



DEPARTMENT OF THE ARMY  
U.S. ARMY ENGINEER DIVISION, GREAT LAKES AND OHIO RIVER  
CORPS OF ENGINEERS  
550 MAIN STREET  
CINCINNATI, OH 45202-3222

CELRD-PD-G

29 Mar 13

MEMORANDUM FOR Commander, U.S. Army Engineer District, Chicago (C  
), 111 N. Canal, Suite 600, Chicago, IL, 60606-7206

SUBJECT: Operations & Maintenance Review Plan for Lake Michigan Diversion Accounting, IL

1. The attached Review Plan (RP) for Lake Michigan Diversion Accounting was presented to the Great Lakes and Ohio River Division for approval in accordance with EC 1165-2-214 "Civil Works Review" dated 15 December 2012.

2. Beginning with the State of Illinois' reversal of the flow of the Chicago River in 1900, the other Great Lakes states (Indiana, Michigan, Minnesota, New York, Ohio, Pennsylvania and Wisconsin) have been concerned about the diversions of Lake Michigan water out of the basin. Their concern has led to litigation and a series of U.S. Supreme Court Decrees, which have regulated the diversion since 1925. The 1967 Decree, modified in 1980, specifies the allowable diversion at 3,200 cubic feet per second (cfs). The Corps of Engineers, who is responsible for measuring and computing the diversion, reported during recent years that Illinois had not been diverting in excess of the amount provided in the Decree. Measurements are presently taken on the Chicago Sanitary and Ship Canal (CSSC) near Lemont, which is approximately six miles upstream from Romeoville.

In accordance with the U.S. Supreme Court Decree modified in 1980, and WRDA 1986, the Chicago District continues to hold the responsibilities of diversion accounting computations and diversion certification.

3. The following project activities are expected to occur throughout the current FY:

a. Conduct water diversion data collection and flow measurements. Perform accounting activities for 2.1 billion gallons of water diverted into the Illinois Waterway annually.

b. Assembly of a three-member external technical committee selected on the basis of recognized experience and technical expertise in flow measurement or hydrology to review USACE water diversion accounting, analysis and reporting actions.


c. Conduct water management and data collection analysis and reporting required to Satisfy Supreme Court decree ordering USACE to perform accounting activities for 2.1 billion gallons of water diverted into the Illinois Waterway annually.

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4. The RP defines the scope and level of peer review for the activities to be performed for the subject project. The USACE LRD Review Management Organization (RMO) has reviewed the attached RP and concurs that it describes the scope of review for work phases and addresses all appropriate levels of review consistent with the requirements described in EC 1165-2-214.
5. I concur with the recommendations of the RMO and approve the enclosed RP for the Lake Michigan Diversion Accounting project.
6. The District is requested to post the RP to its website. Prior to posting, the names of all individuals identified in the RP and the dollar values of all project costs should be removed.
7. If you have any questions please contact Dr. Hank Jarboe, CELRD-PDP, at (513) 684-6050.

Encl  
Review Plan

  
MARGARET W. BURCHAM  
Brigadier General, USA  
Commanding

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1. **Applicability.** This review plan is based on Engineering Circular 1165-2-214 (Civil Works Review Policy). The purpose of this Review Plan is to define the requirements, procedures, and specific details of how District Quality Control (DQC) will be conducted for all activities associated with the Lake Michigan Diversion Accounting O&M project. The document applies only to Lake Michigan Diversion Accounting O&M products/activities, and does not apply to any decision or implementation documents that may be required resulting from the three-member external technical committee review mandated by the U.S. Supreme Court.
2. **References.**
  - (1) Engineering Circular (EC) 1165-2-214, Civil Works Review Policy, 15 Dec 2012
  - (2) Engineering Circular (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 1105-2-100, Planning Guidance Notebook, Appendix H, Policy Compliance Review and Approval of Decision Documents, Amendment #1, 20 Nov 2007
3. **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 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).
  - a) District Quality Control/Quality Assurance (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 EC 1165-2-214 and the Quality Manual of the District and the home Major Subordinate Command (MSC).
  - b) 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 US Army Corps of Engineers (USACE) guidance, and that the document explains the analyses and results in a reasonably clear manner for

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the public and decision makers. ATR is managed within USACE by a designated Review Management Organization (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.

For decision documents, the leader of the ATR team shall be from outside the home MSC.

- c) 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 is generally for decision documents and Type II is generally for implementation products.
  - i. 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.
  - ii. 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

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adequacy, appropriateness, and acceptability of the design and construction activities in assuring public health safety and welfare.

For decision documents Type II IEPR is not required except where public safety issues are present.

- d) **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.
- e) **Cost Engineering DX Review and Certification.** All **decision documents** shall be coordinated with the Cost Engineering Directory of Expertise (DX), located in the Walla Walla District.
- f) **Model Certification/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). Please refer to paragraph 3.c. above for further explanation of specific IEPR activities and their applicability. 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. The use of engineering models is also subject to DQC, ATR, and IEPR (if required). Please refer to paragraph 3.c. above for further explanation of specific IEPR activities and their applicability.

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For decision documents use of existing certified or approved planning models is encouraged. Where uncertified or unapproved model are used, approval of the model for use will be accomplished through the ATR process. The ATR team will apply the principles of EC 1105-2-412 during the ATR to ensure the model is theoretically and computationally sound, consistent with USACE policies, and adequately documented. If specific uncertified models are identified for repetitive use within a specific district or region, the appropriate PCX, MSC(s), and home District(s) will identify a unified approach to seek certification of these models.

4. **Project History**. Beginning with the State of Illinois' reversal of the flow of the Chicago River in 1900, the other Great Lakes states (Indiana, Michigan, Minnesota, New York, Ohio, Pennsylvania and Wisconsin) have been concerned about the diversions of Lake Michigan water out of the basin. Their concern has led to litigation and a series of U.S. Supreme Court Decrees, which have regulated the diversion since 1925. The 1967 Decree, modified in 1980, specifies the allowable diversion at 3,200 cubic feet per second (cfs). The Corps of Engineers, who is responsible for measuring and computing the diversion, reported during recent years that Illinois had not been diverting in excess of the amount provided in the Decree. Measurements are presently taken on the Chicago Sanitary and Ship Canal (CSSC) near Lemont, which is approximately six miles upstream from Romeoville.

In accordance with the U.S. Supreme Court Decree modified in 1980, and WRDA 1986, the Chicago District continues to hold the responsibilities of diversion accounting computations and diversion certification.

5. **Current FY Activities**. The following activities are expected to occur throughout the current FY. Products associated with the activities are identified in italics.
- A. Conduct water diversion data collection and flow measurements. Perform accounting activities for 2.1 billion gallons of water diverted into the Illinois Waterway annually.
  - B. Assembly of a three-member external technical committee selected on the basis of recognized experience and technical expertise in flow measurement or hydrology to review USACE water diversion accounting, analysis and reporting actions.
  - C. Conduct water management and data collection analysis and reporting required to Satisfy Supreme Court decree ordering USACE to perform accounting activities for 2.1 billion gallons of water diverted into the Illinois Waterway annually.

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6. **Product Review Responsibilities.** At LRC, PDTs are assembled for individual contracted maintenance products for O&M. When these maintenance products are required, LRC conforms to all the District Quality Control/Quality Assurance requirements set forth in EC 1165-2-214, Paragraph 8, and prepares appropriate Quality Control Plans along with any necessary Project Management Plan updates.

7. **Risk Informed Decisions Process Implementation.**

No new decision or implementation documents will be prepared in association with this O&M project. As established by the project review plan process, only decision or implementation documents necessitate the need for Agency Technical Review (ATR). Independent External Peer Review (IEPR) is only performed if ATR is first employed.

In accordance with paragraph 15a of EC1165-2-214, the Chicago District Lake Michigan Diversion Accounting PDT considered the following questions for the three major project activities identified in paragraph 5, documented the answers presented looking to recommend whether ATR and/or IEPR levels of review were required. Paragraph 9 below gives the rationale for the decision reached on each activity.

(1) Does it include any design (structural, mechanical, hydraulic, etc)?

- A: No
- B: No
- C: No

(2) Does it evaluate alternatives?

- A: No
- B: No
- C: No

(3) Does it include a recommendation?

- A: No
- B: Yes
- C: No

(4) Does it have a formal cost estimate?

- A: Nothing aside from associated O&M budgetary work package.
- B: Nothing aside from associated O&M budgetary work package.
- C: Nothing aside from associated O&M budgetary work package.

(5) Does it have or will it require a NEPA document?

- A: No
- B: No
- C: No

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(6) Does it impact a structure or feature of a structure whose performance involves potential life safety risks?

- A: No
- B: No
- C: No

(7) What are the consequences of non-performance?

- A: Violation of US Supreme Court decree ordering USACE to perform the water diversion accounting would result in contempt of the Court.
- B: Violation of US Supreme Court decree ordering USACE to periodically hold external peer review of all diversion accounting would result in Contempt of the Court.
- C: Violation of US Supreme Court decree ordering USACE to report on the water diversion would result in contempt of the Court.

(8) Does it support a significant investment of public monies?

- A: No
- B: No
- C: No

(9) Does it support a budget request?

- A: Product is an O&M budget work package request in the Navigation BL.
- B: Product is an O&M budget work package request in the Navigation BL.
- C: Product is an O&M budget work package request in the Navigation BL.

(10) Does it change the operation of the project?

- A: No
- B: No
- C: No

(11) Does it involve ground disturbances?

- A: No
- B: No
- C: No

(12) Does it affect any special features, such as cultural resources, historic properties, survey markers, etc, that should be protected or avoided?

- A: No
- B: No
- C: No

(13) Does it involve activities that trigger regulatory permitting such as Section 404 or stormwater/NPDES related actions?

- A: No



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B: No  
C: No

(14) Does it involve activities that could potentially generate hazardous wastes and/or disposal of materials such as lead based paints or asbestos?

A: No  
B: No  
C: No

(15) Does it reference use of or reliance on manufacturers' engineers and specifications for items such as prefabricated buildings, playground equipment, etc?

A: No  
B: No  
C: No

(16) Does it reference reliance on local authorities for inspection/certification of utility systems like wastewater, stormwater, electrical, etc?

A: No  
B: No  
C: No

(17) Is there or is there expected to be any controversy surrounding the Federal action associated with the work product?

A: No  
B: No  
C: No

(18) LRD SUPPLEMENT: Is there or is there expected to be any public safety impacts separate from the life-safety considerations evaluated in Question #6 above?

A: No  
B: No  
C: No

(19) LRD SUPPLEMENT: Have there been or are there expected to be any local governmental requests for IEPR associated with project activities?

A: No  
B: That is the purpose of this specific activity, which performs an internal peer review independent of USACE.  
C: No

In summary, all of these activities are other work products that either fall below the threshold of products requiring ATR and IEPR levels of review, or are the execution

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of previously completed products that completed ATR and IEPR review requirements.

**8. DISTRICT QUALITY CONTROL (DQC)**

All major O&M work efforts in the harbor each year will undergo DQC. The product team PDT is responsible for producing quality services and/or products. The technical element formulating the various work products for the fiscal year is the Operations Technical Support Section based largely on an assessment of the projected needs of navigation throughout the project. Needs are further refined by examining condition surveys of channels and navigation structures. The extent of the work to be performed is largely driven by the annual O&M budget allocation to the project. Methodology, concurrence, technical adequacy and product quality are obtained through periodic internal reviews by the product team and technical supervisors. Within the Technical Services Division, section chiefs are largely responsible for product review and will document this internal review through certification of product development checklists. The checklists, to be followed by the product team and certified by the section or branch chiefs, are not attached to this RP. Each PDT member is responsible for following current checklist, and coordinating review of document and checklist with their technical supervisor for signature.

**9. AGENCY TECHNICAL REVIEW (ATR)**

O&M products to undergo ATR or IEPR are determined each fiscal year by the Chief of Operations after assessing the current needs in the project, the available funding and resources, and the responses to the 17 questions in paragraph 7 above.

The following determinations are made as to whether O&M products will require an ATR or IEPR:

A. Conduct water diversion data collection and flow measurements. Perform accounting activities for 2.1 billion gallons of water diverted into the Illinois Waterway annually.

**NEITHER ATR OR IEPR REQUIRED**

**Rationale:** The responses to the above-listed seventeen questions from paragraph 7 do not indicate the need for a more extensive review. This work is performed primarily through Government Orders to USGS. No design documents are being assembled by Chicago District design branch personnel.

B. Assembly of a three-member external technical committee selected on the basis of recognized experience and technical expertise in flow measurement or hydrology to review USACE water diversion accounting, analysis and reporting actions.

**NEITHER ATR OR IEPR REQUIRED**

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The responses to the above-listed seventeen questions from paragraph 7 do not indicate the need for a more extensive review by USACE. This effort will be accomplished via an A/E service contract to provide USACE with external peer review outside of the agency as required by the U.S. Supreme Court decision. No design documents are being assembled by Chicago District design branch personnel.

C. Conduct water management and data collection analysis and reporting required to satisfy U.S. Supreme Court decree ordering USACE to perform accounting activities for 2.1 billion gallons of water diverted into the Illinois Waterway annually.

**NEITHER ATR OR IEPR REQUIRED**

**Rationale:** The responses to the above-listed seventeen questions from paragraph 7 do not indicate the need for a more extensive review. This work is performed primarily through Government Orders to USGS. No design documents are being assembled by Chicago District design branch personnel.

**10. ROSTER PDT Members**

**12. Vertical Team**

The Vertical Team consists of members of the HQUSACE and Great Lakes & Ohio River Division Offices. The Vertical Team plays a key role in facilitating execution of the project in accordance with the PMP. The Vertical Team is responsible for providing the PDT with Issue Resolution support and guidance as required. The Vertical Team will remain engaged seamlessly throughout the project via monthly telecons as required and will attend In Progress Reviews and other key decision briefings as required. The District Liaison [REDACTED], CELRD-PD-R, is the District PM's primary Point of

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Contact on the Vertical Team. MSC Vertical Team Members will include the MSC Dam Safety Officer and the Flood Risk Management Business Line Manager