoid inducing flood risk on downstream levee systems without associated mitigation strategy
- Regulatory restraints in portions of the basin that restrict the implementation of local floodplain regulations

6.0 Study Reaches

6.1. Flood Risk Management Reaches

Little Blue River Mainstem

- Little Blue River Upstream of Longview Lake - increase in flood damages and threat to life safety due to increased water runoff from precipitation events.
 - Merrywood, Craig, and Laquinta neighborhoods along Little Blue River (Grandview, MO).
 - Oil Creek Watershed and adjacent neighborhoods (Belton, MO).
 - I-49 Intermodal Facility and adjacent industrial development (Kansas City, MO).
- Longview Lake - concerns about current and future flood storage capacity due to the rate of sedimentation.
- LBR from Longview to 39th Street - direct risk of flooding and loss of life in residential and commercial corridors. Vast transportation network and a great deal of regional commerce exists.
 - Tributaries of Maybrook Creek may be exacerbating issue of flooding in this reach (Lee's Summit/Independence, MO).
 - Residential complaint of water near, at, or in structures. (Kansas City, MO & Independence, MO).
 - Decrease in existing Federal channel capacity. Recent USACE study indicates loss in channel capacity to convey 1% event.
 - Identification of flood risk along tributaries of Adair Creek and East Fork of LBR.
- Little Blue River from 39th Street to Missouri River
 - Federal channel has lost 30% capacity to contain 1% AEP event.
 - Concerns of flood risk and erosion along Blue Mills and Atherton levee units (351-R).
 - Concerns of flood risk at Lake City Army Ammunition Plant levee.
 - Degradation to Federal channel, posing a threat to infrastructure.
 - Residential parcels to the east of LBR has experienced flooding. Blue Mills Levee along left bank of LBR, downstream of Blue Mills Rd.

Tributaries to Little Blue River

- Cedar Creek and Tributaries (Lee's Summit, MO)
 - Erosion along Cedar Creek.
 - Increased flood risk for structures located in FEMA regulatory floodway; City has implemented buyouts in the past.

- White Oak Creek (Raytown, MO)
 - Lack of data available to understand realtime flood risk within the city. No formalized emergency response system currently available to provide live alerts and responses to flood and life safety risks.
- Neff Lake/Unnamed Tributary (Belton, MO)
 - Mobile home park frequently inundated with flash flooding.
- Springdale Lake (Belton, MO)
 - Dam/spillway that is eroding immediately downstream.
- **Prairie Lee Lake (Lee's Summit, MO)**
 - Localized, flash flooding occurring during a 2% AEP (50-year) or less frequent rain event. Duration of event is less than 1 hour, causes structural damages. Overall, approximately fourteen (14) structures that are characterized as repetitive loss

Mouse Creek, Maybrook

6.2. Ecosystem Restoration Reaches

- Little Blue River Mainstem from Longview Lake to Blue Mills Rd.
 - Identify areas that are available for riparian corridor restoration, habitat connectivity, and the restoration of wetland areas.
- Longview Lake – Eastern and western lobes
 - West Lobe - LBR enters, increase in sediment potentially due to upstream development, lack of sediment management.
 - East Lobe - Mouse Creek, increase in sediment potentially due to upstream development and lack of agricultural soil best management practices. Land is currently being platted by developers.
- **Mouse Creek Watershed**
 - Development expected over the next twenty years. Concerns about long-term impacts to environment, sediment deposition.
- Blue Mills/Atherton Levee District
 - Floodplain behind the levee systems
- **East Fork of Little Blue River/Prairie Lee Lake Watershed – restoration along the tributaries, Legacy Park, and Prairie Lee Lake.**
 - Primary concern: Siltation and sediment deposition impacting water quality and ecosystem degradation. Erosion posing a threat to infrastructure and public property, in addition to contribution to the issues of sediment deposition.

Flooding & Stream buffers

Same for Cedar Creek and Maybrook

7.0 Measures & Alternatives

Preliminary measures were brainstormed during LBR FRM Study scoping activities. Measures were identified on the basis of recommendations from the partners, along with recommendations from previous studies done within the Little Blue River Basin. The measures shown in Figure 5 will be considered during the study analysis; however, this list of measures is non exhaustive. The study will take a comprehensive approach to identify and formulate measures based upon analysis and input from study participants. Measures can be structural, nonstructural, or nature based.

Table 5: Measures Identified During Scoping

Measure	Upper Little Blue	Mid Little Blue	Lower Little Blue
Buyouts	X	X	X
Channel Modification (Dredging, Straightening, Widening, etc.)	X		X
Floodproofing (Dry or Wet)	X	X	
Flood Warning System	X	X	
Flood Warning Plan		X	
In-Channel Detention	X	X	
In-Stream Impediment Removal	X		X
Levees & Floodwalls (Installation, Setbacks, Raises)		X	X
Off-Channel Detention	X	X	X
Open Space/Preservation	X	X	
Reallocation (private & public lakes)	X	X	X
Regulatory	X	X	X
Riparian Corridor Restoration		X	X
Wetland Restoration	X	X	X

8.0 Study Framework

The Little Blue River Flood Risk Management Study will serve as a multipurpose study looking at primary, stand-alone benefits to flood risk management, life safety, and ecosystem restoration. The study will also explore ancillary benefits to recreations, water quality, environmental justice, and quality of life.

8.1. Plan Formulation Strategy

8.1.1. Flood Risk Management

8.1.2. Ecosystem Restoration

8.2. Existing & FWOP Conditions

8.3. H&H Analysis

8.4. Ecosystem Restoration Analysis

8.5. Climate Change Analysis

8.6. Sediment Analysis

8.6.1. Flood Risk Management

8.6.2. Ecosystem Restoration

8.7. NEPA Coordination

8.8. Cultural Resources & Tribal Coordination

8.9. Screening & Evaluation Criteria

8.10. Roles and Responsibilities

8.10.1. USACE Roles and Responsibilities

8.10.2. Non-Federal Sponsor

8.10.3. Study Partners' Roles and Responsibilities

8.11. Study Deliverables

8.12. Data Collection and Outreach

9.0 Schedule & Milestones

The following project schedule has been developed for the Little Blue River FRM Study and follows Corps of Engineers project management guidance of executing an investigations study within three (3) years.

Table 6: Little Blue FRM Study Project Schedule

Milestone	Date	Actual
Feasibility Cost Share Agreement	29 September 2021	29 September 2021
Kickoff Meeting	27 October 2021	27 October 2021
Planning Charrette	13 January 2022	13 January 2021
Project Management Plan	16 March 2022	TBD
Tentatively Selected Plan	9 months from AMM	TBD
Draft Report & Public Review	TBD	TBD
Agency Decision Milestone	6 months from TSP	TBD
Final Report	12 months from ADM	TBD
Chief's Report	29 September 2024	TBD

9.1. Alternatives Milestone Meeting

The Alternatives Milestone Meeting (AMM) occurs three to six months after the signing of the feasibility cost share agreement (commencement of the study). The purpose of the AMM is to gain vertical team concurrence on an initial array of alternatives, plan formulation strategy, and risk management strategy. Before the AMM, the project team will initiate NEPA and Tribal/Cultural Resources coordination. This milestone meeting serves as the end of the scoping phase. Deliverable expected for the AMM are the project management plan, risk register, review plan, and the decision management plan.

9.2. Tentatively Selected Plan

The Tentatively Selected Plan (TSP) milestone occurs six to nine months after the AMM. The TSP milestone represents the point to which the project identifies a single alternative and releases a draft Integrated Feasibility/NEPA Report for public and agency review.

9.3. Agency Decision Milestone

The Agency Decision Milestone (ADM) occurs approximately six months after the TSP. The ADM represents agency endorsement of the selected plan.

9.4. Chief's Report

The Chief's Report milestone represents the end of the feasibility process. The final report should be finished about 12 months after the ADM meeting.

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10.0 Work Breakdown Structure

The WBS is a deliverable-oriented hierarchical decomposition of the work to be executed by the PDT to accomplish the project objectives and create the required deliverables. It organizes and defines the total scope of the project. Each descending level represents an increasingly detailed definition of the project work.

1.0 Scoping to AMM

- 1.1 Identify problems, opportunities, objectives, constraints, and risks and uncertainties for the Little Blue River Watershed for the purpose of scoping areas to implement flood risk management and ecosystem restoration measures.
- 1.2 Assess existing and future flood pool capacity at Longview Lake (eastern and western lobes) and other impoundments as identified.
- 1.3 Host a planning charrette to gather concurrence of the problems, objectives, and study goals.
- 1.4 Identify goals, problems, opportunities, objectives, and constraints, risks and uncertainties for ecosystem restoration measures that could reduce sedimentation and loss of aquatic ecosystem habitat in Longview Lakes' east and west lobes.
- 1.5 Complete the Review Plan and assemble the review/vertical team. Coordination will include personnel from the Corps of Engineers Northwestern Division, the Flood Risk Management Planning Center of Expertise (FRM-PCX), the Ecosystem Restoration Planning Center of Expertise (ECO-PCX), the Office of Water Projects Review (OWPR), the Institute for Water Resources (IWR), and the Agency Technical Review Lead for this study with the St. Paul District.
- 1.6 Begin environmental coordination and scoping with federal, state, and local agencies under guidance provided by the National Environmental Policy Act of 1969.
- 1.7 Begin coordination with Native American tribes and the State Historic Preservation Office under the provisions of Section 106 of the National Historic Preservation Act and other applicable cultural resources laws.
- 1.8 Select the course of actions for plan formulation strategy, model development, and risk management for the Little Blue River FRM Study.
- 1.9 Identify measures and develop an array of alternatives using PR&G criteria that feature a no-action, nature based, nonstructural, and a variety of structural measures. Alternatives will be evaluated and compared on how well they meet the study objectives for flood risk management and ecosystem restoration.
- 1.10 Complete the decision management plan and risk register.
- 1.11 Perform a literary review of past and current studies on the Little Blue River Basin.
- 1.12 Outreach and coordination with agencies both external and internal to the Corps to gain insight to future actions that may happen in the basin. Also, begin outreach to stakeholders and other agencies as listed in the communication plan for the Little Blue River FRM study.
- 1.13 Development of Project Management Plan and Communication Plan

This is place to ask for Stream buffers

2.0 AMM to TSP

- 2.1 Continued alternatives formulation and screening considering input from the project disciplines.
- 2.2 Identify modifications and/or additional features for the Federal FRM system.
- 2.3 Identify measures and alternatives associated with the Federal FRM system or spin-off projects to address localized problems.
- 2.4 Conduct hydrologic and hydraulic modeling to identify existing problems areas and future without project conditions.
- 2.5 Perform qualitative climate change/non stationarity analysis and incorporate results into planning considerations.
- 2.6 Assess current and future performance of existing Federal FRM system.
- 2.7 Assess impacts to basin ecology, water quality, recreation, and quality of life from primary issues that could be addressed through multi-purpose study objectives.
- 2.8 Analyze localized flooding, erosion, and ecosystem concerns in the basin that could be addressed with individual Partners as spin-off studies.
- 2.9 Select and perform environmental modeling (Inland, Riparian, Wetland) to identify existing issues and future without project conditions for the highlighted, land and aquatic areas in the Little Blue River basin that have been identified as areas for environmental restoration.
- 2.10 Recommend measures for ecosystem restoration within particular reaches of the Little Blue River Watershed, as identified during scoping, in the project management plan, or revealed during subsequent phases of the planning process.
- 2.11 Develop economic model to estimate flood damages and project benefits from flood risk management measures using the Flood Damage Reduction Analysis (HEC-FDA) software.
- 2.12 Develop cost effectiveness/incremental cost analysis model to analyze potential benefits from ecosystem restoration measures.
- 2.13 Evaluate and compare flood risk management and ecosystem restoration alternatives considering the Corps of Engineers PR&G criteria, the four economic benefits accounts, and any evaluation criteria developed during the scoping and plan formulation process.
- 2.14 Identify risks and uncertainty. Develop a path forward to manage risk levels.

3.0 TSP to ADM (Draft Report & Reviews)

- 3.1 Continued alternatives evaluation and comparison for flood risk management and ecosystem restoration alternatives considering input from the project disciplines.
- 3.2 Recommend and select a plan that addresses flood risk management objectives, satisfies the desires of the partners and general public, and maximizes national economic output (NED Plan).
- 3.3 Recommend and select a plan that addresses environmental restoration plan objectives, satisfies the desires of the partners and general public, and maximizes national habitat output (NER).
- 3.4 Develop a draft report that summarizes the analyses of all disciplines and the overall plan formulation effort for this study.

- 3.5 Initiate peer review, district quality review, legal, and agency technical reviews. Conduct independent external peer review, as highlighted in the review plan.

4.0 ADM to Chief's Report (Final Package & Report)

- 4.1 Final Report packaging and submittal to HQUSACE/
- 4.2 Draft Chiefs Report and submit to HQUSACE
- 4.3 Upon approval of HQUSACE, submit Chiefs Report for State and Agency Review.
- 4.4 Submit to Congress for approval

5.0 Communication & Coordination

- 5.1 Draft the Communication Plan, identify key messages, identify stakeholders, and develop communication goals and objectives.
- 5.2 Internal Communication: communicating with agencies and stakeholders that are cost-share partners for this study.
- 5.3 PDT/ Internal Corps Coordination
- 5.4 External Communication: communicating with agencies and stakeholders that are not a cost-share partner for this study. Two public briefings are anticipated.
- 5.5 Communication with state and other federal agencies
- 5.6 Public Scoping: component of NEPA EA/EIS coordination
- 5.7 Public meetings: 3 regional public meetings *assuming EA requirement

11.0 Budget & Costing

Discipline	Charge Out	Hours	Budget
Project Manager/Planner	\$ 107	3235	\$ 346,000
Tech Lead - H&H	\$ 142	1500	\$ 213,000
PM Support	\$ 117	35	\$ 5,000
GIS	\$ 118	380	\$ 45,000
Geotech	\$ 142	1200	\$ 171,000
River Engineering	\$ 160	1200	\$ 193,000
Communication Planner	\$ 94	311	\$ 30,000
PM Support	\$ 100	249	\$ 25,000
H&H Engineering	\$ 109	2500	\$ 274,000
Cost Engineering	\$ 109	1200	\$ 132,000
Economics	\$ 107	200	\$ 22,000
Environmental Support	\$ 152	2000	\$ 304,000
Economics	\$ 151	1759	\$ 266,000
Real Estate	\$ 113	750	\$ 85,000
Civil Engineering	\$ 165	750	\$ 124,000
Tribal Liaison	\$ 128	750	\$ 96,000
Levee Safety	\$ 147	24	\$ 4,000
Dam Safety	\$ 152	24	\$ 4,000
Supervision			
H&H Supervision	\$ 179	200	\$ 36,000
Comm. Supervision	\$ 152	60	\$ 10,000

Discipline	Charge Out	Hours	Budget
Plan Form Supervision	\$ 169	496	\$ 84,000
Planning Supervision	\$ 184	62	\$ 12,000
Environmental Supervision	\$ 152	150	\$ 23,000
ATR Lead	\$ 152	15	\$ 3,000
Reviews			
District Quality Control (DQC)			\$ 100,000
Agency Technical Review (ATR)			\$ 130,000
Policy Review			\$ -
Independent External Peer Review (IEPR)			\$ -
Other			
Sponsor WIK			\$ 20,000
Contingency			\$ 243,000
Total			\$ 3,000,000

11.1. Funding Requirements**11.2. Sponsor Work In-Kind****11.3. Cost Share Requirements****11.4. Sponsor Budgetary Timeline**

12.0 Communications and Reporting

12.1. Communication with Partners

12.2. Communication with NFS

12.3. Communication with PDT

12.4. Public Scoping

12.5. Roles and Responsibilities

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13.0 Risk Management

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14.0 Decision Management Plan

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15.0 Quality Management Plan

The Quality Management Plan for the Little Blue River FRM Study will follow Corps of Engineer guidance for quality reviews (EC 1165-2-217), along with the Kansas City Districts' best management practices guidelines for peer review and district quality control. The QMP can be found in Attachment D. Additional quality control measures will be adopted at the request of the non-federal sponsor and/or the study partners that agree with the non-federal sponsor. Cost estimates for quality review can be found in the study budget (Section 11).

15.1. District Quality Control

15.2. Agency Technical Review

15.3. Policy Review

15.4. Independent External Review

15.5. Public Review (NEPA)

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16.0 Study Process

16.1. Change Management

Change Management (CM) refers to any approach to transitioning individuals, teams, and organizations using methods intended to re-direct the use of resources, business process, budget allocations, or other modes of operation that significantly reshape a project or program. CM should be a deliberate process with approval by the PM, PDT, District/Division leadership and the stakeholder.

All changes will follow the businesses processes identified in the Project Change Management, NWK BQP 5.5.03. Changes that exceed the allowable project thresholds that affect a project's scope, schedule, key milestones, costs, or fiscal execution require submission and approval of a project change request (PCR). A PCR will be submitted promptly when the need for change is known allowing the USACE PM, Program Manager, Branch Chief, or PRB sufficient time to evaluate and possibly minimize the impacts of the change.

The Little Blue River FRM Study's schedule will be carefully monitored with particular emphasis placed on the watershed memorandum and three milestones to ensure the project is progressing as anticipated. If a change occurs that causes a delay in the major milestones, the PDT will meet to determine if there is a process to mitigate the delay. If the PDT cannot mitigate the delay by shortening an activity, increasing resources, or decreasing scope, a PCR will be prepared to identify the change in the major milestone and routed as specified above.

Any change will be evaluated on its impacts to the project baselines and become the basis for adjusting performance, and thus, impact the metrics and quality objectives established for project success. Significant changes to the project baselines will trigger a major PMP revision as described in the BQP versioning process. Minor changes, or those that can be approved by the USACE PM and PDT, will require minor and recurring PMP updates. All major PMP revisions will be re-approved by the Branch Chiefs and the appropriate Program Manager.

The Investigations Study is cost shared 50/50 (federal/non-federal) with the Mid-America Regional Council. MARC has entered into sub-agreements with the City of Belton; City of Blue Springs; City of Grandview; City of Independence; City of Kansas City, Missouri; City of Lee's Summit; City of Raytown; and Jackson County, Missouri. A full project budget has been developed and will be base-lined. The USACE PM will provide quarterly updates to the sponsors on budget execution. Any costs that exceed planned costs will be discussed and mitigation measures will be determined. If study costs cannot be mitigated all three agencies will need to come to agreement on if a waiver will be sought.

16.2. Acquisition Strategy

TBD

16.3. Value Engineering

Section 1004 of the Water Resources Reform and Development Act (WRRDA) of 2014, Removal of Duplicative Analysis, removes the requirement for formal Value Engineering studies for water resources planning (feasibility) studies.

16.4. Safety

This project will operate in accordance with EM 385-1-1 and no person shall be required or instructed to work in surrounding or under conditions that are unsafe or dangerous to his or her health. While operating during the COVID-19 pandemic meetings will likely be held virtually. If in-person meetings are deemed necessary, all applicable safety protocols and guidelines will be followed.

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17.0 Data Management Plan

The management of the data and information utilized for the Little Blue River Flood Risk Management Study will be managed and produced by the Corps of Engineers, Kansas City District's Survey and Geospatial Data Section of the Geotechnical Engineering Branch Department. The project team shall coordinate geospatial data management requirements with the Geospatial team members.

The team assists in creating efficiencies for a PDT in using technology to automate various business processes. The team also provides advanced spatial analysis and web-based delivery systems to foster informed decision making for the USACE and other federal, state, and local partners for the Little Blue River FRM Study. Analytical production is focused on the development and management of comprehensive land cover, photogrammetric, LIDAR and historical information products and collections. The use of remote sensing, modeling, and other advanced geospatial analysis techniques may be used to enhance other scientific processes in the program.

The team will follow the following Data Management Plan:

Geospatial data management standards, products, and business processes are led by the GIS team. The team will take a program-wide view of the geospatial-data management issues.

The GIS team works to:

1. Provide overall program guidance and direction for geospatial data.
2. Develop specific geospatial data standards, building upon the Spatial Data Standard for Facilities, Infrastructure, and Environment (SDSFIE) (www.sdsfie.org) and the Federal Geographic Data Committee (FGDC) standards for metadata.
3. Support subprojects by assisting in development of contract scopes and in-house work plans to ensure that the geospatial data standards are met.
4. Coordinate geospatial data acquisition requirements that provide program-wide benefits or benefits to multiple subprograms.
5. Maintain Geospatial Data Management Plan.
6. Deploy the centralized database for program-wide use. The database content would include information that is valuable program-wide or to multiple subprograms.
7. Deploy geospatial applications that are valuable across the program, under the same strategy and technology model, as described above for non-geospatial applications.
8. Provide consultation, expertise, and support to the subprograms as needed.

18.0 Closeout

The close out activities will be initiated and carried out by the USACE Project Manager, Program Analyst, and the resource management office.

After action reviews (AAR) will be held with the PDT to share knowledge of lessons learned and to minimize the occurrence or recurrence of potential problems and document and encourage improvements. The non-federal sponsors will be offered the opportunity to participate in the AAR and the AAR results will be shared with the sponsors. The AAR will be posted to the USACE Enterprise SharePoint site within 30 days of submission to the quality manager. AAR procedures will be followed in accordance with NWK BQP 8.5.03.

Depending on the timing of the completion of overall project completion, contract closeouts may occur simultaneous with project close-out or may occur shortly prior to project closeout. Currently, no contracts are planned; however, if contracts are utilized, closeout procedures will be followed as outlined in NWK BQP 7.5.04.

The PDT will identify the necessary hard copy and electronic copies that will be maintained and what archiving is appropriate for the specific task. Most records will be maintained electronically.

These close out procedures will apply also in situations where the study may be terminated. All outstanding obligations and commitments will need to be cleared.

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