

# REVIEW PLAN

River Des Peres – University City General Reevaluation Report with Environmental Assessment  
[August 2020](#)

**Project Name:** [River Des Peres, University City, Missouri \(St. Louis County, MO\)](#)

**P2 Number:** [112365](#)

**Decision Document Type:** [General Reevaluation Report with Environmental Assessment](#)

**Project Business Line:** [Single-Purpose Flood Risk Management](#)

**District:** [St. Louis \(MVS\)](#)

**District Contact:** [Matt Jones, Project Manager, \(314\) 331-8293](#)

**Major Subordinate Command (MSC):** [Mississippi Valley Division](#)

**MSC Contact:** [District Support Team Lead for MVS](#)

**Review Management Organization (RMO):** [FRM-PCX](#)

**RMO Contact:** [Deputy Director](#)

## Key Review Plan Dates

<b>Date of RMO Endorsement of Review Plan:</b>	<a href="#">26 August 2020</a>
<b>Date of MSC Approval of Review Plan:</b>	<a href="#">Pending</a>
<b>Date of IEPR Exclusion Approval:</b>	<a href="#">N/A</a>
<b>Has the Review Plan changed since PCX Endorsement?</b>	<a href="#">N/A</a>
<b>Date of Last Review Plan Revision:</b>	<a href="#">NONE</a>
<b>Date of Review Plan Web Posting:</b>	<a href="#">TBD</a>
<b>Date of Congressional Notifications:</b>	<a href="#">TBD</a>

## Milestone Schedule

	<u>Scheduled</u>	<u>Actual</u>
<b>FCSA Execution:</b> <a href="#">(n/a)</a> <sup>1</sup>	<a href="#">31 January 2020</a>	<a href="#">31 January 2020</a>
<b>Alternatives Milestone:</b>	<a href="#">25 August 2020</a>	<a href="#">25 August 2020</a>
<b>Tentatively Selected Plan:</b>	<a href="#">27 April 2021</a>	<a href="#">TBD</a>
<b>Release Draft Report to Public:</b>	<a href="#">7 June 2021</a>	<a href="#">TBD</a>
<b>Agency Decision Milestone:</b>	<a href="#">28 October 2021</a>	<a href="#">TBD</a>
<b>Final Report Transmittal:</b>	<a href="#">7 September 2022</a>	<a href="#">TBD</a>
<b>Senior Leaders Briefing:</b>	<a href="#">29 November 2022</a>	<a href="#">TBD</a>
<b>Chief's Report or Director's Report:</b>	<a href="#">28 April 2023</a>	<a href="#">TBD</a>

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<sup>1</sup> No FCSA; Amendment 1 to the Design Agreement was signed January 31, 2020 but funds were not received until April 29, 2020.

**Project Fact Sheet**  
July 2020

**Project Name:** River des Peres, University City, Missouri

**Location:** University City, St. Louis County, MO

**Authority:** Section 101(a)(17) of the Water Resources Development Act of 1990

**Sponsor:** University City, MO

**Type of Study:** General Reevaluation Report with Environmental Assessment

**SMART Planning Status:** The study is 3x3x3 compliant.

**Project Area:** The study area is the upper River Des Peres watershed, located in eastern Missouri immediately to the west of the City of Saint Louis. The authorized project area lies between Interstate 170 (upstream) and Heman Park (downstream). The 5,436-acre (22 km<sup>2</sup>) watershed upstream of Heman Park contains 11 miles (17 km) of streams. The headwaters of upper River Des Peres flow through the municipalities of Olivette and Overland before entering University City. Downstream of the study area, River Des Peres flows southeast from Heman Park into underground pipes that convey it under Forest Park and then into open channels through the City of Saint Louis before joining the Mississippi River at the city's southern boundary near the Carondelet neighborhood.

The authorized project (primarily stream channelization) was identified in the 1988 River Des Peres, MO Feasibility Report and authorized for construction in 1990. However, during the design phase modeling revealed unacceptable levels of induced flooding and a general reevaluation was initiated. The reevaluation was suspended in 2011 due to lack of local funding. Contributed funds were provided in April 2020 to complete the reevaluation (the current study effort).

**Problem Statement:** The problems to be considered by the study include economic damages and life safety concerns related to riverine flooding within University City.

**Federal Interest:** The 1988 River Des Peres, MO Feasibility Study and subsequent Chief's Report identified a Federal interest in a flood risk reduction project in University City. The project was authorized in the Water Resources Development Act of 1990.

**Risk Identification:** The study will consider risks to life safety and economic damages associated with riverine flood inundation. Life risks include direct life loss, flooding of critical infrastructure, flooding of evacuation routes, and health concerns with flooded structures (mold, etc.). Economic risks include direct structure inundation (structure, content and vehicles) but may consider traffic disruption, emergency costs, etc. The study team does not believe that there are significant life safety risks in the existing or future conditions, and believes it is unlikely that a plan will be recommended that will significantly increase life safety risk.



## 1. FACTORS AFFECTING THE LEVELS OF REVIEW

### Mandatory IEPR Triggers.

Per Director of Civil Works Memo, 05 April 2019 – Interim Guidance on Streamlining IEPR for Improved Civil works Product Delivery, the River Des Peres GRR does not meet any of the mandatory triggers for IEPR:

- Is the estimated total project cost, including mitigation, greater than \$200 million? **No**
- Has the Governor of an affected state requested a peer review by independent experts? **No**
- Has the Chief of Engineers determined the project study is controversial due to significant public dispute over the size, nature or effects of the project or the economic or environmental costs or benefits of the project (including but not limited to projects requiring an Environmental Impact Statement)? **No**

### Level and Scope of Review.

- Will the study likely be challenging? The study is not anticipated to be particularly challenging. This is a reevaluation of an authorized project and has a lot of past analyses to draw on and inform the study scope.
- Provide a preliminary assessment of where the project risks are likely to occur and assess the magnitude of those risks. Due to the wealth of past study information and modeling, there are very few analysis risks associated with the study. The focused array of alternatives includes standard flood risk reduction measures such as small detention structures, channelization, and nonstructural measures. Of those, only detention would be anticipated to increase incremental life safety risks. However, space constraints will limit the size and effectiveness of detention measures and they may not be included in the final array.

There is a low to moderate risk that the available contributed funds will not be sufficient to complete the study due to changes in USACE study procedures since the time the budget was established. Due to the lengthy process required to achieve permission to accept contributed funds, the study's budget was developed in 2016, prior to the more rigorous study requirements related to life safety analysis. If the study is required to quantify life safety risk, it is possible that funding will be insufficient.

There is a moderate risk that a nonstructural plan consisting predominantly of buyouts would not be supported by the City due to a desire to retain residents and potential difficulty relocating them within the City limits.

- Is the project likely to be justified by life safety or is the study or project likely to involve significant life safety issues? The project is not likely to be justified by life safety based on currently available information. There was one past flood event that resulted in two lives lost when residents left their home to move their vehicles. Existing modeling is insufficient to estimate current flood depths and velocities but updated modeling is underway and will be available soon. The watershed is relatively small and highly urbanized, resulting in relatively fast flood arrival times and also quick recession, per local testimony. There is no flood warning

system in place outside of the standard National Weather Service warnings that go to television, radio and cell phones. There are ample evacuation routes and high ground is a very short distance away. The population at risk in the 1% floodplain is approximately 3,000 at night and approximately 2,000 during the day. Based on population size, storm duration, and existing evacuation routes, the PDT believes there is limited life safety issues with the existing conditions, future without project conditions, or with any of the alternatives likely to be recommended. The District Chief of Engineering concurs with this assessment.

- Is the information in the decision document or anticipated project design likely to be based on novel methods, involve innovative materials or techniques, present complex challenges for interpretation, contain precedent-setting methods or models, or present conclusions that are likely to change prevailing practices? No. The study will use standard flood risk management models and investigate standard measures.
- Does the project design require redundancy, resiliency, and/or robustness, unique construction sequencing, or a reduced or overlapping design/construction schedule? The project is not yet determined but is anticipated to use standard USACE design guidance and practices, and not require any unusual redundancy, resiliency, robustness, construction sequencing or schedule. The focused array includes small detention, channelization, and nonstructural measures.
- Is the project expected to have more than negligible adverse impacts on scarce or unique tribal, cultural, or historic resources? While there are cultural resources located in the floodplain that must be considered, it is not anticipated that any of the alternatives being considered would have more than negligible adverse impacts on these resources.
- Is the project expected to have substantial adverse impacts on fish and wildlife species and their habitat prior to the implementation of mitigation measures? No. The study area is a highly urbanized environment with minimal fish and wildlife habitat.
- Is the project expected to have, before mitigation measures, more than a negligible adverse impact on an endangered or threatened species or their designated critical habitat? No. The study area is a highly urbanized environment with minimal threatened and endangered species habitat. There is potential for four endangered species to be found in the project area but no indication of their presence to date.

## 2. REVIEW EXECUTION PLAN

This section describes each level of review to be conducted. Based upon the factors discussed in Section 1, this study will undergo the following types of reviews:

**District Quality Control (DQC).** All decision documents (including data, analyses, environmental compliance documents, etc.) undergo DQC. This internal review process covers basic science and engineering work products. It fulfills the project quality requirements of the Project Management Plan.

**Agency Technical Review (ATR).** ATR is performed by a qualified team from outside the home district that is not involved in the day-to-day production of the project/product. These teams will be comprised of certified USACE personnel. The ATR team lead will be from outside the home MSC.

**Cost Engineering Review.** All decision documents shall be coordinated with the Cost Engineering Mandatory Center of Expertise (MCX). The MCX will assist in determining the expertise needed on the ATR team. The MCX will provide the Cost Engineering certification. The RMO is responsible for coordinating with the MCX for the reviews. These reviews typically occur as part of ATR.

**Policy and Legal Review.** All decision documents will be reviewed for compliance with law and policy. ER 1105-2-100, Appendix H, and Director’s Policy Memorandum 2019-01, both provide guidance on policy and legal compliance reviews. These reviews culminate in determinations that report recommendations and the supporting analyses and coordination comply with law and policy, and warrant approval or further recommendation to higher authority by the home MSC Commander.

**Public Review.** The district will post the Review Plan and approval memo on the district internet site. Public comment on the adequacy of the Review Plans will be accepted and considered.

Table 1 provides the schedules and costs for reviews. The specific expertise required for the teams are identified in later subsections of this plan covering each review. These subsections also identify requirements, special reporting provisions, and sources of more information.

**Table 1: Schedule and Costs of Review**

Product(s) to undergo Review	Review Level	Start Date	End Date	Cost	Complete
PCSWMM Model Request for “Allowed for Use” Approval	HH&C CoP	8/26/20	9/28/20	n/a	No
Existing and Future Conditions Modeling and Documentation	District Quality Control	12/17/20	12/30/20	\$5,000	No
Existing and Future Conditions Modeling and Documentation	Targeted ATR	12/31/20	2/1/21	\$10,000	No
Draft Feasibility Report & EA	District Quality Control	4/29/21	5/26/21	\$10,000	No
Draft Feasibility Report & EA	Agency Technical Review	6/7/21	8/4/21	\$45,000	No
Draft Feasibility Report & EA	Policy and Legal Review	6/7/21	7/6/21	n/a	No
Final Feasibility Report & EA	District Quality Control	6/14/22	7/14/22	\$10,000	No
Final Feasibility Report & EA	Agency Technical Review	7/15/22	8/25/22	\$45,000	No

Final Feasibility Report & EA	Policy and Legal Review	9/7/22	11/6/22	n/a	No
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**a. DISTRICT QUALITY CONTROL**

The home district will manage DQC and will appoint a DQC Lead to manage the local review (see EC 1165-2-217, section 8.a.1). Table 2 identifies the required expertise for the DQC team. The DQC Team members should not be involved in the production of any of the products reviewed.

**Table 2: Required DQC Expertise**

<b>DQC Team Disciplines</b>	<b>Expertise Required</b>
DQC Lead	A senior professional with extensive experience preparing Civil Works decision documents and conducting DQC. The lead may also serve as a reviewer for a specific discipline (such as planning, economics, environmental resources, etc).
Planning	A senior water resources planner with experience in flood risk management planning.
Economics	A senior economist with thorough knowledge of the various economic analyses utilized in feasibility study (life safety, transportation, flood damage). Has capability and experience to estimate and communicate likely variance in the outcomes of models, analyses, and designs. Is familiar with HEC-FDA and LifeSim and/or HEC-FIA modeling. Should also be familiar with required display of flood risk analysis risks per ER 1105-2-101.
Environmental Resources	A senior environmental specialist experienced with National Environmental Policy Act (NEPA) compliance requirements and mitigation plan preparation.
Cultural Resources	A senior cultural resources specialist experienced in National Historic Preservation Act (NHPA) processes and analysis and preferably will have experience in historic structures.
Hydrology and Hydraulic Engineering	A senior engineer with experience in the field of hydraulics and hydrology with experience in climate change impacts to inland flood risk management projects. They should have a thorough understanding of the application of structural and non-structural flood risk management solutions, and computer modeling techniques. Has capability and experience to estimate and communicate likely variance in the outcomes of models, analyses, and designs. Is familiar with HEC-RAS, PCSWMM, and HEC-HMS modelling which are likely to be used as a part of this study. Must be familiar with required display of flood risk analysis risks per ER 1105-2-101 and requirements of climate change analysis for inland hydrology.
Geotechnical Engineering	A senior geotechnical engineer with a thorough knowledge and experience in geotechnical considerations related to flood risk management projects (e.g., slope stability). Has capability and experience to estimate and communicate likely variance in the outcomes of models, analyses, and designs.
Civil Engineering	A senior engineer and expert in the field of civil engineering. They must have a thorough knowledge of and experience with civil

	design products (e.g., site selection, civil site design, project development, real estate, and relocations) related to flood risk reduction and protection solutions.
Cost Engineering	A senior engineer and expert in the field of cost engineering, assigned by the Cost CX. They must have a thorough knowledge of and experience in costing structural and non-structural flood risk management solutions. Has capability and experience to estimate and communicate likely variance in the outcomes of models, analyses, and designs.
Real Estate	A senior real estate specialist with experience preparing Real Estate Plans and in acquisition of LERRD's. The realty specialist(s) should have experience in residential/business relocation assistance, utility/facility relocation, and non-structural flood risk management (Public Law 91-646).
Water Quality (HTRW)	The Environmental Quality reviewer will be experienced in performing and reviewing Phase 1 assessments for HTRW and environmental quality concerns.

**Documentation of DQC.** Quality Control will be performed continuously. A specific certification of DQC completion will be prepared at the draft and final report stages. Documentation of DQC will follow the District Quality Manual and the MSC Quality Management Plan. Dr. Checks will be used for documentation of DQC comments. An example DQC Certification statement is provided in EC 1165-2-217, on page 19 (see Figure F).

Documentation of completed DQC will be provided to the MSC, RMO and ATR Team leader prior to initiating an ATR. The ATR team will examine DQC records and comment in the ATR report on the adequacy of the DQC effort.

**b. AGENCY TECHNICAL REVIEW**

The ATR will assess whether the analyses are technically correct and comply with guidance, and that documents explain the analyses and results in a clear manner. An RMO manages ATR. The review is conducted by an ATR Team whose members are certified to perform reviews. Lists of certified reviewers are maintained by the various technical Communities of Practice (see EC 1165-2-217, section 9(h)(1)). Table 3 identifies the disciplines and required expertise for this ATR Team.

**Table 3: Required ATR Team Expertise**

ATR Team Members/Disciplines	Expertise Required
ATR Lead	The ATR lead should be a senior professional with extensive experience in preparing Civil Works decision documents and conducting ATR. The lead should also have the necessary skills and experience to lead a virtual team through the ATR process. The ATR lead may also serve as a reviewer for a specific discipline (such as planning, economics, environmental resources, etc). The ATR Lead will participate in all milestone reviews and in-progress reviews.
Planning	The Planning reviewer should be a senior water resources planner with experience in urban flood risk management studies.
Economics	The Economics reviewer should be a senior economist experienced in flood risk management economics in urban settings. Should have experience in nonstructural plan development and evaluation. May also need experience with LifeSim modeling for estimating incremental life risk. This may or may not require more than one reviewer, depending on expertise and availability.
Environmental Resources	The Environmental reviewer must be experienced with National Environmental Policy Act (NEPA) compliance requirements and mitigation plan preparation.
Cultural Resources	The Cultural reviewer must be experienced in National Historic Preservation Act (NHPA) processes and analysis and preferably will have experience in historic structures.
Hydrology and Hydraulic Engineering	The hydrology and hydraulics engineering reviewer will be an expert in the field of hydrology and hydraulics and have a thorough understanding of open channel dynamics, application of detention basins, non-structural solutions and computer modeling techniques. Reviewer will need experience with SWMM (required) or PCSWMM (preferred) and HEC-RAS. This may or may not require more than one reviewer, depending on expertise and availability.
Risk Analysis	The risk analysis reviewer will be experienced with performing and presenting risk analyses in accordance with ER 1105-2-101 and other related guidance, including familiarity with how information from the various disciplines

	involved in the analysis interact and affect the results. This reviewer may also serve as the reviewer for another discipline such as economics or hydraulics.
Geotechnical Engineering	The geotechnical reviewer must be experienced in design requirements detention structures and open channels.
Civil/Structural Engineering	The civil design reviewer must have experience in design of open channels, detention structures and nonstructural flood risk management measures.
Cost Engineering	The Cost reviewer must be familiar with cost estimating for similar civil works projects using MCACES. Reviewer will be a Certified Cost Technician, Certified Cost Consultant, or Certified Cost Engineer.
Real Estate	A senior real estate specialist with experience preparing Real Estate Plans and in acquisition of LERRD's. The realty specialist(s) should have experience in residential/business relocation assistance, utility/facility relocation, and non-structural flood risk management (Public Law 91-646).
Climate Preparedness and Resilience CoP Reviewer	A member of the Climate Preparedness and Resiliency Community of Practice (CoP) with experience in climate change analysis for inland flood risk management projects.

**Documentation of ATR.** DrChecks will be used to document all ATR comments, responses and resolutions. Comments should be limited to those needed to ensure product adequacy. All members of the ATR team will use the four part comment structure (see EC 1165-2-217, Section 9(k)(1)). If a concern cannot be resolved by the ATR team and PDT, it will be elevated to the vertical team to resolve using the EC 1165-2-217 issue resolution process. Concerns will be closed in DrChecks by noting the concern has been elevated. The ATR Lead will prepare a Statement of Technical Review (see EC 1165-2-217, Section 9), for the draft and final reports, certifying that review issues have been resolved or elevated. ATR will be certified when all concerns are resolved or referred to the vertical team and the ATR documentation is complete.

**c. INDEPENDENT EXTERNAL PEER REVIEW**

**(i) Type I IEPR.**

**Decision on Type I IEPR.**

Based on the criteria in Director of Civil Works Policy Memo 05 April 2019 – Interim Guidance on Streamlining Independent External Peer Review (IEPR) for Improved Civil works Product Delivery, the risk factors discussed in Section I, and current data, the PDT has determined through risk-informed decision making that a Type I IEPR for the River des Peres, University City, MO GRR will not significantly benefit the study and will not be performed.

**(ii) Type II IEPR.**

The second kind of IEPR is Type II IEPR. These Safety Assurance Reviews are managed outside of the USACE and are conducted on design and construction for hurricane, storm and flood risk management projects or other projects where existing and potential hazards pose a significant threat to human life. If the characteristics of the recommended plan warrant a Safety Assurance Review, a panel will be convened to review the design and construction activities before construction begins, and until construction activities are completed, on a regular schedule.

**Decision on Type II IEPR.** For the reasons discussed in Scope of Review and in the Decision on Type I IEPR, the project is unlikely to involve significant life safety concerns that warrant a Type II IEPR. Therefore, a Type II IEPR is not anticipated at this time. However, the decision on whether a Type II IEPR will be required will be made in the implementation phase of the project and documented in a separate review plan that covers the implementation phase.

#### d. MODEL CERTIFICATION OR APPROVAL

EC 1105-2-412 mandates the use of certified or approved models for all planning activities to ensure the models are technically and theoretically sound, compliant with USACE policy, computationally accurate, and based on reasonable assumptions. Planning models are any models and analytical tools used to define water resources management problems and opportunities, to formulate potential alternatives to address the problems and take advantage of the opportunities, to evaluate potential effects of alternatives and to support decision making. The use of a certified/approved planning model does not constitute technical review of a planning product. The selection and application of the model and the input and output data is the responsibility of the users and is subject to DQC, ATR, and IEPR.

**Table 4: Planning Models.** The following models may be used to develop the decision document:

Model Name and Version	Brief Model Description and How It Will Be Used in the Study	Certification / Approval
HEC-FDA 1.4.2	The program integrates hydrologic engineering and economic analysis to formulate and evaluate plans using risk-based analysis methods. It will be used to evaluate/compare plans to aid in selecting a recommended plan.	Certified
LifeSim 1.01 or HEC-FIA 3.1	Both models simulate life loss using hydrologic and demographic data and risk-based estimation techniques. These models will only be used if the study needs to quantify life safety risk (for example, if detention measures are included in the final array).	Certified
HEP (Habitat Evaluation Procedures)	If mitigation is determined to be required, the Habitat Evaluation Procedures (HEP) is an established approach to assess natural resources. The HEP approach has been well documented and is approved for use in Corps projects as an assessment framework that combines resource quality and quantity over time and is appropriate throughout the United States. The Habitat Suitability Index (HSI) models are the format for quantity determinations that are applied within the HEP framework. <b>While the exact models have yet to be determined, only HEP models which have been certified or approved for use will be utilized for this study.</b> ATR of input data is required in all instances.	Certified or Approved for Use

EC 1105-2-412 does not cover engineering models used in planning. The responsible use of well-known and proven USACE developed and commercial engineering software will continue. The professional practice of documenting the application of the software and modeling results will be followed. The USACE Scientific and Engineering Technology Initiative has identified many engineering models as preferred or acceptable for use in studies. These models should be used when appropriate. The selection and application of the model and the input and output data is still the responsibility of the users and is subject to DQC, ATR, and IEPR.

**Table 5: Engineering Models.** These models may be used to develop the decision document:

Model Name and Version	Brief Model Description and How It Will Be Used in the Study	Approval Status
HEC-RAS 5.07	Used to simulate impacts due to flooding along the River Des Peres and tributaries. Given a set of reach inflows from a hydrologic analysis, HEC-RAS will be used to visualize impacts, assess velocities in the channel and overbank, and compute flood frequency profiles. Model will have multiple geometries to study with and without project conditions.	HH&C CoP Preferred
PCSWMM 7.2	Used to simulate inflow into the River Des Peres from the surrounding watershed based on observed and frequency based rainfall events.	Pending HH&C CoP “Allowed for Use” approval*

\* Per Enterprise Standard 08101 (Software Validation for the HH&C CoP), if proposed software is not on the HH&C CoP List of Software, it must be justified and vetted before it can be used to support a planning study. This process includes a request by the District or Division, review by the appropriate Area of Expertise point of contact and resulting recommendation, review of the recommendation by the HEC committee member and notification to the District or Division of approval or denial.

**e. POLICY AND LEGAL REVIEW**

Policy and legal compliance reviews for draft and final planning decision documents have been delegated to the MSC (see Director’s Policy Memorandum 2018-05, paragraph 9).

**(i) Policy Review.**

The policy review team will be selected through the collaboration of the MSC Chief of Planning and Policy and the HQUSACE Chief of the Office of Water Project Review. The team is identified in Attachment 1 of this Review Plan. The makeup of the Policy Review team may be drawn from Headquarters (HQUSACE), the MSC, the Planning Centers of Expertise, and other review resources as needed.

- The Policy Review Team will be invited to participate in key meetings during the development of decision documents as well as SMART Planning Milestone meetings. These engagements may include In-Progress Reviews, Issue Resolution Conferences or other vertical team meetings plus the milestone events.
- The input from the Policy Review team will be documented in a Memorandum for the Record (MFR) produced for each engagement with the team. The MFR will be distributed to all meeting participants.
- In addition, teams may choose to capture some of the policy review input in a risk register if appropriate. These items should be highlighted at future meetings until the

issues are resolved. Any key decisions on how to address risk or other considerations will be documented in an MFR.

**(ii) Legal Review.**

Representatives from the Office of Counsel will be assigned to participate in reviews. Members may participate from the District, MSC and HQUSACE. The MSC Chief of Planning and Policy will coordinate membership and participation with the office chiefs.

- In some cases legal review input may be captured in the MFR for the particular meeting or milestone. In other cases, a separate legal memorandum may be used to document the input from the Office of Counsel.
- Each participating Office of Counsel will determine how to document legal review input.