



**US Army Corps
of Engineers®**

REVIEW PLAN

for

MRLS 385L Deficiencies Corrections

Riverside, Missouri

**Kansas City District
Northwestern Division**

April 25, 2011

REVIEW PLAN FOR MRLS 385L DEFICIENCIES CORRECTIONS

1.0 Purpose and Requirement

1.1 Purpose and Authority. The purpose of this review plan (RP) is to define the scope and level of review for implementation documents for the Missouri River Levee System (MRLS) river mile 385, left bank (385L) deficiencies corrections. This RP is a standalone document but is also included as an appendix to the 385L Deficiencies Corrections Draft Project Management Plan (PMP). The L-385 project was authorized and constructed pursuant to the Flood Control Act of 1944 (P.L. 534). A Project Cooperation Agreement with the Riverside-Quindaro Bend Levee District (RQBLD) called for shared cost of the project design and construction. After a substantial part of the construction had been completed and the Project was functioning as designed, a number of deficiencies in the Project were discovered that the parties agreed must be corrected. P.L. 111-8 then authorized the Chief of Engineers to take such action as is necessary to correct deficiencies in the L-385 levee system in Riverside, Missouri at full Federal expense at a cost of no more than \$7,000,000.

1.2 Documents for Review. The project is in the implementation phase. Implementation documents are 100% plans and specifications, and design memorandums.

1.3 Requirement. This review plan is required by EC 1165-2-209 which establishes the procedures for ensuring the quality and credibility of U.S. Army corps of Engineers (USACE) decision and implementation documents through independent review. The EC outlines three levels of review: District Quality Control (DQC), Agency Technical Review (ATR), and Independent External Peer Review (IEPR). In addition to these three levels of review, decision documents are subject to policy and legal compliance review and, if applicable, safety assurance review and model certification/approval.

1.4 References.

Table 1. Responsible Staff			
Function	Location	Name	Phone
District Quality Control (DQC)	Kansas City District	[REDACTED]	[REDACTED]
Review Management Office (RMO)	Northwestern Division	[REDACTED]	[REDACTED]
Agency Technical Review	St. Paul District	[REDACTED]	[REDACTED]

Table 2. Reference Documents		
Document Type	Title	Date
Engineering Circular (EC 1165-2-209)	Water Resources Policies and Procedures: Civil Works Review Policy	31 Jan 2010
Draft Project Management Plan (PMP)	MRLS 385L Deficiencies Corrections, Riverside, Missouri, Project Management Plan	7 Mar 2011
Project Cooperation Agreement	Project Cooperation Agreement between the Department of the Army and the Riverside-Quindaro Bend Levee District for the Construction of the Missouri River Levee Unit L-385	23 Sep 1997
Memorandum of Agreement (MOA)	MOA to Establish Roles & Responsibilities to Correct Existing Deficiencies	11 June 2010
CENWK-ED-GC Memorandum to CENWK-PM-CJ	Recommended Repair for Failed Reinforced Concrete Pipe (RCP) at Various Locations, Missouri River Levee Unit L-385	26 Oct 2010
Pipe Repair Scope of Work	Scope of Work, Repair of Pipes, Levee Unit L-385, Riverside, Missouri	24 Mar 2011
Lower Line Creek Plans and Specifications	Stabilization of Lower Line Creek*	13 May 2011*

*- anticipated at time of printing

2.0 Review Documents Information

2.1 Project Background and Description. The L-385 flood risk reduction project is located on the Missouri river upstream of Kansas City in Riverside, Missouri. The project is 6.2 miles long, consisting of mostly earth embankment and approximately 2200 feet of floodwall. Features include two rolling gates, five stop log gaps, one pump station, and eight pipes with gatewells. It was authorized in the 1944 Flood Control Act. Design appropriations were made in 1997 and the construction project was awarded in 2002. Construction was effectively completed in 2005. Pipe damage occurred during a 2007 high water event which triggered delay in project turnover. Other issues were discovered during the delay that are collectively referred to as “deficiencies.” The official turnover of the levee has not occurred.

2.1.1 P.L. 111-8 included authorizing \$7M at “full Federal expense” to “correct deficiencies” signed on March 11, 2009. Riverside-Quindaro Bend Levee District (RQBLD), the local sponsor, and NWK signed a Memorandum of Agreement (MOA) dated 11 June 2010. The MOA outlines the terms of the P.L. 111-8 and its relationship with the original construction project, as well as the prioritization of activities to be performed. Categories I, II, and III were established to describe priorities, highest to lowest, respectively. Activities range from significant design and construction activities, to smaller scale efforts that, after a risk-informed decision, are not considered for ATR.

Table 3 shows the MOA Exhibit A items that are included in the scope of this Review Plan.

MOA Exhibit A Category	Item Number	Description
I	2	Implement remedies for DS4*
	3	Implement remedies for gatewell pipe 5A*
	7	Implement stabilization of lower Line Creek from STA 199+50 to STA 205+00
	8	Implement remedies for gatewell 10*
II	6	Implement remedies for pipe at gatewell 4*
	7	Implement remedies for pipe at gatewell 4A*

* These are preliminary rankings. Final rankings for these items shall be determined by L-385 pipe project development team and the USACE NWD.

2.2 Site Description. The two deficiencies addressed in this review plan are the stabilization of Lower Line Creek, and the repair of gatewell pipes.

2.2.1 Lower Line Creek is generally the last 1300 feet of Line Creek before it confluences with the Missouri River. It lies on the east side of the Quindaro Bend portion of the project, passing Gatewell 4A near stop log gap Q3. Portions of the levee embankment and floodwall lie on the west bank, and Young Park lies on the east bank. Line Creek is a relatively small creek draining an urbanized area.

2.2.2 Some damaged gatewell pipes are to be lined and some pipe foundations grouted. The scope of work titled “Repair of Pipes” details the requirements to install structural liners in portions of pipes near gatewells (GW) and one drainage structure (DS), as well as low pressure grouting in the pipe foundations and backfill. Table 4 summarizes the pipe repair SOW.

Feature Location	Structural Liner	Low Pressure Grouting
GW4		RS
GW4A		RS
GW5A	RS	RS
GW10	LS	Well
DS4	Road	

RS – pipe on the river side of gatewell
 LS – pipe on land side of the gatewell
 Well- at the gatewell structure
 Road – below NW Platte Rd

2.3 Implementation Documents Implementation documents include plans, specifications, and design documentation memorandums, all developed by a USACE Project Delivery Team (PDT). A construction contractor will complete the construction for the pipe repair. If funding projections are not realized, in-house staff will perform the work on Lower Line Creek with a reduced scope. A significant scope change would be re-submitted for ATR.

2.4 Factors Affecting the Scope and Level of Review This section addresses the factors necessary to determine the appropriate scope and level of review for these documents. This information is used by the PDT and vertical team (per EC 209, District, MSC, PCX, RMC, and HQ members) to assess the appropriate level of review and types of expertise represented on the review teams. Following are factors considered in selecting the type of review.

2.4.1 Project Cost The total cost for both projects is estimated to be less than \$4 million.

2.4.2 Factors Considered The engineering employed to support the implementation documents is hydraulics, biology, geotechnical evaluation, materials science, and civil engineering. The design and design methods in the implementation documents are not based on novel methods, do not present complex challenges for interpretation, do not contain precedent-setting methods or models, and do not present conclusions that are likely to change prevailing practices. These projects will have no significant environmental impact, disturb no known cultural or historically significant sites, and have a minimal construction period (no more than 6 months for either one). Little to no public controversy is expected.

2.4.2.1 Deficiencies not for review in this Review Plan Deficiencies that are significant design and construction efforts are included in Table 3 as the scope of this Review Plan. The remaining L-385 Deficiencies have either already been performed or are not considered design or construction activities like the pipe repair and Lower Line Creek stabilization. Based on paragraph 15 “Risk Informed Decisions on Appropriate Reviews” of EC 209, the remaining deficiencies not yet performed are considered other work products that do not require ATR.

Table 5. L-385 Deficiencies NOT in Review Plan Scope

Category	Item No.	Description	Status
I	1	Implement Middle Line Creek Repair	Emergency action completed April 2010
	4	Implement Remedies at Fairfax Bridge Sinkhole	11' excavation and backfill performed Dec 2010
	5	Install Relief Wells at Southern Star and QPS	Contract for 3 Relief Wells awarded March 2011
	6	Implement Stabilization of Burlington Creek from Sta 20+00 to Sta 22+00	Emergency action completed November 2010
II	1	Check for vertical gaps in flood wall transitions at north end of Line Creek, Q2 north, and Q1 north and south. Repair if required, possibly including modifications to vertical joints to address leakage and slow continued deterioration.	NWK Structural engineer to recommend repairs to be performed by NWK staff
	2	Install grade control protection at QPS outlet from STA 1+90 TO STA 4+30	Not scoped due to funding limits
	3	Conduct comprehensive subsurface investigation and implement required remedies at: a. STA Q142+00 to Q174+00 for clay blanket thickness b. subsidence west of QPS at approximately STA Q159+00. c. STA 60+80 to Q62+83, and near Q75+00 for subsurface anomalies	Soil sampling, CPT borings, and piezometer installation occurred in Fall 2010 at these locations. Analysis in summer 2011 to determine subsurface conditions.
	4	Replace floodwall joint sealant	See Category II, Item 1
	5	Implement stabilization of upper Line Creek	Likely to be amended as a non-deficiency, no work performed or planned.
	8	Implement remedies for pipe at gatewell 8*	No action, per ED pipe memo
	9	Implement remedies for pipe at gatewell 11*	No action, per ED pipe memo
III	1	Repair damage to levee resulting from the KCMO force main leak (pipe constructed by USACE).*	Performed by RQBLD in 2010
	2	Address Burlington Creek flooding through Q1	Not scoped due to funding limits
	3	Lower third rail track at Q1	Not scoped due to funding limits
	4	Remedy deficiencies in City of Kansas City, Missouri force main vaults to conform with plan drawings.*	Will modify as-builts to reflect field conditions
	5	Correct equipment for proper operation of sluiceway operator at gatewell 9	Performed by RQBLD

*- These are preliminary rankings. Final rankings for these items shall be determined by L-385 pipe project development team and the USACE NWD.

3.0 Purpose of Review Plan

This Review Plan is intended to ensure that quality-engineering products are developed by the Kansas City District Corps of Engineers. The Review Plan covers the following work:

- Lower Line Creek Stabilization Plans and Specifications: the bank and bed stabilization of a portion of Lower Line Creek on the east side of the Quindaro Bend portion of the system.
- Pipe Repair Contract: repairing pipe sections following the recommendations in a memorandum from CENWK-ED-GC to CENWK-PM-CJ.

4.0 Levels of Review

4.1 There are four levels of review considered for the L-385 Deficiencies Corrections project: 1) District Quality Control (DQC), 2) Agency Technical Review (ATR), 3) Type I Independent External Peer Review (IEPR), 4) Type II IEPR. Each level, and how it applies is explained below:

4.2 District Quality Control DQC is the review of basic science and engineering work products focused on fulfilling the project quality requirements defined in the PMP. It is managed in the home district and is conducted by staff in the home district not already doing work for the project. The design products for the project were developed entirely internally to the Corps of Engineers by the PDT. Basic quality control tools used on the project include a Quality Management Plan (QMP) based on Business Quality Practice (BQP) 7.3.01, individual branch practices, and contracting policies. The BQP provides checklists, peer review policy, peer quality checks and reviews, PDT reviews, stakeholder reviews, a biddability, constructability operability and environmental (BCOE) review, and established Business Quality Practices used to ensure quality procedures are followed. The QMP also includes certification of the plans, specifications, and DDR and BCOE. The BCOE includes the chiefs of Construction, Engineering, and Operations Divisions and the chiefs of the Civil, Construction, Hydrological Engineering and Geotechnical Engineering Branches.

4.2.1 DQC efforts include the necessary expertise to address compliance with published Corps policy. The NWD and NWK quality management plans address the conduct and documentation of this fundamental level of review. DQC is required for this project.

4.3 Risk Informed Decisions on Appropriate Reviews All work products undergo DQC and all implementation documents undergo ATR. However, judgment is applied to determine if IEPR is required. Therefore, this RP includes documentation of the risk-informed decision on the IEPR level of review.

4.4 Agency Technical Review (ATR) ATR is an in-depth review undertaken to ensure the quality and credibility of the government's scientific information, managed within USACE, and constructed by a qualified team outside the home district that is not involved in the day-to-day production of the project or product. ATR is mandatory for all

decision and implementation documents. For other work products, a case-specific risk-informed analysis is performed to determine whether ATR is appropriate. The purpose of ATR is to ensure proper application of clearly established criteria, regulations, laws, codes, principle, and professional practices.. The ATR team reviews the various work products and assures that all the parts fit together in a coherent whole. ATR teams are comprised of senior USACE personnel and may be supplemented by outside experts as appropriate. To assure independence, the leader of the ATR team is selected from outside the Northwestern Division.

4.4.1 Required ATR Team Expertise for Pipe Repairs and Lower Line Creek The ATR team consists of two members including the ATR team lead. The following paragraphs describe the list of required disciplines as well as the experience required by each of the ATR team members.

4.4.1.1 Civil/Hydraulics One team member will be an expert in the field of pipe design and construction and open channel hydraulics. This position is anticipated to also serve as the lead.

4.4.1.2 Geotechnical One team member will be an expert in the geotechnical engineering aspects of pipes, including repair materials properties and slope stability.

4.4.3 Documentation of ATR ATR comments, responses and associated resolutions accomplished will be documented using Dr. Checks. ATR team members must register with the DR. Checks website and they will receive access to Dr. Checks through the project manager. A PDT member is assigned to take the lead in resolving comments for each of the primary project disciplines. It is the PDT member's responsibility to coordinate resolution of the comment with other team members as required, evaluate the Dr. Checks comment, enter the PDT's response into Dr. Checks, and ensure the ATR team member conducts a comment back check. It is the PDT member's responsibility to ensure all Dr. Checks ATR comments in their discipline are properly addressed, resolved, and closed.

4.4.4 ATR Report In some situations, especially addressing incomplete or unclear information, comments may seek clarification or try to assess whether further specific concerns may exist. The ATR documentation in Dr. Checks will include the text of each ATR concern, the PDT response, a brief summary of the pertinent point in any discussion, including any vertical team coordination, and lastly the agreed upon resolution. Each unresolved issue will be raised to the vertical team for resolution. The ATR team will prepare a Review Report to document the ATR. Review reports will:

- Disclose the names of the reviewers, their organizational affiliations, and include a short paragraph on both the credentials an relevant experiences of each reviewer;
- Include the charge to the reviewers;
- Describe the nature of their review and their findings and conclusions; and

- Include a verbatim copy of each reviewer's comments, or represent the views of the group as a whole, including any disparate and dissenting views.

4.4.5 ATR Issue Resolution ATR efforts include the necessary expertise to address compliance with applicable published policy. When policy or legal concerns arise during ATR that are not readily and mutually resolved by the PDT and the reviewers, the District will seek issue resolution support from NWD and HQUSACE.

4.4.6 ATR Completion ATR is considered complete and certified when the ATR Review Report is completed and all ATR concerns are resolved. Issues that cannot be resolved among the Districts or within the Division will be referred to HQUSACE for resolution. All issues must be resolved before ATR documentation is complete. A sample ATR certification is included as Attachment 1.

4.5 Independent External Peer Review (IEPR) IEPR is the most independent level of review, and is applied in cases that meet certain criteria where the risk and magnitude of the proposed project are such that a critical examination by a qualified team outside of USACE is warranted. Any work product that undergoes ATR may also undergo Type I or Type II IEPR. In general, decision documents undergo Type I IEPR and implementation documents undergo Type II IEPR (or Safety Assurance Review, SAR). Meeting the specific conditions identified for possible exclusions is not, in itself, necessarily sufficient grounds for recommending exclusion. However, judgment is applied to determine if IEPR is required.

4.5.1 Type I IEPR This project is not anticipated to require Type I IEPR because it is in the implementation phase and not the study phase.

4.5.2 Type II IEPR A Type II IEPR is conducted to insure public health, safety, and welfare. The circumstances requiring a Type II IEPR are described in Appendix E of EC 1165-2-209. Each of those circumstances is explicitly considered in developing a risk-informed rationale for determining the appropriate level of review, including the need for a safety assurance review. Therefore, this RP includes documentation in Attachment 2 of the risk-informed decision on the IEPR level of review.

4.5.3 Type II IEPR Decision Based on the risk-informed analysis provided in Attachment 2, it is recommended that Type II IEPR is not required for either the lower Line creek stabilization or the pipe repairs.

4.6 Policy and Legal Compliance Review The Kansas City District office of counsel is responsible for legal review of decision and implementation documents and signs a certification of legal sufficiency prior to the construction of the projects. An example certification of legal review is shown in Attachment 3.

4.7 Model Certification/Approval EC 1165-2-209 requires certification or approval of planning models used for all planning activities. The EC defines planning models as any

models and analytical tools that planners use 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 responsible use of well-known and proven USACE developed and commercial engineering software will follow the professional practice of documenting the application of the software and modeling results.

4.7.1 Due to the simplicity and limited hydraulic, environmental, economic, social, geologic, and geotechnical aspects of this project, in the professional judgment of the PDT, conventional HEC-RAS hydraulic modeling is appropriate to verify the design.

5.0 Posting Review Plans

5.1 District The Kansas City District (NWK) maintains a web site that hosts electronic versions of review plans for its studies/projects as well as a list of the current and active Review Plans with links to the documents. In posted documents, lists of the names of USACE reviewers may be displayed. Northwestern Division and HQUSACE posting also link to the District's site. The District will establish a mechanism on their web site for allowing the public to comment on the adequacy of the RP, and will consider public comments on RPs. The RP is published on the Kansas City District's public internet site following approval by Northwestern Division. The Kansas City District website is located here: <http://www.nwk.usace.army.mil/index.cfm>.

5.2 Division The Northwestern Division will post on its website and update at least every three months, an agenda for RPs. The agenda describes all decision and implementation documents, the RP for each entry on the agenda, and provides a link from the agenda to each document made public. The Northwestern Division's website is located at: <http://www.nwd.usace.army.mil/home.asp>.

6.0 Review Schedules and Cost

6.1 DQC Schedule and Cost. DQC, which includes peer reviews, interdisciplinary, stakeholder, and vertical reviews, and a bidability, constructability, operability, and environmental (BCOE) review (if to be awarded as a construction contract), is accomplished prior to the ATR. The entire DQC process takes about 6 months and costs are paid from project funds.

6.1.1 DQC Schedule

Table 6. DQC Schedule		
Activity	Pipe Repair	Lower Line Creek Stabilization
Plans Complete	14 March 2011	13 May 2011
Specifications Complete	14 March 2011	13 May 2011
BCOE Approval	NA (RFP)	27 May 2011
Advertise	22 March 2011	3 Jun 2011
Award	23 May 2011	1 Jul 2011

6.1.2 Peer Reviews Prior to ATR reviews, all implementation documents will receive a peer review. The peer review is conducted by a peer in the same discipline and double check calculations, assumptions, and other design details used in the design and specifications. Peer review is a standard requirement outlined in NWK Business Quality Process (BQP) 7.3.01, “Product Development Process, In-House.”

6.1.3 Certification of Technical and Legal Review Also prior to awarding the contract, the implementation documents will receive a certification of technical review and legal review.

6.2 ATR Schedule and Cost Due to the nature of the deficiencies corrections and the relationship with the local sponsor, the District decided to proceed with design and advertising while the ATR is underway. The District accepts the risk that ATR comments requiring amendments to the advertised documents could be received.

6.2.1 Review Plan Schedule

Review plan receives NWK approval	D*+0
Draft Review Plan sent to NWD	D+0
ATR begins on implementation documents	D+5
Public notice and comment period opens	D+7
Public comment period closes	D+22
PDT completes addressing public comments	D+29
NWD approves Review Plan	D+36
Review Plan sent to RIT	D+36
Director of Civil Works approves IEPR decision	D+66

* “D” is the date the Kansas City District approves the review plan, which is currently unknown

6.2.2 ATR Schedule

Table 7. ATR Schedule		
Activity	Pipe Repair	Lower Line Creek Stabilization
NWD Approves ATR Team	2 May 2011	2 May 2011
Review Documents and Charge distributed to ATR Team	3 May 2011	3 May 2011
Charge approved by PDT and ATR Team	3 May 2011	3 May 2011
Review Documents sent to ATR Team	3 May 2011	13 May 2011
ATR Dr. Checks comments complete	13 May 2011	23 May 2011
PDT Dr. Checks evaluations complete	20 May 2011	31 May 2011
ATR back checks complete; Dr. Checks closed	27 May 2011	7 Jun 2011
ATR Certification form signed	27 May 2011	7 Jun 2011
ATR final report complete	8 Jun 2011	17 Jun 2011
Report sent to NWD for approval	8 Jun 2011	17 Jun 2011
Report approved by NWD	15 Jun 2011	24 Jun 2011

6.2.3 ATR Costs

Table 8. ATR Costs		
Discipline	Pipe Repair	Lower Line Creek
Hydraulics	\$5,000	\$10,000
Geotechnical	\$2,500	\$2,500
Discipline Total	\$7,500	\$12,500
TOTAL		\$20,000

6.2.4 IEPR Schedule and Cost Not Applicable.

6.3 Model Certification/Approval Schedule and Cost Not Applicable.

7.0 Public Participation

Public comments are welcome on the review plan. The review plan is posted on the Kansas City District’s web page located at: <http://www.nwk.usace.army.mil/index.cfm>. The public comment period is 15 days. The Kansas City District will consider public comments and recommend changes to the review plan if necessary to the Northwestern Division. Significant and relevant public comments will also be provided to reviewers prior to conduct of the review. Also, due to changes in the project, the review plan may require updates. Updates are posted to the same website and the Public will have a similar opportunity to comment on the review plan updates. Since the project does not meet the requirements for IEPR, the Public, including scientific or professional societies, is not asked to nominate potential reviewers. Public comments on the review plan may be made by writing or e-mailing the following contact:

US Army Corps of Engineers, Kansas City District
 c/o John Benson, CENWK PM-CJ
 601 E. 12th St.
 Kansas City, MO 64106

e-mail: John.M.Benson@usace.army.mil

8.0 Review Teams

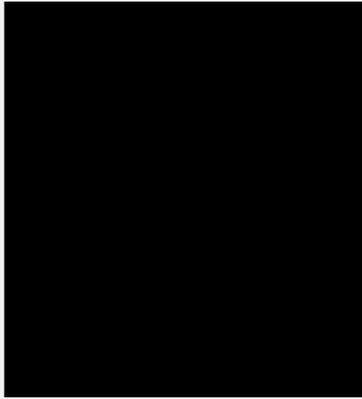
Table 9. Lower Line Creek PDT		
Name	District	Discipline
John Benson	CENWK	Project Management
	CENWK	Hydrology & Hydraulics
	CENWK	Civil Engineering
	CENWK	Geotechnical Engineering
	CENWK	Cost Estimating
	CENWK	CADD
	CENWK	Construction
	CENWK	Construction
	CENWK	Construction
	CENWK	Survey
	CENWK	Real Estate
	CENWK	Technical Specifications

Table 10. Pipe Repair PDT		
Name	District	Discipline
John Benson	CENWK	Project Management
	CENWK	Civil Engineering
	CENWK	Geotechnical Engineering
	CENWK	Structural Engineering
	CENWK	CADD
	CENWK	Construction
	CENWK	Cost Estimating
	CENWK	Survey
	CENWK	Contracting

Table 11. ATR Team		
Name	District	Discipline
	MVP	Civil Engineering
	MVP	Geotechnical Engineering

Attachment 1: ATR Certification

STATEMENT OF AGENCY TECHNICAL REVIEW (ATR)

CERTIFICATION OF AGENCY TECHNICAL REVIEW:

The ATR team has completed the review. Notice is hereby given that an Agency Technical Review that is appropriate to the level of risk and complexity inherent in the project is complete as defined in the Review Plan. During the Agency Technical Review, compliance with established policy, principles, and procedures, utilizing justified and valid assumptions were verified. This included review of assumptions, methods, procedures, and material used in analyses, alternative evaluated, the appropriateness of data used and level of data obtained, and reasonableness of the results including whether the product meets the customer's needs consistent with law and existing Corps policy.

████████████████████ Review Team Lead

Date: _____

John M. Benson, Project Manager

Date: _____

Attachment 2: IEPR Decision Documentation

TYPE I IEPR: The project is in the implementation phase. EC 1165-2-209 paragraph 11 a. states “Type I IEPR is conducted on project studies.” Since the L-385 Deficiencies Corrections are not studies, Type I IEPR criteria are not applicable, and a Type I IEPR is not required.

TYPE II IEPR: This attachment documents the vertical team’s risk-informed recommendation to not conduct Type II IEPR. According to EC 1165-2-209, the vertical team must make a risk-informed recommendation to the Chief of Engineers or Director of Civil Works to not conduct Type II IEPR.

The following table details the risks, frequency, severity, risk assessment, and how the risk contributes to the IEPR decision.

Type II IEPR Risk Assessment		
Factor (from EC 1165-2-209, App. E)	Pipe Repair Notes	Lower Line Creek Stabilization Notes
Project addresses flood risk management or the failure of the project would pose a significant threat to human life.	WEKO joint seals already installed at the joints with the highest risk. Joint settlement is likely complete, and sand drains around pipe are designed to prevent loss of fines that could lead to catastrophic failure.	Likely mode of failure would be rapid draw down, which by definition is a post-flood event failure. Threat to the levee is minimal if stabilization happens before further deterioration.
Project involves the use of innovative materials or techniques where the engineering is based on novel methods, presents complex challenges for interpretations, contains precedent-setting methods or models, or presents conclusions that are likely to change prevailing practices	Conventional structural lining of pipes and low technology grouting is the main scope; does not apply.	Standard, non-structural stream stabilization design relying primarily on excavation and 42” stone placement; does not apply.
The project design includes redundancy, resiliency, and robustness	The feature already has a fair amount of redundancy. As a concrete pipe surrounded by a permeable layer, partially on a concrete cradle, redundancy against failure is in place. Placing liners provides more protection against primary failure modes. Already placed remedies (WEKO seals) increases the safety factor against failure.	Factors of safety are met with confidence.
The project has unique construction sequencing or a reduced or overlapping design construction schedule.	No abnormal sequencing or overlapping design schedules; does not apply.	No abnormal sequencing or overlapping design schedules; does not apply.

Based on the above assessment, as well as the fact that the project is so limited in scope and impact that it would not significantly benefit from Type II IEPR, it is the risk-informed recommendation that Type II IEPR is not required for this project.

Attachment 3: Statement of Legal Review

STATEMENT OF LEGAL REVIEW

CERTIFICATION OF LEGAL REVIEW:

This product including all associated documents required by the National Environmental Policy Act, has been fully reviewed by the Office of Counsel, Kansas City District, and is approved as legally sufficient.

Date: _____

XXXX, District Counsel