REVIEW PLAN

Northwest El Paso Feasibility Study, El Paso County, Texas
General Investigations Report
Albuquerque District

MSC Approval Date: 5 April 2013
Last Revision Date: None

US Army Corps
of Engineers ®

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1. PURPOSE AND REQUIREMENTS

a. Purpose. This Review Plan defines the scope and level of peer review for the Northwest El Paso Feasibility Study, General Investigations Report in El Paso County, Texas.

b. References

1. Engineering Circular (EC) 1165-2-214, Civil Works Review Policy, 15 Dec 2012
2. EC 1105-2-412, Assuring Quality of Planning Models, 31 Mar 2011
3. Engineering Regulation (ER) 1110-1-12, Quality Management, 30 Sep 2006
4. ER 1105-2-101, Risk Analysis for Flood Damage Reduction Studies, 3 January 2006
5. ER 1105-2-100, Planning Guidance Notebook, Appendix H, Policy Compliance Review and Approval of Decision Documents, Amendment #1, 20 Nov 2007
6. Engineering Manual (EM) 1110-2-1619, Risk-Based Analysis for Flood Damage Reduction Studies, 1 August 1996
7. CECW-CP Memo for Distribution, “Peer Review Process”, 2007-03-30
8. Director of Civil Works’ Policy Memorandum #1, CECW-P, dated 19 January 2011
9. QMS 02500-SPD, Preparation and Approval of Review Plans
10. QMS 02500.1-SPD, Supplemental Review Plan Checklist
11. Northwest El Paso Feasibility Project Management Plan

c. Requirements. This review plan was developed in accordance with EC 1165-2-214, which establishes an accountable, comprehensive, life-cycle review strategy for Civil Works products by providing a seamless process for review of all US Army Corps of Engineers (USACE) 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 1165-2-214) and planning model certification/approval (per EC 1105-2-412).

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. The RMO for the peer review effort described in this Review Plan is the Flood Risk Management PCX.

The RMO will coordinate with the Cost Engineering Mandatory Center of Expertise (MCX) to ensure the appropriate expertise is included on the review teams to assess the adequacy of cost estimates, construction schedules and contingencies. Northwest El Paso Feasibility Study, El Paso County, Texas is a single purpose study.

3. STUDY INFORMATION

a. Decision Document.

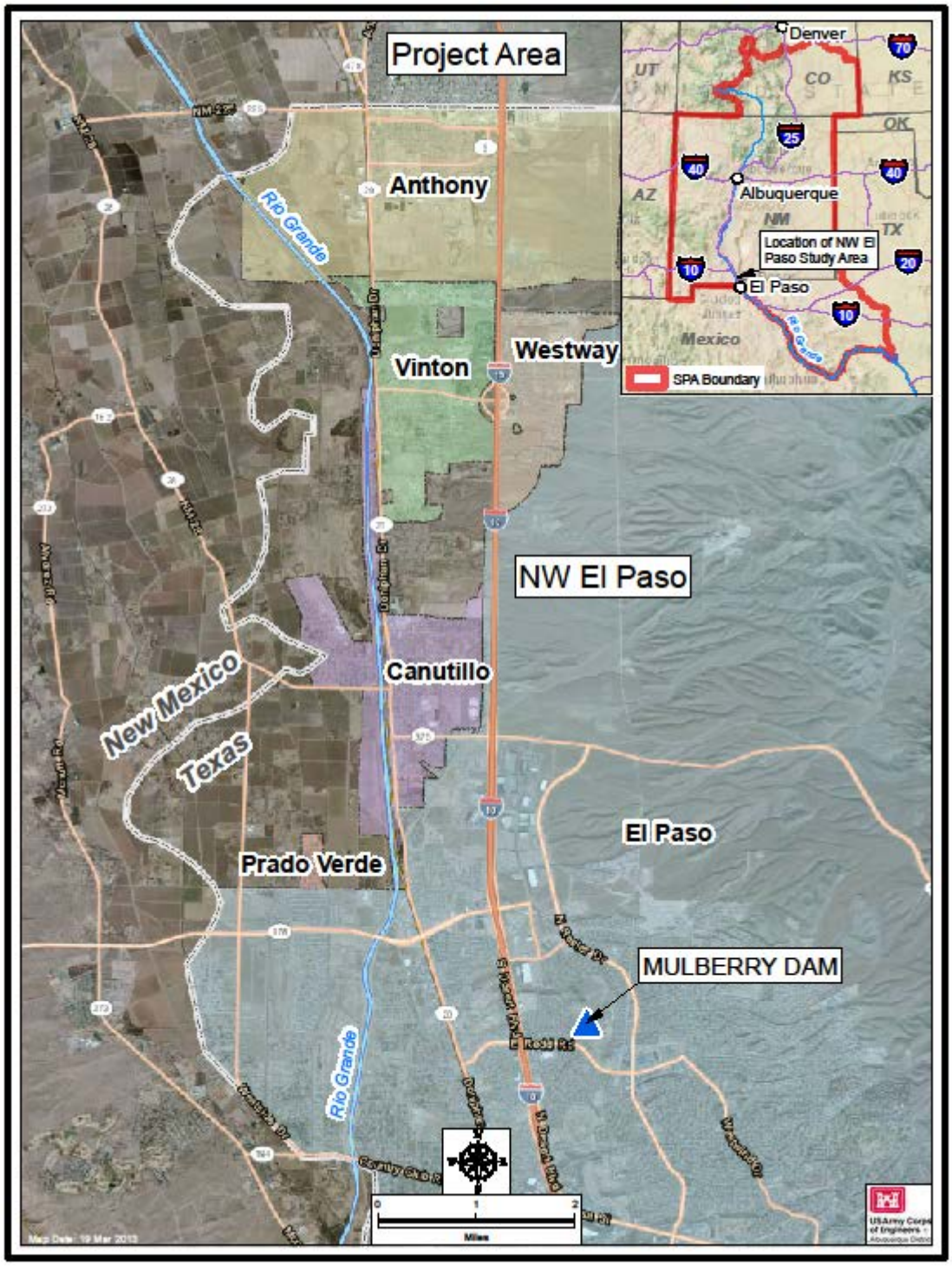
The purpose of the study is to investigate potential solutions to the flooding problems in Northwest El Paso County, TX, originating from arroyos that drain the West slope of the Franklin Mountains. The project is a General Investigations study undertaken to evaluate structural and non-structural Flood Risk Management (FRM) measures. The decision document will present planning, engineering, and implementation details of the array of alternatives including detention structures, channelization structures, and non-structural measures. The feasibility phase of this project is cost shared 50/50 with the project sponsor, City of El Paso, Texas acting through the El Paso Water Utilities.

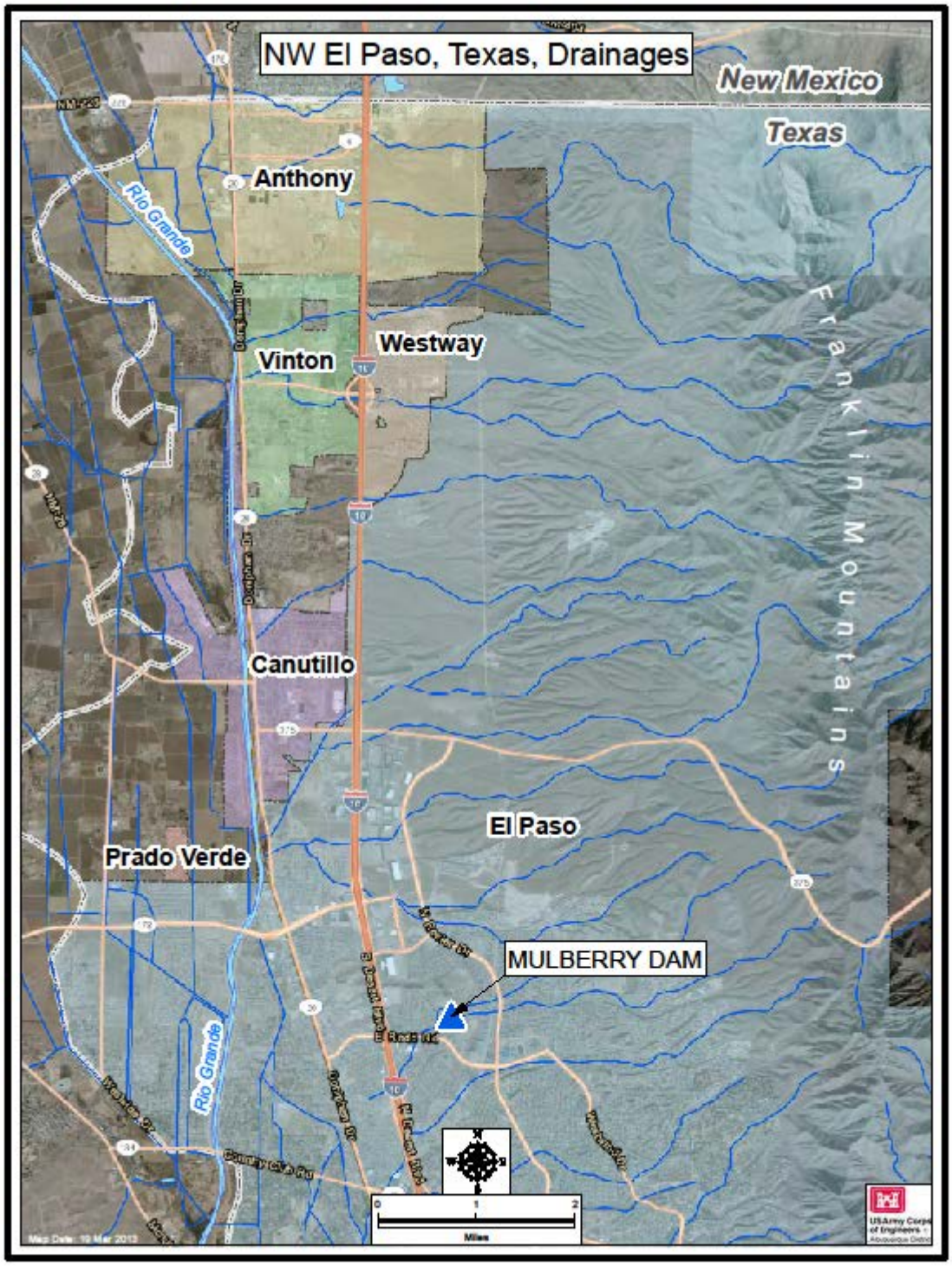
> *Resolved by the Committee Of Environment and Public Works of the United States Senate, that the Board of Engineers for Rivers and Harbors, created under Section 3 of the River and Harbor Act approved June 13, 1902, was requested to review the report of the Chief of Engineers on El Paso County, Texas, published as House Document Number 207, 89th Congress, 1st Session, and other pertinent reports with particular reference to providing a plan for development, vicinity of El Paso, Texas.*

Pursuant to EC 1165-2-214, coordination with the Planning Center of Expertise (PCX) for Flood Risk Management is recommended. It is anticipated that while this study will be challenging and beneficial, it will not be novel, controversial or precedent setting, nor have significant national importance. An Environmental Assessment (EA) is anticipated to be prepared to comply with NEPA requirements.

b. Study/Project Description. This single purpose study will focus on flood risk management alternatives northwest of El Paso, Texas. The focus of the study will examine solutions to flooding at the along Arroyos that drain the west slope of the Franklin Mountains and empty into the valley bottom near the Rio Grande. Preliminary analyses were completed during the reconnaissance study to establish the Federal interest and to determine the need for additional investigations.

The Northwest El Paso, Texas study area is bordered by the Rio Grande on the west, the New Mexico state line on the north, the Franklin Mountains on the east, and Mulberry Dam on the south. The study area has numerous washes that trend to the west then empty into the flat valley bottom of the Rio Grande. There are numerous industrial and commercial developments that are located along the west side of the Franklin Mountains that experience flood damages due to the high


Project Area
Anthony
Rio Grande
Vinton
Westway
NW El Paso
Canutillo
New Mexico
Texas
Prado Verde
El Paso
MULBERRY DAM
Rio Grande
Denver
Albuquerque
El Paso
Location of NW El Paso Study Area
SPA Boundary
Mexico


NW El Paso, Texas, Drainages
New Mexico
Texas
Anthony
Rio Grande
Vinton
Westway
Franklin Mountains
Canutillo
El Paso
Prado Verde
MULBERRY DAM
Rio Grande
0
1
2
Miles

intensity summer storm runoff. In addition, the communities of Canutillo, Vinton, and Anthony, Texas located in the flat valley bottom on the east of the Rio Grande River are subject to flooding.

Intense summer thunderstorms on the west side of the Franklin Mountains produce high flows in several arroyos that drain to the Rio Grande valley. Flood flows spread across the valley bottom and slowly drain along the valley to the south. The major flooding problems identified during the reconnaissance study are overbank flooding along Arroyo channels, inundation of the valley bottom, and backwater effects from the Rio Grande at the confluence of some Arroyos. The flood threat is exacerbated by development within the flood plain and encroachment within the floodways. Over 1,000 residences, commercial, and industrial properties are situated within the 100-year flood plain. The study area is currently experiencing rapid growth, and new development is planned in the study area.

Because the development that is occurring in the upper drainage basin within the El Paso city limits has the potential to increase flooding to properties situated on the valley floor within El Paso County, a comprehensive regional flood management plan is needed. This should include the study area. Without such a plan to guide future development, private developers will provide spotty, piecemeal flood protection for their individual developments. This piecemeal approach to flood damage reduction is costly and inefficient. A more comprehensive, coordinated approach would capture greater flood control benefits and provide greater flood protection.

Potential Alternatives:
Preliminary flood risk management measures include channelization, diversions and detention structures, as well as non-structural measures.

c. Factors Affecting the Scope and Level of Review.

Planning Challenges include:

1. New Corps policy and procedures for performing feasibility studies including Civil Works Modernization has brought about changes in the scope of feasibility studies to reduce the amount of superfluous analysis and focus on decision points.
2. Properly incorporating project history through many personnel changes and stochastic funding streams has had a great impact on project schedule and cost.
3. Project specific (Technical) Challenges include:
    a. The areas of northwest El Paso are rapidly being developed. Although El Paso has been proactive in setting aside lands for watershed management measures and requirements for stormwater management in new development, engineering models will have to account for the rapid development within the study area.

b. Commingling flows from multiple adjacent arroyos complicates the analysis of effects caused by any one arroyo or benefits derived from flood risk management measures.

This project is considered to have low risk because:

1. The Corps has recently and successfully completed studies and projects of this nature that include detention structures and improved channels;
2. The Sponsor has committed to the project despite a long study period; and
3. The study area is not environmentally sensitive due to the absence of endangered species or high value wildlife habitat.

Some Project risk exists due to life safety risk considerations.

1. Life safety risk under existing conditions includes:
    a. Due to the slope of upper arroyo channels in the area, resulting flows have high velocities and pose a risk to people or vehicles.
    b. Highly erodible soils and sparse desert vegetation contribute to erosion in upper arroyo channels and high sediment loads being deposited at arroyo outlets.
    c. Once the water reaches the valley floodplain water depths of 2.5 to 3.5 feet occur blocking ingress and egress along roads to the area. Emergency help may not be able to reach the area in the case of fire or a medical emergency until flood waters recede.
2. The With-Project life safety risk includes:
    a. One possible measure involves constructing detention strctures upstream of residential and commercial structures. The retention structures would be designed to state and/or Corps standards. In this case the dams would be designed to hold some design event and safely pass the Probable Maximum Flood.
    b. Failure of a detention structure could exacerbate existing flooding by introducing a large amount of water to the floodplain in a short time. A single structure may cause 1-2 feet of flooding to the floodplain. Any people, residences or vehicles in close vicinities to a structure when it fails may be subject to high velocity flows.
    c. Failure of a dam in the upper Arroyo channels would send a large wave of water down the relatively steep hillside and subject the area to several feet of water at very high velocities that would likely carry large amounts of sediment and debris.
    d. Catastrophic failure of more than one or all dams simultaneously would likely result in flood depths several inches or a few feet higher than the existing condition.

This project study will require Type I and Type II IEPRs due to the life safety risk described above. The Project Delivery Team (PDT) has determined that this study/project:

1. Is not expected to be controversial as:
    a. Similar flood risk management systems have been constructed nearby without significant public dispute or interagency interest because there are no endangered species or high value wildlife habitat present. Risk of flooding may impact I-10 and local roadways.
    b. Land ownership within the project area is private, County, and local municipality.
    c. U.S. Army Corps of Engineers Albuquerque District (SPA) has experience doing similar types of measures (channels, detention) within El Paso City and County and along upstream reaches of the Rio Grande.
    d. There is no request by the Governor of an affected state for a peer review by independent experts.
2. Is not expected to have adverse impacts on scarce or unique cultural, historic, or tribal resources based on database searches of known sites:
3. Is not likely to contain influential scientific information, nor is it likely to be a highly influential scientific assessment. 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:
4. Does not involve the rehabilitation or replacement of existing hydropower turbines, lock structures, or flood control gates.

The U.S. Army Corps of Engineers Albuquerque District Chief of Engineering has assessed the threat to human life and agrees with the PDT's life safety assessment that IEPR Type I and Type II (Safety Assurance Review - SAR) are warranted.

As a result, DQC, ATR and IEPR will focus on:

- Completeness and compliance of H&H analysis;
- Review of the planning process and criteria applied;
- Review of the methods of preliminary analysis and design;
- Compliance with sponsor, program, NEPA and ESA requirements;
- Completeness of preliminary design and support documents;
- Spot checks for interdisciplinary coordination.

In accordance with Section 2035 of WRDA 2007, EC 1165-2-214, a Type II IEPR (SAR) shall be conducted on design and construction activities for any flood risk management projects where existing and potential hazards pose a significant threat to human life. The Northwest El Paso General Investigation is a flood risk management project that will include an environmental assessment. Safety assurance factors must be considered in all reviews for those studies. Prior to preconstruction engineering and design (PED) of the project identified for construction, a Project Management Plan (PMP) will be developed that will include safety assurance review. Safety assurance review will also be accomplished during construction.

d. In-Kind Contributions. Products and analyses provided by non-Federal sponsors as in-kind services are subject to DQC, ATR, and IEPR. The in-kind products and analyses to be provided by the non-Federal sponsor include:

1. Existing reports and hard data that they contribute to the study / project;
2. Assistance during public involvement actions;
3. Assistance during the formulation of alternatives.

Existing reports or data provided as part of the study are subject to peer review requirements.

4. DISTRICT QUALITY CONTROL (DQC)

All decision documents (including supporting data, analyses, environmental compliance documents, etc.) shall undergo DQC. 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 Major Subordinate Command (MSC).

Prior to the formal reviews at major milestones, informal Independent Peer Reviews (IPR) will be conducted by the PDT to allow the vertical team to provide ongoing over-the-shoulder reviews of proposed methods, major assumptions, and analyses throughout the study process.

a. Documentation of DQC. DrChecks review software will be used to document all formal DQC comments, responses and associated resolutions accomplished throughout the review process. Comments should be limited to those that are required to ensure adequacy of the product. The four key parts of a quality review comment will normally include:

1. The review concern – identify the product's information deficiency or incorrect application of policy, guidance, or procedures;
2. The basis for the concern – cite the appropriate law, policy, guidance, or procedure that has not be properly followed;
3. 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
4. The probable specific action needed to resolve the concern – identify the action(s) that the reporting officers must take to resolve the concern.

b. Products to Undergo DQC. The combined feasibility report and environmental assessment, supporting appendices and any existing, sponsor or contractor

products used to inform the alternative analysis and decision to select one alternative will undergo DQC review. This will include the interim documentation prepared for the Alternatives Milestone and the Tentatively Selected Plan Milestone presentations.

c. Required DQC Expertise.

DQC Team Members/Disciplines	Expertise Required
Planning	The reviewer should have recent experience in reviewing Plan Formulation processes for multi-objective studies and be able to draw on "lessons learned" in advising the PDT of best practices.
Economics	The reviewer should be familiar with the processes used in evaluation of flood risk management projects and have recent experience in preparing economic analysis plans for flood risk management feasibility studies. HEC-FDA will be used for analysis. Analysis will address all four project accounts during the Feasibility phase.
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 may impact 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 arid-land, flashy wash systems and the Rio Grande or similar river system. The reviewer should also have knowledge of HMS and FLO-2D models.
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. The reviewer should also have knowledge of HMS and FLO-2D models.
Geotechnical Engineering	The reviewer should carry a Professional Engineer's license and have recent experience in the Corps' design requirements. 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; designing earthworks and structure foundations; and monitoring site conditions, earthwork and foundation construction.
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.

DQC Team Members/Disciplines	Expertise Required
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.
Real Estate	Reviewer must be experienced in civil work real estate laws, policies and guidance and experience working with sponsor real estate issues.

5. AGENCY TECHNICAL REVIEW (ATR)

ATR is mandatory for all decision documents (including supporting data, analyses, environmental compliance documents, etc.). The objective of ATR is to ensure consistency with established criteria, guidance, procedures, and policy. The ATR will assess whether the analyses presented are technically correct and comply with published USACE guidance, and that the document explains the analyses and results in a reasonably clear manner for the public and decision makers. 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 and may be supplemented by outside experts as appropriate. The ATR team lead will be from outside the home MSC.

a. Products to Undergo ATR. The combined feasibility report and environmental assessment, supporting appendices and any existing, sponsor or contractor products used to inform the alternative analysis and decision to select one alternative will undergo ATR. As alternative plans are formulated and comments from the Alternatives Milestone presentation are addressed, an ATR will be conducted on the draft documentation following the Tentatively Selected Plan Milestone and concurrent with public review/policy review/IEPR. The review process will focus on data, assumptions and the engineering, scientific, economic, social & environmental analysis process. Major review process milestones will include the preparation for Tentatively Selected Plan Milestone Briefing and Civil Works Review Board including review of the Environmental Document.

Contractor or sponsor generated reports and data will be reviewed in conjunction or as part of the General Investigation and supporting documentation during required review milestones for example ATR, IEPR, etc.

b. Required ATR Team Expertise. An ATR Leader shall be designated for the review by the FRM-PCX and will come from outside the MSC. The PDT requests that the PCX recommend an ATR Leader and ATR team from district(s) that have experiences in flood risk management projects in large, semi-arid river systems similar to that in El Paso County. In general, the ATR Leader will be involved with the Project Delivery Team's formulation of alternatives starting at the Alternatives

Milestone presentation through project approval to include interim project reviews (IPR) and all milestone presentations. The ATR Leader is responsible for reviewing the plan formulation products such as the risk register, decision management plan and report synopsis as they are developed. The ATR Leader will also provide information necessary for setting up the reviews, communicating with the Project Manager and Plan Formulator, providing a summary of critical review comments, collecting grammatical and editorial comments from the ATR team, ensuring that the ATR team has adequate funding to perform the review, facilitating the resolution of the comments, and certifying that the ATR has been conducted and resolved in accordance with policy.

The ATR team has yet to be determined, but will be determined by the PCX. If necessary, as reviewers are determined, their names, qualifications and years of relevant experience will be added to the Review Plan.

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 ATR 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).
Planning	The reviewer should have recent experience in reviewing Plan Formulation processes for multi-objective studies and be able to draw on “lessons learned” in advising the PDT of best practices.
Economics	The reviewer should be familiar with the processes used in evaluation of flood risk management projects and have recent experience in preparing economic analysis plans for flood risk management feasibility studies. HEC-FDA will be used for analysis. Analysis will address all four project accounts during the Feasibility phase.
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 may impact 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 arid-land, flashy wash systems and the Rio Grande or similar river system. The reviewer should also have knowledge of HMS and FLO-2D models.
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. The reviewer should also have knowledge of HMS and FLO-2D models.

ATR Team Members/Disciplines	Expertise Required
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; designing earthworks and structure foundations; and monitoring site conditions, earthwork and foundation construction.
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.
Risk Analysis	The risk analysis reviewer should be a senior professional with extensive experience in performing and presenting risk analysis in accordance with ER 1105-2-101, EM 1110-2-1619 and any other p[ertinent guidance, including experience with hydrologic, hydraulic and geotechnical uncertainties, the guidelines described in the FEMA / USACE memo on Levee Certification for the NFIP, annual exceedance probabilities, long-term risk rather than level-of-protection, and performance analyses such as: capacity exceedance at the least damaging or other planned location. This may include providing superiority at critical locations.
Real Estate	Reviewer must be experienced in civil work real estate laws, policies and guidance and experience working with sponsor real estate issues.

c. Documentation of ATR. DrChecks review software will be used to document all ATR comments, responses and associated resolutions accomplished throughout the review process. Comments should be limited to those that are required to ensure adequacy of the product. The four key parts of a quality review comment will normally include:

1. The review concern – identify the product's information deficiency or incorrect application of policy, guidance, or procedures;
2. The basis for the concern – cite the appropriate law, policy, guidance, or procedure that has not be properly followed;
3. 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

4. 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 will prepare a Review Report summarizing the review. Review Reports will be 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, for the final report. A sample Statement of Technical Review is included in Attachment 2.

6. INDEPENDENT EXTERNAL PEER REVIEW (IEPR)

IEPR may be required for decision documents under certain circumstances. 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 1165-2-214, 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. There are two types of IEPR:

- 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 1165-2-214.

- 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.

a. Decision on IEPR. Based on the criteria in EC 1165-2-214 and the discussion in Section 3, “Factors Affecting the Scope and Level of Review”, this project study will require Type I and Type II IEPR due to the life safety risk and the estimated total project cost may exceed $45 million.

IEPR will focus on the formulation of the flood risk management plan. The review panel will be composed of individuals with expertise in arid region riverine systems ecology, groundwater surface water interactions, geotechnical engineering, hydraulic, hydrologic and sediment modeling. The entire feasibility report with appendices will be provided to the IEPR team. It is not anticipated that the public, including scientific or professional societies, will be asked to nominate potential external peer reviewers. It is recommended that the panel conduct a site visit if possible. A representative of the panel will attend the Civil Works Review Board.

IEPR will be conducted by a contractor and managed by the FRM-PCX. The FRM-PCX will follow the process established in EC 1165-2-214 in managing the IEPR.

b. Products to Undergo Type I IEPR The combined feasibility report and environmental assessment, supporting appendices and any existing, sponsor or

contractor products used to inform the alternative analysis and decision to select one alternative will undergo IEPR review.

c. Required Type I IEPR Panel Expertise. The IEPR will be conducted by a contractor and managed by the FRM-PCX. The FRM-PCX will follow the process established in EC 1165-2-214 in managing the IEPR.

Primary disciplines or expertise needed for the review – the IEPR panel may include the same disciplines as the ATR team, but for most studies the makeup of the IEPR panel is a subset of the ATR disciplines and may focus on more specific aspects of the study. Final determination of the review disciplines required for IEPR will be determined later in the study process through consultation between the PDT and ATR team. At a minimum, the IEPR panel will consist of engineering, environmental and economics.

Anticipated reviewers as well as number of reviewers – will be determined by the PDT and ATR team after the ATR process. At a minimum, the IEPR panel will consist of Engineering, Hydrology and Hydraulics, environmental and economics.

Type I IEPR Panel Members/Disciplines	Expertise Required
Economics	The reviewer should be familiar with the processes used in evaluation of flood risk management projects and have recent experience in preparing economic analysis plans for flood risk management feasibility studies. HEC-FDA will be used for analysis. Analysis will address all four project accounts during the Feasibility phase.
Environmental	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 may impact native species of plants and animals.
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.
Hydrology	The reviewer should have extensive knowledge of hydrology of arid-land, flashy wash systems and the Rio Grande or similar river system. The reviewer should also have knowledge of HMS and FLO-2D models.
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. The reviewer should also have knowledge of HMS and FLO-2D models.

Type II IEPR Panel Members/Disciplines	Expertise Required
Natural 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.
Civil / Geotechnical / Hydraulic Engineering	The reviewer(s) 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. The reviewer should also have recent experience in the design and of plans and specifications for levees and river bridges, to include tie in to natural features. Lastly, 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; designing earthworks and structure foundations; and monitoring site conditions, earthwork and foundation construction.

d. Documentation of Type I and Type II IEPR. Documentation of Type I and Type II IEPR. The IEPR panel will be selected and managed by an Outside Eligible Organization (OEO) per EC 1165-2-214; Appendix D. Panel comments will be compiled by the OEO and should address the adequacy and acceptability of the economic, engineering and environmental methods, models, and analyses used. IEPR comments should generally include the same four key parts as described for ATR comments in Section 4.d above. The OEO will prepare a final Review Report that will accompany the publication of the final decision document and shall:

- 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; 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.

The final Review Report will be submitted by the OEO no later than 60 days following the close of the public comment period for the draft decision document. USACE shall consider all recommendations contained in the Review Report and prepare a written response for all recommendations adopted or not adopted. The final decision document will summarize the Review Report and USACE response. The Review Report and USACE response will be made available to the public, including through electronic means on the internet.

7. POLICY AND LEGAL COMPLIANCE REVIEW

All decision documents will be reviewed throughout the study process for their compliance with law and policy. Guidance for policy and legal compliance reviews is

addressed in Appendix H, ER 1105-2-100. These reviews culminate in determinations that the recommendations in the reports 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. DQC and ATR augment and complement the policy review processes by addressing compliance with pertinent published Army policies, particularly policies on analytical methods and the presentation of findings in decision documents.

8. COST ENGINEERING MANDATORY CENTER OF EXPERTISE (MCX) REVIEW AND CERTIFICATION

All decision documents shall be coordinated with the Cost Engineering MCX, located in the Walla Walla District. The MCX will assist in determining the expertise needed on the ATR team and Type I IEPR team (if required) and in the development of the review charge(s). The MCX will also provide the Cost Engineering MCX certification. The RMO is responsible for coordination with the Cost Engineering MCX.

9. MODEL CERTIFICATION AND 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, for the purposes of the EC, are defined 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 use of a certified/approved planning model does not constitute technical review of the planning product. 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 (if required).

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 and the professional practice of documenting the application of the software and modeling results will be followed. As part of the USACE Scientific and Engineering Technology (SET) Initiative, many engineering models have been identified as preferred or acceptable for use on Corps studies and these models should be used whenever 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 (if required).

a. Planning Models. The following planning models are anticipated to be used in the development of the decision document:

Model Name and Version	Brief Description of the Model and How It Will Be Applied in the Study	Certification / Approval Status
HEC-FDA 1.2.5 (Flood Damage Analysis)	The Hydrologic Engineering Center's Flood Damage Reduction Analysis (HEC-FDA) program provides the capability for integrated hydrologic engineering and economic analysis for formulating and evaluating flood risk management plans using risk-based analysis methods. The program will be used to evaluate and compare the future without- and with-project plans to aid in the selection of a recommended plan to manage flood risk.	Certified

b. Engineering Models. The following engineering models are anticipated to be used in the development of the decision document:

Model Name and Version	Brief Description of the Model and How It Will Be Applied in the Study	Approval Status
HEC-HMS (Hydrologic Modeling System)	Corps approved for assessing and reducing flooding in a watershed to simulate the precipitation-runoff processes of dendritic watershed systems. It implements the risk-based analysis procedures contained in EM 1110-2-1619 to develop hydrology models and determine water usage in the study area.	HH&C CoP Preferred Model
HEC-RAS 4.0 (River Analysis System)	HEC-RAS provides the capability to perform one-dimensional steady and unsteady flow river hydraulics calculations. The program will be used for steady flow analysis to evaluate the future without and with project conditions along the Rio Grande and its tributaries. This model will be used for with project flood stages and levee design.	HH&C CoP Preferred Model
MCACES	This is a cost estimating model that was developed by Building Systems Design Inc. The Army Corps of Engineers began using this model in 1989. This will be used as a tool to determine cost estimates for project alternatives.	
FLO-2D	It is used by the Corps Flood Plain Management Group and includes graphics and reporting. This model will be used for hydrologic routing for with and without project floodplains and flood stages.	Approved for flood routing and floodplain mapping

c. Value Engineering (VE). The PDT used value management knowledge gained from previous projects in the Rio Grande Valley including the Central and Southeast El Paso Flood Risk Management systems. During the plan formulation portion of the feasibility phase, the input will be solicited from the personnel listed in the table shown in Attachment 1, who possess the experience and collective knowledge in development and construction of similar projects.

10. REVIEW SCHEDULES AND COSTS

a. ATR Schedule and Cost. The Albuquerque District shall provide labor funding by cross charge labor codes. Funding for travel, if needed, will be provided through government order. The Project Manager will work with the ATR Team Leader to ensure that adequate funding is available and is commensurate with the level of review needed. Any funding shortages will be negotiated on a case by case basis and in advance of a negative charge occurring.

The ATR Team Leader shall provide organization codes for each team member and a responsible financial point of contact (CEFMS responsible employee) for creation of labor codes. Reviewers shall monitor individual labor code balances and alert the ATR Leader to any possible funding shortages. The ATR is estimated to cost approximately $70,000, which includes $20,000 to support the ATR Lead effort. As additional information becomes available, this Review Plan will be updated.

b. Type I IEPR Schedule and Cost. The IEPR will follow the GRR/SEIS ATR. The IEPR is estimated to cost approximately $150,000. As additional information becomes available, this Review Plan will be updated.

c. Type II IEPR Schedule and Cost. This IEPR will take place during PED. The IEPR is estimated to cost approximately $100,000. As additional information becomes available, this Review Plan will be updated.

d. Model Certification/Approval Schedule and Cost. All models are certified or approved for use without further model review. The hydrology and hydraulic models will be certified as part of the ATR by the Hydraulic Engineering Center. Cost/Schedule risk analysis and the MCACES will be certified by the Cost Center of Expertise also as part of the ATR. As additional information becomes available, this Review Plan will be updated.

e. In-Progress Reviews. To facilitate the study process and to access the vertical team, In-Progress Reviews (IPRs) have been incorporated into the PDTs detailed task schedule. These IPRs are currently scheduled to take place during Plan Formulation of Alternatives, at the Tentatively Selected Plan, at the NED Plan determination and at the draft GRR/SEIS. Additional IPRs may be added to achieve USACE vertical team alignment on particular issues if they are identified.

f. Value Engineering (VE) studies have not been completed and are expected to cost about $20,000 for this project. VE studies are anticipated during the plan formulation portion of the feasibility phase in accordance with CESPD R 1110-1-8.

Major Milestone Activity	Complete
Alternative Milestone	December 2014

Tentatively Selected Plan Milestone	July 2015
Agency Technical Review (ATR)	October 2015 – November 2015
Independent External Technical Review	October 2015 – March 2016
Public Review of EA	January 2016 – March 2016
Agency Decision Milestone	May 2016
Final Report Milestone	July 2016
Civil Works Review Board	November 2016
Chief's Report	January 2017
ASA Approval and Congressional Authorization	March 2017

g. Type I IEPR Schedule and Cost. The IEPR will begin concurrently with the ATR, with an estimated cost of $150,000 to include District, ATR team, and Contract efforts. Following is the draft schedule for the IEPR:

RESOURCE	TASK	DURATION	EST. START	EST. FINISH
PDT / PCX IEPR Manager	Write IEPR Scope of Work	15d	10 July 2015	31 July 2015
PCX IEPR Manager / IWR	Review / Finalize IEPR Scope	10d	1 August 2015	11 August 2015
IWR	Advertise / Negotiate IEPR Contract	25d	12 August 2015	6 September 2015
IWR	Award IEPR Contract	1d	7 September 2015	
OEO	Conduct IEPR	150d	15 October 2015	15 March 2016

h. Model Certification/Approval Schedule and Cost. HEC- FDA 1.2.5 is a certified model; therefore, no additional model certification is anticipated.

11. PUBLIC PARTICIPATION

To date there have been no public meetings for Northwest El Paso Project alternatives, however coordination with local sponsor and interested stakeholders have occurred.

Public Comment Action	Estimated Date
Public Meetings	September 2015
Public Comments or Questions	January 2016 – March 2016
Public Meetings During Public Review of the EA	January 2016

The public will have opportunity to provide written comments on the draft EA in January 2016.

Release of the draft combined Feasibility Report/EA for public review will occur after issuance of the Tentatively Selected Plan policy guidance memo and concurrence by U.S. Army Corps of Engineers Headquarters (HQUSACE). The public for comment period will coincide with finalization of the policy compliance review. Upon completion of the review periods, comments will be consolidated in a matrix and addressed, if needed. A summary of the comments and resolutions will be included in the document.

Tribal coordination will be performed and will continue once a tentatively selected plan is identified. There have also been numerous informal discussions with the County of El Paso, and the United States Fish and Wildlife Services (USFWS) regarding this project.

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 Project Management Plan, the Review Plan is a living document and may change as the study progresses. The Review Plan will be updated at each milestone and provided to the vertical team and PCX for concurrence. 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 are documented in Attachment 3. 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: Planning Chief, (505-342-3201)
- Review Management Organization: FRM PCX Deputy Director, (415-503-6852)
- SPD Reviewer: District Support Team Lead, (415) 503-6556

ATTACHMENT 1: TEAM ROSTERS

Project Delivery Team Members

Name	Discipline	Phone
	Economics	505-342-3366
	Cost Engineering	505-342-3411
	Hydrology, Hydraulics & Sedimentation [H&H]	505-342-3329
	Cultural Resources	505-342-3671
	Geotechnical	505-342-3469
	Plan Formulation	505-342-3364
	Project Management	505-343-6262
	Environmental Engineering	505-342-3139
	Environmental	505-342-3264
	Civil Engineering	505-342-3419
	Real Estate	505-342-3229

ATR Team (TBD by FRM-PCX)

Name	Discipline	District	Qualifications/ Experience	Phone

An ATR Team Lead outside the MSC will need to be determined.

ATTACHMENT 2: SAMPLE STATEMENT OF TECHNICAL REVIEW FOR DECSION DOCUMENTS

COMPLETION OF AGENCY TECHNICAL REVIEW

The Agency Technical Review (ATR) has been completed for the Northwest El Paso Feasibility General Investigations Report for Northwest El Paso Feasibility Study, El Paso County, Texas. The ATR was conducted as defined in the project's Review Plan to comply with the requirements of EC 1165-2-214. During the ATR, compliance with established policy principles and procedures, utilizing justified and valid assumptions, was verified. This included review of: assumptions, methods, procedures, and material used in analyses, alternatives evaluated, the appropriateness of data used and level obtained, and reasonableness of the results, including whether the product meets the customer's needs consistent with law and existing US Army Corps of Engineers policy. The ATR also assessed the District Quality Control (DQC) documentation and made the determination that the DQC activities employed appear to be appropriate and effective. All comments resulting from the ATR have been resolved and the comments have been closed in DrChecks[sm].

SIGNATURE _____ _____

Name Date
ATR Team Leader
Office Symbol/Company

SIGNATURE _____ _____

Date

Project Manager, *PMC*

SIGNATURE _____ _____

Name Date
Architect Engineer Project Manager[1]
Company, location

SIGNATURE _____ _____

Name Date
Review Management Office
Representative
Office Symbol

CERTIFICATION OF AGENCY TECHNICAL REVIEW

Significant concerns and the explanation of the resolution are as follows:

As noted above, all concerns resulting from the ATR of the project have been fully resolved.

SIGNATURE _____ _____

Date

Chief, Engineering Division
EC

SIGNATURE _____ _____

Date

Chief, Planning Division
PML

[1] Only needed if some portion of the ATR was contracted

ATTACHMENT 3: REVIEW PLAN REVISIONS

Revision Date	Description of Change	Page / Paragraph Number

ATTACHMENT 4: ACRONYMS AND ABBREVIATIONS

Term	Definition	Term	Definition
AFB	Alternative Formulation Briefing	NED	National Economic Development
ASA(CW)	Assistant Secretary of the Army for Civil Works	NER	National Ecosystem Restoration
ATR	Agency Technical Review	NEPA	National Environmental Policy Act
CSDR	Coastal Storm Damage Reduction	O&M	Operation and maintenance
DPR	Detailed Project Report	OMB	Office and Management and Budget
DQC	District Quality Control/Quality Assurance	OMRR&R	Operation, Maintenance, Repair, Replacement and Rehabilitation
DX	Directory of Expertise	OEO	Outside Eligible Organization
EA	Environmental Assessment	OSE	Other Social Effects
EC	Engineer Circular	PCX	Planning Center of Expertise
EIS	Environmental Impact Statement	PDT	Project Delivery Team
EO	Executive Order	PAC	Post Authorization Change
ER	Ecosystem Restoration	PMP	Project Management Plan
FDR	Flood Damage Reduction	PL	Public Law
FEMA	Federal Emergency Management Agency	QMP	Quality Management Plan
FRM	Flood Risk Management	QA	Quality Assurance
FSM	Feasibility Scoping Meeting	QC	Quality Control
GRR	General Reevaluation Report	RED	Regional Economic Development
Home District/MSC	The District or MSC responsible for the preparation of the decision document	RMC	Risk Management Center
HQUSACE	Headquarters, U.S. Army Corps of Engineers	RMO	Review Management Organization
IEPR	Independent External Peer Review	RTS	Regional Technical Specialist
ITR	Independent Technical Review	SAR	Safety Assurance Review
LRR	Limited Reevaluation Report	USACE	U.S. Army Corps of Engineers
MSC	Major Subordinate Command	WRDA	Water Resources Development Act