

**REVIEW PLAN
ENGINEERING AND DESIGN PRODUCTS
WOLF CREEK DAM BERM REMEDIATION
NASHVILLE DISTRICT**

Current Version Date: 21 JANUARY 2026
Mandatory Revision Date: 21 JANUARY 2029

1. PURPOSE AND REFERENCES

a. Purpose. This review plan describes necessary quality reviews for engineering and design (E&D) products for the Wolf Creek Dam Berm Remediation.

b. References.

- (1) Engineering Regulation (ER) 415-1-11, Biddability, Constructability, Operability, Environmental and Sustainability (BCOES) Reviews
- (2) Engineering Regulation (ER) 1165-2-217, Civil Works Quality and Review Policy
- (3) Qualtrax 08504 LRD, Supplemental Quality Procedures for Civil Works (CW) Engineering and Design (E&D) Products
- (4) Project Management Plan (PMP)

2. REVIEW MANAGEMENT ORGANIZATION (RMO). The RMO for this project is the MSC (Great Lakes and Ohio River Division).

3. PROJECT SCOPE AND PRODUCTS

a. Project Description and Scope of Work. During the repair to the berm slide done in 2024 at Wolf Creek Dam, it was discovered that the soil was softened and overly saturated. This was an indicator of a much larger drainage issue and that the berms need to be regraded to mitigate further slope failures. If not addressed, this flaw could escalate to become a significant Dam Safety incident. The access road and drainage channel also require retrofitting to prevent further erosion and potential slope instability in that area. The embankment berm and access road require repair to prevent further erosion and potential slope instability in this area which could lead to slope failure and personnel safety concerns. Phase 1 Plans and Specs estimated costs are \$400k and have been funded. Phase 2 repairs estimated to cost \$7.05M and funding has not been received but is requested for FY27. CPT testing is required for soil analysis and to determine the scope of the repairs needed

Project Number	573153
Business Line	O&M
Project Type	Berm remediation/Drainage improvement/Dam Safety
Geographic Location	Jamestown KY 36°52'22.8"N 85°08'07.9"W
Main Project Features	Embankment regrading and construction of drainage features
Estimated Construction Cost	\$7.45M
E&D Product Delivery Method	In-House Design; A-E support for data collection (CPT).
Construction Delivery Method	Fixed Price, BVTO



Figure 1: CPT Testing Locations

b. Products. The E&D products to be reviewed include the following:

- (1) Geotechnical Report
- (2) Design Documentation Report (DDR)
- (3) Plans and Specifications (P&S)
- (4) Engineering Considerations and Instructions for Field Personnel (ECIFP)
- (5) Bid Amendments
- (6) E&D Products for Engineering During Construction (EDC)

4. DOCUMENTATION OF RISKS AND ISSUES

a. Life Safety Assessment: The District Chief of Engineering has reviewed the project requirements and determined there is not a significant threat to human life if the project were to fail. Prior to contractor mobilization a DIPP will be conducted to ensure the means and methods of the contractor do not increase risk to the structure during construction.

b. Technical Complexities and Risks. The project delivery team (PDT) performed a thorough risk analysis of the anticipated project design, construction, and operations activities and identified the critical technical complexities and risks listed below. Quality reviews will be planned and performed with the goal to best manage these project technical complexities and risks. A E-Risk Register has been completed for the project at the following link <https://err.sec.usace.army.mil/projects/9305/risks>.

- (1) Cut/Fill earthwork along the downstream earthen embankment to remove a portion of the original access road (Dam Rd). Due to on-going sink holes and non-essential necessity of the old access road, it was determined to remove a portion of the material to mitigate subsurface and present O&M issues. Earthwork and grading modifications to a dam of this nature carry risk and technical complexity regarding dam safety.

- (2) Contractor Quality Control of Linear grading work along the 3 berms of the dam. Existing swales at each berm do not have positive drainage to the existing storm network system. As part of the project new grades and elevations are proposed to properly facilitate the surface runoff as intended. Due to some underwhelming quality control during the last project (which installed the existing swales) it is critical to this project to properly scope, communicate, and specify the grading requirements and emphasize the QC/QA process.

5. REVIEW EXECUTION

- a. Project Delivery Team (PDT): PDT members are listed in Attachment 1. PDT members will work collaboratively with review team members to ensure effective performance of the planned quality reviews.

- b. District Quality Control (DQC): DQC is required for all products. Follow DQC procedures in Chapter 4 of ER 1165-2-217 and District local work instructions. The Engineering Technical Lead and DQC Lead will collaborate to oversee and ensure effective DQC performance. The DQC will be executed in two efforts, with an initial (50%) and final (90%) review. The expectation for the initial (50%) DQC review will be conducted first with the reviewer's initial comment submission period over an open 2 work week period. After completing, the PDT will familiarize with the review comments and continue working towards the next milestone while conducting comment evaluations. Evaluation of the 50% comments will be fully addressed and ready for reviewer backcheck upon the start of their final (90%) DQC review. Reviewers will be instructed to backcheck their comments as part their 90% review effort. Before final DQC certification, all comments will be closed out from both the 50% and 90% DQC review.

- c. Biddability, Constructability, Operability, Environmental, Sustainability (BCOES): BCOES reviews are required for all products. Follow BCOES review procedures in ER 415-1-11 and District local work instructions. It should be noted that BCOES start may be delayed if construction funding is not available or projected to be available within six months of certification.

- d. Agency Technical Review (ATR): ATR is required for all products and shall follow ATR procedures in Chapter 5 of ER 1165-2-217. ATR will address the technical complexities and risks described in sub-section 4.b. Required senior technical disciplines and expertise needed for ATR are described in Table 1. Assigned ATR team members are listed in Attachment 1. ATR members in engineering disciplines are verified as certified in the Corps of Engineers Review and Certification Access Program (CERCAP) [[Command Training Plan & CERCAP Tool \(CTP\) - PROD v2.5.2 - Home \(army.mil\)](#)]. The PDT and ATR team leaders and members will collaborate to oversee and ensure effective review execution. The expectation for the initial (50%) ATR review will be conducted first with the reviewer's initial comment submission period over an open 2 work week period. After completing, the PDT will familiarize with the review comments and continue working towards the next milestone while conducting comment evaluations. Evaluations of the 50% comments will be fully addressed and ready for reviewer backcheck upon the start of their final (90%) ATR review. Reviewers will be instructed to backcheck their comments as part their 90% review effort. Before final ATR certification, all comments will be closed out from both the 50% and 90% DQC and ATR review.

Technical Discipline	Expertise Required
GEOTECHNICAL ENGINEER (ATR Team Leader)	Geotechnical engineer that is CERCAP qualified familiar with dam safety, slope stability, seepage, and subsurface testing. May be utilized as the DIPP reviewer, depending on LRD's approval.
SITE CIVIL ENGINEER	Civil Engineer familiar with pipe construction, site development, grading, stormwater management and runoff estimation, and dam safety.

e. Safety Assurance Review (SAR): The District Chief of Engineering has determined that the performance of a Safety Assurance Review (SAR) will not benefit the project.

f. Review Charge. Reviewers will refer to and perform ATR per Section 5.7 of ER 1165-2-217, Objectives, Scope, and Review Criteria. Reviewers shall check to confirm the project engineering and design addresses the technical complexities and risks described in Section 4.b.

6. REVIEW SCHEDULE AND BUDGETS. The schedule and budgets for reviews are shown in Table 2. BCOES reviews will not be scheduled performed concurrently with DQC and ATR review periods.

Review Activities	Start Date	Finish Date	Budget (\$)
DQC – Intermediate Design (50%)	01/26/2026	02/23/2026	\$23,000
ATR – Initial (50%)	02/23/2026	03/16/2026	\$3,000
DQC – Final Design (90%)	04/13/2026	05/22/2026	\$20,000
ATR – Final Design (90%)	05/25/2026	07/15/2026	\$6,000
BCOES – Final Design (90%)	07/16/2026	07/31/2026	\$23,000
BCOES – Backcheck (100%)	08/12/2026	09/02/2026	\$4,000

7. REVIEW DOCUMENTATION. The ATR leader will prepare and submit an ATR report per Section 5.10 of ER 1165-2-217. The ATR report with certification form will be transmitted to approvers for review and signature, including the RMO representative. Review documents will be stored with the official project records.

8. REVIEW PLAN POINTS OF CONTACT. Questions and comments relating to this review plan can be directed to the following points of contact:

- a. District Project Leaders
 - (1) Project Manager: Joseph Cotton, PMM-D, joseph.r.cotton@usace.army.mil , 630-461-2415.
 - (2) Engineering Technical Lead: Jake Pierce, ECG-C jake.p.pierce@usace.army.mil 615-736-7554.
- b. Review Management Organization (RMO) Representative: CELRD-ECD, Frank Appelfeller (frank.a.appelfeller@usace.army.mil) or Amit Dash (amit.k.dash@usace.army.mil).

ATTACHMENT 1 – TEAM MEMBERS

PROJECT DELIVERY TEAM		
Function/Discipline	Name (Last, First)	Office
Customer	Watters, Anthony	CELRN-OPE-WP
Project Manager	Cotton, Joseph	CELRN-PMM-D
Technical Lead	Pierce, Jake	CELRN-ECG-C
Cost Engineer (required)	Amman, Nathan	CELRN-ECD-T
Value Engineer (required)	Abernathy, Peyton	CELRN-ECD-T
Geospatial Lead (required)	Haley, Noah	CELRN-ECG-C
Real Estate (required)	N/A	N/A
Geotechnical	Worsham, Baron	CELRN-ECC-S
Construction Support	Peck, Michael	CELRN-ECC-S
Geologist	Carter, Bailey	CELRN-ECG-G
Historian	Looney, Katherine	CELRN-PMP
Biologist	Vollmers, Grace	CELRN-PMP
Archaeologist	Wood, Catharine	CELRN-PMP
Contracting Officer	Abernathy, Alison	CELRN-CT
Contracting Specialist	Cox, Jori	CELRN-CT
DQC REVIEWERS		
Function/Discipline	Name (Last, First)	Office
DQC Lead	Brock, Zachary	CELRN-ECG-D
Geologist	Krembs, Peter	CELRN-ECG-G
Site Civil	Pagani, Greg	CELRN-ECG-C
Cost	Lockard, Martin	CELRN-ECD-T
DSPM	Sherry, Wyatt	CELRN-ECG-D
Biologist	Riddle, Sid	CELRN-PMP
Cultural	Wood, Cate	CELRN-PMP
BCOES REVIEWERS		
Function/Discipline	Name (Last, First)	Office
Biddability	Peck, Michael	CELRN-ECC-S
Constructability	Matthews, Jordan	CELRN-ECC-S
Operability	Marlow, Chris	CELRN-OPE-WP
Operability	Watters, Anthony	CELRN-OPE-WP
Operability	Bohlin, Alexander	CELRN-OPS-O
Operability	Bryant, Coy	CELRN-OPM
Biologist	Riddle, Sid	CELRN-PMP
Cultural	Wood, Cate	CELRN-PMP
ATR REVIEWER(S)		
Function/Discipline	Name (Last, First)	Office
ATR Leader - Civil Site	Boone, Johnathan	CE-ERDC
Geotechnical	Karri, Madhusudhana	CELRN-CT



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Safety Assurance Review (SAR) Determination

EC Quality
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CELRN-EC

March 3, 2025

Project Name (WOL Berm Remediation)

Purpose: This document is to serve as the formal risk informed decision to determine if an SAR is required for the scope of work.

Reference:

U.S. Army Corps of Engineers. (2021, May 1). Civil Works Review Policy. *ER 1165-2-217*. CECW.

U.S. Army Corps of Engineers. (2021). Supplemental Quality Procedures for Civil Works. *08504 LRD*. CELRD.

Discussion:

Discussion (WOL Berm Remediation is an OPs project in response to mitigate future slope failures along the downstream eastern dam at Wolf Creek. It is expected to be an IFB construction contract. PED is expected to take 9 months upon receipt of funding, Operations have instructed that they intend on funding the project for PED this FY, contract award is to be determined. As the assigned Technical Lead, and discussions within the preliminary PDT, I do not recommend SAR given that any safety concerns will be evaluated thoroughly in the DIPP. The project will show a significant improvement to the improper drainage which only will benefit the integrity of the dam structure and not impose any public safety concerns.)

This document will be filed with the project IAW paragraph 7.3.b, 08504 (U.S. Army Corps of Engineers, 2021)

X

Office of the Chief,
Engineering and Construction Division

Enclosure(s):

1. Project Technical Scope
2. Safety Assurance Review Questions



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Safety Assurance Review (SAR) Determination

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Enclosure 1: Technical Scope

Technical Scope The purpose of this project is in response to a slope failure that occurred last year along the downstream earthen dam at Wolf Creek. The failure occurred just downstream, along an expected seepage path that is assumed to be caused by insufficient drainage and runoff control along the access berms. Tire rutting and localized ponding along the berms have been observed overtime and it is believed that the location of the failure is a consequence of this unintended routine over saturation and seepage. Operations repaired the initial slope failure and are requesting support from E&C to create a project that will address the improper drainage to mitigate any future drainage concerns. The technical work within the Wolf Creek Berm Remediation Project is expected to consist of the following:

Subgrade preparation by means of regrading the existing gravel surfaces along each access berm. Demolition/Removal of the existing stone lined ditches. Constructing cast-in-place concrete 'V'-ditches. Installation of either a geogrid or geocell product along the berms. Grading 12" of new surface aggregate course. Installation of sub-drains along the upper mid slope, outletting the drains into the newly constructed concrete ditches.

The final deliverables are expected to be Plans, Specifications, Bidding Schedule, DDR (and technical Appendices), and ECIFP.)



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Safety Assurance Review (SAR) Determination

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Enclosure 2: Safety Assurance Review Questions

Any federal action or project that would pose a significant threat to human life (public safety) requires a Safety Assurance Review (SAR). To help determine if an SAR would be required the PDT should answer the questions below, document the responses, then have this worksheet signed by the Chief of Engineering.

ER 1165-2-217 7.4. *Decision on Conducting SAR. The District Chief of Engineering, as the Engineer-In-Responsible-Charge, will consider life safety implications to make a risk-informed decision whether the project would benefit from a SAR and document the rationale to conduct or not conduct a SAR in the RP, see Paragraph 3.6.2.2.*

Question 1: Does the 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?

YES NO

Question 1 Description *(If yes, then briefly describe why.)*

Question 2: In terms of Dam Safety does the project require deliberate considerations in **redundancy**, **resiliency**, and **robustness**? Select Yes/No as it applies to each and a brief description if “Yes” is selected.

2A Redundancy: Does the project require duplication of critical components of a system with the intention of increasing reliability of the system, usually in the case of a backup or failsafe. Where if the backup or failsafe shall fail, a risk to the public would occur.

YES NO

Question 2A. Description *(If yes, then briefly describe why.)*

2B Resiliency: Does the project require the ability to avoid, minimize, withstand, and recover from adverse conditions, whether natural or manmade, where the adverse conditions if not mitigated could lead to a public safety risk?

YES NO

Question 2B. Description *(If yes, then briefly describe why.)*

2C Robustness: Does the project require a relatively large increase in design or overdesign to withstand all possible operational conditions because some conditions are low probability of occurring but high severity consequences?

YES NO

Question 2C. Description *(If yes, then briefly describe why.)*



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Safety Assurance Review (SAR) Determination

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Question 3: Does the project have unique construction sequencing and/or a reduced/overlapping design construction schedule that could present a risk to public safety?

For example, significant project features accomplished using the Design-Build or Early Contractor Involvement (ECI) delivery systems that relies on the contractor to provide a solution with an impact to public safety.

YES NO

Question 3 Description (If yes, then briefly describe why.)