



DEPARTMENT OF THE ARMY
US ARMY ENGINEER DIVISION, SOUTHWESTERN
1100 COMMERCE STREET, SUITE 831
DALLAS TX 75242-1317

REPLY TO
ATTENTION OF

CESWD-PDS-P (1105)

18 MAR 2010

MEMORANDUM FOR Commander, Tulsa District

SUBJECT: Review Plan for Red River Chloride Control Project, Elm Fork, Area VI General
Reevaluation Report

1. References:


- a. EC 1165-2-209, 31 January 2010, Civil Works Review Policy.
- b. Memorandum, CECW-CP, 30 March 2007, subject: Peer Review Process.
- c. Addendum to Reference 1.b., CECW-CP, September 2008, subject: Supplemental
Information for the Peer Review Process.

2. The review plan for the subject study, enclosed, has been reviewed and cleared for approval by the Water Management and Reallocation Studies Planning Center of Expertise. It has been prepared in accordance with the referenced guidance, and public comments received will be incorporated into the plan as the study progresses. It does require Independent External Peer Review.

3. I hereby approve this review plan, which is subject to change as study circumstances require, consistent with study development under the Project Management Business Process. Subsequent substantial revisions to this plan or its execution will require new written approval from this office.

4. If you have questions or need further information, please contact Jo Ann M. Duman, CESWD-PDS-P, at (469) 487-7065.

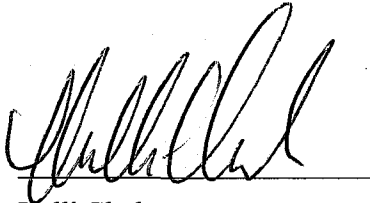
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ANTHONY C. FUNKHOUSER
Colonel, EN
Commanding

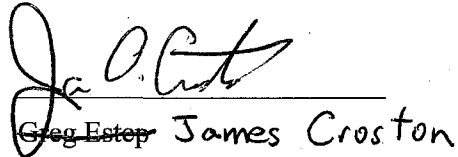
CF:
CESWT-PE-P (Rossman)

ENDORSEMENTS

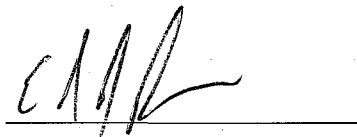
The attached Review Plan is an autonomous appendix of the Project Management Plan for the Red River Chloride Control Project, Area VI, Oklahoma. The Review Plan was developed by the project delivery team with concurrence from:



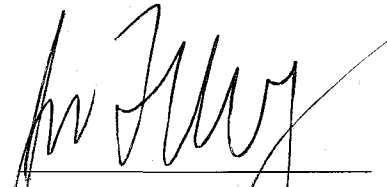
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REVIEW PLAN

**Red River Chloride Control Project
Elm Fork, Area VI, Oklahoma
General Reevaluation Report**

US Army Corps of Engineers, Tulsa District

March 2010

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Review Plan
Red River Chloride Control Project
Elm Fork, Area VI, Oklahoma
US Army Corps of Engineers, Tulsa District

1. Purpose and Requirements.

A. Purpose. This Review Plan defines the scope and level of review required for the Elm Fork, Area VI Project Revaluation Red River Chloride Control Project. The purpose of this review plan is to insure that the review of the reevaluation report's analyses and documentation meets the spirit of independent review, as well as complying with the most current regulations related to the Corps of Engineers Civil Works decision documents.

B. References.

- (1) Engineering Circular (EC) 1165-2-209, Civil Works Review Policy, 31 December 2009
- (2) EC 1105-2-407, Planning Models Improvement Program: Model Certification, 31 May 2005
- (3) Engineering Regulation (ER) 1110-2-12, Quality Management, 30 Sep 2006
- (4) Elm Fork, Area VI Project Revaluation Red River Chloride Control Project Management Plan (PMP)—5 January 2007
- (5) Section 1107 of PL 99-662.

C. Requirements. This review plan was developed in accordance with EC 1165-2-209, (which superseded EC 1105-2-410), which establishes the procedures for ensuring the quality and credibility of U.S. Army Corps of Engineers (USACE) decision documents through independent review. The EC outlines three levels of review: District Quality Control, Agency Technical Review, and Independent External Peer Review (Type I and Type II). In addition to these three levels of review, decision documents are subject to policy and legal compliance review and, if applicable, safety assurance review (Type II IEPR) and model certification/approval.

- (1) ***District Quality Control (DQC)***. DQC is the review of basic science and engineering work products focused on fulfilling the project quality requirements defined in the Project Management Plan (PMP). It is managed in the home district and may be conducted by staff in the home district as long as they are not doing the work involved in the study, including contracted work that is being reviewed. Basic quality control tools include a Quality Management Plan providing for seamless review, quality checks and reviews, supervisory reviews, Project Delivery Team (PDT) reviews, etc. Additionally, the PDT is responsible for a complete reading of the report to assure the overall integrity of the report, technical appendices and the recommendations before approval by the District Commander. The Major Subordinate Command (MSC)/District quality management plans address the conduct and documentation of this fundamental level of review; DQC is not addressed further in this review plan.

- (2) **Agency Technical Review (ATR).** ATR is an in-depth review, managed within USACE, and conducted by a qualified team outside of the home district that is not involved in the day-to-day production of the project/product. The purpose of this review is to ensure the proper application of clearly established criteria, regulations, laws, codes, principles and professional practices. The ATR team reviews the various work products and assure that all the parts fit together in a coherent whole. ATR teams will be comprised of senior USACE personnel (Regional Technical Specialists (RTS), etc.), and may be supplemented by outside experts as appropriate. To assure independence, the leader of the ATR team shall be from outside the home MSC.
- (3) **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. IEPR is managed by an outside eligible organization (OEO) that is described in Internal Revenue Code Section 501(c) (3), is exempt from Federal tax under section 501(a), of the Internal Revenue Code of 1986; is independent; is free from conflicts of interest; does not carry out or advocate for or against Federal water resources projects; and has experience in establishing and administering IEPR panels. The scope of review will address all the underlying planning, engineering, including safety assurance, economics, and environmental analyses performed, not just one aspect of the project.
- **Type I IEPR.** EC 1165-2-209 has extended application of IEPR and defined two categories. Type I IEPR is conducted on project studies. Section 2034 of WRDA 2007 and the OMB Peer Review Bulletin provide the requirement for Type I IEPR. However, USACE has extended the requirements to cover most studies.
 - **Type II IEPR.** EC 1165-2-209 redefines Safety Assurance Review as Type II IEPR. Type II IEPR is conducted on design and construction activities for hurricane and storm risk management and flood risk management projects, as well as other projects with potential significant threat to human life. Requirements for Type II IEPR are based on Section 2035 of WRDA 2007, the OMB Peer Review Bulletin, and USACE policy.
- (4) **Policy and Legal Compliance Review.** Decision documents will be reviewed throughout the study process for their compliance with law and policy. These reviews culminate in Washington-level 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 Chief of Engineers. Guidance for policy and legal compliance reviews is addressed further in Appendix H, ER 1105-2-100, Planning Guidance Notebook. When policy and/or legal concerns arise during DQC or ATR that are not readily and mutually resolved by the PDT and the reviewers, the District will seek issue resolution support from the MSC and HQUSACE in accordance with the procedures outlined in Appendix H, ER 1105-2-100. IEPR teams are not expected to be knowledgeable of Army and administration polices, nor are they expected to address such concerns. The home district Office of Counsel is responsible for the legal review of each decision document and signing a certification of legal sufficiency.

- (5) Model Certification/Approval. EC 1105-2-407 requires certification (for Corps models) or approval for use (for non-Corps models) of planning models used for all planning activities. The EC defines planning models as any models and/or 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 EC does not cover engineering models used in planning. Engineering software is being addressed under the Engineering and Construction (E&C) Science and Engineering Technology (SET) initiative. Until an appropriate process that documents the quality of commonly used engineering software is developed through the SET initiative, engineering activities in support of planning studies shall proceed as in the past. 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.

2. Study Information.

A. Project Title, Subject and Purpose of the Decision Document. The project title is the Red River Chloride Control Project, Area VI, Elm Fork, Oklahoma, General Reevaluation Report. The subject of the General Reevaluation Report (GRR) is the evaluation of the proposed chloride control features in the Elm Fork, Area VI and also the evaluation of potential positive and negative effects of constructed and operating features and proposed Elm Fork, Area VI chloride control features on the downstream reaches of the Red River. The study area is shown in Figure 1. The purpose of the GRR is to reexamine all data assumptions, methodologies, and conclusions and was not to be constrained to the previously recommended or authorized chloride control plan. Chloride control would have a number of primary benefits. These benefits were the object of the Congressional direction to the Corps of Engineers to implement chloride control measures. As such, they are the intended results. However, the Corps is concerned about all aspects of project implementation and operation. Whether dealing with costs, benefits, social, or environmental issues, the Corps works to formulate projects for economic development that are environmentally sustainable. The National Environmental Policy Act (NEPA) documentation for the GRR will be an Environmental Impact Statement. Approval for the GRR will be HQUSACE, Chief of Engineers. Congressional authorization will be required for implementation.

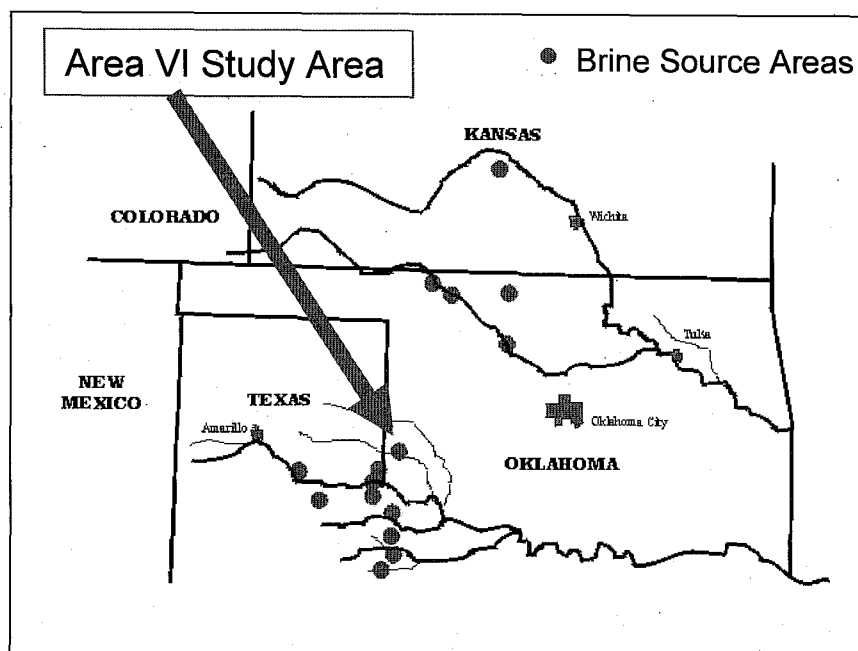


Figure 1
Elm Fork River
Area VI Study Area

B. Study Background.

Red River Chloride Control, OK and TX Chronology

- 1957 - Congress directed U.S Public Health Service to identify chloride sources under authority of Federal Water Pollution Control Act – PL 660 – 84th Congress. Ten Major sources were located in the Red River Basin on the upper Red River and the Wichita River.
- 1959 - Congress directed COE to determine control measures for chlorides.
- 1962 - Experimental Work at Estelline Springs was authorized.
- 1964 - Work at Estelline Springs Operational.
- 1966 – Part 1 Survey report completed recommending source control on the Wichita Basin portion of Arkansas-Red River Chloride Control Project.
- 1966 – Part 1, Wichita Basin portion of Chloride Control Project, specifically authorized for Construction (PL 89-789). Decision Document, approved by the Board of Engineers for Rivers and Harbors, based on the October 1966 Corps of Engineers Survey Report, later became Senate Document 110.
- 1968 – Part II Survey report completed, recommending source control on the remaining features of the Arkansas-Red River Chloride Control Project.
- 1970 – Congress (PL 91-611) authorized construction of the remaining features of Chloride Control in the remaining Red River Basin.
- 1972 – General Design efforts (DM 3) for the Wichita River Basin completed

- 1974 – Corps authorized to initiate construction efforts at source control Area VIII on the Wichita River and Truscott Lake (PL 93-251)
- 1976 – General Design efforts (DM 25) completed, which provided formulation and Final Environmental Statement (FES) on remaining Red River features.
- 1977 - Construction of Area VIII and Truscott Brine Lake initiated.
- 1978 – Design Memorandum 26 completed which provided final project design features on remaining features (Area VI) on Red River
- 1986 - WRDA 86 (PL 99-662) amended earlier authorizations to separate Arkansas River Chloride control (not economically justified) from Red River Chloride control.
- 1987 - Area VIII and Truscott Lake construction complete and operational
- 1993 - Limited Reevaluation Report completed (economic update only).
- 1995 - Draft Supplement to the FES released for public review
- 1996 - Final Supplement to the FES submitted to HQUSACE
- 1997 - The Office of the Assistant Secretary of the Army for Civil Works (ASA/CW) requested that the Corps of Engineers to delay construction efforts on the Red River Chloride Control Project and perform a thorough reevaluation of the Wichita River Basin chloride control features (13 November 1997).
- 1998 - 2004 - Comprehensive reevaluation of only the Wichita Basin portion of the project. Revised and updated all benefit and cost criteria as well as reevaluating the potential project impacts.
- 2004 – ASA(CW) concurred with Corps recommendation for NED Plan and environmental Record of Decision executed 5 Mar 04.
- 2004 – Oklahoma Governor requests reevaluation of Elm Fork, Area VI portion of the project.
- 2005 – Completed the Design Documentation Report (DDR) for the Wichita Basin portion of the project.
- 2006 – Begin general reevaluation of Elm Fork, Area VI portion of the project.

Area VI is located on the Elm Fork of the North Fork of the Red River in Harmon County, Oklahoma. The three major chloride sources for Area VI are in Salton, Robinson, and Kaiser Canyons along the south bank of the Elm Fork. These narrow canyons emit brine in high concentrations from low average flows that originate from emission points confined to relatively small areas. The canyons are located from about one mile west of Oklahoma State Highway 30 to 3 miles east of the Texas-Oklahoma State line. These narrow canyons emit brine in high concentrations from relatively small areas. The drainage area of the three canyons combined is about seven square miles. The drainage area of the Elm Fork at the Carl gaging station, just below Area VI, is about 416 square miles. The total Area VI chloride load is about 510 tons per day.

Plan formulation for the GRR includes review of plans selected during previous phases of study, review of applicable new technologies, and review of alternatives mutually developed with current stakeholders. The plan formulation process will ensure that the report is prepared in accordance with pertinent engineering, environmental, and economic guidance and regulations, including ER 1105-2-100, ER 200-2-2, ER 5-7-1, EC 1105-2-206, EC 1105-2-208, P&G, NEPA, and other guidance, regulations, policy, and law.

The chloride control plan authorized for Area VI utilizes subsurface cutoff walls and collection conduits at the mouths of the three canyons for the collection of brine with attended pumping

facilities and pipelines for disposal in Fish Creek Brine Lake. Concrete subsurface walls would extend about seven feet from the streambed down to bedrock to stop brine flow in the alluvium. Brine would enter perforated conduits on the upstream side of the cutoff wall. Collected brine would flow by gravity to a sump on one side of the stream. From a central pump, an average flow of five cubic feet per second of brine would be pumped to the evaporation lake about five miles downstream. The chloride control plan would remove about 420 tons per day of chlorides from the Elm Fork. That would be an 82 percent level of control. Other dissolved solids (such as sulfates) and elements (such as selenium) would also be removed in similar proportion to the level of chloride control. The estimated cost in 1978 prices to implement the recommendations was \$25,600,000. That cost in 2010 prices is \$79,232,000.

While Fish Creek Brine Lake is not expected to release brine flows, it would have an emergency spillway for passing very large design floods. The lake is designed to store a 100-year flood event on top of a 100-year accumulation of brine and sediment. With the brine pool filled, after about 100-years of operation, the surface area of the lake would be large enough that evaporation from the lake would keep pace with continued brine inflow and rainfall runoff from the lake watershed. Therefore, brine pumping and lake operation would not be limited to a 100-year project life. With proper maintenance the project could operate indefinitely. The brine pool would store about 74,320 acre-feet with an additional 2,410 acre-feet of storage for sediment. The dam would be about 3,000 feet long and the lake would have a maximum surface area of about 2,200 acres.

Due to advances in technology and the length of time since previous evaluation efforts for this portion of the project; a comprehensive reevaluation of the Elm Fork chloride control plan was recommended. The reevaluation effort will build on all those previous efforts and utilize the unique expertise developed within the Tulsa District Corps of Engineers (and our supporting AE community) from project implementation efforts and experiences gained from operation and maintenance of completed portions of the Red River Chloride Control project. The reevaluation effort will be similar to the recently completed effort for the Wichita River Basin portion of the project and would include detailed analyses of alternative plans, their economic viability, and overall environmental impacts. This effort will be a collaborative process with local, state, and Federal agencies and stakeholders

3. LEVEL OF REVIEW

A. Factors Affecting the Scope and Level of Review. It is likely that the GRR recommendation will exceed \$45 million. There is significant interest by the public, state, and Federal agencies due to the size, nature or effects of this project, and significant interest in economic or environmental cost and benefits of the project. Therefore, the recommendation of the vertical team, with PCX concurrence is that the level of review be DQC, ATR, and Type I IEPR, as defined in the Water Resources Development Act (WRDA) of 2007 (Public Law 110-114), and EC 1165-2-209 for the following reasons:

(1) WRDA 2007 Section 2034, Paragraph (3)(A)(i), states independent peer review is mandatory if a project has an estimated total cost of more than \$45 million and is not determined by the Chief of Engineers to be exempt. The Elm Fork, Area VI, Oklahoma portion of the Red

River Chloride Control Project recommendation is expected to have an estimated total construction cost exceeding \$79,000,000.

(2) EC 1165-2-209, Appendix D, requires IEPR if there is significant public interest due to the size/nature/effects of the project. The Elm Fork, Area VI, Oklahoma, Red River Chloride Control Project Reevaluation is expected to have significant public interest to the nature and effects of the project.

(3) EC 1165-2-209, Appendix D, requires IEPR if there is significant public interest regarding economic/environmental benefits/costs of the project. The Elm Fork, Area VI, Oklahoma, Red River Chloride Control Project Reevaluation is expected to have significant public interest in the environmental costs of the project.

(4) Risk and uncertainty. The level of risk and uncertainty associated with the project is expected to be similar to other large scale civil works projects.

(5) The project will have significant interagency interest, specifically from the USFWS. The reevaluation of the Wichita River Basin Chloride Control Project, which is a separable part of the Red River Chloride Control Project, produced controversy and much interagency interest. This GRR is similar and is expected to provoke the same reaction.

(6) The project will not involve significant threat to human life or safety. The project area is located in a rural sparsely settled area, away from human habitation. A failure of the brine control structure would be unlikely to impact human safety. Therefore a Safety Assurance Review will not be required.

(7) The project will likely be controversial. The source of controversy is expected to be the effect of reduced chloride on the environment. The Wichita River Basin Chloride Control Project resulted in much controversy of the expected impacts of reduced chloride on the fishery and vegetation in the study area.

(8) The GRR will present an evaluation of the work done in the 1970's and consider the use of current technologies. At this time, it is not expected that novel or precedent setting methods would be used. Nor would the recommendations be likely to change prevailing practices.

B. Agency Technical Review (ATR). In accordance with EC 1165-2-209, Civil Works Review Policy, dated 31 December 2009, all decision documents and their supporting analyses will undergo District Quality Control (DQC) and Agency Technical Review (ATR) and may also require Type I IEPR and/or Type II IEPR, to ensure the quality and credibility of the government's scientific information. ATR for decision documents covered by EC 1165-2-209 is managed by the appropriate Planning Center of Expertise (PCX) with appropriate consultation with the allied Communities of Practice such as engineering and real estate. The ATR shall ensure that the product is consistent 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 the results in a reasonably clear manner for the public and decision makers. Members of the ATR team will be from outside the home district. The ATR lead will be from outside the home MSC. The leader

of the ATR team will participate in milestone conferences and the Civil Works Review Board (CWRB) to address review concerns. The lead PCX for this study is the Water Management and Reallocation Studies PCX located at Southwestern Division.

(1) Products for Review. The products for review will be the FSM package and supporting documentation, the preliminary draft report (AFB package) and supporting documents, the draft final report and supporting documents, and the final report. The study will not include in-kind services.

(2). Required ATR Team Expertise.

- **Formulation:** The team member will be the Review team lead and will be from a district outside of Southwestern Division. The team lead should be an expert in formulation for large scale studies dealing with water supply and water quality. The team lead must be familiar with current guidance and procedures for General Investigations and General Reevaluation studies.
- **Hydrology and Hydraulics:** The team member must be an expert in hydrology and hydraulics and must have knowledge and experience in contaminant transport in river systems. The team member should have a thorough knowledge of frequency analysis of water quality and flow data. The team member must have experience in evaluation of methods employed to determine project impacts on flow and water quality.
- **Economics:** The team member must be an expert in benefit analysis in all four accounts (NED, RED, EQ, and OSE) for Corps Civil Works projects and knowledgeable of applicable guidance. Must be an expert with methods for determining economic benefits from improvements to water quality for agricultural, municipal, and industrial uses, as well as recreation economics. Must be an expert in the use of economic models including, Generalized Algebraic Modeling system (GAMS), Environmental Policy Integrated Climate (EPIC) model, SWAT with chloride adjustments, Impact Analysis for Planning (IMPLAN) model, and IWR-PLAN.
- **NEPA:** The team member will be a subject matter expert on application and documentation of the NEPA process. Must be experienced in public involvement for controversial studies. Must have knowledge of social effects of civil works projects.
- **Biology:** The team members will be subject matter experts related to the NEPA process and documenting environmental impacts. Team members must be experts in the field of fisheries biology, water quality, limnology, selenium fate and transport, selenium bioaccumulation, *Prymnesium parvum* impacts to aquatic communities, and environmental/ecological modeling. The team member must have a thorough understanding of water quality impacts on stream and reservoir aquatic communities as well as water quality impacts to terrestrial communities. Must be knowledgeable in the use of various habitat analyses and computer models including CASM, HEP, and IWR-PLAN.
- **Civil/Structural Design:** The team member must be an expert in civil engineering and familiar with all Corps of Engineers guidance on the design of civil works projects. Must have knowledge of design of detention systems, subsurface water collection and diversion.
- **Geotechnical Engineering:** The team member will be experienced in subsurface cut off walls and construction of detention systems.

- Real Estate: Team member will be experienced in Federal civil works real estate laws, policies and guidance.
- Cost Engineering: Team member will be from the Walla Walla District DX for cost engineering and knowledgeable of civil works construction methods and cost estimating software.

(3). 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 been 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, commenters 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 coordination, and lastly the agreed upon resolution. The ATR team will prepare a Review Report which includes a summary of each unresolved issue; each unresolved issue will be raised to the vertical team for resolution. Review Reports will be considered an integral part of the ATR documentation 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.

ATR may be certified when all ATR concerns are either resolved or referred to HQUSACE for resolution and the ATR documentation is complete. Certification of ATR should be completed, based on work reviewed to date, for the FSM, AFB, draft report, and final report. A sample certification is included in ER 1110-2-12.

C. Independent External Peer Review (IEPR)

Type I IEPR is conducted for decision documents if there is a vertical team decision (involving the district, MSC, PCX, and HQUSACE members) that the covered subject matter meets certain

criteria (described in EC 1165-2-209) where the risk and magnitude of the proposed project are such that a critical examination by a qualified team outside the USACE is warranted. Type II IEPR is conducted during design and construction phases on those project which meet the criteria set forth in EC 1165-2-209. Type I IEPR is coordinated by the appropriate PCX and managed by an Eligible Outside Organization (OEO) external to the USACE. The panels shall evaluate whether the interpretations of analysis and conclusions based on analysis are reasonable. To provide effective review, in terms of both usefulness of results and credibility, the review panels should be given the flexibility to bring important issues to the attention of decision makers; however, review panels should be instructed to not make a recommendation on whether a particular alternative should be implemented, as the Chief of Engineers is ultimately responsible for the final decision on a study. Type I IEPR panels will accomplish a concurrent review that covers the entire decision document and will address all the underlying engineering, economics, and environmental work, not just one aspect of the study. Whenever feasible and appropriate, the office producing the document shall make the draft decision document available to the public for comment at the same time it is submitted for review (or during the review process) and sponsor a public meeting where oral presentations on scientific issues can be made to the reviewers by interested members of the public. An IEPR panel or OEO representative will participate in the CWRB.

(1) Decision on Type I IEPR. As described in section 4B, this study meets several of the criteria from EC 1165-2-209 which would require Type I IEPR. The construction cost is estimated to exceed \$45 million. An Environmental Impact Statement will be prepared to document the NEPA process. The study is expected to be controversial and to have the benefits and impacts challenged by others. The project is not expected to require Type II IEPR.

(2) Products for Review. The products for review will be the draft report and supporting documents. The study will not include in-kind services.

As part of the NEPA public involvement process, a draft EIS and a draft GRR will be made available for public comment. The draft GRR and the draft EIS will be posted on the District's website, with a point of contact for comments and questions. The District will hold meetings with stakeholder groups throughout the course of the study.

Significant comments will be provided to ATR Reviewers before the ATR on the draft final GRR. These comments will also be provided to the IEPR team.

(3) Required Type I IEPR Panel Expertise-[2-3 biologists, 2-3 economists, hydraulic engineer]

The IEPR panel should consist of experts in the fields of hydrology and hydraulics, biology, and economics. These are the areas of the study that pose the most possibility for controversy. The other subject matter areas are typical of a large scale civil works study. The panel member will review the draft report and all supporting documentation.

- **Economics:** The team members must be knowledgeable in benefit analysis in all four accounts (NED, RED, EQ, and OSE) for Corps Civil Works projects and knowledgeable of applicable guidance. Must be an expert with methods for determining economic benefits from improvements to water quality for agricultural, municipal, and

industrial uses. Must be an expert in recreation economics. Must be an expert in the use of economic models including, Generalized Algebraic Modeling system (GAMS), Environmental Policy Integrated Climate (EPIC) model, and SWAT with chloride adjustments.

- **Biology:** The team member will be subject matter experts related to the NEPA process and documenting environmental impacts. Team members must be expert in the field of fisheries biology, water quality, limnology, selenium fate and transport, selenium bioaccumulation, *Prymnesium parvum* impacts to aquatic communities, and environmental/ecological modeling. The team must have a thorough understanding of water quality impacts on stream and reservoir aquatic communities as well as water quality impacts to terrestrial communities. Must be knowledgeable in the use of various habitat analyses and computer models including CASM, HEP, and IWR-PLAN.
- **Hydrology and Hydraulics:** The team member must be an expert in hydrology and hydraulics and must have knowledge and experience in contaminant transport in river systems. The team member should have a thorough knowledge of frequency analysis of water quality and flow data. The team member must have experience in evaluation of methods employed to determine project impacts on flow and water quality.

(4). Documentation of Type I IEPR

DrChecks review software will be used to document Type I IEPR comments and aid in the preparation of the Review Report. Comments should address the adequacy and acceptability of the economic, engineering and environmental methods, models, and analyses used. Comments should generally include the same four key parts as described for ATR comments in Section 3. The OEO will be responsible for compiling and entering comments into DrChecks. The IEPR team will prepare a Review Report that will accompany the publication of the final report for the project 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 IEPR panel no later than 60 days following the close of the public comment period for the draft decision document. The report will be considered and documentation prepared on how issues were resolved or will be resolved by the District Commander before the district report is signed. The recommendations and responses will be presented to the CWRB by the District Commander with an IEPR panel or OEO representative participating, preferable in person.

4. MODEL CERTIFICATION AND APPROVAL

The use of certified or approved models for all planning activities is required by EC 1105-2-407. This policy is applicable to all planning models currently in use, models under development and

new models. The appropriate PCX will be responsible for model certification/approval. The goal of certification/approval is to establish that planning products are theoretically sound, compliant with USACE policy, computationally accurate, and based on reasonable assumptions. The use of a certified or approved model does not constitute technical review of the planning product. Independent review of the selection and application of the model and the input data and results is still required through conduct of DQC, ATR, and, if appropriate, IEPR. Independent review is applicable to all models, not just planning models. Both the planning models (including the certification/approval status of each model) and engineering models used in the development of the decision document are described below:

A. Planning Models

Comprehensive Aquatic Ecosystems Model (CASM). This model will be used to assess impacts to the aquatic ecosystem in the study area for different alternatives. Status: not yet approved for use.

Habitat Evaluation Procedure (HEP). This model may be used for assessing terrestrial and riparian habitat and possible impacts from different alternatives. Status: approved for use.

IWR-PLAN. This model will be used in developing the most cost effective mitigation plan. Status: certified.

Soil and Water Assessment Tool (SWAT). This model was developed by the USDA and is widely applied. This model may be used to determine which areas are producing the most effect down stream of the chloride sources. Status: not yet approved for use.

Environmental Policy Integrated Climate Model (EPIC) and Agricultural Policy Extender (APEX). EPIC was developed by the USDA and Texas A&M. It would be used to assess the effects of soil erosion on productivity and water quality. APEX is an extension of EPIC developed by Blacklands Research Center at Texas A&M. APEX is a tool that is capable of simulating a wide array of management practices, cropping systems, and other land use across a broad range of agricultural landscapes. Status: not yet approved for use.

General Algebraic Model System (GAMS). This model is used for determining the maximum net agricultural benefits and costs associated with agricultural use of waters from the study area and their impacts on the Red River System. The GAMS model measures the salinity response. Status: not yet approved for use.

Impact Analysis for Planning (IMPLAN). This model was developed by the Forest Service for community impact analysis. The model is widely used by the NRCS and other Federal agencies. IMPLAN will be used in this study to determine regional economic benefits. Status: approval for use is expected in March 2010.

Recreational Economic Assessment System (REAS). REAS is an extension of IMPLAN, in that it uses multipliers developed by IMPLAN in a simple regression model. It was developed by Dr. Wen-Huei Chang, Steve Jackson of IWR and Daniel Styne, Dennis Propst of Michigan State University to be a more feasible alternative than IMPLAN for modeling how a Corps project would affect the local economy. Status: not yet approved for use.

B. Engineering Models

HYDROLOGY: Due to the unique nature of this project, individual models/routines were developed to simulate the impacts of the project on water quality and flow within the basin. Routines were developed to route daily changes in contaminant load and flow through the basin using average daily data.

5. REVIEW SCHEDULES AND COST

A. ATR Schedule and Cost

FSM Package Submitted for ATR	December 2010
Completion of Interim ATR	March 2011
Draft GRR Submitted for ATR	June 2013
Completion of Interim ATR	August 2013
Draft Final GRR Submitted for ATR	December 2015
Completion of ATR	January 2016
Total ATR Cost	\$150,000

B. Type I IEPR Schedule and Cost

Type I IEPR	January 2016
Response to IEPR Comments	June 2016
Completion of IEPR	October 2016
Cost Estimate for Type I IEPR	\$200,000

C. Model Certification / Approval Schedule and Cost

CASM	Approval for single use	November 2010	\$100,000
SWAT	Approval for single use	November 2010	\$50,000
EPIC	Approval for single use	November 2010	\$75,000
GAMS	Approval for single use	November 2010	\$75,000
REAS	Approval for single use	November 2010	\$75,000

6. PUBLIC PARTICIPATION

A. Opportunities for Public Comment. As part of the NEPA public involvement process, a draft Environmental Impact Statement (DEIS) and a draft reevaluation report will be made available for public comment. The reevaluation report and the DEIS will be posted on the District's website with a point of contact for comments and questions. The District will hold meetings with stakeholder groups throughout the course of the study.

B. Significant Comments Provided to Reviewers. Significant comments will be provided to ATR Reviewers before the ATR on the draft final GRR. These comments will also be provided to the Type I IEPR team.

7. PCX COORDINATION

Review plans for decision documents and supporting analyses outlined in EC 1165-2-209 are coordinated with the appropriate Planning Center(s) of Expertise (PCXs) based on the primary purpose of the basic decision document to be reviewed. The lead PCX for this study is Water

Management and Reallocation Studies. The lead PCX should coordinate with the ECO-PCX due to the large amount of environmental monitoring and modeling that will be done on the study.

8. MSC APPROVAL.

The MSC that oversees the home district is responsible for approving the review plan. Approval authority is provided the MSC Commander. The commander's approval should reflect vertical team input (involving district, MSC, PCX, and HQUSACE members) as to the appropriate scope and level of review for the decision document. Like the PMP, the RP is a living document and may change as the study progresses. Changes to the RP should be approved by following the process used for initially approving the RP. In all cases the MSCs will review the decision on the level of review and any changes made in updates to the project. The approved review plan and the MSC approval memorandum will be posted on the District webpage with links to the MSC, PCX, and HQUSACE sites.

9. REVIEW PLAN POINTS OF CONTACT

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

Tulsa District: Project Manager 918-669-7236

Planning Center of Expertise: Water Management and Reallocation Studies 469-487-7038

Southwestern Division: 469-487-7045

ATTACHMENT 1: TEAM ROSTERS

To protect the privacy of the team members, Attachment 1 is not included for public posting of the review plan.

ATTACHMENT 2: DQC and ATR CERTIFICATION TEMPLATES

CERTIFICATION OF DISTRICT QUALITY CONTROL

The Tulsa District has completed the District Quality Control (DQC) review of the [insert review product] for the Red River Chloride Control Project, Elm Fork, Area VI, Oklahoma, General Reevaluation Report.

Notice is hereby given that an quality control review has been conducted that is appropriate to the level of risk and complexity inherent in the project, as defined in the Project Management Plan and the Southwestern Division Quality Control Plan. During the review, compliance with established policy, principles and procedures, utilizing justified and valid assumptions were verified. This included review of assumptions; methods and procedures; alternatives evaluated; the appropriateness of data used and level of data obtained; and reasonableness of the results; including whether the product meets the customer's needs consistent with law and existing Corps policy. The review was accomplished by senior district personnel with experience in civil works projects.

REVIEWER NAME--FORMULATION

Signature / Job Title of DQC Reviewer	Date
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REVIEWER NAME--ECONOMICS AND SOCIAL ANALYSIS

Signature / Job Title of DQC Reviewer	Date
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REVIEWER NAME—Hydrology & Hydraulics

Signature / Job Title of DQC Reviewer	Date
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REVIEWER NAME--CIVIL ENGINEERING

Signature / Job Title of DQC Reviewer	Date
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REVIEWER NAME—GEOTECHNICAL ENGINEERING

Signature / Job Title of DQC Reviewer	Date
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REVIEWER NAME--REAL ESTATE

Signature / Chief, Acquisition & Realty Services Branch	Date
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REVIEWER NAME--NEPA DOCUMENTATION

Signature / Job Title of DQC Reviewer	Date
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REVIEWER NAME--BIOLOGY

Signature / Job Title of DQC Reviewer

Date

REVIEWER NAME—OPERATIONS

Signature / Job Title of DQC Reviewer

Date

REVIEWER NAME—CONSTRUCTION

Signature / Job Title of DQC Reviewer

Date

CERTIFICATION OF AGENCY TECHNICAL REVIEW

Agency Technical Review (ATR) of the [insert review product] for the Red River Chloride Control Project, Elm Fork, Area VI, Oklahoma, General Reevaluation Report.

Notice is hereby given that a technical review appropriate to the level of risk and complexity inherent in the project has been completed as defined in the Review Plan contained in the Project Management Plan. The ATR team verified that the study was compliant with established policy, principles, and procedures and that assumptions used were justified and valid. The ATR included review of: assumptions; methods, procedures, and material used in the analyses; alternatives evaluated; appropriateness of data used and detail of data obtained; and reasonableness of the result, including whether the product met the customer's need. The ATR team reviewed the conduct of the study to verify that it was consistent with established laws and existing Corps policy. The review was accomplished by an independent team with all members outside the home district. All comments resulting from the ATR have been resolved. Attached is the Review Report and Dr.Checks report documenting the comments and resolutions.

_____ ATR Team Lead	_____ date
_____ Project Manager	_____ date

All comments and concerns were resolved and documented in the attached report.

_____ Chief, Planning and Environmental Division	_____ date
_____ Chief, Engineering and Construction Division	_____ date

ATTACHMENT 3: ACRONYMS AND ABBREVIATIONS (optional)

<u>Term</u>	<u>Definition</u>	<u>Term</u>	<u>Definition</u>
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
MSC	Major Subordinate Command	O&M	Operation and maintenance
RRCC	Red River Chloride Control	OMB	Office and Management and Budget
DQC	District Quality Control	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
HQUSACE	Headquarters, U.S. Army Corps of Engineers	RRCC	Red River Chloride Control Project
IEPR	Independent External Peer Review	RTS	Regional Technical Specialist
ITR	Independent Technical Review	USACE	U.S. Army Corps of Engineers
		WRDA	Water Resources Development Act