

REVIEW PLAN

**Villanueva Acequia Diversion Weir Rehabilitation
Villanueva, New Mexico
Implementation Documents (Plans and Specifications)**

**U.S. Army Corps of Engineers
Albuquerque District**

1 November 2012

MSC Approval Date: TBD



**US Army Corps
of Engineers®**

REVIEW PLAN

**Villanueva Acequia Diversion Weir Rehabilitation
Villanueva, New Mexico**

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1. PURPOSE AND REQUIREMENTS

a. Purpose. This Review Plan defines the scope and level of peer review for the implementation documents of the *Villanueva Acequia Diversion Weir Rehabilitation, Villanueva, New Mexico*. A Reconnaissance Report, completed in December 2008, indicated the diversion structure was failing and repairs were needed to bring the structure back to full functionality. The Construction Phase has been on hold pending availability of funds, which is expected in FY13. The schedule is for the design to begin in April 2013 and the District Quality Control in September 2013. An Agency Technical Review is not envisioned for this project.

b. References

- 1) Water Resources Development Act of 1986, Section 1113, Acequias Irrigation System
- 2) Engineering Circular (EC) 1165-2-209, Civil Works Review Policy, 31 Jan 2010
- 3) EC 1105-2-407, Planning Models Improvement Program: Model Certification, 31 May 2005
- 4) Engineering Regulation (ER) 1110-1-12, Quality Management, 30 Sep 2006
- 5) ER 1105-2-100, Planning Guidance Notebook, Appendix H, Policy Compliance Review and Approval of Decision Documents, Amendment #1, 20 Nov 2007

c. Requirements. This review plan was developed in accordance with EC 1165-2-209, which establishes an accountable, comprehensive, life-cycle review strategy for Civil Works products by providing a seamless process for review of all Civil Works projects from initial planning through design, construction, and operation, maintenance, repair, replacement and rehabilitation (OMRR&R). The EC outlines four general levels of review: District Quality Control/Quality Assurance (DQC), Agency Technical Review (ATR), Independent External Peer Review (IEPR), and Policy and Legal Compliance Review. In addition to these levels of review, decision documents are subject to cost engineering review and certification (per EC 1165-2-209) and planning model certification/approval (per EC 1105-2-407).

2. REVIEW MANAGEMENT ORGANIZATION (RMO) COORDINATION

The RMO is responsible for managing the overall peer review effort described in this Review Plan. The RMO for decision documents is typically either a Planning Center of Expertise (PCX) or the Risk Management Center (RMC), depending on the primary purpose of the decision document. Because this review plan covers only the implementation documents, the RMO for the peer review effort described in this Review Plan is the Corps Albuquerque District.

The RMO will coordinate to ensure the appropriate expertise is included on the review teams to assess the adequacy of the implementation documents.

3. STUDY INFORMATION

- a. **Decision Document.** The project for diversion structure repair for the Villanueva Acequia Diversion Structure Rehabilitation, Villanueva, New Mexico (the project) was authorized by Water Resources Development Act of 1986, Section 1113, Acequias Irrigation System.

The Corps completed the Reconnaissance Report and Environmental Assessment (EA) for the rehabilitation of the diversion structure in December 2008. The Finding of No Significant Impact (FONSI) for the EA was signed in September 1991. A Supplemental Environmental Assessment (SEA) will be completed to address the impacts of the proposed rehabilitation.

- b. **Study/Project Description.** The New Mexico Interstate Stream Commission (ISC) and the U.S. Army Corps of Engineers, Albuquerque District (Corps), administer the Acequia Rehabilitation Program authorized by PL 99-662, the Water Resources Development Act of 1986. *Acequias* are "ditch" type irrigation systems, consisting of a diversion and a simple earthen-ditch conveyance channel. The program is a multi-year program that is designed to promote the continued operation of these important agricultural facilities. The Corps has conducted a reconnaissance investigation of the Villanueva Acequia at the request of the New Mexico State Engineer's Office and the Villanueva Acequia Association.

The weir and heading structures are located off of State Highway 3, on the Pecos River approximately one and one-half miles upstream from the Village of Villanueva, San Miguel County.

The Villanueva diversion weir is a rock filled gabion concrete capped structure with a crest length of approximately 143 feet, and a weir section of 110 feet. The current diversion weir was built in 1992. This weir diverts water for two acequias, 80 members and over 500 acres of land. The weir has a notched, step-down cross section with a total water drop of about 9 feet.

The downstream edge steel attached to the bottom gabion step is separating from the concrete. Approximately 40 feet length of steel has separated from the downstream edge of structure; however, the steel railing is still attached at one end. Additionally, the gabion rock of the weir step downs have eroded back upstream approximately four feet. If the eroded portion of the weir is not replaced the structure will ultimately fail. It is critical that the downstream step downs of this weir be stabilized soon. The current condition of the weir is fair if the eroded portion of the step downs is stabilized.

Two alternatives were considered for the rehabilitation, with the alternative #2 being the preferred alternative.

1. Remove the existing weir and rebuild to existing north and south gated outlet headwalls.

2. Replace eroded gabions in weir step downs. Add new gabions downstream of the existing weir. Concrete cap all existing vertical gabion faces. Concrete cap new horizontal and vertical faces of new gabions. Install angle iron on new thicker weir.

Both alternatives would require dewatering of the river upstream during construction. Timely rehabilitation of the downstream weir step downs would avoid the complete weir rebuild.

Figure 1.

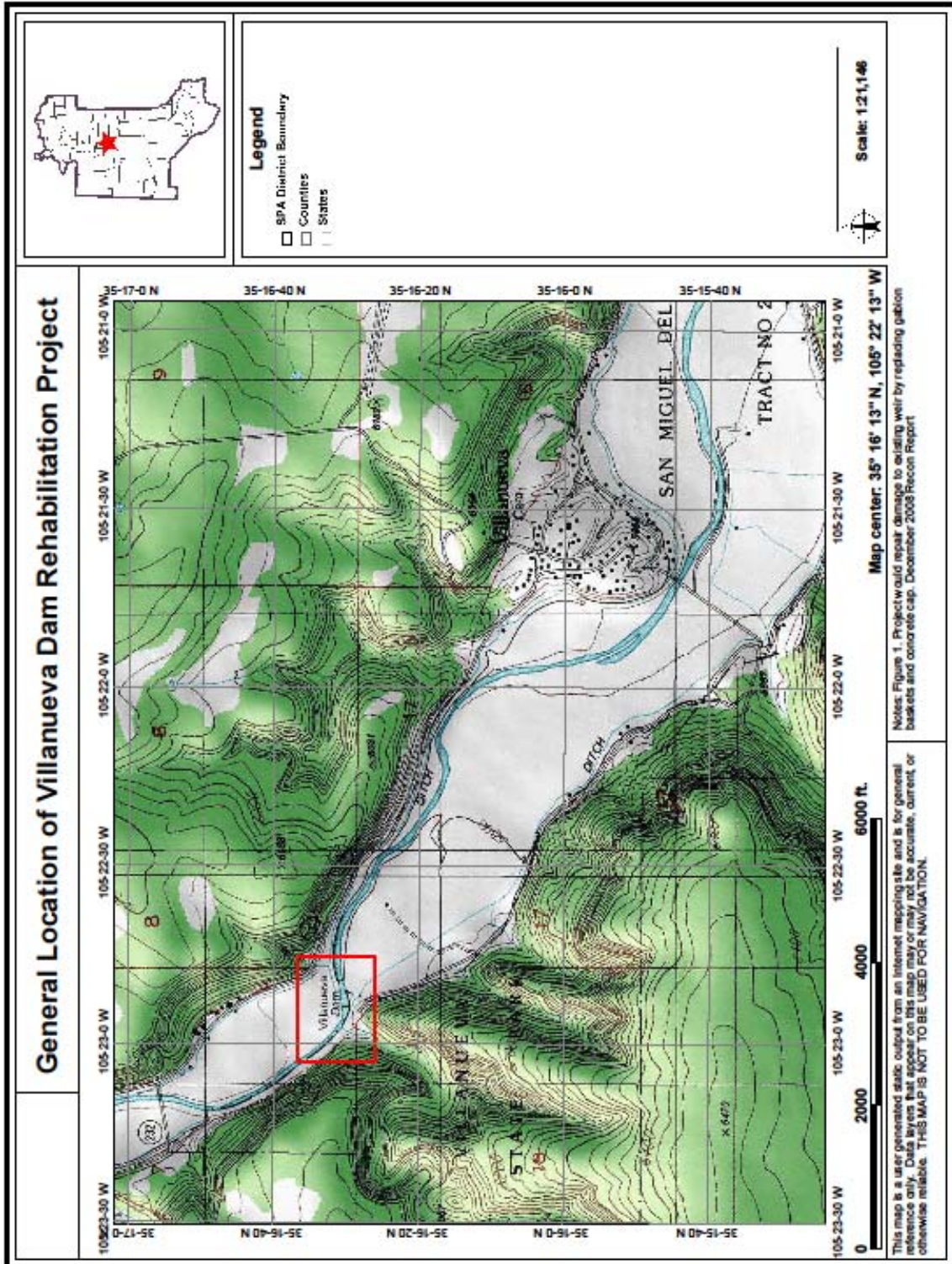


Figure 2.



View of weir looking north along downstream side of weir.

c. Factors Affecting the Scope and Level of Review.

Challenges include:

- There are no significant challenges due to the small scope and previous experience with this project.

The project features are considered to have low overall risk because:

- The problems with the weir and the rehabilitation alternatives are clear.
- The weir is relatively small and the design is straightforward.
- The Corps has completed design and construction on projects of this nature in the past, successfully;
- Health and human safety factors are low;
 - River flows are typically low and construction will be during the low-flow season..
 - Design will incorporate improvements to the existing structure and does not significantly alter the weir characteristics.
- The weir rehabilitation documents will not require a type II IEPR because the work proposed therein is not considered to have potential hazards that pose a significant threat to human life. An SEA will be required for the rehabilitation design.
- The rehabilitation effort is not expected to be contentious;
 - Rehabilitation will not increase the weir footprint.
- Is not expected to have adverse impacts on scarce or unique cultural, historic, or tribal resources;
 - Cultural surveys have not identified cultural resources in the vicinity of the weir but will be rechecked.
 - Proposed features will be constructed in previously disturbed locations within existing rights-of-way.
- Is not expected to have adverse impacts on any fish or wildlife species or their habitat whether or not they are listed as endangered or threatened under the Endangered Species Act of 1973;
 - Alignment of existing weir will not be changed, therefore, it will not impact any critical or important habitats.
- Is not likely to contain influential scientific information, nor is it likely to be a highly influential scientific assessment;
- Does not involve the rehabilitation or replacement of existing hydropower turbines, lock structures, or flood control gates;
- Is not expected to be based on novel methods, does not present complex challenges for interpretation, does not contain precedent-setting methods or models, and will not present conclusion that are likely to change prevailing practices.
- Has minimal life safety risk.
 - SPA has experience using flood damage reduction methods on Corps projects within New Mexico.
 - Width of floodplain, low gradient of this portion of the Pecos River results in low flow velocities.

- Inundation in the event of overtopping is minimal.
- Ample egress available in throughout the vicinity of the weir.

The SPA Chief of Engineering concurs with the factors and the level of review and a signed assessment is provided as Attachment 3.

The Villanueva Acequia Diversion Weir Rehabilitation project has had interest from the non-Federal Sponsor, ISC, who have been active participants throughout the history of the Acequia Rehabilitation Program.

As a result, the level of review will be DQC for this project and will focus on:

- Review of the methods for analysis and design;
- Compliance with sponsor, program, NEPA and ESA requirements;
- Completeness of design and support documents; and
- Spot checks for interdisciplinary coordination.

d. In-Kind Contributions. No products or analyses are planned to be provided by non-Federal sponsors for the project as in-kind services. The in-kind activity by the non-Federal sponsors will include:

- Attendance at meetings;
- Review of implementation documents prior to advertisement for construction;
- Assistance during public involvement as needed.

4. DISTRICT QUALITY CONTROL (DQC)

The Reconnaissance Report and Environmental Assessment for the project was completed and approved, and underwent the required review processes that were required. DQC is an internal review process of basic science and engineering work products focused on fulfilling the project quality requirements defined in the Project Management Plan (PMP). The home district shall manage DQC. Documentation of DQC activities is required and should be in accordance with the Quality Manual of the District and the home MSC.

a. Documentation of DQC for this project. Reviewers shall review the implementation documents for the weir rehabilitation to confirm that work was done in accordance with established professional principles, practices, codes, and criteria and for compliance with laws and policy. Comments, responses and backchecks will be documented in DrChecks software.

Reviewers shall pay particular attention to one's discipline but may also comment on other aspects as appropriate. Reviewers that do not have any significant comments pertaining to their assigned discipline shall provide a comment stating this.

Review comments shall contain these principal elements:

- A clear statement of the concern;
- The basis for the concern, such as law, policy, or guidance;
- Significance for the concern; and
- Specific actions needed to resolve the comment.

b. Products to Undergo DQC. Products to undergo DQC include the weir rehabilitation plans and specifications, as well as the Design Documentation Report.

c. Required DQC Expertise. This optional section could identify the required expertise needed to conduct DQC consistent with the District/MSD Quality Management plans.

DQC Team Members/Disciplines	Expertise Required
Environmental Resources	The reviewer should have a solid background in the habitat types to be found in the arid southwestern United States, and understand the factors that influence the reestablishment of native species of plants and animals.
Cultural Resources	The reviewer should have extensive Corps' experience regarding cultural resources on public and tribal lands. They need to be familiar with Department of Defense as well as USACE policies and procedures as they pertain to Corps studies and projects. http://www.usace.army.mil/CECW/Pages/cultural.aspx
Hydrology	The reviewer should have extensive knowledge of hydrology of the Southwest Valley or similar.
Hydraulic Engineering	The reviewer should have extensive knowledge of HEC-RAS modeling including the use of GIS (ARC-INFO) inputs to the model. The reviewer should also have a solid understanding of the geomorphology of alluvial rivers.
Geotechnical Engineering	The reviewer should carry a Professional Engineer's license and have recent experience in the Corps' design requirements for levee work. This person should also have experience in investigating existing subsurface conditions and materials; determining their physical/mechanical and chemical properties that are relevant to the project considered, assessing risks posed by site conditions; and designing earthworks and structure foundations.
Civil Engineering	The reviewer should have recent experience in the design and of plans and specifications for levees and river bridges, to include tie in to natural features.
Cost Engineering	The reviewer should have extensive Corps' experience in the application of scientific principles and techniques to

	problems of cost estimating, cost control, business planning and management science, profitability analysis, project management, and planning and scheduling.
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5. AGENCY TECHNICAL REVIEW (ATR)

The objective of ATR is to ensure consistency with established criteria, guidance, procedures, and policy. The ATR will assess whether the implantation documents are technically correct and comply with published USACE guidance, and that the documents explain the analyses and results in a reasonably clear manner. Since the project does not include a decision document with cost or enonomic analysis and will not require real estate acquisition the scope of this review is relatively narrow and focused on implementation documents and enviromental compliance if they become necessary.

ATR is managed within USACE by the designated RMO and is conducted by a qualified team from outside the home district that is not involved in the day-to-day production of the project/product. ATR teams will be comprised of senior USACE personnel. The ATR team lead will be from outside the home MSC.

DrChecks review software will be used to document all ATR comments, responses and associated resolutions accomplished throughout the review process. Comments will be limited to those that address the technical content of the implementation documents. Comments to grammar, style or spelling should not added to Dr Checks but may be submitted to ATRT Leader via electronic mail using tracked Changes feature in the Word document.

- a. **Products to Undergo ATR.** Products to undergo DQC include the weir rehabilitation plans and specifications, Design Documentation Report and any environemtal and cultural resource compliance documentation (SEA) if these are required.
- b. **Required ATR Team Expertise.**

DQC Team Members/Disciplines	Expertise Required
Environmental Resources	The reviewer should have a solid background in the habitat types to be found in the arid southwestern United States, and understand the factors that influence the reestablishment of native species of plants and animals.
Cultural Resources	The reviewer should have Corps' experience regarding cultural resources on public and tribal lands. They need to be familiar with Department of Defense as well as USACE policies and procedures as they pertain to Corps studies and projects. http://www.usace.army.mil/CECW/Pages/cultural.aspx

Hydrology	The reviewer should have extensive knowledge of hydrology of the Southwest and understanding of the Pecos in this reach or similar.
Hydraulic Engineering	The reviewer should have extensive knowledge of HEC-RAS modeling including the use of GIS (ARC-INFO) inputs to the model. The reviewer should also have a solid understanding of the geomorphology of alluvial rivers.
Geotechnical Engineering	The reviewer should carry a Professional Engineer's license and have recent experience in the Corps' design requirements for levee work. This person should also have experience in investigating existing subsurface conditions and materials; determining their physical/mechanical and chemical properties that are relevant to the project considered, assessing risks posed by site conditions; and designing earthworks and structure foundations.
Civil Engineering	The reviewer should have recent experience in the design and of plans and specifications for levees and river bridges, to include tie in to natural features.
Cost Engineering	The reviewer should have extensive Corps' experience in the application of scientific principles and techniques to problems of cost estimating, cost control, business planning and management science, profitability analysis, project management, and planning and scheduling.

Documentation of ATR. DrChecks review software will be used to document all ATR comments, responses and associated resolutions accomplished throughout the review process. Comments will be limited to those that address the technical content of the implementation documents. Comments to grammar, style or spelling should not added to Dr Checks but may be submitted to ATRT Leader via electronic mail using tracked Changes feature in the Word document.

The four key parts of a quality review comment included:

- The review concern – identify the product's information deficiency or incorrect application of policy, guidance, or procedures;
- The basis for the concern – cite the appropriate law, policy, guidance, or procedure that has not be properly followed;
- The significance of the concern – indicate the importance of the concern with regard to its potential impact on the plan selection, recommended plan components, efficiency

(cost), effectiveness (function/outputs), implementation responsibilities, safety, Federal interest, or public acceptability; and

- The probable specific action needed to resolve the concern – identify the action(s) that the reporting officers must take to resolve the concern.

In some situations, especially addressing incomplete or unclear information, comments may seek clarification in order to then assess whether further specific concerns may exist.

The ATR documentation in DrChecks will include the text of each ATR concern, the PDT response, a brief summary of the pertinent points in any discussion, including any vertical team coordination (the vertical team includes the district, RMO, MSC, and HQUSACE), and the agreed upon resolution. If an ATR concern cannot be satisfactorily resolved between the ATR team and the PDT, it will be elevated to the vertical team for further resolution in accordance with the policy issue resolution process described in either ER 1110-1-12 or ER 1105-2-100, Appendix H, as appropriate. Unresolved concerns can be closed in DrChecks with a notation that the concern has been elevated to the vertical team for resolution.

At the conclusion of each ATR effort, the ATR team prepared a Review Report summarizing the review. Review Reports were considered an integral part of the ATR documentation and shall:

- Identify the document(s) reviewed and the purpose of the review;
- Disclose the names of the reviewers, their organizational affiliations, and include a short paragraph on both the credentials and relevant experiences of each reviewer;
- Include the charge to the reviewers;
- Describe the nature of their review and their findings and conclusions;
- Identify and summarize each unresolved issue (if any); and
- Include a verbatim copy of each reviewer's comments (either with or without specific attributions), or represent the views of the group as a whole, including any disparate and dissenting views.

ATR may be certified when all ATR concerns are either resolved or referred to the vertical team for resolution and the ATR documentation is complete. The ATR Lead will prepare a Statement of Technical Review certifying that the issues raised by the ATR team have been resolved (or elevated to the vertical team). A Statement of Technical Review should be completed, based on work reviewed to date.

c.

6. 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. A risk-informed decision, as described in EC 1165-2-209, is made as to whether IEPR is appropriate. IEPR panels will consist of independent, recognized experts from outside of the USACE in the appropriate disciplines, representing a balance of areas of expertise suitable for the review being conducted.

- **Type I IEPR.** Type I IEPR reviews are managed outside the USACE and are conducted on project studies. Type I IEPR panels assess the adequacy and acceptability of the economic and environmental assumptions and projections, project evaluation data, economic analysis, environmental analyses, engineering analyses, formulation of alternative plans, methods for integrating risk and uncertainty, models used in the evaluation of environmental impacts of proposed projects, and biological opinions of the project study. Type I IEPR will cover the entire decision document or action and will address all underlying engineering, economics, and environmental work, not just one aspect of the study. For decision documents where a Type II IEPR (Safety Assurance Review) is anticipated during project implementation, safety assurance shall also be addressed during the Type I IEPR per EC 1165-2-209.
- **Type II IEPR.** Type II IEPR, or Safety Assurance Review (SAR), are managed outside the USACE and are conducted on design and construction activities for hurricane, storm, and flood risk management projects or other projects where existing and potential hazards pose a significant threat to human life. Type II IEPR panels will conduct reviews of the design and construction activities prior to initiation of physical construction and, until construction activities are completed, periodically thereafter on a regular schedule. The reviews shall consider the adequacy, appropriateness, and acceptability of the design and construction activities in assuring public health safety and welfare. For decision documents where a Type II IEPR (Safety Assurance Review) is anticipated during project implementation, safety assurance shall also be addressed during the Type I IEPR per EC 1165-2-209

Decision on IEPR. The Reconnaissance Report and Environmental Assessment was approved in 2008 and 1991, respectively, and no IEPR type 1 is required. Based on the criteria in EC 1165-2-209 and the information provided in Section 3.c. “Factors Affecting the Scope and Level of Review”, Type 2 IEPR will not be conducted on the implementation documents. The estimated total project cost is \$480,000.

Products to Undergo Type I IEPR. ‘Not-Applicable’

Required Type I IEPR Panel Expertise. ‘Not-Applicable’

Documentation of Type I IEPR. ‘Not-Applicable’

7. POLICY AND LEGAL COMPLIANCE REVIEW

'Not Applicable'

8. COST ENGINEERING DIRECTORY OF EXPERTISE (DX) REVIEW AND CERTIFICATION

'Not-Applicable'

9. MODEL CERTIFICATION AND APPROVAL

'Not-Applicable'

10. REVIEW SCHEDULES AND COSTS

DQC schedule and Cost

DQC, local sponsor, and stakeholder reviews will be initiated at the 65% design completion stage. It is anticipated that the 65% design will be available for review in July 2013. Incorporation of comments from the 65% review will allow reaching the 95% complete by September 2013. The cost for the DQC review is estimated at \$20,000 to include document review, PDT respond to comments, and DQC backcheck.

The following documents will be provided for the DQC review:

- Plans and Specifications
- Design Documentation Report

ATR Schedule and Cost.

'Not-Applicable'

Type I IEPR Schedule and Cost.

'Not-Applicable'

Type II IEPR Schedule and Cost.

'Not-Applicable'

11. PUBLIC PARTICIPATION

Completed as part of the Environmental Assessment in 1991. No additional public reviews are anticipated.

12. REVIEW PLAN APPROVAL AND UPDATES

The South Pacific Division Commander is responsible for approving this Review Plan. The Commander's approval reflects vertical team input (involving district, MSC, RMO, and HQUSACE members) as to the appropriate scope and level of review for the decision document. Like the PMP, the Review Plan is a living document and may change as the study progresses. The home district is responsible for keeping the Review Plan up to date. Minor changes to the review plan since the last MSC Commander approval will be documented in Attachment 2. Significant changes to the Review Plan (such as changes to the scope and/or level of review) should be re-approved by the MSC Commander following the process used for initially approving the plan. The latest version of the Review Plan, along with the Commanders' approval memorandum, should be posted on the Home District's webpage. The latest Review Plan should also be provided to the RMO and home MSC.

13. REVIEW PLAN POINTS OF CONTACT

Public questions and/or comments on this review plan can be directed to the following points of contact:

- SPA Chief of Design (505 342 3417)
- PCX Director, (415-503-6852)
- PCX Reviewer,
- District Support Team Lead, (415-503-6556)

ATTACHMENT 1: TEAM ROSTERS

PDT - Albuquerque

Name	Discipline	Phone
	Project Management	505-342-3694
	Environmental	505-342-3661
	Cost Engineering	505-342-3411
	Structural Engineering	
	Environmental Engineering	
	Geotechnical	
	Cultural Resources	505-342-3671
	Civil Engineering	505-342-3406
	Hydrology, Hydraulics	

ATR Team

Name	Discipline	Phone
TBD	Environmental	
TBD	Cost Engineering	
TBD	Structural Engineering	
TBD	Geotechnical	
TBD	Cultural Resources	
TBD	Civil Engineering	
TBD	Hydrology, Hydraulics	

Non Federal Sponsor

Name	Discipline	Phone
	Acequia Program Manager	505-827-6134

Stakeholders

Name	Discipline	Phone
	Villanueva Acequia Commissioner	505-421-2593

ATTACHMENT 2: REVIEW PLAN REVISIONS

Revision Date	Description of Change	Page / Paragraph Number

ATTACHMENT 3: CHIEF OF DESIGN ASSESSMENT

**ALBUQUERQUE, CHIEF OF DESIGN
IEPR TYPE II ASSESSMENT**

I have assessed the conditions to verify if there is a significant threat to human life and I concur with the PDT's life safety assessment presented in section 3.c., Factors Affecting the Scope and Level of Review, of the Review Plan, Villanueva Acequia Diversion Weir Rehabilitation, Villanueva, New Mexico. I concur that there are no existing and potential hazards that pose a significant threat to human life and certify IEPR type II Safety Assurance Review is not required.

20/12

Date

Chief of Design
Albuquerque District